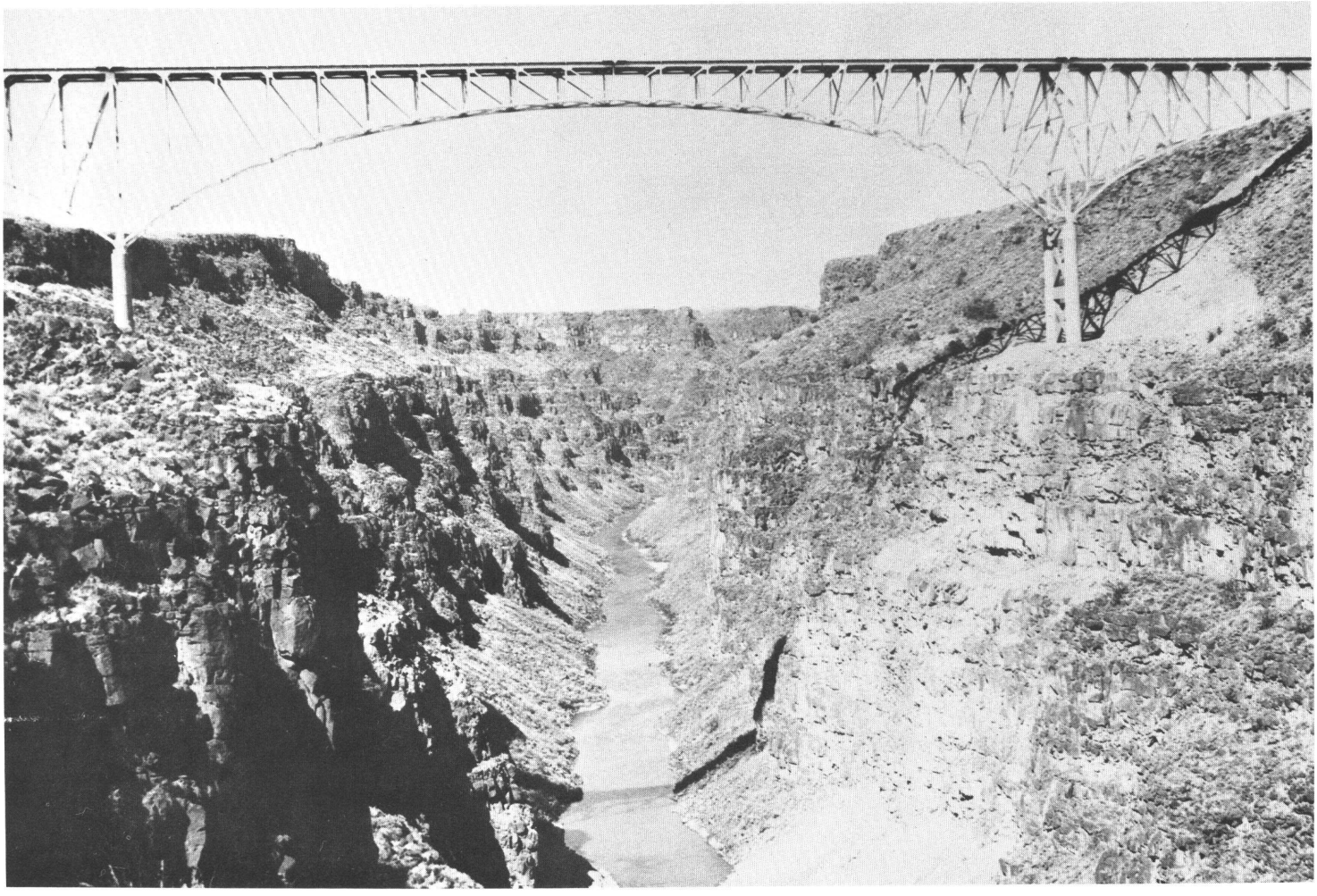
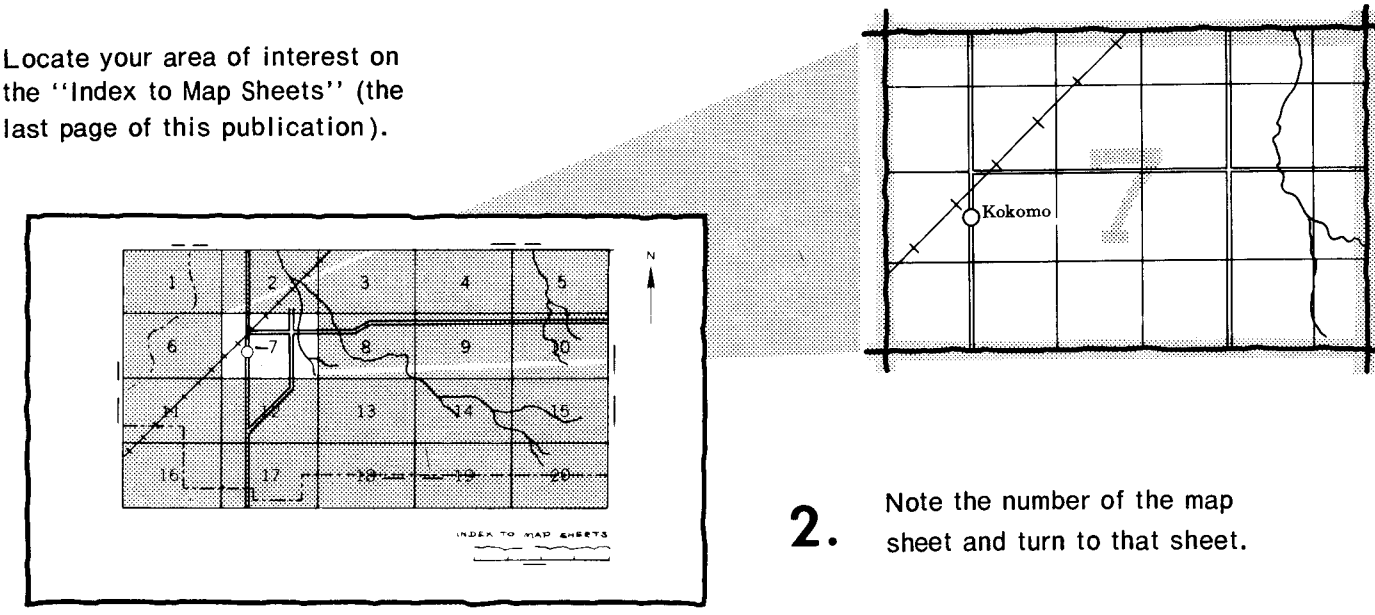
Soil Survey of Taos County
and parts of
Rio Arriba and Mora Counties
New Mexico



United States Department of Agriculture
Soil Conservation Service and Forest Service and
United States Department of the Interior
Bureau of Indian Affairs and
Bureau of Land Management
in cooperation with the
New Mexico Agricultural Experiment Station

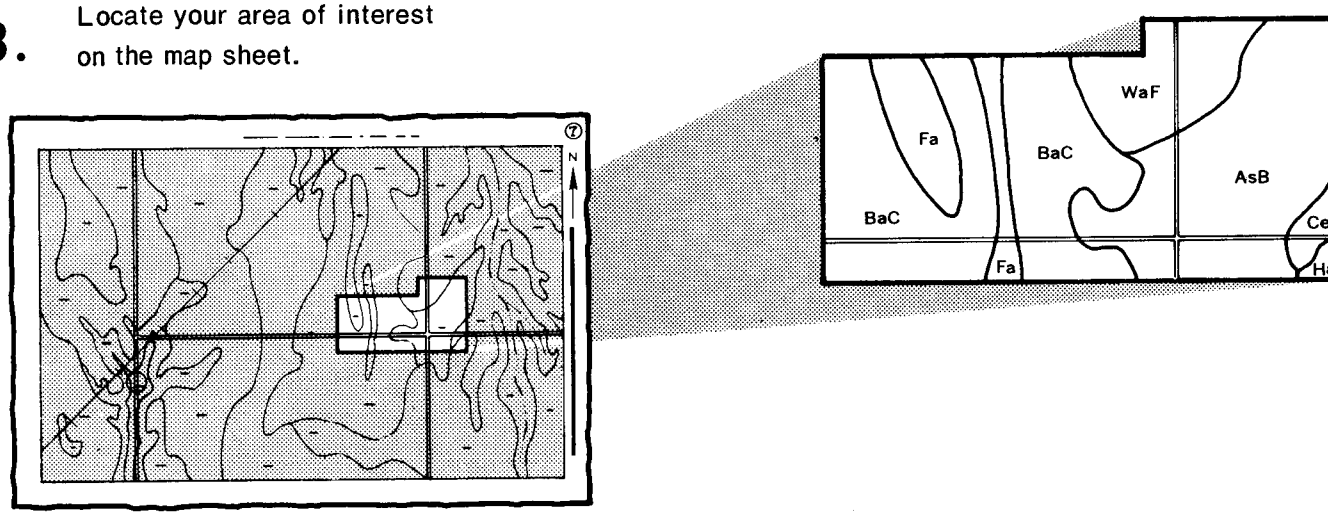
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

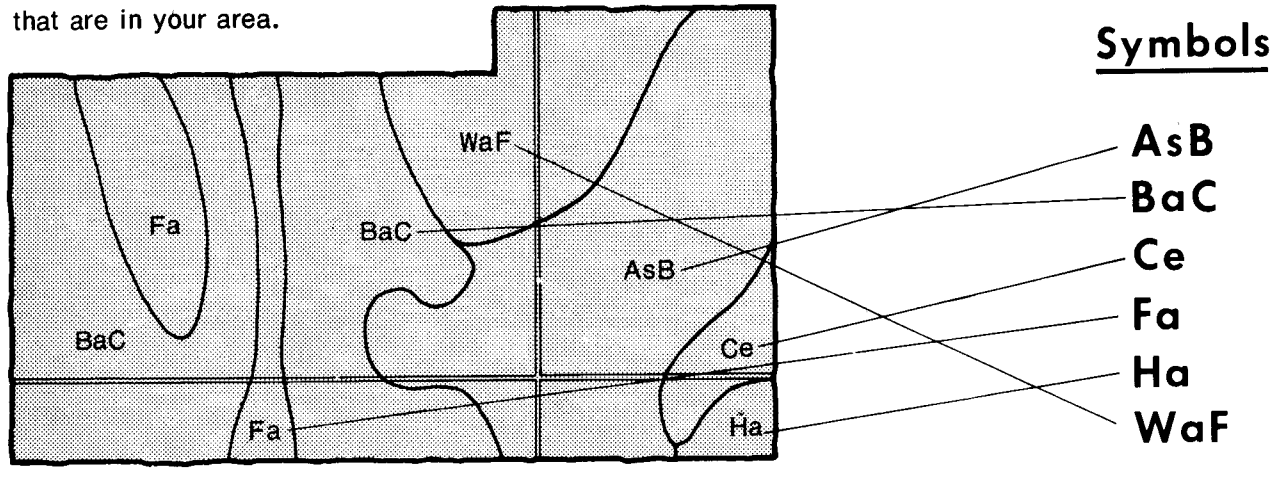


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

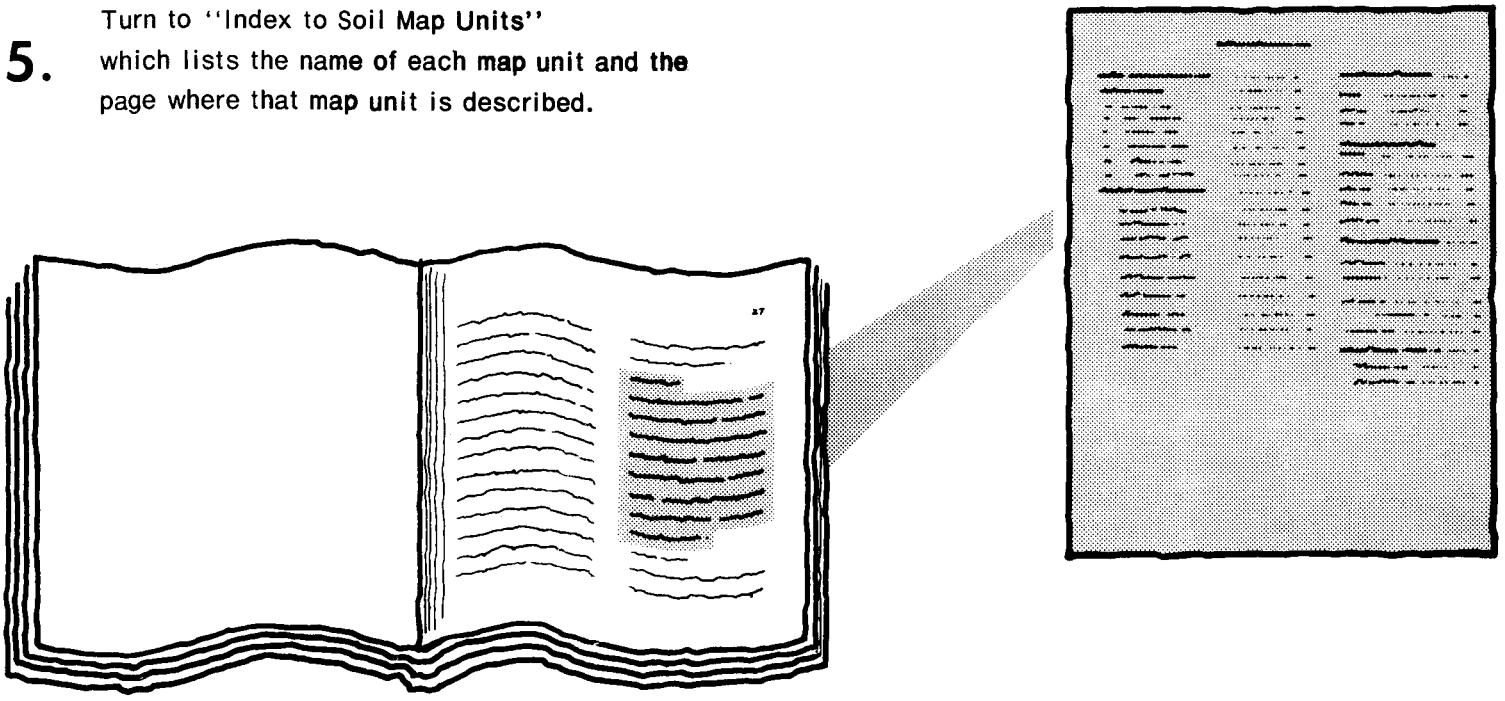


4. List the map unit symbols that are in your area.

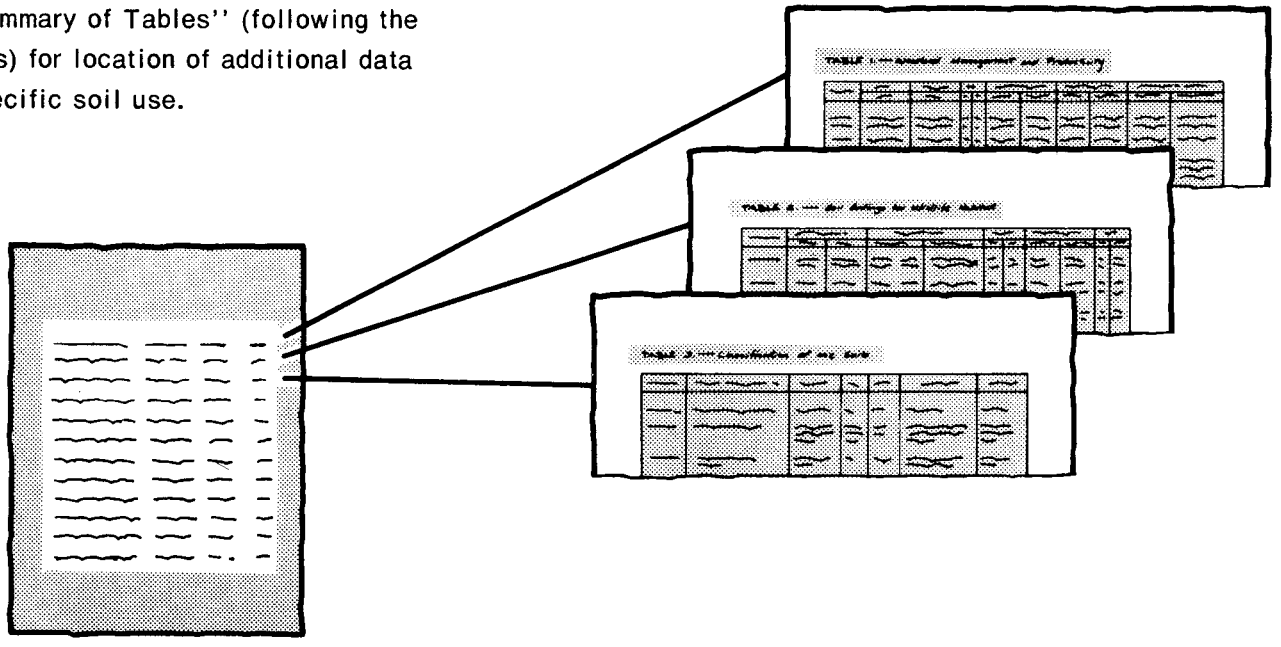


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1963-1975. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the Forest Service, United States Department of Agriculture; the Bureau of Indian Affairs and the Bureau of Land Management, United States Department of the Interior; and the New Mexico Agricultural Experiment Station. It is part of the technical assistance furnished to the Taos and East Arriba Natural Resource Conservation Districts, the Carson National Forest, and the Taos and Ricures Pueblos.

Cover: The Rio Grande in an area of Rock outcrop, very steep. The change in elevation is approximately 540 feet.

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soil series

Issued April 1982

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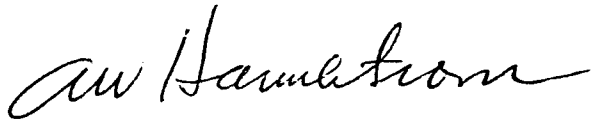
foreword

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

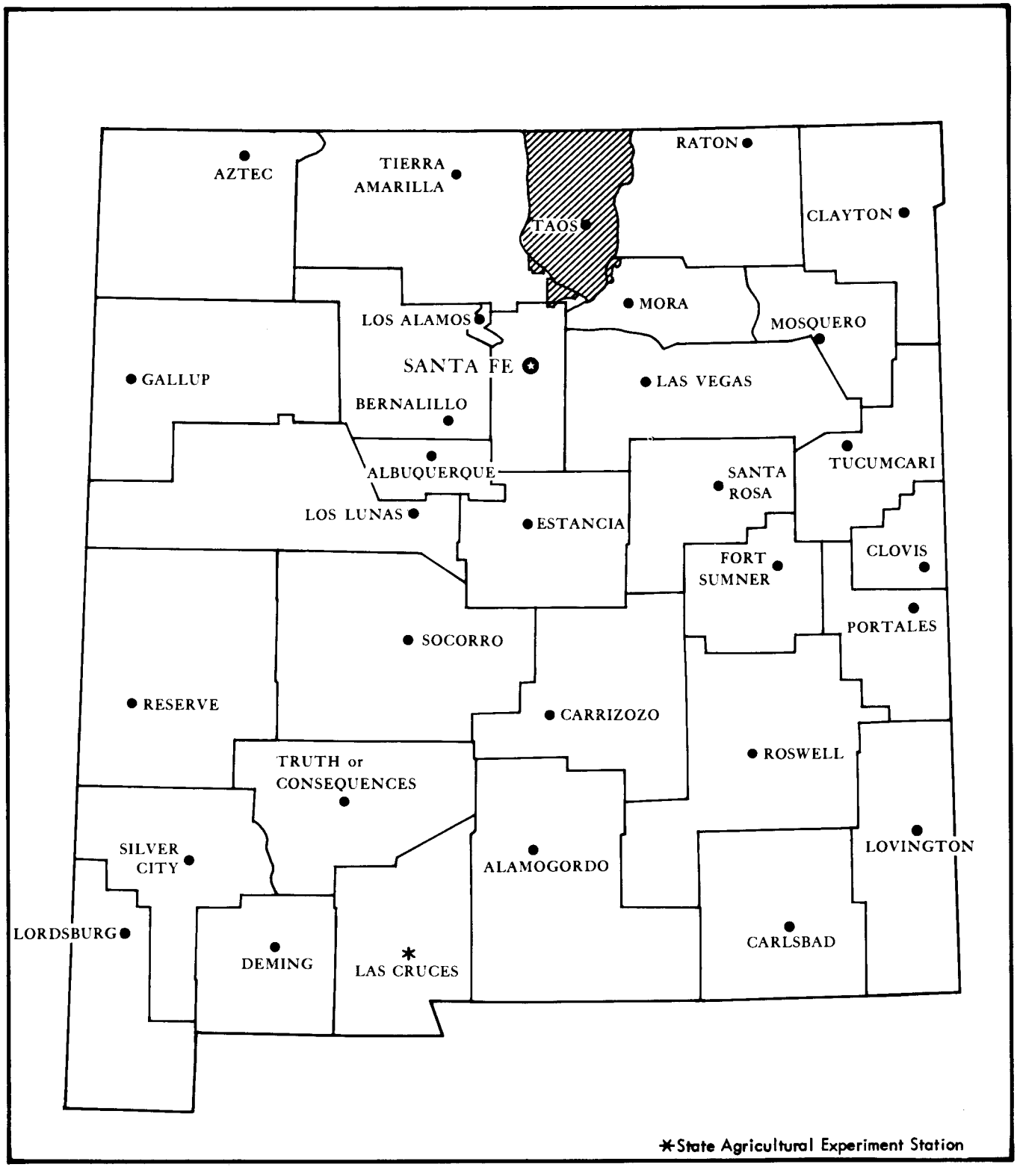
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use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

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for 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 Soil Conservation Service or the Cooperative Extension Service.



A. W. Hamelstrom
State Conservationist
Soil Conservation Service



Location of Taos County and parts of Rio Arriba and Mora Counties, New Mexico.

SOIL SURVEY OF TAOS COUNTY AND PARTS OF RIO ARRIBA AND MORA COUNTIES, NEW MEXICO

By Leroy W. Hacker, Soil Conservation Service, and Joseph Owen Carleton, Forest Service

Soils surveyed by Raymond E. Neher, Harold B. Maxwell, William A. Buchanan, James J. Folks, Charles R. Neal, and Donald R. King, Soil Conservation Service
Joseph Owen Carleton, Kenneth L. Dalrymple, and Paul Winkelaars, Forest Service
Edward Bookless and Elmer J. Kingsolver, Bureau of Indian Affairs

Assisting in the fieldwork were Thomas E. Calhoun, Soil Conservation Service
Jerry M. Biglam and Jerry D. Williamson, Forest Service

United States Department of Agriculture, Soil Conservation Service and Forest Service, and
United States Department of the Interior, Bureau of Indian Affairs and Bureau of Land Management, in cooperation with the
New Mexico Agricultural Experiment Station

This survey area is in the north-central part of New Mexico. It includes Taos County and parts of Rio Arriba and Mora Counties. The size of the area is about 2,432 square miles, or 1,556,613 acres.

Taos, the county seat of Taos County, is on U.S. Highway 64 and New Mexico State Highway 3.

The climate of the area, not including high mountain regions, is semiarid continental. The summers are cool and pleasant, and the winters are crisp, clear, and sunny. The wind velocity is low, precipitation is light, and humidity is low.

Irrigated cropland, rangeland, and forest land are dominant in the survey area. The irrigated farms are on flood plains, terraces, and alluvial fans along streams that begin in the Sangre de Cristo Mountains. These streams are the source of irrigation water. Other irrigated cropland is in an area between the foothills of the Sangre de Cristo Mountains and Ute Mountain in the northern part of the area. The main crops are small grains, alfalfa, and irrigated pasture.

Range, throughout the area, is used mainly for grazing beef cattle and sheep.

The Forest Service, United States Department of Agriculture, administers 537,260 acres of federally owned forest land. This acreage is along the eastern and southwestern parts of the survey area.

Most of the survey area is drained by the Rio Grande. A small section in the southwestern part is drained by the Rio Ojo Caliente and by Moreno Creek.

The Rio Grande Gorge extends along the entire length of Taos County.

general nature of the survey area

This section gives general information about the climate; water for irrigation; physiography, relief, and drainage; and history and development of the survey area.

climate

Frank E. Houghton, state climatologist for New Mexico, Department of Commerce, Environmental Science Services Administration, Environmental Data Service, prepared this section.

The Taos area is in the northern-mountain climatological division of New Mexico.

Temperatures in the Taos area vary greatly because of the great differences in elevation. Near Ojo Caliente, the average annual temperature is 50 degrees, decreasing to 44 degrees toward the northern end of the Rio Grande Valley and more rapidly to 39 degrees in the mountains, for example, in the mountain valley of the Red River at

an elevation of about 9,000 feet. Similarly, the average daily maximum temperature ranges from 66 degrees at Ojo Caliente to 56 at Red River, and the average daily minimum temperature ranges from 32 degrees at Ojo Caliente to 23 degrees at Red River. The diurnal range of temperature averages 30 degrees. The wide range of temperature is characteristic of a continental, dry climate.

Summer temperatures are mild, averaging from 80 degrees in the day to 45 at night. Winter temperatures are cold. The daytime average is 40 degrees, and the minimum is about 10 degrees. The highest temperature recorded in Taos County is 101 degrees at Taos in July 1894, but temperatures of 100 degrees or more are rare. Temperatures of 90 degrees or higher occur on an average of 21 days a year at Taos, and temperatures of zero or below occur on an average of 11 days per year, mostly in December through February. Temperatures reached 35 degrees below zero at Tres Piedras on February 19, 1933, and at Red River on February 12, 1948. Temperatures in the upper valley are given in table 1. The data were recorded at Cerro. Similar temperature patterns, allowing for elevation effects, can be expected at other places in the county.

Figure 1 shows the probability that selected temperature thresholds will occur in spring and fall. The 50 percent probability is that of the average date of occurrence. At Taos, the period between the average dates of the last temperature of 32 degrees or lower in spring and the earliest in fall is 131 days. At Cerro, the average difference is 123 days, or 1 week less than at Taos. This difference is mainly due to the fact that the last temperature of 32 degrees or lower in spring occurs later at Cerro than at Taos.

Table 1 shows the seasonal pattern of precipitation in Taos County. The data were recorded at Cerro. Precipitation is lightest in winter; the average is a little more than one-half inch a month. The monthly average for the remainder of the year is 1 inch a month in spring and fall and nearly 2 inches in August. The heavier precipitation is caused mostly by thunderstorms, which occur on an average of 63 days a year. Two-thirds of these storms are in summer. Thunderstorms rarely occur in winter. In a period of 24 hours, precipitation generally is less than 3 inches; however, there are two exceptions on record. At Virsylvia, northwest of Cerro, 7.5 inches of precipitation was recorded in 24 hours on August 17, 1922, and at San Cristobal, 4.06 inches was recorded in 39 hours on May 19, 1965.

Only three heavy hailstorms have been recorded in 14 years of record. One of these storms caused damage to property and crops.

The average annual precipitation along the Rio Grande Valley in Taos County ranges from nearly 9 inches in the south to 14 inches at the higher elevations in the north. Annual precipitation increases to 15 inches in the west-central part and from 15 to 19 inches along the western slopes of the Sangre de Cristo Mountains. Annual averages of 34 inches or more occur in the higher mountains.

This mountainous area has a wide range in precipitation from month to month and from year to year. In 1914, for example, the total annual precipitation at Red River was 28.13 inches, and in 1956, the total precipitation at Tres Piedras was only 6.12 inches. The highest monthly total recorded in Taos County was 8.16 inches in August 1922, at Cerro. In some months there is no precipitation. The average number of days each year that have 0.10 inch or more precipitation ranges from 28 at Ojo Caliente to 51 at Red River. The average number of days each year that have precipitation of 0.50 inch or more ranges from 3 in the south to 8 at Red River.

Average annual snowfall ranges from 20 inches in the southwest to 55 inches on the mesas. It increases in the mountains to 100 inches or more. Some of the heaviest snowfalls in the state have occurred in this mountainous area. A record monthly total of 88 inches was recorded at Ancho Mine in January 1915, and the highest seasonal total, 428 inches, also was recorded at Ancho Mine in 1914-15. On the mesas, snow can fall from November through March.

Southeasterly winds prevail, but a secondary peak of northeasterly winds occurs in September and in winter. Local topography influences the wind. For example, in a generally east-west mountain valley at Red River, prevailing winds are easterly in May through September because of valley-heating effects, and they are northerly in other months due to drainage of cold air from the mountain slopes.

Generally, the Sangre de Cristo Mountains in the east prevent extremely cold polar air from entering the county.

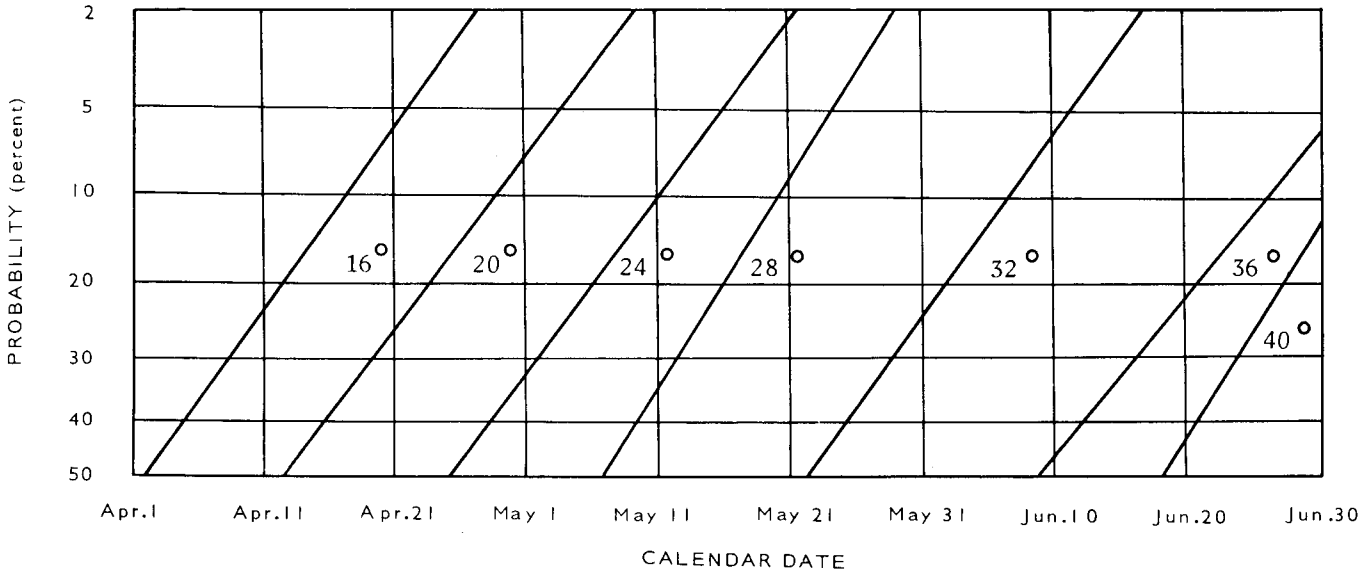
On the average, 211 days a year are expected to be clear (less than four-tenths of the sky covered by clouds) and about 47 days are expected to be cloudy (more than seven-tenths of the sky covered by clouds).

No tornadoes have been reported in Taos County.

Relative humidity, although not measured at specific locations in Taos County, can be estimated from humidity observations at points in surrounding areas and from average temperatures recorded in the county. The average annual relative humidity is almost 65 percent. The average humidity in winter is 70 percent, and the average humidity in spring is 60 percent. The average humidity is lower in the warmer valleys and higher in the cooler mountains.

Nearly 70 percent, or about 3,000 hours a year, of the possible hours of sunshine can be expected in this survey area. Sunshine occurs about 60 percent of the possible time in winter, and about 80 percent of the possible time in June.

Class A evaporation-pan measurements can be expected to show near 65 to 70 inches of moisture evaporation a year, increasing southward. About 72 percent of this evaporation (47 to 50 inches) occurs from May through October.



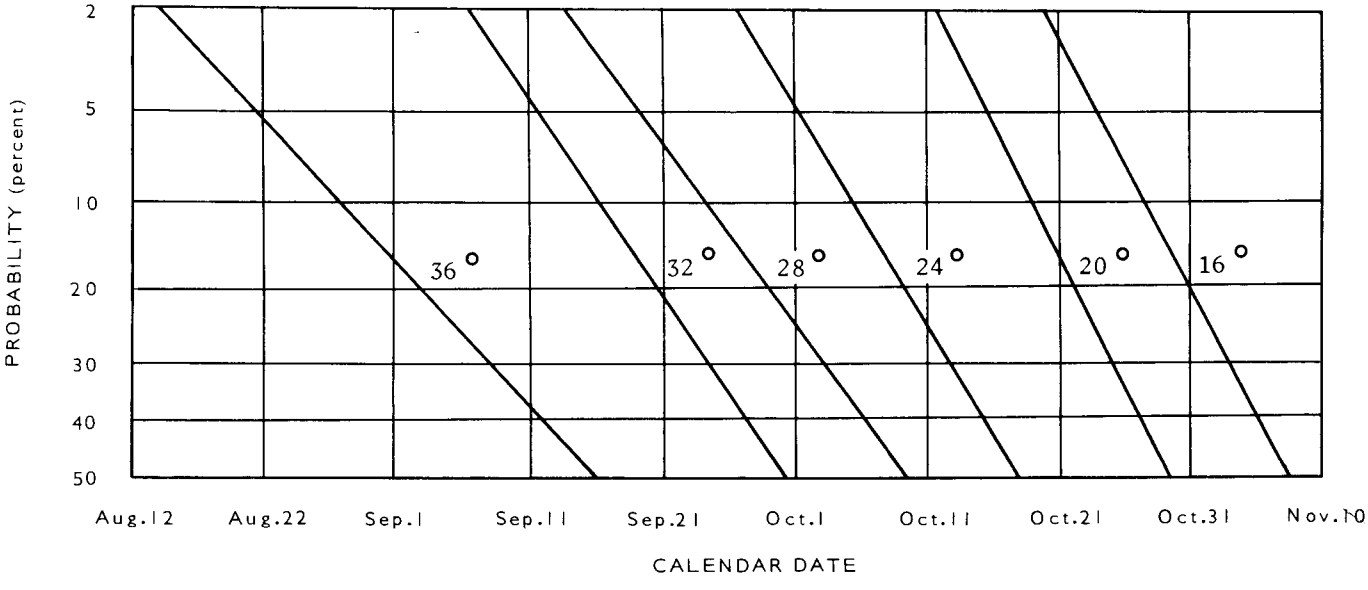


Figure 1.—Probability of selected temperatures in spring and fall.

water for irrigation

Surface water diverted from streams and springs is the main source of irrigation water. Water pumped from wells is used for irrigation in a small area east of Ute Mountain.

Surface irrigation systems are used on about 40,000 acres on bottoms and terraces along streams on the western side of the Sangre de Cristo Mountains. Most of these streams run intermittently, and thus they are unreliable as an irrigation-water supply. Generally, snowmelt in spring and thunderstorms in July and August provide an adequate supply of water. The water quality is satisfactory for most uses.

physiography, relief, and drainage

Clarence L. Haverland, geologist, Soil Conservation Service, prepared this section.

The survey area lies within the Southern Rocky Mountain Physiographic Province. The area is divided into three broad geomorphic units consisting of (1) the Sangre de Cristo Mountains on the east, (2) the westward sloping alluvial piedmont plains and fans from the mountains, generally in the middle of the area, and (3) the basalt areas, generally on the western side of the Rio Grande Gorge. Some basalt areas such as Ute Mountain and other igneous peaks and flows are on the eastern side of the Rio Grande. A separate small breaks area of approximately 50 square miles is in the southwestern part of the Taos area near Ojo Caliente.

Elevation in the mountains ranges from 13,151 feet on Wheeler Peak to about 7,800 feet at the base of the mountains where the alluvial fans begin. Drainage patterns are well defined. Approximately 20 square miles in the southeastern part of the mountain area is drained by the Mora River. Drainage generally is westward, through the dissected alluvial plains into the Rio Grande. Mountain slopes are generally steep. The extent of erosion on these slopes depends on the amount of precipitation, vegetative cover, and bedrock outcrops.

West of the mountains and abutting them are the piedmont alluvial plains and fans. The slopes generally are steep at the mountain fronts and gradually lessen westward toward the Rio Grande Gorge. Drainage on the plains and fans generally is well defined, especially in the area of major streams. There are five main geomorphic surfaces in the plains and fans area:

1. A topographically high alluvial plain of about 60 square miles extends north from Rio Hondo to the village of Questa. Another plain of about 30 square miles is southeast of the village of Costilla. Generally, in these areas, a cap of basalt is on the surface.
2. A second surface is located south of Costilla and east of New Mexico State Highway 3. It covers only about 1 square mile but is significant because it shows that the Rio Grande at some time meandered through the area and cut an erosion scarp. At present, the Rio Grande is entrenched in a deep gorge approximately 10 miles west of the scarp.
3. A third geomorphic surface consists of the alluvial plains near Taos and in the area north of Questa. Deposition there probably occurred later than in areas of the first two surfaces.
4. The fourth surface consists of old lake bottoms. The largest area, which covers about 20 square miles, is near Sunshine Valley. A smaller area covering about 4 square miles is located about 2 miles north of Amalia. This area probably is similar in age to the Sunshine Valley area.
5. The fifth surface consists of the more level parts of alluvial plains and old lake bottoms. Slopes are mostly gentle, and very little erosion has occurred.

The area west of the Rio Grande Gorge is underlain by a very thick sequence of basalt flows. This area dips gently toward the east. The drainage pattern is very poorly defined, and the soils generally are shallow. Slopes range from very steep on the volcanic plugs and cones to gentle on the flats. Elevation ranges from 10,100 feet to 7,800 feet on the cones and plugs and from 7,800 to 6,800 feet on the flow surfaces.

Along the southern edge of the basalt flows is an area known as the "breaks", which has badland-type topography and active geologic erosion. Slopes are steep and, in places, vertical. This area is drained by the Ojo Caliente River. Elevation ranges from 7,400 feet at the edge of the basalt flows to 6,400 feet in the bed of the river.

history and development

Taken from *A Brief History of Taos, New Mexico*, by Jack Boyer, director, Kit Carson Memorial Foundation.

The first permanent dwellers in the Taos area were the Pit House People, who came into the area about 900 A.D. and lived in round pits in the ground. These people were hunters and farmers. They grew beans, corn, and squash. By 1200 A.D., these Indians were living in small pueblos, probably because of raids by other Indians. Large pueblos, such as the present Taos Pueblo, were developed as fortress-type structures.

In 1540, Coronado encountered a group of Plains Indians in the Texas Panhandle who had just come from a trading trip to Taos. This is the first written record of the early Indian trade at Taos. In September 1598, Fray Zamora and two other men were assigned to the Taos Pueblo by Don Juan de Onate, the first colonizer of New Mexico. By 1615, a number of Spanish families were farming and raising livestock in the Taos, Trampas, and Penasco Valleys. The population of the area increased rapidly, spreading to the surrounding mountain valleys in what is now Taos County. Community ditch systems were built to convey irrigation water to cropland and pastureland.

In 1970, according to the U.S. Census of that year, the Taos Area had a population of about 17,500, or about 7.8 persons per square mile.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, rangeland and woodland managers, engineers, planners, developers and builders, home buyers, and others.

soil survey intensities

The soils in the Taos area were mapped at two levels of intensity, which were designed to meet the expected uses of the soils. The irrigated cropland and the area in and near Taos and other communities were mapped at a high degree of detail. The soils in these areas make up the narrowly defined map units in this survey. Those map units named as a phase of a soil series or as a complex generally are narrowly defined.

The rest of the Taos area, where the soils are used as rangeland and woodland and for recreation uses and wildlife habitat, was mapped at a lesser degree of detail. These soils make up the broadly defined map units in this survey, which generally are less homogeneous than the narrowly defined units. Those map units named as associations and miscellaneous areas generally are broadly defined.

The map unit symbol identifies the level of intensity at which the soils were mapped. In all map unit symbols, the first letter is a capital. If the map unit is narrowly defined, the second letter is lowercased; and if the map unit is broadly defined, the second letter is capitalized. The third letter in the map unit symbol identifies the slope of the soil or soils making up the map unit. If the letters in the map unit symbol are followed by the number 2, the soil or soils are eroded.

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, a map unit 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 other units 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 map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

soil descriptions

Deep soils on alluvial fans, on dunes and terraces, and in valleys

The soils in this group are east and west of the Rio Grande. These soils formed mainly in alluvium. The native vegetation is mostly short and mid grasses, shrubs, and scattered trees. The elevation ranges from 6,400 to 8,000 feet.

1. Fernando-Tenorio-Silva

Deep, well drained, level to strongly sloping soils; on alluvial fans and valley side slopes

This map unit is on alluvial fans and valley side slopes mainly west of the base of the Sangre de Cristo Mountains to the Rio Grande Gorge. The soils formed in mixed alluvium. Slopes range from 0 to 10 percent.

The elevation ranges from 6,500 to 8,000 feet. The mean annual precipitation is 12 to 13 inches, and the mean annual temperature is 48 degrees to 49 degrees F. The frost-free season is 120 to 135 days.

This map unit makes up about 12 percent of the survey area. Fernando soils make up about 45 percent of the unit, Tenorio soils 25 percent, and Silva soils 20 percent. Sedillo, Hernandez, and Manzano soils and Orthents make up the rest.

The Fernando soils are on alluvial fans near the base of the mountains. The surface layer is light brown silt loam, and the subsoil is brown, light brown, and light reddish brown clay loam. The substratum is pink clay loam and loam.

The Tenorio soils are on valley sides. The surface layer is brown loam, and the subsoil is dark brown loam. The substratum is yellowish brown extremely gravelly sand.

The Silva soils are on broad upland fans and valley sides. The surface layer is brown loam, and the subsoil is brown and light brown clay loam. The substratum is very pale brown clay loam.

The soils in this map unit are used mainly as range. However, they are important in use for cultivated crops. A lack of irrigation water is one of the main limitations to farming.

This map unit has medium potential for improved range. The low precipitation and the short growing season are the main limitations. Shrinking and swelling, low strength, and slow or moderately slow permeability are limitations on the Silva and Fernando soils, but these limitations can be overcome. The potential for residential and other urban uses is medium. Ground water contamination from septic tank filter fields can be a hazard on Tenorio soils.

The potential for habitat for rangeland wildlife is medium.

2. Royosa-Vibo-Montecito

Deep, somewhat excessively drained and well drained, nearly level to moderately steep soils; on uplands, dunes, and alluvial fans

This map unit is on old dunes and alluvial fans in the southwestern part of the survey area. The soils formed in eolian material or in alluvium. Slopes range from 1 to 30 percent.

Elevation ranges from 6,400 to 8,000 feet. The mean annual precipitation is 13 to 14 inches, and the mean annual temperature is 50 degrees to 52 degrees F. The frost-free season is 125 to 135 days.

This map unit makes up about 6 percent of the survey area. Royosa soils make up about 35 percent of the unit, Vibo soils 25 percent, and Montecito soils 10 percent. The remaining 30 percent of the unit consists of Orejas, Hernandez, and Silva soils and Fluvents and Orthents.

The Royosa soils are somewhat excessively drained and are on stabilized dunes. They are brown loamy sand throughout.

The Vibo soils are well drained and are on alluvial fans. The surface layer is brown sandy loam, and the subsoil is brown sandy clay loam. The substratum is light brown sandy loam and brown loamy sand.

The Montecito soils are well drained and are on alluvial fans. The surface layer is light yellowish brown and brown loam, and the subsoil is brown and light brown clay loam and gravelly clay loam. The substratum is white very gravelly sandy loam and light gray extremely gravelly sandy loam.

The soils in this unit are used mainly as grazable woodland, for which they have medium potential. The low precipitation, short growing season, and the hazard of wind erosion are the main limitations.

These soils have medium potential for use as habitat for openland, woodland, and rangeland wildlife.

3. Manzano-Loveland-Caruso

Deep, well drained to poorly drained, level to gently sloping soils; on valley bottoms, terraces, and fans

This map unit is on valley bottoms, terraces, and fans along streams extending west from the Sangre de Cristo Mountains. The soils formed in mixed alluvium. Slopes range from 0 to 5 percent.

Elevation ranges from 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 48 degrees to 49 degrees F. The frost-free season is 125 to 135 days.

This map unit makes up about 2 percent of the survey area. Manzano soils make up about 40 percent of the unit, Loveland soils 15 percent, and Caruso soils 10 percent. The remaining 35 percent of the unit consists of Fernando, Poganeab, and Tenorio soils and Fluvents.

The Manzano soils are well drained and are on valley bottoms and fans along streams. The surface layer is brown clay loam, and the subsoil is dark brown clay loam. The substratum is brown clay loam.

The Loveland soils are poorly drained and are on valley bottoms and terraces near perennial streams. The surface layer is dark grayish brown clay loam and loam. The upper part of the underlying material is dark grayish brown loam, and the lower part is mixed sand, gravel, and cobblestones. These soils have a seasonal water table between depths of 6 and 18 inches.

The Caruso soils are somewhat poorly drained and are on valley bottoms and terraces near perennial streams. The surface layer is grayish brown silty clay loam and clay loam. The upper part of the underlying material is light brownish gray and pale brown clay loam, and the lower part is pale brown stratified clay loam to very fine sandy loam. These soils have a seasonal water table at a depth of 30 inches.

Most of this map unit is used for irrigated hay and as pasture. This unit has high potential for these uses. Limitations are the high water table, the gravelly subsoil, slope, and the hazard of flooding.

The potential for residential and other urban uses is low. Limitations include the hazard of flooding, the high water table, and the low strength of the soils.

The potential of this unit is high for use as habitat for openland wildlife and low to medium for use as habitat for wetland wildlife.

Shallow to deep soils on mesas, cones, hills, and alluvial fans

The soils in this group are mainly west of the Rio Grande. They formed in material that weathered from basalt, in eolian sediment, and in mixed alluvium. The native vegetation is short and mid grasses, shrubs, pinyon pine, and oneseed juniper. The elevation ranges from 6,500 to 10,000 feet.

4. Travelers-Luhon-Stunner

Shallow and deep, well drained, nearly level to moderately sloping soils; on mesas

This map unit is on basalt mesas in the northwestern part of the survey area. The soils formed in material that weathered from basalt, in eolian sediment, and in mixed alluvium. Slopes range from 1 to 8 percent.

The elevation ranges from 7,600 to 8,800 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is about 44 degrees F. The frost-free season is 90 to 110 days.

This unit makes up about 13 percent of the survey area. Travelers soils make up about 35 percent of the unit, Luhon soils 25 percent, and Stunner soils 20 percent. Rock outcrop and Antonito and Shawa soils make up the rest.

The Travelers soils are on old, low basalt flows. The surface layer and subsoil are brown very stony loam. The substratum is pale brown very stony clay. Basalt bedrock is at a depth of 10 to 20 inches.

The Luhon soils formed in sediment on side slopes between basalt flows. The surface layer and the upper part of the underlying material are brown loam. The lower part of the underlying material is pinkish gray clay loam and pinkish white loam and has a high content of lime.

The Stunner soils formed in sediment on the top of basalt mesas. The surface layer is brown cobbly loam, and the subsoil is brown and light brown clay loam. The substratum is pink loam and pinkish white gravelly loam.

This map unit is used mainly as range, for which it has high potential. The main limitations are the depth to basalt, the high lime content, the low precipitation, and the short growing season.

This unit has medium potential for use as habitat for rangeland wildlife.

5. Petaca-Servilleta-Hernandez

Shallow to deep, well drained, level to strongly sloping soils; on mesas and alluvial fans

This map unit is on basalt mesas and alluvial fans in the west-central part of the Taos area. The soils formed in material that weathered from basalt, in eolian sediment, and in mixed alluvium. Slopes range from 0 to 15 percent.

The elevation ranges from 6,500 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is about 49 degrees F. The frost-free season is 125 to 135 days.

This map unit makes up about 6 percent of the survey area. Petaca soils make up about 20 percent of the unit, Servilleta soils 20 percent, and Hernandez soils 15 percent (fig. 2). The remaining 45 percent of the unit consists of Prieta, Fernando, Kim, and Silva soils and Rock outcrop.

The Petaca soils are on low basalt ridges and breaks. The surface layer is brown very stony loam, and the next layer is brown cobbly loam. The underlying material is pale brown cobbly clay loam and very gravelly sandy loam and has a high content of lime. Basalt bedrock is at a depth of 10 to 20 inches.

The Servilleta soils are on broad basalt mesas. The surface layer is brown silty clay loam, and the subsoil is reddish brown and light brown silty clay loam. The substratum is light brown silty clay loam. Basalt bedrock is at a depth of 20 to 40 inches.

The Hernandez soils are on alluvial fans between basalt ridges. The surface layer is brown loam, and the subsoil is pale brown clay loam. The substratum is pink clay loam and has a high content of lime.

This unit is used mainly as range. It has low to medium potential for this use. The main limitations are the depth to basalt, the high lime content, the low precipitation, and the short growing season.

The potential of this unit for use as habitat for rangeland wildlife is medium.

6. Raton-Rock outcrop-Orejas

Shallow, well drained, gently sloping to steep soils, and Rock outcrop; on mesas, cones, and hills

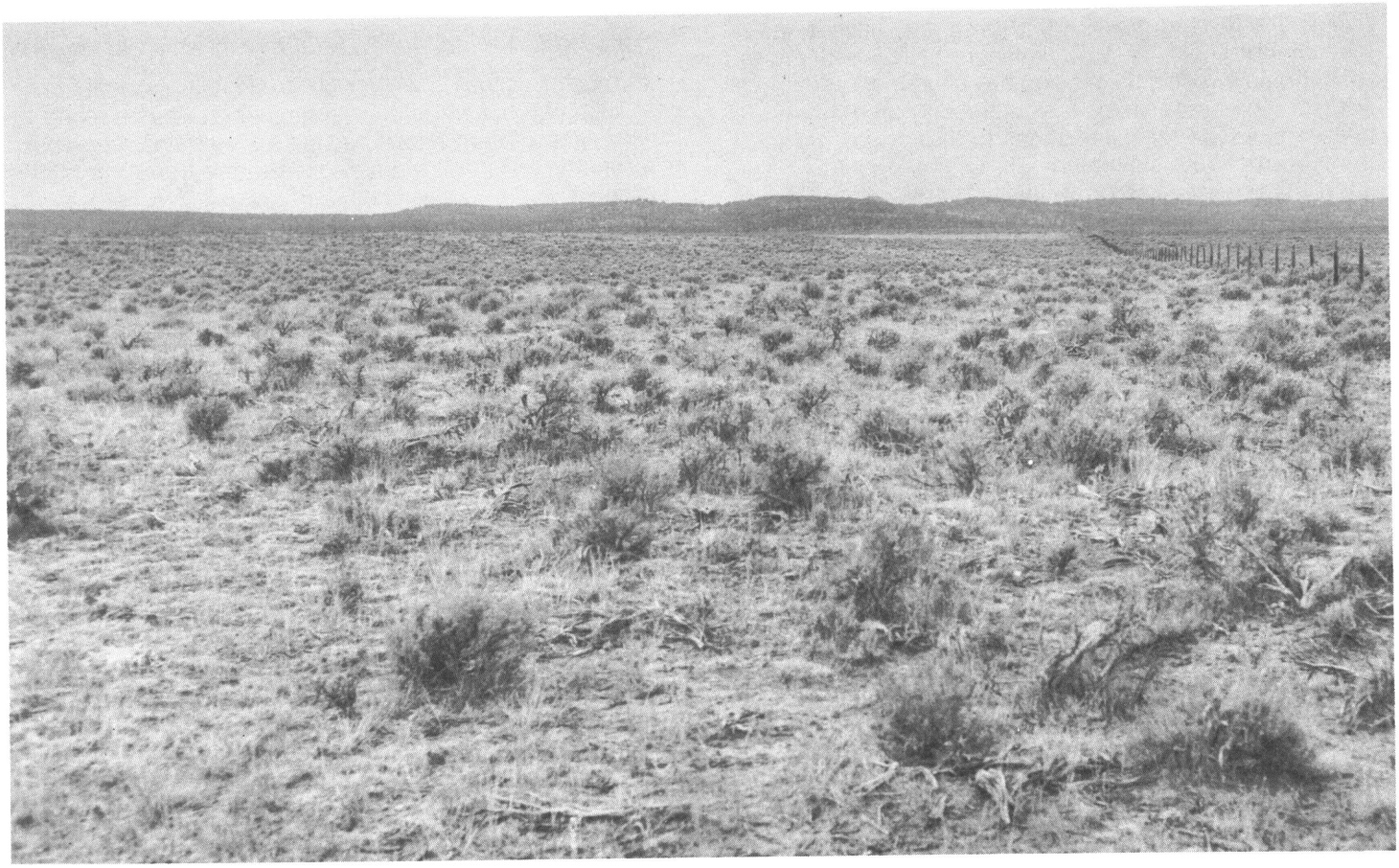


Figure 2.—An area of Servilleta silty clay loam, in the foreground, and Hernandez loam and Petaca stony loam, in the background.

This map unit is on basalt mesas, hills, and volcanic cones in the western part of the survey area. The soils formed in material that weathered from basalt and in eolian sediment. Slopes range from 3 to 40 percent.

The elevation ranges from 7,000 to 10,000 feet. The mean annual precipitation is 14 to 15 inches, and the mean annual temperature is 41 degrees to 52 degrees F. The frost-free season is 80 to 130 days.

This unit makes up about 8 percent of the survey area. Raton soils make up about 25 percent of the unit, Rock outcrop 25 percent, and Orejas soils 10 percent. Montecito, Prieta, Stunner, and Fernando soils make up the rest.

The Raton soils are at the higher elevations on basalt mesas and hills. The surface layer is dark grayish brown very stony silt loam, and the subsoil is dark brown very stony silty clay loam and very stony clay. Basalt bedrock is at a depth of 10 to 20 inches.

Rock outcrop is folded, broken, and barren basalt on cones, hills, and mountains.

The Orejas soils are at the lower elevations on basalt cones and hills. The surface layer is pale brown very stony loam, and the subsoil is light brown cobbly clay loam and pinkish gray very gravelly clay loam. Basalt bedrock is at a depth of 10 to 20 inches.

This unit is used mainly for grazing, for which it has medium potential. The main limitations are the depth to rock, the low precipitation, and the short growing season. The potential for residential and other urban uses is low. The main limitations to these uses are the depth to rock, the slow permeability, the slope, and the shrinking and swelling of the soil.

This map unit has medium potential for use as habitat for woodland and rangeland wildlife.

Moderately deep to deep soils on dissected piedmonts, mountainsides, alluvial fans, and terraces

The soils in this group are on dissected piedmonts, mountainsides, alluvial fans, and terraces. The soils formed in mixed alluvium or in colluvium and residuum. The native vegetation is mid grasses, shrubs, oneseed juniper, pinyon pine, ponderosa pine, Douglas-fir, and white fir. The elevation ranges from 6,800 to 9,800 feet.

7. Orthents-Amalia-Devisadero

Moderately deep and deep, well drained, steep and very steep soils; on piedmonts and mountainsides

This map unit is on piedmonts and mountainsides along the west face of the Sangre de Cristo Mountains. The soils formed in mixed alluvium or in colluvium and residuum.

The elevation ranges from 6,800 to 8,500 feet. The mean annual precipitation is 13 to 16 inches, and the mean annual temperature is 44 degrees to 52 degrees F. The frost-free season is 80 to 140 days.

This map unit makes up about 9 percent of the survey area. Orthents make up about 20 percent of the unit, Amalia soils 15 percent, and Devisadero soils 15 percent. Rock outcrop, Badland, and Chimayo, Montecito, Manzano, Lama, and Orejas soils make up the remaining 50 percent.

Orthents are on dissected piedmonts. They are very gravelly loam or very gravelly clay loam throughout.

The Amalia soils are on piedmonts and mountain side slopes. The surface layer is brown very gravelly loam, and the subsoil is reddish brown and yellowish red very gravelly clay loam. The substratum is pink very gravelly sandy loam.

The Devisadero soils are on mountainsides. The surface layer is brown gravelly loam, and the subsoil is brown very gravelly clay and very gravelly sandy loam. The substratum is light yellowish brown very gravelly sandy loam. Sandstone bedrock is at a depth of 20 to 40 inches.

This unit is used as grazable woodland and for wildlife habitat. The potential for use as range is low. The limitations to this use are slope, the low precipitation, the short growing season, and the hazard of erosion. This unit has medium potential for use as habitat for woodland and rangeland wildlife.

8. Trampas-Ustorthents-Mirand

Deep, well drained, nearly level to very steep soils; on mountainsides, alluvial fans, and terraces

This map unit is on alluvial fans and terraces along the west face of the Sangre de Cristo Mountains. The soils formed in mixed alluvium. Slopes range from 0 to 80 percent.

The elevation ranges from 7,500 to 9,800 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 42 degrees to 45 degrees F. The frost-free season is 80 to 120 days.

This unit makes up about 8 percent of the survey area. Trampas soils make up about 25 percent of the unit, Ustorthents 15 percent, and Mirand soils 10 percent. Diamante, Sabe, and Mirabal soils, Rock outcrop, Cumulic Haplaquolls, Cumulic Haploborolls, and Fluvents make up the rest.

The Trampas soils are on old alluvial fans and plains. The surface layer is grayish brown cobbly sandy loam and light gray gravelly sandy loam. The subsoil is reddish brown extremely gravelly clay and yellowish red extremely cobbly sandy clay loam. The substratum is reddish brown extremely cobbly sandy clay loam.

Ustorthents are on dissected terraces along drainageways. They are gravelly loam to very gravelly clay loam throughout.

The Mirand soils are on the sides of canyons and mountains. The surface layer is grayish brown cobbly loam, and the subsoil is brown, light brown, and yellowish red cobbly clay and clay. The substratum is light brown sandy clay.

This unit is used for timber production, wildlife habitat, and limited grazing. The Mirand and Trampas soils have

medium to high potential for the production of ponderosa pine. They have medium potential for use as habitat for woodland wildlife. Ustorthents have low potential for most uses. The limitations are the steep slopes and the hazard of water erosion.

Deep soils on high mountains

The soils in this group are on mountains. They formed in alluvium, colluvium, and residuum. The native vegetation is mid grasses, shrubs, ponderosa pine, Douglas-fir, white fir, Engelmann spruce, and subalpine fir. The elevation ranges from 8,000 to 13,000 feet.

9. Wellsville-Ess

Deep, well drained, strongly sloping to steep soils; on mountainsides

This map unit is in valleys along Costilla and Comanche Creeks in the northeastern part of the survey area. The soils formed in alluvium and colluvium. Slopes range from 9 to 45 percent.

The elevation ranges from 9,000 to 10,500 feet. The mean annual precipitation is 25 inches, and the mean annual temperature is 38 degrees F. The frost-free season is less than 60 days.

This unit makes up about 2 percent of the survey area. Wellsville soils make up about 35 percent of the unit, and Ess soils make up 25 percent. Cryoborolls, Cryaquolls, and Rock outcrop make up the rest.

The Wellsville soils are strongly sloping to moderately steep and are on mountainsides. The surface layer is dark grayish brown gravelly loam, and the subsoil is dark grayish brown and brown gravelly clay loam and gravelly sandy clay loam. The substratum is light brown very gravelly sandy clay loam.

The Ess soils are moderately steep to steep and are on mountainsides. The surface layer is brown gravelly loam, and the subsoil is brown very gravelly sandy clay loam. The substratum is brown very gravelly sandy loam.

This unit is used mainly as range. It has medium to high potential for this use. The main limitations are climate and slope. The potential of this unit for use as habitat for rangeland wildlife is medium.

10. Rock outcrop-Penitente

Rock outcrop and deep, well drained, moderately sloping to steep soils; on mountaintops

This map unit is on mountaintops above the timber line in the Sangre de Cristo Mountains. The soils formed in colluvium and residuum. Slopes range from 5 to 80 percent.

The elevation ranges from 12,000 to 13,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is about 30 degrees F. The frost-free season is less than 60 days.

This unit makes up about 2 percent of the survey area. Rock outcrop makes up about 45 percent of the unit, and Penitente soils make up 35 percent. Nambe, Marosa, and Presa soils make up the rest.

Rock outcrop consists of nearly vertical cliffs and bare rock.

The Penitente soils are on mountaintops between areas of Rock outcrop. The surface layer is dark grayish brown gravelly loam and brown very gravelly loam. The subsoil is light brown very gravelly loam and very pale brown very cobbly sandy clay loam. The substratum is light gray, extremely gravelly loamy sand.

This map unit is used mainly for wildlife habitat. It has medium potential for this use. Limitations to other uses are the slope, the rock outcrops, the hazard of erosion, and the very short growing season.

11. Presa-Jaroso-Angostura

Deep, well drained, nearly level to very steep soils, on mountainsides

This map unit is on the sides of the Sangre de Cristo Mountains in the southeastern part of the Taos area. The soils formed in colluvium and residuum. Slopes range from 0 to 80 percent.

The elevation ranges from 9,000 to 12,000 feet. The mean annual precipitation is 30 to 35 inches, and the mean annual temperature is 34 degrees to 36 degrees F. The frost-free season is 50 to 70 days.

This map unit makes up about 9 percent of the survey area. Presa soils make up about 30 percent of the unit, Jaroso soils 25 percent, and Angostura soils 20 percent. Mascarenas, Maes, and Etoe soils and Rock outcrop make up the rest.

The Presa soils are on the higher part of mountainsides. The surface layer is yellowish brown cobbly loam, the subsurface layer is light yellowish brown gravelly loam, and the subsoil is very pale brown and pale yellow extremely cobbly loam and extremely cobbly sandy clay loam. The substratum is light yellowish brown, extremely stony sandy loam.

The Jaroso soils are on the lower part of mountainsides. The surface layer is very pale brown cobbly loam, and the subsoil is very pale brown gravelly clay loam, very gravelly clay, extremely cobbly clay, and extremely cobbly sandy clay.

The Angostura soils are on the lower part of mountainsides. The surface layer is light brownish gray cobbly loam, and the subsoil is pale brown very stony sandy clay loam.

This unit is used mainly for timber production. It has medium potential for this use. The limitations are the slope, the short growing season, and the hazard of erosion. The potential of this unit for use as habitat for woodland wildlife is high.

12. Nambe-Marosa

Deep, well drained, nearly level to very steep soils; on mountainsides and mountaintops

This map unit is in the northern half of the Sangre de Cristo Mountains. The soils formed in colluvium and residuum. Slopes range from 0 to 80 percent.

The elevation ranges from 9,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees to 40 degrees F. The frost-free season is less than 60 days.

This map unit makes up about 18 percent of the survey area. Nambe soils make up about 40 percent of the unit, and Marosa soils make up 25 percent. Rock outcrop, Cryaquolls, and Cryoborolls make up the rest.

The Nambe soils are on mountainsides at the higher elevations. The surface layer is light yellowish brown cobbly loam, and the subsurface layer is light yellowish brown very cobbly sandy clay loam. The subsoil is light brown cobbly sandy clay loam and pale brown and grayish brown very cobbly sandy loam. The substratum is yellowish brown extremely gravelly sandy loam.

The Marosa soils are on mountainsides, mountaintops, and benches at the lower elevations. The surface layer is light brownish gray cobbly sandy loam. The subsurface layer is light gray and white extremely gravelly loamy sand and very pale brown extremely gravelly sandy loam. The subsoil is light yellowish brown extremely gravelly sandy clay loam. The substratum consists of gravel, cobbles, and stones.

This map unit is used mainly for timber production. It has medium potential for this use. The limitations are slope, the very short growing season, and the hazard of erosion. The potential of this unit for use as habitat for woodland wildlife is high.

13. Maes-Etoe

Deep, well drained, nearly level to steep soils; on mountainsides

This map unit is on the western side of the Sangre de Cristo Mountains, south of Rio Fernando de Taos. The soils formed in colluvium and residuum. Slopes range from 0 to 80 percent.

The elevation ranges from 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 70 to 90 days.

This map unit makes up about 5 percent of the survey area. Maes soils make up about 50 percent of the unit, and Etoe soils make up 30 percent. Rock outcrop and Derecho, Jaroso, Angostura, and Presa soils make up the rest.

The Maes soils are on mountainsides. The surface layer is light brownish gray cobbly loam. The subsurface layer is pale brown cobbly sandy loam. The subsoil is yellowish brown very cobbly sandy clay.

The Etoe soils are on mountains. The surface layer is pale brown cobbly loam. The subsoil is very pale brown very cobbly and extremely cobbly sandy clay loam.

This unit is used for timber production and for wildlife habitat. The soils have medium potential for use as habitat for woodland wildlife.

broad land use considerations

Most of the survey area is used as native grazing land and as woodland. A small part is used for irrigated small grains, hay, and pasture.

About 2.6 percent of the area, or about 40,000 acres, is irrigated. A short growing season, cool nights, wetness, and a shortage of irrigation water limit the choice of crops and reduce crop yields. Most of the irrigated land is in the Manzano-Loveland-Caruso and Fernando-Tenorio-Silva map units.

About 60 percent of the area, or 934,000 acres, is woodland. The Maes-Etoe map unit has the highest potential for use as woodland. The Presa-Jaroso-Angostura, Trampas-Ustorthents-Mirand, and the Nambe-Marosa units have medium potential for use as woodland. Production is reduced because of the short growing season, rockiness, and steep slopes. In most areas, these map units have high potential for use as habitat for woodland wildlife.

The soils in about 35 percent, or 544,000 acres, of the survey area are suited to use as native grazing land. The Petaca-Servilleta-Hernandez, Travelers-Luhon-Stunner, and Fernando-Tenorio-Silva map units are mainly used as native grazing land. The low precipitation, short growing season, and lack of irrigation water limit these soils for most other uses.

The soils in the rest of the survey area are suited to use as wildlife habitat and to recreation use. The main limitations to these uses are the steep slopes, the hazard of erosion, and the rock outcrops.

In some areas, the Fernando-Tenorio-Silva map unit is used for urban development. Restricted permeability, low strength, and, in places, slope are moderate limitations to this use. In the Manzano-Loveland-Caruso map unit, the hazard of flooding and the seasonal high water table are severe limitations to urban development.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil 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 or of the underlying material, 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 or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. 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, Nambe cobbly loam, 0 to 15 percent slopes, is one of several phases in the Nambe series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Maes-Etoe complex, very steep, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Fernando-Hernandez association, nearly level, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 2 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

AMF—Amalia-Manzano association, steep. The soils in this association are on mountain foot slopes. The Amalia soil is at an elevation of 7,000 to 8,500 feet, and the Manzano soil is at 6,500 to 7,500 feet. The mean annual precipitation is 13 inches. For the Amalia soil, the mean annual temperature is 44 to 48 degrees F, and the frost-free season is 80 to 115 days. For the Manzano soil, the mean annual temperature is 48 degrees F, and the frost-free season is 115 to 135 days.

This association is about 55 percent Amalia very gravelly loam that has 30 to 50 percent slopes, and about 20 percent Manzano clay loam that has 3 to 5 percent slopes. The Amalia soil is on steep side slopes. The Manzano soil is between hills on dissected alluvial fans and valley bottoms.

Included in mapping and making up about 10 percent of this association are areas of Rock outcrop, mainly along Costilla Creek. Also included are Tenorio and Fernando soils, which make up about 10 percent of this unit; and Manzano soils that have 5 to 10 percent slopes, which make up about 5 percent of the unit.

The Amalia soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown very gravelly loam about 3 inches thick. The subsoil is brown, reddish brown, and yellowish red very gravelly clay loam

about 14 inches thick. The substratum is pink very gravelly sandy loam to a depth of 60 inches or more.

The Amalia soil is moderately permeable to a depth of about 17 inches and rapidly permeable below that. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is rapid. Water erosion is a moderate hazard.

The Manzano soil is deep and well drained. It formed in alluvium. Typically, the surface layer is brown clay loam about 10 inches thick. The subsoil is dark brown clay loam about 33 inches thick. The substratum, to a depth of 60 inches or more, is brown clay loam that has a few fine strong brown mottles.

The Manzano soil is moderately slowly permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium. Water erosion is a moderate hazard.

These soils are suited to use as woodland and native grazing land. They can provide forage for domestic livestock and for wildlife.

Proper grazing use improves the plant cover, results in the accumulation of plant residue, and helps prevent erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary. This kind of system results in a balanced plant community of vigorous and productive forage plants such as blue grama, western wheatgrass, and galleta. The Amalia soil produces pinyon pine, oneseed juniper, big sagebrush, and understory grasses and shrubs. The Manzano soil produces grasses, shrubs, and forbs. If the condition of the plant community deteriorates, the desirable plants decrease in number and are replaced by big sagebrush, broom snakeweed, and rubber rabbitbrush. This deterioration generally results in accelerated erosion.

Constructing earthen ponds, installing pipelines, brush management, and range seeding are feasible in managing range on the Manzano soil. The use of machinery is restricted on the Amalia soil because of the steep slopes. Wood crops are used for firewood and fenceposts.

ATC—Antonito-Travelers association, gently sloping. The soils in this association are on uplands. The elevation is 7,500 to 8,000 feet. The mean annual precipitation is about 11 inches, and the mean annual temperature is 44 degrees F. The frost-free season is 90 to 110 days. Antonito loam makes up about 45 percent of the association and Travelers very stony loam makes up about 30 percent. The Antonito soil is on mesas, and slopes range from 1 to 5 percent. The Travelers soil is on old basalt flows, and slopes range from 3 to 8 percent.

Included with these soils in mapping are Rock outcrop, which makes up 15 percent of the map unit, and Stunner and Luhon soils, which each make up 5 percent.

The Antonito soil is moderately deep and well drained. It formed in material that weathered from basalt and in eolian material. Typically, the surface layer is brown loam about 3 inches thick. The subsoil is brown and pinkish gray clay loam about 13 inches thick. The substratum is pink loam about 9 inches thick. Fractured, lime-coated basalt bedrock is at a depth of about 25 inches. The soil is strongly calcareous in the lower part.

The Antonito soil is moderately slowly permeable. The effective rooting depth is 20 to 40 inches. The available water capacity is low to moderate. Runoff is medium and water erosion is a moderate hazard. Wind erosion is a slight hazard.

The Travelers soil is shallow and well drained. It formed in material that weathered from basalt and in eolian material. Typically, the surface layer is brown very stony loam about 4 inches thick. The subsoil is brown very stony loam about 4 inches thick, and the substratum is pale brown very stony clay loam about 5 inches thick. Fractured, lime-coated basalt is at a depth of 13 inches. The soil is slightly calcareous to moderately calcareous.

The Travelers soil is moderately permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is slow to medium, and water erosion is a slight to moderate hazard. Wind erosion is a slight hazard.

These soils are used for grazing by domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of litter, and prevents erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary. This kind of system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, needleandthread, black sagebrush, Indian ricegrass, fringed sagewort, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by shrubby plants such as rubber rabbitbrush and broom snakeweed. This deterioration generally increases the susceptibility of these soils to wind erosion.

When the vegetation on the Antonito soils is in excellent condition, it consists of western wheatgrass, black sagebrush, blue grama, winterfat, and needleandthread. The vegetation on the Travelers soils consists of winterfat, fourwing saltbrush, Douglas rabbitbrush, Indian ricegrass, and blue grama.

The use of machinery is restricted on the Travelers soil because of the stony surface, the shallowness of the soil, and the rock outcrops. The moderately deep Antonito soil is suited to the use of machinery in brush management, range seeding, and fencing. If the soil is not disturbed below a depth of 20 inches, the Antonito soil is also suited to pipeline installation.

CaB—Caruso silty clay loam, 0 to 3 percent slopes. This is a deep, somewhat poorly drained, level to nearly level soil. It formed in mixed alluvium on stream bottoms

and terraces. Individual areas are 3 to 100 acres. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 49 degrees F. The frost-free season is about 125 to 135 days.

Included with this soil in mapping are a few areas of Manzano, Loveland, Poganeab, and Tenorio soils. These soils make up about 15 percent of this map unit.

Typically, the surface layer is grayish brown silty clay loam and clay loam about 14 inches thick. The underlying material, to a depth of 36 inches, is light brownish gray and pale brown clay loam. Below that, to a depth of 60 inches or more it is pale brown stratified clay loam to very fine sandy loam. The soil is slightly calcareous to strongly calcareous. It has a water table within a depth of 30 inches late in winter, in spring, or early in summer.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is very slow, and water erosion is a slight hazard.

Most areas of this soil are used for irrigated hay and pasture. Some are vegas. Vegetation on the vegas is a mixture of native and introduced plants that include sedges, Kentucky bluegrass, orchardgrass, and redtop. The vegas are also used for hay and as pasture.

The major limitations to use of this soil for irrigated crops and pasture are poor drainage and a short growing season with cool nights. The choice of crops is limited to small grains, adapted grasses and legumes, and vegetables such as carrots, lettuce, and green peas.

Soil drainage can be improved by diverting offsite water and by installing surface and underground drains. The climatic factors can be partly overcome by selecting crops and varieties suited to the local climate.

Other management needs include the use of crop rotations that include high-residue producing crops often enough to maintain the physical condition of the soil. Fertilization and improved water application help to increase yields. Timely application of irrigation water in amounts adequate to meet crop needs without overirrigation is essential on this soil because it is somewhat poorly drained. Border, furrow, corrugation, and sprinkler irrigation systems are suitable. Surface irrigation systems are generally the most practical because of the moderately slow permeability and because fields are small. Generally, all crops except legumes respond to nitrogen, and all legumes respond to phosphorus fertilizer. Rotation grazing can increase the yield and quality of pasture. Timely harvesting improves the yield and quality of crops.

This soil has low potential for most urban uses. The flooding hazard, high water table, and low soil strength and the moderately slow permeability in the subsoil are limitations. The low strength can be overcome by good design and careful installation, but the flooding hazard and high water table are continuing limitations in most areas. The moderately slow permeability is a limitation to use of this soil as a site for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption field or by modifying the field.

This soil has medium potential for use as habitat for openland, wetland, and rangeland wildlife.

CHG—Chimayo-Rock outcrop complex, very steep. This complex consists of small areas of Chimayo cobbly sandy loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The areas are on mountain slopes at an elevation of 7,000 to 8,200 feet. The mean annual precipitation is 18 inches, and the mean annual temperature is 48 degrees F. Chimayo cobbly sandy loam that has 40 to 80 percent slopes makes up about 50 percent of the complex, and Rock outcrop makes up about 30 percent.

Included in mapping are areas of Mirabal soils, which make up about 20 percent of this complex.

The Chimayo soil is shallow and well drained. It formed in colluvium and in residuum of granite. Typically, the surface layer is dark grayish brown stony sandy loam about 5 inches thick. The underlying material, to a depth of 15 inches, is light brownish gray and pale brown very stony sandy loam. Granite bedrock is at a depth of about 15 inches.

Permeability is moderate. The effective rooting depth is 12 to 20 inches. The available water capacity is very low. Runoff is medium, and the hazard of water erosion is high.

Rock outcrop consists mainly of nearly vertical escarpments of granite.

The dominant vegetation is pinyon pine and oneseed juniper. The understory consists of Indian ricegrass, needleandthread, sideoats grama, alkali sacaton, little bluestem, and blue grama.

The Chimayo soil is used for wildlife habitat. Some areas are wooded, and the trees are used for firewood and fenceposts. The vegetation should be maintained to give maximum protection to the soil. The high water-erosion hazard, the rock outcrops, and the very steep slopes severely limit the use of this soil.

This complex has medium potential for use as habitat for rangeland wildlife.

CRG—Cryoboralfs-Rock outcrop association, very steep. This association consists of Rock outcrop and very steep soils on mountain slopes and cirque walls at an elevation of 9,500 to 12,000 feet. The mean annual precipitation is 30 inches, the mean annual temperature is 38 degrees F, and the frost-free season is less than 60 days. Cryoboralfs make up about 50 percent of the map unit, and Rock outcrop makes up about 30 percent.

Included in mapping are Presa and Angostura soils, each making up about 20 percent of the association.

Cryoboralfs are deep, well drained, and cobbly. They formed in colluvium and glacial till. The surface layer is brown cobbly loam or sandy loam. The subsoil is brown

cobbly clay loam, cobbly clay, very cobbly clay, or very cobbly sandy clay that extends to a depth of more than 60 inches.

Permeability is moderately slow to very slow. The effective rooting depth is 60 inches or more, and the available water capacity is moderate. Runoff is rapid, and the hazard of water erosion is high.

The dominant vegetation is Engelmann spruce and Douglas-fir and some white fir and subalpine fir. The understory consists of kinnikinnick, grouse whortleberry, Thurber fescue, tufted hairgrass, and mountain brome.

This association is used for timber and as wildlife habitat.

Although Cryoboralfs can support timber, harvesting timber is severely restricted because of the very steep slopes and the high erosion hazard. Management practices must be responsive to the cultural needs of Engelmann spruce, subalpine fir, Douglas-fir, white fir, and aspen.

This association has medium potential for use as woodland wildlife habitat.

CSC—Cryoborolls, 0 to 8 percent slopes. These are deep, level to moderately sloping soils. They formed in alluvium on bottoms between steep mountain side slopes. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 30 inches. The mean annual temperature is 34 degrees F. The mean temperature in summer is about 44 degrees F, and the frost-free season is less than 60 days.

Included with these soils in mapping and making up about 15 percent of this map unit are Cryaquolls and rocky stream channels. The areas of included soils are less than 10 acres in size. In some small areas, Cryoborolls have slopes that range to 15 percent.

These soils have a dark-colored surface layer 10 to 20 inches thick. They are stratified gravelly sandy loam, gravelly loam, gravelly clay loam, and gravelly clay to a depth of 40 inches or more. The content of gravel and cobblestones ranges from 15 to 50 percent.

Permeability is slow to moderate. The effective rooting depth is 40 inches or more. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is sedges, shrubby cinquefoil, Kentucky bluegrass, and mountain brome. There are a few scattered Engelmann spruce and subalpine fir.

In most areas, these soils are used for grazing and for wildlife habitat. They have medium potential for these uses. Conventional methods of harvesting trees can be used, but they generally are restricted in rainy periods. Because these soils are on alluvial bottoms, their use is limited. Concentration of water in these areas can result in severe erosion and sediment deposition.

These soils have medium potential for habitat for use as rangeland wildlife.

CTC—Cryoborolls-Cryaquolls complex, 0 to 8 percent slopes. This complex consists of small areas of Cryoborolls and Cryaquolls that are so intermingled that they could not be mapped separately at the scale selected. These soils formed in alluvium in high mountain valleys at an elevation of 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days. Cryoborolls make up about 50 percent of the complex. These are deep, well drained soils that have slopes of 3 to 8 percent. Cryaquolls make up about 30 percent of the complex. These are deep, poorly drained soils that have slopes of 0 to 5 percent.

Included in mapping are soils that have muck and peat as much as 20 inches thick over moderately fine textured gravelly material. These soils make up about 20 percent of this map unit.

Cryoborolls have a dark-colored surface layer 10 to 20 inches thick. They are stratified gravelly sandy loam and gravelly loam to a depth of 60 inches or more. The content of gravel and cobbles ranges from 15 to 50 percent.

Permeability is moderate to moderately slow. The available water capacity is moderate. The effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate.

Cryaquolls have a dark-colored surface layer of silty clay loam, clay loam, or loam that is 7 to 20 inches thick. The underlying material is gravelly clay or gravelly clay loam to a depth of 60 inches or more. The seasonal water table is within a depth of 20 inches.

Permeability is moderately slow to very slow. The available water capacity is moderate. The effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight.

The dominant vegetation on Cryoborolls is sedges, Kentucky bluegrass, tufted hairgrass, timber oatgrass, silverweed cinquefoil and other forbs. A few Engelmann spruce and subalpine fir are scattered on these soils. Cryoborolls are used for grazing and for wildlife habitat.

The dominant vegetation on Cryaquolls is sedges, shrubby cinquefoil, skunkcabbage, western yarrow, and Kentucky bluegrass. A few Engelmann spruce and subalpine fir are scattered on these soils.

Cryaquolls are suited to use as native grazing land. They provide limited summer grazing for domestic livestock and wildlife.

A management system is needed that periodically defers grazing to maintain a balanced plant community.

Cryoborolls have high potential for use as habitat for rangeland wildlife. Cryaquolls have high potential use as habitat for wetland wildlife.

CUB—Cumulic Haplaquolls, nearly level. These are deep, poorly drained, level to gently sloping soils adjacent to stream bottoms. They formed in mixed alluvium. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 48 degrees F. The frost-free season is 110 to 135 days.

Included with these soils in mapping are Manzano soils and gravel bars. These soils make up about 15 percent of this map unit, but the separate areas are less than 3 acres in size.

These soils are dark-colored to a depth of more than 20 inches. They are stratified gravelly sandy loam, gravelly loam, and gravelly sandy clay loam to a depth of 60 inches or more. The content of gravel and cobblestones ranges from 15 to 50 percent. The seasonal water table is within a depth of 20 inches. Where these soils are adjacent to streams, they are subject to periodic flooding resulting from runoff in spring and from intense thunderstorms.

Permeability is moderate to moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is low to moderate. Runoff is slow, and the hazard of water erosion is slight.

In most areas, these soils are used as native grazing land for domestic livestock. Proper grazing use improves the productivity of forage plants, results in the accumulation of litter, and helps prevent erosion.

The dominant vegetation is bluegrass, sedges, clover, bromegrass, and mountain muhly. Fringed sagewort, western wheatgrass, and blue grama are in areas where the soils are drier. Shrubby cinquefoil, willow, and mountain cottonwood grow along perennial streams. Oneseed juniper, Rocky Mountain juniper, and pinyon pine are scattered throughout the map unit.

A planned grazing system that periodically defers grazing is needed. Brush management and noxious-plant control are feasible.

These soils have low potential for most urban uses. The hazard of flooding and the high water table are limitations. The high water table can be overcome by drainage and by special design. The hazard of flooding is a continuing limitation.

These soils have medium potential for use as rangeland wildlife habitat.

CYB—Cumulic Haploborolls, nearly level. These are deep, well drained, gently sloping to moderately sloping soils. They formed in mixed alluvium on valley side slopes and alluvial fans. The elevation is 7,500 to 9,500 feet. The mean annual precipitation is 21 inches. The mean annual temperature is 45 degrees F. The frost-free season is 60 to 110 days.

Included in mapping are some areas of poorly drained soils. These soils make up about 10 percent of this map unit, but the areas are less than 3 acres in size.

These soils are dark colored to a depth of 20 inches or more. They are stratified gravelly sandy loam, gravelly loam, gravelly clay loam, and gravelly clay to a depth of 40 inches or more. The content of gravel and cobblestones ranges from 15 to 50 percent. Soils adjacent to streams are subject to periodic flooding resulting from runoff in spring and from intense thunderstorms.

Permeability is slow to moderate. The effective rooting depth is 40 inches or more. The available water capacity is moderate. Runoff is slow to medium, and the hazard of water erosion is slight to moderate.

The dominant vegetation is Douglas-fir, aspen, and ponderosa pine. Kentucky bluegrass and silverleaf cinquefoil make up the understory.

In most areas, these soils are used for timber and wildlife habitat. They have high potential for the production of Douglas-fir and medium potential for the production of ponderosa pine. Harvesting trees is restricted because of the position of the soils. Buffer strips to reduce the hazards of erosion and sedimentation should be maintained between the cutting areas and the stream channels.

These soils have low potential for most urban uses. The flooding hazard is a continuing limitation.

These soils have high potential for use as habitat for woodland wildlife.

DeF—Derecho cobbly loam, 15 to 40 percent slopes. This is a deep, well drained, moderately steep to steep soil on south-facing mountain slopes. It formed in colluvium and residuum of interbedded shale and sandstone. The elevation is about 8,000 to 10,500 feet. The mean annual precipitation is 25 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 85 to 105 days.

Included in mapping are Maes and Jaroso soils and a soil that is shallow to bedrock. These soils make up about 25 percent of this map unit.

Typically, the surface layer is grayish brown cobbly loam and gravelly loam about 12 inches thick. The subsoil is about 39 inches thick. It is brown very cobbly clay loam and extremely cobbly clay and yellowish brown extremely stony clay. The substratum is grayish brown extremely stony sandy clay loam to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is Gambel oak and true mountainmahogany. A few Douglas-fir, ponderosa pine, and white fir are scattered on this soil.

This soil is used mainly as habitat for woodland wildlife.

This soil is best suited to use as wildlife habitat. Old burned stumps indicate that the vegetation is representative of a fire climax. Reforestation is extremely difficult because plant competition is severe.

This soil has medium potential for use as habitat for openland and woodland wildlife.

DeG—Derecho-Rock outcrop complex, 40 to 80 percent slopes. This complex consists of small areas of Derecho cobbly loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The Derecho soil is very steep and is on south-facing mountain and canyon slopes at an

elevation of 8,000 to 10,500 feet. The mean annual precipitation is 25 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 85 to 105 days. Derecho cobbly loam makes up about 50 percent of the map unit, and Rock outcrop makes up about 35 percent.

Included in mapping are areas of Jaroso, Angostura, and Etoe soils, which make up about 15 percent of this complex. These soils generally occur as isolated islands within the complex.

The Derecho soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is brown cobbly loam 17 inches thick. The subsoil is yellowish brown very cobbly sandy clay to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is more than 60 inches, and the available water capacity is moderate. Runoff is rapid, and the hazard of erosion is high.

Rock outcrop consists mainly of nearly vertical escarpments of interbedded sandstone and shale.

The dominant vegetation is Gambel oak and true mountainmahogany and a few scattered Douglas-fir, ponderosa pine, and white fir.

The soil in this complex is used mainly for wildlife habitat.

The Derecho soil is best suited to the development of habitat for wildlife. Old burned stumps indicate that the vegetation is representative of a fire climax. Reforestation is extremely difficult because plant competition is severe. The very steep slopes and scattered rock outcrops preclude most uses.

The Derecho soil in this complex has medium potential for use as habitat for woodland wildlife.

DFG—Devisadero-Rock outcrop complex, very steep. This complex consists of small areas of Devisadero gravelly loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The elevation ranges from 7,000 to 8,500 feet. The mean annual precipitation is 16 inches, and the mean annual temperature is 52 degrees F. The frost-free season is 120 to 140 days. Devisadero gravelly loam that has slopes of 40 to 80 percent makes up about 50 percent of the complex. Rock outcrop that has slopes of 50 to 99 percent makes up about 30 percent.

Included in mapping and making up about 20 percent of the complex are areas of Trampas soils.

The Devisadero soil is moderately deep and well drained. It formed in colluvium and residuum of sandstone and shale. Typically, the surface layer is brown gravelly loam about 3 inches thick. The upper part of the subsoil is brown gravelly clay and very gravelly clay 10 inches thick. The lower part is brown very gravelly sandy loam 11 inches thick. The substratum, to a depth of 30 inches, is light yellowish brown very gravelly sandy loam. Fractured bedrock is at a depth of 30 inches.

Permeability is moderately slow. The effective rooting depth is 20 to 40 inches. The available water capacity is mainly low. Runoff is medium, and the erosion hazard is moderate to high.

Rock outcrop consists of very steep to vertical escarpments of interbedded shale and sandstone and, in some areas, of limestone.

The dominant vegetation is oneseed juniper, pinyon pine, blue grama, sideoats grama, broom snakeweed, and sand dropseed.

The Devisadero soil is used for grazing and for wildlife habitat. The vegetation should be maintained to give maximum protection to the soil. The moderate to high erosion hazard, the rock outcrops, and the steep slopes severely limit the use of this map unit.

This complex has medium potential for use as habitat for woodland wildlife.

DmF—Diamante extremely gravelly loam, 15 to 40 percent slopes. This is a deep, well drained, moderately steep to steep soil on terrace slopes adjacent to drainageways. It formed in mixed alluvium. The elevation is 8,000 to 9,800 feet. The mean annual precipitation is 24 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 90 to 110 days.

Included in mapping are areas of Trampas and Jaroso soils, which make up about 20 percent of this map unit.

Typically, the surface layer is light brownish gray extremely gravelly loam and light gray extremely gravelly sandy loam about 14 inches thick. The subsurface layer is very pale brown extremely gravelly sandy loam about 17 inches thick. The subsoil is light brown very gravelly sandy clay and extremely gravelly sandy clay to a depth of 60 inches and more.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is Douglas-fir and ponderosa pine and associated white fir, aspen, limber pine, and Gambel oak. The understory is mainly Kentucky bluegrass, mountain muhly, pine dropseed, and kinnikinnick.

This soil is used mainly for timber and for wildlife habitat. It has medium potential for timber.

This soil is suited to the production of Douglas-fir, ponderosa pine, white fir, limber pine, and aspen. In harvesting trees, conventional methods can be used, but they generally are restricted in rainy periods. Because of the droughty surface layer, reforestation after harvest must be managed carefully. Planting should take place when the soil is moist, after spring snowmelt or after the late-June rains.

This soil has low potential for use as habitat for openland and woodland wildlife.

EGG—Eutroboralfs-Glossoboralfs-Rock outcrop association, very steep. This association consists of

very steep soils and Rock outcrop at an elevation of 7,500 to 10,500 feet. The mean annual precipitation is 20 inches for Eutroboralfs and 30 inches for Glossoboralfs. The mean annual temperature is 42 degrees F for Eutroboralfs and 40 degrees F for Glossoboralfs soils. The frost-free season is 80 to 100 days. This association is about 40 percent Eutroboralfs, 40 to 80 percent slopes; 30 percent Glossoboralfs, 40 to 80 percent slopes, and 20 percent Rock outcrop. Much of the Rock outcrop is scattered throughout the association as nearly vertical escarpments.

Included in mapping are areas of Etoe and Jaroso soils, which make up about 10 percent of this association.

Eutroboralfs are deep, well drained soils on mountain and canyon slopes. They formed in colluvium and residuum of sandstone and shale. The surface layer is cobbly loam or cobbly sandy loam. The subsoil is very cobbly clay loam or very cobbly clay. The substratum is stony silty clay to a depth of 60 inches or more.

Permeability is very slow to moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is high.

Glossoboralfs are deep, well drained soils on mountain and canyon slopes. They formed in colluvium and residuum of sandstone and shale. The surface layer is cobbly loam or cobbly sandy loam. The subsoil is very cobbly sandy clay or very cobbly clay that extends to a depth of 60 inches or more.

Permeability is very slow to moderately slow. The effective rooting depth is more than 60 inches, and the available water capacity is moderate. Runoff is moderate, and the hazard of water erosion is high.

Rock outcrop consists of interbedded shale and sandstone and in some areas, limestone.

The dominant vegetation on the Eutroboralfs is ponderosa pine and some scattered Gambel oak. The understory consists mainly of kinnikinnick, prairie junegrass, and mountain muhly.

The dominant vegetation on the Glossoboralfs is Douglas-fir and ponderosa pine, and there are scattered white fir, limber pine, and Gambel oak. The understory consists mainly of Kentucky bluegrass, prairie junegrass, mountain brome, and kinnikinnick.

These soils are mainly used for wildlife habitat. The very steep slopes, high erosion hazard, and rock outcrops preclude most other uses. The potential is low for the production of ponderosa pine, Douglas-fir, white fir, and aspen.

This association has medium potential for use as habitat for woodland wildlife.

FaC—Fernando cobbly loam, 1 to 7 percent slopes. This is a deep, well drained, nearly level to moderately sloping soil on alluvial fans at the base of mountains and cones. It formed in mixed alluvium. Slopes are smooth and convex. The areas are 100 to 640 acres. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days.

Included in mapping are Fernando loam, which makes up about 10 percent of the map unit; Hernandez soils, which makes up 15 percent; and Rock outcrop, which makes up 5 percent.

Typically, the surface layer is brown cobbly loam about 3 inches thick. The subsoil is brown and light brown loam and clay loam about 20 inches thick. The substratum is light brown loam to a depth of 60 inches or more. Cobbles and gravel cover 15 to 35 percent of the surface.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow to medium, and the hazard of water erosion is slight to moderate. The hazard of wind erosion is slight.

This soil is suitable for use as native grazing land for domestic livestock. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent erosion.

A management system that provides definite periods of deferment and grazing use results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and bottlebrush squirreltail.

When in excellent condition, the vegetation on this soil is western wheatgrass, big sagebrush, galleta, blue grama, and bottlebrush squirreltail. If the condition of the plant community deteriorates, the proportion of desirable forage plants and the plant cover decrease. These plants are replaced by shrubby plants such as rubber rabbitbrush and big sagebrush, and pinyon pine and Rocky Mountain juniper invade the plant community. This deterioration generally results in accelerated wind and water erosion.

The use of machinery in areas of this soil is restricted because of the cobbly surface layer. Constructing earthen ponds, installing pipelines, and managing brush, however, are feasible.

This soil has medium potential for use as habitat for rangeland wildlife.

FbC—Fernando silt loam, 0 to 7 percent slopes. This is a deep, well drained, level to moderately sloping soil on alluvial fans. It formed in mixed alluvium. The areas mainly are rounded and range from 200 to 1,000 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches, and the average annual temperature is 49 degrees F. The frost-free season is 125 to 135 days.

Included with this soil in mapping are Petaca, Prieta, Servilleta, and Sedillo soils and Orthents, each making up about 5 percent of the map unit.

Typically, the surface layer is light brown silt loam about 2 inches thick. The subsoil is about 34 inches

thick. It is brown silt loam and clay loam in the upper part and light brown and light reddish brown clay loam in the lower part. The substratum is pink clay loam and loam to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow, and water erosion is a moderate hazard. Wind erosion also is a moderate hazard.

This soil is used as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of plant residue, and helps prevent erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and galleta.

When in excellent condition, the vegetation on this soil is western wheatgrass, big sagebrush, galleta, blue grama, and bottlebrush squirreltail. If the condition of the plant community deteriorates, the proportion of desirable forage plants and the plant cover decreases. These plants are replaced by big sagebrush and rubber rabbitbrush. This deterioration generally results in accelerated wind and water erosion.

Range seeding, brush management, stock trails, earthen ponds, fences, access roads, and pipelines are feasible on this soil.

This soil has medium potential for use as habitat for openland and rangeland wildlife.

FeB—Fernando clay loam, 1 to 3 percent slopes. This is a deep, well drained, nearly level soil in broad, intermountain valleys. It formed in mixed alluvium. The areas mainly are elongated and are oriented according to the drainage. They are 10 to 100 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days.

Included with this soil in mapping are Silva soils, which make up 10 percent of the map unit. Also included are narrow arroyo bottoms. In an area near Picuris, some soils are as much as 15 percent coarse fragments. Also included, in the northern part of the survey area, are Tenorio soils, which make up about 15 percent of the map unit.

Near the community of Sunshine there is an area approximately 2 miles long and 1/2 mile wide where the seasonal water table is within a depth of 3 to 5 feet. In this area, many very strongly alkaline slickspots have formed, and the soils have a pH of 9.4 or higher. These slickspots are scattered throughout this area and are nearly barren of vegetation. They are shown on the map by a spot symbol.

Typically, the surface layer is brown clay loam about 6 inches thick. The subsoil is brown silty clay loam about 23 inches thick. The substratum is light brown silt loam to a depth of 60 inches or more. The soil is slightly calcareous in the upper part and strongly calcareous in the lower part.

This soil is moderately slowly permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow. Water and wind erosion are moderate hazards.

This soil is used as native grazing land and for irrigated hay and pasture. It has high potential for irrigated hay and pasture and moderately high potential for small grains and some row crops.

The major limitations to the use of this soil for irrigated crops and pasture are the short growing season and cool nights. These factors limit the choice of crops and reduce yields. Suitable crops include alfalfa, small grains, and cool-season grasses. Other crops are potatoes and vegetables that are adapted to the short growing season and cool nights.

Growing mainly high-residue crops and grasses or legumes helps to reduce water erosion and soil blowing. These crops also help to maintain soil tilth. Fertilization and improved water-management practices help to maintain or increase yields. Generally, all crops except legumes respond to nitrogen, and all legumes respond to phosphate fertilizer. Border, furrow, corrugation, and sprinkler irrigation systems are suitable. Rotation grazing increases the yield and quality of pasture. Timely harvesting improves the quality of crops.

This soil has medium potential for most urban uses. Low strength and the moderate shrink-swell potential and moderately slow permeability in the subsoil are limitations. The shrinking and swelling and the low strength can be overcome by good design and careful installation. The moderately slow permeability is a limitation to the use of this soil for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has medium potential for use as habitat for openland, wetland, and rangeland wildlife.

FeC—Fernando clay loam, 3 to 5 percent slopes. This is a deep, well drained, gently sloping soil that formed in alluvium on alluvial fans. Slopes are smooth and convex. Individual areas are 5 to 40 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches. The mean annual temperature is 49 degrees F, and the frost-free season is 125 to 135 days.

Included with this soil in mapping and making up about 15 percent of the unit are small areas of Silva and Hernandez soils.

Typically, the surface layer is brown clay loam about 7 inches thick. The subsoil is brown silty clay loam 18 inches thick. The substratum is light brown silt loam to a depth of 60 inches or more. The soil is slightly calcareous in the upper 15 inches and strongly calcareous below that.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity

is high. Runoff is medium, and water erosion is a moderate to severe hazard. Wind erosion is a moderate hazard.

This soil is used as native grazing land and for irrigated hay and pasture. It has medium potential for hay and pasture and for small grains.

The major limitations in using this soil for irrigated crops are the short growing season, cool nights, and moderate slopes. These factors limit the choice of crops and the type of irrigation systems used. Maintaining a good cover of crops or of crop residue helps to control erosion. Suitable crops are grasses and legumes for hay or pasture. Barley or other small grains can also be grown.

Fertilization and improved water-management practices help to maintain or increase yields. Generally, all crops except legumes respond to the use of nitrogen, and all legumes respond to the use of phosphate fertilizer. Corrugation, border, and sprinkler irrigation systems are suitable. Rotation grazing increases the yield and quality of pasture. Timely harvesting improves the quality of crops.

This soil has medium potential for most urban uses. Low strength and the moderate shrink-swell potential and moderately slow permeability in the subsoil are limitations. The shrinking and swelling and the low strength can be overcome by good design and careful installation. The moderately slow permeability is a limitation to the use of this soil for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has medium potential for use as habitat for openland and rangeland wildlife.

FfC—Fernando clay loam, 5 to 7 percent slopes. This is a deep, well-drained, moderately sloping soil that formed in alluvium on alluvial fans. Slopes are smooth and convex. Individual areas are 5 to 40 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches. The mean annual temperature is 49 degrees F, and the frost-free season is 125 to 135 days.

Included with this soil in mapping and making up about 15 percent of the unit are small areas of Silva and Hernandez soils.

Typically, the surface layer is brown clay loam about 5 inches thick. The subsoil is brown silty clay loam about 14 inches thick. The substratum is light brown silt loam to a depth of 60 inches or more. The soil is slightly calcareous in the upper 15 inches and strongly calcareous below that.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate to severe. The wind erosion hazard is moderate.

This soil is used as native grazing land and as irrigated pasture. It has medium potential for hay and pasture and for small grains.

The major limitations in using this soil for crops are the short growing season, cool nights, and steep slopes. Maintaining a good cover of crops or crop residue throughout the year helps to control erosion. Suitable crops are grasses and legumes for hay or pasture. Barley or other small grains can also be grown.

Fertilization and improved water-management practices help to maintain or increase yields. Generally, all crops except legumes respond to the use of nitrogen, and all legumes respond to the use of phosphate fertilizer. Border, corrugation, and sprinkler irrigation systems are suitable. Rotation grazing increases the yield and quality of pasture. Timely harvesting improves the quality of crops.

This soil has medium potential for most urban uses. Low strength and the moderate shrink-swell potential and moderately slow permeability in the subsoil are limitations. The shrinking and swelling and the low strength can be overcome by good design and careful installation. The moderately slow permeability is a limitation to the use of this soil for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has medium potential for use as habitat for openland and rangeland wildlife.

FHB—Fernando-Hernandez association, nearly level. This association consists of nearly level and undulating soils on alluvial fans and valley sides. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches. The mean annual temperature is 49 degrees F, and the frost-free season is 125 to 135 days. This association is about 65 percent Fernando clay loam, 1 to 3 percent slopes, and 20 percent Hernandez loam that has 3 to 5 percent slopes. The nearly level Fernando soil is on the bottom of large fans. The gently sloping Hernandez soil is on the side slopes of drainageways. The mapped areas are elongated and are oriented according to the drainage. They are 100 to 500 acres in size.

Included in mapping are Tenorio, Silva, and Sedillo soils, each making up about 5 percent of the association.

The Fernando soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown clay loam about 2 inches thick. The subsoil is brown silty clay loam about 25 inches thick, and the substratum is light brown silt loam to a depth of 60 inches or more.

The Fernando soil is moderately slowly permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow. The hazards of water and wind erosion are moderate.

The Hernandez soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown loam about 4 inches thick. The subsoil is pale brown clay loam about 10 inches thick. The substratum is pink clay loam to a depth of 60 inches or more. The soil is moderately calcareous to strongly calcareous.

The Hernandez soil is moderately permeable. The effective rooting depth is 60 inches or more. The

available water capacity is high. Runoff is medium. The hazards of water and wind erosion are moderate.

These soils are suitable for use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, galleta, blue grama, and winterfat.

When in excellent condition, the vegetation on these soils is western wheatgrass, galleta, blue grama, winterfat, fourwing saltbush, and big sagebrush. If the condition of the plant community deteriorates, the proportion of desirable forage plants and the plant cover decreases. These plants are replaced by big sagebrush, rubber rabbitbrush, broom snakeweed, and cacti. This deterioration generally results in accelerated wind and water erosion.

The use of machinery in installing pipelines, in brush management, in range seeding, and in constructing access roads, earthen ponds, and stock trails is feasible on these soils.

This association has medium potential for use as habitat for rangeland wildlife.

FLB—Fluvents, nearly level. These are deep, well drained, level to gently sloping soils. They formed in stratified alluvium adjacent to stream bottoms. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 13 inches. The mean annual temperature is 49 degrees F, and the frost-free season is 124 to 135 days.

Included in mapping and making up about 20 percent of the unit are soils that have a loam or clay loam subsoil. The areas of these soils are dissected by stream channels.

Fluvents consist of stratified gravelly loamy sand and gravelly sandy loam that are 15 to 90 percent gravel and cobbles.

Permeability is rapid to very rapid. The effective rooting depth varies. The available water capacity is low. Runoff is slow, and the hazard of water erosion is moderate.

An area of these soils in the Ojo Caliente area is farmed. In much of this area, the soils are slightly saline.

These soils have low potential for urban uses. The flooding hazard is the major limitation.

These soils have medium potential for use as habitat for rangeland wildlife.

Most areas of these soils are used as native grazing land for domestic livestock and wildlife. The soils are subject to frequent flooding.

Proper grazing use improves productivity, restores the natural ecosystem, and helps prevent erosion.

The dominant vegetation is blue grama, bottlebrush squirreltail, sand dropseed, rubber rabbitbrush, big sagebrush, and Apacheplume.

A planned grazing system is needed that provides for periods of deferred grazing. The use of machinery is feasible in brush and noxious-weed control and in constructing and maintaining fences and livestock watering facilities, including earthen ponds.

HaB—Hernandez gravelly loam, 0 to 5 percent slopes. This is a deep, well drained, calcareous soil on alluvial fans at an elevation of 7,100 to 8,000 feet. It formed in mixed alluvium, and in local areas it is strongly influenced by basalt. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 145 days.

Included in mapping are Silva and Petaca soils, which make up about 20 percent of this map unit.

Typically, the surface layer is brown gravelly loam about 10 inches thick. The subsoil is light brownish gray clay loam about 5 inches thick. The substratum is light gray gravelly sandy clay loam to a depth of 60 inches or more. The soil is moderately calcareous to strongly calcareous.

Permeability is moderate. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is slow, and the hazard of water erosion is moderate.

This soil is suited to use as native grazing land for domestic livestock and wildlife.

Proper grazing use improves the plant cover and helps prevent erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, needleandthread, galleta, and winterfat.

When in excellent condition, the vegetation on these soils is blue grama, galleta, western wheatgrass, needleandthread, winterfat, fourwing saltbush, and big sagebrush. If the condition of the range deteriorates, the proportion of desirable forage plants and the plant cover decrease. These plants are replaced by threeawn, rubber rabbitbrush, cacti, broom snakeweed, and big sagebrush. This deterioration results in accelerated erosion.

The use of machinery in fencing, range seeding, brush management, and contructing stock trails and livestock watering facilities is feasible.

HKC—Hernandez-Kim association, gently sloping. This association consists of soils on alluvial fans at an elevation of 7,000 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 145 days. This association is about 50 percent

Hernandez loam that has 3 to 5 percent slopes, and 35 percent Kim loam that has 1 to 3 percent slopes.

Included in mapping are Fernando and Silva soils, which make up about 10 percent of the unit. Also included are small areas of Petaca and Prieta soils, basalt outcrops, and Fluvents which make up 5 percent of the unit. Royosa soils are included in this unit in an area northwest of Ute Mountain along Costilla Creek.

The Hernandez soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown loam about 4 inches thick. The subsoil is pale brown clay loam about 10 inches thick. The substratum is pink clay loam to a depth of 60 inches or more. The soil is moderately calcareous to strongly calcareous.

The Hernandez soil is moderately permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium. The hazards of water and wind erosion are moderate.

The Kim soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is pale brown loam about 12 inches thick. The underlying material is pale brown and brown loam to a depth of 60 inches or more.

The Kim soil is moderately permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow, and the hazard of water erosion is slight. The wind erosion hazard is moderate. In most areas, these soils are used as native grazing land for domestic livestock and wildlife.

These soils are suitable for use as native grazing land. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting of the forage in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, needleandthread, and winterfat.

When in excellent condition, the vegetation on these soils is needleandthread, blue grama, western wheatgrass, galleta, winterfat, fourwing saltbush, and big sagebrush. If the condition of the plant community deteriorates, the proportion of desirable forage plants and the plant cover decreases. These plants are replaced by broom snakeweed, ring muhly, threeawn, rubber rabbitbrush, and big sagebrush. This deterioration results in accelerated wind and water erosion.

The use of machinery is feasible in range seeding, brush management, installing pipelines, and constructing fences, earthen ponds, access roads, and stock trails.

This association has medium potential for use as rangeland and for wildlife habitat.

HPC—Hernandez-Petaca association, gently sloping. This association consists of soils on uplands. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 12 inches. The mean annual temperature is 49 degrees F., and the frost-free season is 125 to 145 days. Hernandez loam that has 1 to 5 percent slopes and Petaca stony loam that has 3 to 8 percent slopes each make up about 40 percent of this association. The Hernandez soil is on side slopes between gravelly and stony ridges. The Petaca soil is on basalt ridges and breaks. Drainage from these soils contributes to the Rio Grande watershed.

Included with these soils in mapping are Prieta, Silva, and Servilleta soils and Rock outcrop, each making up about 5 percent of the association.

The Hernandez soil is deep and well drained. It formed in mixed alluvium and in eolian sediment. Typically, the surface layer is brown loam about 4 inches thick. The subsoil is pale brown clay loam about 10 inches thick. The substratum, to a depth of 60 inches or more, is pink clay loam that has a high lime content. The soil is moderately calcareous to strongly calcareous.

The Hernandez soil is moderately permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium. The hazards of water and wind erosion are moderate.

The Petaca soil is shallow and well drained. It formed in material that weathered from basalt and in eolian material. Typically, the surface layer is brown stony loam about 2 inches thick. The next layer is pale brown and light gray stony loam about 13 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of about 15 inches. The soil is strongly calcareous.

The Petaca soil is moderately permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium to rapid, and the hazard of water erosion is moderate. The wind erosion hazard is slight.

These soils are suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover and helps prevent erosion.

When in excellent condition, the vegetation on these soils is western wheatgrass, needleandthread, galleta, blue grama, and big sagebrush. If the condition of the plant community deteriorates, the proportion of desirable forage plants and the plant cover decrease. These plants are replaced by threeawn, big sagebrush, broom snakeweed, and rubber rabbitbrush. This deterioration can result in accelerated wind and water erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide resting of forage in successive years. The result will be a well balanced plant community of vigorous and productive forage plants such as needleandthread, galleta, winterfat, western wheatgrass, and blue grama.

The use of machinery in fencing, range seeding, brush management, and constructing stock trails and livestock watering facilities is feasible on the Hernandez soil. It is not feasible on the Petaca soil because of the shallowness to rock.

This association has medium potential for use as habitat for rangeland wildlife.

HSC—Hernandez-Silva association, gently sloping. This association consists of gently sloping soils on upland fans. The elevation is 7,100 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 145 days. Hernandez gravelly loam that has 0 to 5 percent slopes makes up about 55 percent of this association, and Silva loam that has 0 to 5 percent slopes makes up 35 percent.

Included with these soils in mapping are areas of Petaca soils which make up 10 percent of this association.

The Hernandez soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown gravelly loam and brown loam about 10 inches thick. The subsoil is light brownish gray clay loam about 5 inches thick. The substratum is light brownish gray very gravelly sandy clay loam to a depth of 60 inches or more. This soil is moderately calcareous to strongly calcareous.

Permeability is moderate. The effective rooting depth is 60 inches or more, and the available water capacity is high. Runoff is slow, and the hazard of water erosion is slight. The wind erosion hazard is moderate.

The Silva soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown loam about 2 inches thick. The subsoil is brown clay loam about 30 inches thick. The substratum is pinkish white calcareous loam over white very gravelly sandy loam to a depth of 60 inches or more.

Permeability is slow. The effective rooting depth is 60 inches. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate.

These soils are suited to use as native grazing land for domestic livestock and wildlife.

When in excellent condition, the vegetation on these soils is western wheatgrass, needleandthread, galleta, blue grama, and big sagebrush. If the condition of the range deteriorates, the proportion of desirable forage plants and the plant cover decrease. These plants are replaced by threeawn, big sagebrush, broom snakeweed, and rubber rabbitbrush. Deterioration of the plant community can result in accelerated wind and water erosion.

Proper grazing use is needed to maintain adequate plant cover. A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide resting of forage in successive years. This can increase the quantity of the more desirable plants, such as western wheatgrass, needleandthread, galleta, and winterfat. Fencing, brush management, installing pipelines, constructing access roads and stock trails, and range seeding are feasible in managing grazing land.

This association has medium potential for use as habitat for rangeland wildlife.

JaD—Jaroso-Angostura complex, 5 to 15 percent slopes. This complex consists of small areas of Jaroso and Angostura soils that are so intermingled that they could not be mapped separately at the scale selected. These moderately to strongly sloping soils are on broad mountaintops and benches at an elevation of 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 36 degrees F. The frost-free season is 50 to 70 days. These soils are in similar positions on the landscape. The Jaroso soil is similar to the Angostura soil except that it has a subsoil that is more than 35 percent clay. The Jaroso soil makes up about 60 percent of this complex, and the Angostura soil makes up about 25 percent.

Included in mapping are Maes, Etoe, and Presa soils, which make up about 15 percent of this complex.

The Jaroso soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is very pale brown cobbly loam about 16 inches thick. The subsoil is very pale brown cobbly clay loam, cobbly clay, very cobbly clay, and very cobbly sandy clay. It extends to a depth of more than 60 inches.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is slow, and the hazard of water erosion is slight.

The Angostura soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam about 10 inches thick. The subsoil is light yellowish brown very cobbly sandy clay loam that extends to a depth of more than 60 inches.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is low. Runoff is slow, and the hazard of water erosion is slight.

The dominant vegetation is Engelmann spruce and Douglas-fir and some scattered white fir, subalpine fir, and aspen. The understory consists of Thurber fescue, tufted hairgrass, mountain brome, kinnikinnick, and grouse whortleberry.

These soils are well suited to the production of Douglas-fir, Engelmann spruce, white fir, subalpine fir, and aspen. Conventional methods of harvesting can be used for trees, but they generally are restricted in rainy periods.

The soils have medium potential for use as habitat for woodland wildlife.

JaF—Jaroso-Angostura-Mascarenas complex, 15 to 40 percent slopes. This complex consists of small areas of Jaroso, Angostura, and Mascarenas soils that are so intermingled that they could not be mapped separately at the scale selected. These moderately steep to steep soils are on smooth mountain slopes at an elevation of 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual

temperature is 36 degrees F. The frost-free season is 50 to 70 days. These soils are in similar positions on the landscape. The Jarcso soil is similar to the Angostura soil except that it has a subsoil that is more than 35 percent clay. The Jaroso soil has a thinner surface layer than the Mascarenas soil. This complex is 40 percent Jaroso soil, 30 percent Angostura soil, and 20 percent Mascarenas soil.

Included in mapping are areas of Maes and Presa soils, which make up about 10 percent of the complex.

The Jaroso soil is deep and well drained. It formed in colluvium of interbedded shale and sandstone. Typically, the surface layer is very pale brown cobbly loam about 16 inches thick. The subsoil extends to a depth of more than 60 inches. It is very pale brown gravelly clay loam, very gravelly clay, extremely cobbly clay, and extremely cobbly sandy clay.

The Jaroso soil has moderately slow permeability. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is moderate.

The Angostura soil is deep and well drained. It formed in colluvium of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam about 10 inches thick. The subsoil is light yellowish brown very cobbly sandy clay loam that extends to a depth of more than 60 inches.

The Angostura soil has moderate permeability. The effective rooting depth is more than 60 inches. The available water capacity is low. Runoff is medium, and the hazard of water erosion is moderate.

The Mascarenas soil is deep and well drained. It formed in colluvium of interbedded sandstone and shale. Typically, the surface layer is light brownish gray cobbly sandy loam over very pale brown gravelly loam. It is about 30 inches thick. The subsoil extends to a depth of more than 60 inches. It is brown, extremely gravelly sandy clay and light yellowish-brown, extremely stony sandy clay loam.

The Mascarenas soil has moderately slow permeability. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is medium, and the erosion hazard is moderate.

The dominant vegetation is Engelmann spruce and Douglas-fir and some scattered white fir, subalpine fir, and aspen. The understory is mainly Thurber fescue, tufted hairgrass, mountain brome, kinnikinnick, and grouse whortleberry.

These soils are used mainly for timber and wildlife habitat.

These soils are well suited to the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods of harvesting trees can be used, but they are restricted in rainy periods. Natural regeneration after harvest is adequate. Logging roads must be designed so that the slope gradient is less than 8 percent. This will minimize the concentration of water and the resulting soil erosion. Cutting practices should favor the shade-tolerant Engelmann spruce and white fir or the Douglas fir. A stand of aspen can be maintained through cultural practices.

The soils in this complex have medium potential for use as habitat for woodland wildlife.

JaG—Jaroso-Angostura-Mascarenas complex, 40 to 80 percent slopes. This complex consists of small areas of Jaroso, Angostura, and Mascarenas soils that are so intermingled that they could not be mapped separately at the scale selected. These very steep soils are on smooth mountain slopes at an elevation of 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 36 degrees F. The frost-free season is 50 to 70 days. These soils are in similar positions on the landscape. The Jaroso soil is similar to the Angostura soil except that it is more than 35 percent clay in the subsoil. The Jaroso soil has a thinner surface layer than the Mascarenas soil. This complex is about 40 percent Jaroso soil, 30 percent Angostura soil, and 20 percent Mascarenas soil.

Included in mapping are areas of Maes and Presa soils, which make up about 10 percent of the complex.

The Jaroso soil is deep and well drained. It formed in colluvium of interbedded shale and sandstone. Typically, the surface layer is very pale brown cobbly loam about 16 inches thick. The subsoil extends to a depth of more than 60 inches. It is very pale brown cobbly clay loam, cobbly clay, very cobbly clay, and very cobbly sandy clay.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is rapid, and the erosion hazard is high.

The Angostura soil is deep and well drained. It formed in colluvium of interbedded sandstone and shale. Typically, the surface layer is light brownish gray cobbly loam about 6 inches thick. The subsurface layer is mixed pale brown very cobbly sandy clay loam and light brownish gray cobbly loam about 14 inches thick. The subsoil is pale brown, very stony sandy clay loam that extends to a depth of more than 60 inches.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is low. Runoff is rapid, and the erosion hazard is high.

The Mascarenas soil is deep and well drained. It formed in colluvium of interbedded sandstone and shale. Typically, the surface layer is light brownish gray cobbly sandy loam and very pale brown gravelly loam about 30 inches thick. The subsoil extends to a depth of more than 60 inches. It is brown, stony sandy clay and light yellowish brown, stony sandy clay loam.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is rapid, and the erosion hazard is high.

The dominant vegetation is Engelmann spruce and Douglas-fir and some scattered white fir and subalpine

fir. The understory is mainly Thurber fescue, tufted hairgrass, mountain brome, kinnikinnick, and grouse whortleberry.

These soils are used mainly for timber and wildlife habitat.

The soils in this complex are well suited to the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods of tree harvesting cannot be used. The production or harvest of timber is restricted by the steep slopes and the high erosion hazard. The very steep slopes severely restrict the mobility of most equipment. Natural regeneration after harvest is adequate. Soil disturbance and the consequent erosion should be kept to a minimum during harvest. Logging roads must be designed to minimize exposure of the fine-textured subsoil material of the Jaroso and Mascarenas soils. They must be designed so that the slope gradient is less than 8 percent. This minimizes the concentration of water and the resulting soil erosion. Cut and fill slopes for roads can fail on these soils because of the high precipitation and the saturation of the subsoil.

Cutting practices should favor the shade-tolerant Engelmann spruce and white fir or the Douglas-fir. A stand of aspen can be maintained through cultural practices.

The soils in this complex have medium potential for use as habitat for woodland wildlife.

JRG—Jaroso-Angostura-Rock outcrop complex, very steep. This complex consists of small areas of Jaroso and Angostura soils and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. These very steep soils and Rock outcrop are on mountain slopes at an elevation of 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 36 degrees F. The frost-free season is 50 to 70 days. These soils are in similar positions on the landscape. The Jaroso soil is similar to the Angostura soil except that it has a subsoil that is more than 35 percent clay. This complex is about 40 percent Jaroso soil, 30 percent Angostura soil, and 20 percent Rock outcrop.

Included in mapping are areas of Maes, Mascarenas, and Presa soils, which make up about 10 percent of the complex.

The Jaroso soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is very pale brown cobbly loam about 16 inches thick. The subsoil extends to a depth of 60 inches or more. It is very pale brown cobbly clay loam, cobbly clay, very cobbly clay, and very cobbly sandy clay.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is medium, and the erosion hazard is moderate.

The Angostura soil is deep and well drained. It formed in colluvium of interbedded sandstone and shale. Typically, the surface layer is light brownish gray cobbly loam about 10 inches thick. The subsoil is light yellowish brown very cobbly sandy clay loam that extends to a depth of more than 60 inches.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is low. Runoff is medium, and the erosion hazard is moderate.

Rock outcrop consists mainly of escarpments of interbedded and highly fractured sandstone and shale.

The dominant vegetation is Engelmann spruce and Douglas-fir and some scattered white fir and subalpine fir. The understory is mainly Thurber fescue, tufted hairgrass, mountain brome, kinnikinnick, and grouse whortleberry.

These soils are used for timber and for wildlife habitat. They are suited to the production of Douglas-fir, Engelmann spruce, white fir, and aspen. The very steep slopes and Rock outcrop severely restrict the mobility of most equipment.

This complex has moderate potential for use as habitat for woodland wildlife.

LaE—Lama loam, 0 to 20 percent slopes. This is a deep, well drained soil on old terraces and plains. It formed in mixed alluvium that derived from sedimentary and igneous rock. The elevation is 7,800 to 8,500 feet. The mean annual precipitation is 17 inches, and the mean annual temperature is 48 degrees F. The frost-free season is 120 to 130 days.

Included in mapping are small areas of Montecito soils, which make up about 10 percent of the map unit.

Typically, the surface layer is brown loam about 7 inches thick. The subsoil is reddish brown and brown clay, brown gravelly clay, and reddish yellow very cobbly sandy clay about 34 inches thick. The substratum, to a depth of 48 inches, is light reddish brown extremely gravelly sandy clay loam. Below that, it is yellow extremely gravelly loamy sand to a depth of 60 inches or more.

Permeability is slow to moderately slow in the subsoil. It is rapid in the sandy lower part of the substratum. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is moderate.

These soils are suitable for use as woodland and for grazing by domestic livestock and wildlife. They produce pinyon pine, oneseed juniper, Rocky Mountain juniper, and Gambel oak. The understory vegetation is blue grama, bottlebrush squirreltail, and bluegrass. Big sagebrush is common at the lower elevations.

Proper grazing of the understory vegetation maintains woodland, improves the plant cover, results in the accumulation of plant residue and helps prevent erosion.

A management system is needed that provides periodic resting from grazing to allow key management

plants to complete their growth cycle. The result will be a balanced plant community that helps to maintain the woodland and that provides productive forage for grazing animals. Fences, trails, and access roads can be constructed on this soil to facilitate grazing management.

This soil has medium potential for use as habitat for openland, woodland, and rangeland wildlife. It has medium potential for the production of firewood.

LoB—Loveland clay loam, 0 to 3 percent slopes. This is a deep, poorly drained, level to nearly level soil. It formed in mixed alluvium on alluvial bottoms and terraces. Individual areas are 3 to 100 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days.

Included with this soil in mapping are Caruso and Manzano soils. These soils make up about 15 percent of this map unit.

Typically, the surface layer is dark grayish brown clay loam and loam about 9 inches thick. The underlying material, to a depth of 21 inches, is dark grayish brown loam. Below that, it is water-worn mixed sand, gravel, and cobblestones to a depth of 60 inches or more. The soil is moderately calcareous in the surface layer and strongly calcareous in the layer below that. Depth to the seasonal water table ranges from 6 to 18 inches.

Permeability is moderate down to the sand and gravel and rapid below that depth. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is very slow, and the hazard of water erosion is slight.

Most areas of this soil are used as pasture or are vegas. Dominant vegetation on the vegas includes tufted hairgrass, mountain brome, sedges, Kentucky bluegrass, and red fescue. Adapted pasture plants include creeping foxtail, reed canarygrass, western wheatgrass, orchardgrass, alsike clover, and strawberry clover.

The major limitations to irrigation are poor drainage, a high water table, and a short growing season with cool nights. The choice of plants is limited to adapted grasses and legumes.

Drainage of this soil can be improved by diverting offsite water, by intercepting and safely disposing of underground seepage, and by installing surface and subsurface drains.

Fertilization and improved water-application practices help to maintain or increase the yield and quality of forage. Timely application of irrigation water in an amount that is adequate for crops is essential on this soil because it is poorly drained. Border, corrugation, and sprinkler irrigation systems are suitable. Generally, all grasses respond to nitrogen, and all legumes respond to phosphate fertilizer. Rotation grazing helps to increase the yield and quality of pasture. Timely harvesting improves the yield and quality of hay.

This soil has low potential for most urban uses because of the high water table and the hazard of flooding, which are continuing limitations.

This soil has high potential for use as habitat for wetland wildlife and medium potential for use as habitat for rangeland wildlife.

LtC—Luhon-Travelers complex, 3 to 7 percent slopes. This complex consists of small areas of Luhon and Travelers soils that are so intermingled that they could not be mapped separately at the scale selected. The elevation is 7,600 to 8,800 feet. The mean annual precipitation is 11 inches and the mean annual temperature is 44 degrees F. The frost-free season is 90 to 110 days. The Luhon soil makes up about 50 percent of the complex. The slope is 1 to 5 percent. The Travelers soil makes up about 30 percent of the complex. The slope is 3 to 9 percent. The nearly level and gently sloping Luhon soil is in areas between basalt flows. The gently sloping to moderately sloping Travelers soil is on the basalt flows and is shallow over the basalt. The mapped areas are mainly rounded in shape and are 100 to 4,000 acres in size.

Included in mapping are Stunner and Antonito soils, each making up about 5 percent of this complex. Rock outcrop makes up 10 percent of the complex.

The Luhon soil is deep and well drained. It formed in material that weathered from basalt and in eolian sediment. Typically, the surface layer is brown loam about 3 inches thick. The underlying material, to a depth of 12 inches, is brown loam. Below that, it is pinkish gray clay loam and pinkish white loam to a depth of 60 inches or more. The soil is slightly calcareous in the upper part of the underlying material and strongly calcareous in the lower part.

Permeability is moderate. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow to medium. The hazards of water and wind erosion are moderate.

The Travelers soil is shallow and well drained. It formed in residuum of basalt and in eolian sediment. Typically, the surface layer is brown, very stony loam about 4 inches thick. The subsoil is brown, very stony loam about 4 inches thick. The substratum is pale brown, very stony loam about 5 inches thick. Basalt is at a depth of 13 inches. The soil is strongly calcareous throughout.

Permeability is moderate. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium. The hazard of water erosion is moderate, and the wind erosion hazard is slight.

These soils are suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of litter on the surface, and helps prevent erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced

plant community of vigorous and productive forage plants such as Indian ricegrass, western wheatgrass, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by broom snakeweed, rubber rabbitbrush, and pingue. This deterioration generally results in accelerated soil erosion.

Range management, including fencing, range seeding, brush management, and constructing livestock watering facilities, access roads, and stock trails is feasible on the Luhon soil. The use of machinery is not feasible on the Travelers soil because of the shallowness to bedrock and the rock outcrops. However, because the Travelers and Luhon soils are so intermingled on the landscape, it is difficult to separate them for management purposes.

These soils have medium potential for the development of habitat for rangeland wildlife.

MaF—Maes cobbly loam, 15 to 40 percent slopes. This is a deep, well drained, moderately steep to steep soil on south-facing mountain slopes. It formed in colluvium and residuum of interbedded shale and sandstone. The elevation is 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 70 to 90 days.

Included in mapping and making up about 25 percent of this map unit is a soil that is similar to this Maes soil except that it has a thick, dark-colored surface layer. Also included and making up about 15 percent of this unit are areas of Etoe soils.

Typically, the upper part of the surface layer is light brownish gray cobbly loam 2 inches thick, and the lower part is pale brown cobbly sandy loam about 18 inches thick. The subsoil is yellowish brown, very cobbly sandy clay that extends to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is Douglas-fir and ponderosa pine and some scattered white fir, aspen, and Gambel oak. The understory is mainly kinnikinnick, grouse whortleberry, snowberry, mountain brome, and timber oatgrass.

This soil has medium potential for the production of Douglas-fir, ponderosa pine, white fir, and aspen. This map unit has potential for grazing, mainly on the dark-colored soils that are included in mapping.

Conventional methods can be used to harvest trees, but they generally are restricted in rainy periods because of the fine textured soil material in the subsoil.

This soil has medium potential for use as habitat for openland and woodland wildlife.

MeD—Maes-Etoe complex, 0 to 15 percent slopes. This complex consists of Maes and Etoe soils in small areas that are so intermingled that they could not be mapped separately at the scale selected. These level to strongly sloping soils are on broad mountaintops and benches at an elevation of 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 70 to 90 days. The Maes soil makes up about 50 percent of this map unit, and the Etoe soil makes up about 35 percent. The Maes soil is similar to the Etoe soil except that it has more clay in the subsoil.

Included in mapping are Jaroso, Angostura, and Presa soils, which make up about 15 percent of this complex.

The Maes soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam and pale brown cobbly sandy loam about 20 inches thick. The subsoil is yellowish brown, very cobbly sandy clay that extends to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is slow, and the hazard of water erosion is slight.

The Etoe soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam about 26 inches thick. The subsoil is brown very cobbly sandy clay loam that extends to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is slow, and the hazard of water erosion is slight.

The dominant vegetation is Douglas-fir and ponderosa pine and some scattered white fir, aspen, and Gambel oak. The understory is mainly kinnikinnick, grouse whortleberry, and mountain brome.

These soils have medium potential for the production of Douglas-fir, ponderosa pine, white fir, and aspen. Conventional methods can be used to harvest trees, but they generally are restricted in rainy periods. Management practices should favor the Douglas-fir or the ponderosa pine.

These soils have medium potential for use as habitat for openland or woodland wildlife.

MeF—Maes-Etoe complex, 15 to 40 percent slopes. This complex consists of small areas of Maes and Etoe soils that are so intermingled that they could not be mapped separately at the scale selected. These moderately steep to steep soils are on mountaintops, mountainsides, and benches at an elevation of 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 70 to 90 days. Maes cobbly loam makes up about 60 percent of this map unit, and Etoe cobbly loam makes up about 25 percent. The Maes soil is similar to the Etoe soil except that it has more clay in the subsoil.

Included in mapping are areas of Jaroso, Angostura, and Presa soils, which make up about 15 percent of this complex.

The Maes soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam and pale brown cobbly sandy loam about 7 inches thick. The next layer is mixed very pale brown very cobbly sandy loam and yellowish brown very cobbly sandy clay about 28 inches thick. The subsoil is yellowish brown very cobbly sandy clay that extends to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is medium, and the hazard of water erosion is moderate.

The Etoe soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is pale brown cobbly loam about 27 inches thick. The subsoil is very pale brown, very cobbly sandy clay loam and extremely cobbly sandy clay loam that extends to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches, and the available water capacity is moderate. Runoff is medium, and the hazard of water erosion is medium.

The dominant vegetation is Douglas-fir and ponderosa pine and some scattered white fir, aspen, and Gambel oak. The understory is mainly kinnikinnick, grouse whortleberry, and mountain brome.

These soils have medium potential for the production of Douglas-fir, ponderosa pine, white fir, or aspen. Management should favor the Douglas-fir or the ponderosa pine, depending on the extent to which the canopy is opened up in harvesting. Conventional methods can be used to harvest trees, but they generally are restricted in rainy periods because of the fine-textured subsoil.

These soils have medium potential for use as habitat for woodland wildlife.

MeG—Maes-Etoe complex, very steep. This complex consists of small areas of Maes and Etoe soils that are so intermingled that they could not be mapped separately at the scale selected. These soils are on mountain slopes at an elevation of 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F. The frost-free season is 70 to 90 days. The Maes soil makes up about 50 percent of this map unit, and the Etoe soil makes up about 35 percent. The Maes soil is similar to the Etoe soil except that it has more clay in the subsoil.

Included in mapping are areas of Jaroso, Angostura, and Presa soils which make up about 15 percent of this complex.

The Maes soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam and pale brown cobbly loam about 20 inches thick. The subsoil is yellowish brown very cobbly sandy clay that extends to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is medium, and the hazard of water erosion is high.

The Etoe soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam about 26 inches thick. The subsoil is brown, very cobbly sandy clay loam that extends to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is high.

The dominant vegetation is Douglas-fir and ponderosa pine and some scattered white fir, aspen, and Gambel oak. The understory is mainly kinnikinnick, grouse whortleberry, and mountain brome.

These soils have medium potential for the production of Douglas-fir, ponderosa pine, and white fir. Management practices that favor either Douglas-fir or ponderosa pine and white fir are feasible. The practices that favor either Douglas-fir or ponderosa pine depend on the extent to which the canopy is opened up in harvesting. Conventional methods of harvesting trees cannot be used because slopes are too steep. The hazard of water erosion limits the management potential.

These soils have moderate potential for the development of habitat for woodland wildlife.

MFG—Maes-Etoe-Rock outcrop complex, very steep. This complex consists of small areas of Maes and Etoe soils and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. These soils and Rock outcrop are on mountainsides at an elevation of 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F. The Maes soil makes up about 40 percent of this map unit, the Etoe soil about 25 percent, and Rock outcrop 25 percent. The Maes soil is similar to the Etoe soil except that is has more clay in the subsoil.

Included in mapping and making up about 10 percent of this complex are Jaroso, Angostura, and Presa soils.

The Maes soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is light brownish gray cobbly loam and pale brown cobbly sandy loam about 20 inches thick. The subsoil is yellowish brown very cobbly sandy clay that extends to a depth of 60 inches or more. The soil material is neutral in the surface layer and slightly acid in the subsoil.

Permeability is moderately slow. The effective rooting depth is more than 60 inches. The available water

capacity is low to moderate. Runoff is medium, and the hazard of water erosion is high.

The Etoe soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and cobblestones. Typically, the surface layer is light brownish gray cobbly loam about 26 inches thick. The subsoil is brown very cobbly sandy clay loam that extends to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is high.

Rock outcrop is scattered throughout the map unit. It is mainly highly fractured, vertical escarpments of interbedded sandstone and shale.

The dominant vegetation is Douglas-fir and ponderosa pine and some scattered white fir, aspen, and Gambel oak. The understory is mainly kinnikinnick, grouse whortleberry, and mountain brome.

The soils in this complex have medium potential for the production of Douglas-fir, ponderosa pine, and white fir. Conventional methods of harvesting trees cannot be used because of the areas of Rock outcrop, which restrict the mobility of harvesting equipment.

The soils have medium potential for the development of habitat for woodland wildlife.

MNC—Manzano clay loam, 0 to 5 percent slopes. This is a deep, well drained, nearly level to gently sloping soil. It formed in mixed alluvium on valley floors and in drainage channels. Slopes are smooth and concave. The areas are 5 to 160 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches. The mean annual temperature is 48 degrees F, and the frost-free season is 125 to 135 days.

Included with this soil in mapping are gravelly soils that have a fine-textured subsoil. Also included are a few areas of Caruso and Tenorio soils. In some areas, the Manzano soil has slopes of as much as 80 percent. The soils that are included in mapping make up about 20 percent of this map unit, but the areas of these soils generally are less than 10 acres in size.

Typically, the surface layer is brown clay loam about 10 inches thick. The subsoil is brown clay loam, loam, and sandy clay loam about 20 inches thick. The substratum, to a depth of 60 inches or more, is brown clay loam and loam.

Permeability is moderately slow. The available water capacity is high. The effective rooting depth is 60 inches or more. Runoff is very slow to medium, depending on the slope. The hazard of water erosion is slight to moderate, depending on the slope.

This soil is suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue on the surface, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, galleta, and sideoats grama. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by big sagebrush, rabbitbrush, and broom snakeweed. This deterioration generally results in accelerated soil erosion. Fencing, constructing earthen ponds, installing pipelines, brush management, range seeding, and noxious weed control are feasible in range management.

This soil has low potential for most urban uses. The flooding hazard on the lesser slopes, the moderate shrink-swell potential, the low soil strength, and the moderately slow permeability are limitations. The shrinking and swelling and the low strength of the soil can be overcome by good design and careful installation. However, the hazard of flooding is a continuing limitation in many areas. The moderately slow permeability is a limitation for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has medium potential for the development of habitat for openland and rangeland wildlife.

MnA—Manzano clay loam, 0 to 1 percent slopes. This is a deep, well drained, level soil. It formed in mixed alluvium on valley floors and along arroyos. Slopes are smooth and concave. The areas are 5 to 100 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 48 degrees F. The frost-free season is 125 to 135 days.

Included with this soil in mapping are some areas of gravelly soils and a few areas of intermingled Caruso, Loveland, and Tenorio soils. These soils make up about 15 percent of this map unit, but the areas of these soils generally are less than 1 acre in size.

Typically, the surface layer is dark brown clay loam about 11 inches thick. The subsoil is dark brown clay loam about 33 inches thick. The substratum, to a depth of 60 inches or more, is brown clay loam. A few fine strong brown mottles are below a depth of 48 inches.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is very slow, and the hazard of water erosion is slight.

This soil is used as native grazing land and hayland and for irrigated crops and pasture. The dominant native vegetation is blue grama, big sagebrush, and western wheatgrass. The main irrigated crops are pasture grasses and hay. This soil is suitable for alfalfa, small grains, and cool-season grasses. Potatoes and vegetables that are adapted to the short growing season and cool nights can also be grown.

The main limitations to the use of this soil for irrigated crops and pasture are the short growing season and cool nights. In some areas, wind erosion is a moderate

hazard. In some areas, the soil is subject to flooding from overflow. Dikes or diversions can be built to protect the soil from flooding.

Growing grasses and legumes or other crops that produce a high amount of residue helps to control erosion and to maintain soil tilth. Fertilization and improved water-application practices help to maintain or increase yields. Generally, all crops except legumes respond to nitrogen, and legumes respond to phosphate fertilizer. Border, furrow, sprinkler, and corrugation irrigation systems are suitable. Rotation grazing helps to increase the yield and quality of pasture. Timely harvesting improves the yield and quality of crops.

This soil has low potential for most urban areas. The hazard of flooding, the moderate shrink-swell potential, the low soil strength, and the moderately slow permeability are limitations. The shrinking and swelling and the low strength of the soil can be overcome by good design and careful installation. However, the hazard of flooding is a continuing limitation in most areas. The moderately slow permeability is a limitation for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has high potential for use as habitat for openland wildlife. It has medium potential for use as habitat for wetland and rangeland wildlife.

MnB—Manzano clay loam, 1 to 3 percent slopes. This is a deep, well drained, nearly level soil. It formed in mixed alluvium on valley floors and along arroyos. Slopes are smooth and concave. The areas are 5 to 100 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches. The mean annual temperature is 48 degrees F, and the frost-free season is 125 to 135 days.

Included with this soil in mapping are some areas of gravelly soils and a few areas of intermingled Caruso, Loveland, and Tenorio soils. The included soils make up about 15 percent of this map unit, but the areas of these soils generally are less than 1 acre in size.

Typically, the surface layer is dark brown clay loam about 10 inches thick. The subsoil is dark brown clay loam about 33 inches thick. The substratum is brown clay loam to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate.

This soil is used as native grazing land and for irrigated crops and pasture. The dominant vegetation is blue grama, big sagebrush, and western wheatgrass. The main irrigated crops are cool-season pasture grasses and alfalfa hay. This soil has good potential for the production of barley, potatoes, and other vegetables that are adapted to the local climate.

If this soil is used for cultivated crops, water erosion is a moderate hazard. The major limitations are the short growing season and cool nights. They limit the choice of crops and reduce crop yields. This soil is suitable for alfalfa, small grains, and cool-season grasses. Potatoes and vegetables that are adapted to the short growing season and cool nights can also be grown. Growing mainly grasses or legumes and other high residue-producing crops helps to prevent water erosion and to maintain soil tilth. Fertilization and improved water-management practices help to maintain or increase yields. Generally, all crops except legumes respond to nitrogen, and all legumes respond to phosphate fertilizer. Border, furrow, corrugation, and sprinkler irrigation systems are suitable. Rotation grazing increases the yield and quality of pasture. Timely harvesting improves the quality of crops.

This soil has medium potential for most urban uses. The hazard of flooding, the moderate shrink-swell potential, the low soil strength, and the moderately slow permeability are limitations. The shrinking and swelling and the low strength of the soil can be overcome by good design and careful installation. In some areas the flood hazard can be overcome by constructing diversions. The moderately slow permeability is a limitation for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has high potential for use as habitat for openland wildlife. It has medium potential for use as habitat for wetland and rangeland wildlife.

MnC—Manzano clay loam, 3 to 5 percent slopes. This is a deep, well drained, gently sloping soil. It formed in mixed alluvium along arroyo channels in the northern part of the survey area. Slopes are concave. The areas are 5 to 160 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches. The mean annual temperature is 48 degrees F, and the frost-free season is 125 to 135 days.

Included with this soil in mapping are some areas of gravelly soils and a few areas of intermingled Caruso and Tenorio soils. The included soils make up about 15 percent of this map unit, but the areas of these soils generally are less than 1 acre in size. In some areas, the slopes range to 8 percent.

Typically, the surface layer is brown clay loam about 10 inches thick. The subsoil is dark brown clay loam about 33 inches thick. The substratum is brown clay loam to a depth of 60 inches or more.

Permeability is moderately slow. The available water capacity is high. The effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is high.

This soil is used as native grazing land and for irrigated crops and pasture. The dominant native vegetation is blue grama, big sagebrush, and western wheatgrass. The main irrigated crops are cool-season pasture grasses and alfalfa hay. Barley and other small grains can be grown occasionally.

If this soil is used for cultivated crops, the hazard of water erosion is severe, and the hazard of wind erosion is moderate. The main limitations are the short growing season, the cool nights, and the moderate slopes. They limit the choice of crops and the type of irrigation systems used. This soil is suitable for alfalfa, small grains, and cool-season grasses.

Growing mainly grasses or legumes and other high residue-producing crops helps to prevent water erosion and to maintain soil tilth. Fertilization and improved water-management practices help to maintain or increase yields. Generally, all crops except legumes respond to nitrogen, and all legumes respond to phosphate fertilizer. Border, corrugation, and sprinkler irrigation systems are suitable. Rotation grazing increases the yield and quality of pasture. Timely harvesting improves the quality of crops.

This soil has medium potential for most urban uses. The moderate shrink-swell potential, the low soil strength, the moderately slow permeability, and slope are limitations. The shrinking and swelling and low strength of the soil can be overcome by good design and careful installation. The moderately slow permeability is a limitation for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

This soil has high potential for use as habitat for openland wildlife. It has moderate potential for use as habitat for wetland and rangeland wildlife.

MrD—Marosa cobbly sandy loam, 0 to 15 percent slopes. This is a deep, well drained, level to strongly sloping soil on broad mountaintops and benches. It formed in colluvium and residuum of acid igneous or metamorphic rock. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days.

Included with this soil in mapping and making up about 20 percent of this map unit are areas of Nambe soils and soils that are similar to this Marosa soil except that they are somewhat poorly drained.

Typically, the surface layer is light brownish gray cobbly sandy loam about 3 inches thick. The subsurface layer is white and very pale brown very gravelly loamy sand about 31 inches thick. The subsoil is light yellowish brown very cobbly sandy clay loam about 10 inches thick. The substratum to a depth of 60 inches or more consists of mixed cobbles, gravel, and stones and a small amount of sandy clay loam.

Permeability is moderate. The available water capacity is low. Runoff is medium, and the hazard of water erosion is slight.

The dominant vegetation is Douglas-fir and Engelmann spruce and some scattered white fir, subalpine fir, and aspen. The understory is mainly Kentucky bluegrass, kinnikinnick, grouse whortleberry, Arizona fescue, and mountain brome.

This soil is used mainly for timber and for wildlife habitat. It has medium potential for the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods can be used to harvest trees.

This soil has low potential for use as habitat for openland and woodland wildlife.

MrF—Marosa cobbly sandy loam, 15 to 40 percent slopes. This is a deep, well drained, moderately steep to steep soil on mountain slopes. It formed in colluvium and residuum of rhyolite. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Nambe soils, which make up about 20 percent of this map unit.

Typically, the surface layer is light brownish gray cobbly sandy loam about 3 inches thick. The subsurface layer is white and very pale brown very gravelly loamy sand about 31 inches thick. The subsoil is light yellowish brown very cobbly sandy clay loam about 10 inches thick. The substratum to a depth of 60 inches or more consists of mixed gravel, cobbles, stones, and a small amount of sandy clay loam.

Permeability is moderate. The available water capacity is low. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is Douglas-fir and Engelmann spruce and some scattered white fir, subalpine fir, and aspen. The understory is mainly Kentucky bluegrass, kinnikinnick, grouse whortleberry, Arizona fescue, and mountain brome.

This soil is used mainly for timber production and for wildlife habitat. It has medium potential for the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods can be used to harvest trees. Logging roads should be properly located and constructed so that erosion is minimized during tree harvest. Managing this soil to favor aspen increases timber production and improves the habitat for wildlife.

This soil has low potential for use as habitat for openland and woodland wildlife.

MrG—Marosa cobbly sandy loam, 40 to 80 percent slopes. This is a deep, well drained, steep to very steep soil on mountain slopes. It formed in colluvium and residuum of rhyolite. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Nambe soils, which make up about 20 percent of this map unit.

Typically, the surface layer is light brownish gray cobbly sandy loam about 3 inches thick. The subsurface layer is light gray and white extremely gravelly loamy sand and very pale brown extremely gravelly sandy loam about 31 inches thick. The subsoil is light yellowish brown extremely gravelly sandy clay loam about 10

inches thick. The substratum to a depth of 60 inches or more consists of mixed cobbles, gravel, and stones, and a small amount of sandy clay loam.

Permeability is moderate. The available water capacity is low. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is Douglas-fir and Engelmann spruce and some scattered white fir, subalpine fir, and aspen. The understory is mainly Kentucky bluegrass, kinnikinnick, grouse whortleberry, Arizona fescue, and mountain brome.

This soil is used mainly for timber production and for wildlife habitat. It has medium potential for the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods cannot be used to harvest trees. The steep to very steep slopes severely restrict the mobility of most equipment. Soil disturbance and erosion should be kept to a minimum during harvest. Managing this soil to favor aspen increases timber production and improves the habitat for wildlife.

MSG—Marosa-Rock outcrop complex, very steep. This complex consists of small areas of Marosa very cobbly sandy loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The areas are on mountain slopes at an elevation of 9,000 to 11,000 feet. Most areas are associated with rhyolite rock. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days. This complex is about 50 percent Marosa very cobbly sandy loam and 30 percent Rock outcrop.

Included in mapping are areas of Nambe soils, which make up about 20 percent of this complex.

The Marosa soil is deep and well drained. It formed in colluvium and residuum of acid igneous rock. Typically, the surface layer is light brownish gray very cobbly sandy loam about 3 inches thick. The subsurface layer is white and very pale brown very gravelly loamy sand about 31 inches thick. The subsoil is light yellowish brown very cobbly sandy clay loam about 10 inches thick. The substratum to a depth of 60 inches or more consists of mixed cobbles, gravel, and stones, and a small amount of sandy clay loam.

Permeability is moderate. The available water capacity is low. Runoff is medium, and the hazard of water erosion is high.

The dominant vegetation is Douglas-fir and Engelmann spruce and some scattered white fir, subalpine fir, and aspen. The understory is mainly Kentucky bluegrass, kinnikinnick, grouse whortleberry, Arizona fescue, and mountain brome.

The Marosa soil is used mainly for timber production and for wildlife habitat. It has medium potential for the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods cannot be used to harvest trees. The very steep slopes, the high erosion hazard, and the rock outcrops preclude most uses. Managing the Marosa soil to favor aspen increases timber production and improves the habitat for wildlife.

This complex has low potential for the development of habitat for openland and woodland wildlife.

MSG2—Marosa-Rock outcrop complex, very steep, eroded. This complex consists of small areas of Marosa very cobbly sandy loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The areas are on mountain slopes at an elevation of 9,000 to 11,000 feet. Most areas are associated with rhyolite rock. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days. This complex is about 50 percent eroded Marosa soils and 30 percent Rock outcrop.

Included in mapping are areas of Nambe soils, which make up about 20 percent of this complex.

The Marosa soil is deep and well drained. It formed in colluvium and residuum of acid igneous rock. Typically, the surface layer is about 12 inches thick. It is light brownish gray very cobbly sandy loam over white and very pale brown very gravelly loamy sand. The subsoil is light yellowish brown very cobbly sandy clay loam about 10 inches thick. The substratum to a depth of 60 inches or more consists of mixed cobbles, gravel, and stones, and a small amount of sandy clay loam. The surface layer ranges from 6 to 25 inches in thickness depending on the degree of erosion.

Permeability is moderate. The available water capacity is low. Runoff is rapid, and the hazard of water erosion is very high.

The dominant vegetation is aspen and some scattered Douglas-fir, Engelmann spruce, white fir, and subalpine fir. The understory is mainly kinnikinnick, grouse whortleberry, Arizona fescue, and mountain brome.

The Marosa soil is used mainly for timber production and for wildlife habitat. It has low potential for the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods cannot be used to harvest trees. Managing the Marosa soil to favor aspen increases timber production and improves the habitat for wildlife.

This complex has low potential for use as habitat for openland and woodland wildlife.

MTE—Marosa-Nambe association, moderately steep. This association consists of moderately steep soils on north-facing mountain side slopes in the northern part of the survey area. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days. This association is about 45 percent Marosa gravelly sandy loam and 30 percent Nambe gravelly sandy loam. The Marosa soil is at the lower elevations, and the Nambe soil is at the higher elevations.

Included in mapping are Rock outcrop, making up about 15 percent of this association, and Cryaquolls, making up about 10 percent. It formed in colluvium and residuum of acid igneous rock.

The Marosa soil is deep and well drained. Typically, the surface layer is light gray gravelly sandy loam about 26 inches thick. The subsoil is yellowish brown very gravelly clay loam that extends to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is medium. The hazard of water erosion is moderate to high.

The Nambe soil is deep and well drained. It formed in colluvium of rhyolite. Typically, the surface layer is light brownish gray gravelly sandy loam about 15 inches thick. The subsoil is light brown cobbly sandy loam about 34 inches thick. The substratum is very pale brown very cobbly sandy loam to a depth of 60 inches or more.

Permeability is moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is low to moderate. Runoff is moderate to very rapid, and the hazard of water erosion is moderate to high.

The dominant vegetation on the Marosa soil is Douglas-fir and Engelmann spruce and some scattered subalpine fir, white fir, and aspen. The main understory is kinnikinnick and grouse whortleberry. On the Nambe soil, the dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

These soils are used mainly for timber production and for wildlife habitat. They have medium potential for the production of Douglas-fir, Engelmann spruce, white fir, and aspen. Conventional methods can be used to harvest trees. Soil disturbance should be kept to a minimum during harvest. Managing the Marosa soil to favor aspen increases timber production and improves the habitat for wildlife.

These soils have low potential for the development of habitat for openland and woodland wildlife.

MUG—Mirabal-Rock outcrop association, very steep. This association consists of Mirabal stony loam and Rock outcrop on mountain slopes at an elevation of 8,000 to 9,500 feet. The mean annual precipitation is 20 inches, and the mean annual temperature is 42 degrees F. The frost-free season is 80 to 100 days. Mirabal stony loam makes up about 50 percent of this association, and Rock outcrop makes up about 30 percent.

Included in mapping and making up about 20 percent of this map unit are areas of Chimayo and Marosa soils. In some small areas near Tres Piedras, the slopes are less than 40 percent.

The Mirabal soil is moderately deep and well drained. It formed in residuum of granite. Typically, the surface layer is grayish brown stony loam about 3 inches thick. The underlying material, to a depth of 32 inches, is light brownish gray stony loam and light brown and pink very stony sandy loam. Granite bedrock is at a depth of 32 inches.

Permeability is moderately rapid. The effective rooting depth is 20 to 35 inches. The available water capacity is very low. Runoff is medium, and the hazard of water erosion is high.

Rock outcrop consists mainly of nearly vertical escarpments of granite.

The dominant vegetation is ponderosa pine and some scattered Gambel oak. The understory consists of mountain muhly, prairie junegrass, pine dropseed, and bottlebrush squirreltail.

The Mirabal soil is used mainly for wildlife habitat. It has low potential for the production of ponderosa pine. The droughtiness of this soil restricts the regeneration and production of ponderosa pine. The very steep slopes, the high erosion hazard, and the rock outcrops preclude most uses.

This association has moderate potential for use as habitat for woodland wildlife.

MwD—Mirand cobbly loam, 0 to 15 percent slopes. This is a deep, well drained, level to strongly sloping soil on terraces. It formed in mixed alluvium. The elevation is 7,500 to 9,000 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 42 degrees F. The frost-free season is 80 to 100 days.

Included in mapping and making up about 20 percent of this unit are areas of Trampas and Maes soils and small areas of soils that have slopes of 15 to 30 percent.

Typically, the surface layer is grayish brown cobbly loam about 3 inches thick. The subsoil is brown, light brown, and yellowish red clay and cobbly clay about 42 inches thick. The substratum is light brown sandy clay to a depth of 60 inches or more.

Permeability is very slow. The available water capacity is moderate. The effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is moderate.

The dominant vegetation is ponderosa pine and some scattered Gambel oak. The understory is mainly Arizona fescue, pine dropseed, prairie junegrass, and mountain muhly.

This soil is used mainly for timber and for wildlife habitat. It has high potential for the production of ponderosa pine. Conventional methods can be used to harvest trees, but they generally are restricted in rainy periods.

This soil has moderate potential for use as habitat for openland and woodland wildlife.

MxD—Montecito loam, 1 to 15 percent slopes. This is a deep, well drained soil on terraces and plains at an elevation of 7,000 to 7,800 feet. It formed in material that derived from alluvium and basalt. The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F. The frost-free season is 125 to 135 days.

Included in mapping are areas of Hernandez and Lama soils, each making up about 10 percent of this map unit.

Typically, the surface layer is light yellowish brown and brown loam about 6 inches thick. The subsoil is brown and light brown clay loam and gravelly clay loam about 24 inches thick. The substratum, to a depth of 60 inches or more, is white very gravelly sandy loam and light gray extremely gravelly sandy loam.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is moderate.

This soil is suitable for use as woodland and for grazing by domestic livestock and wildlife. It produces pinyon pine, Rocky Mountain juniper, oneseed juniper, and understory vegetation consisting of blue grama, big sagebrush, broom snakeweed, muttongrass, and sideoats grama.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. This system results in a balanced plant community of productive forage that helps to maintain the woodland. Brush management, range seeding, installing pipelines, and constructing earthen ponds, fences, and trails are feasible in managing grazing land.

This soil has medium potential for use as habitat for rangeland wildlife.

MxE—Montecito-Rock outcrop complex, moderately steep. This complex consists of areas of Montecito loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The Montecito soil is moderately sloping and strongly sloping, and the Rock outcrop is steep and very steep. The elevation is 6,500 to 8,000 feet. The mean annual precipitation is 14 inches. The mean annual temperature is 52 degrees F, and the frost-free season is 125 to 135 days. Montecito loam makes up about 50 percent of this complex, and Rock outcrop makes up 25 percent.

Included in mapping and making up about 15 percent of this complex are soils that are similar to this Montecito soil except that they have a cobbly surface layer and slopes of 15 to 25 percent. Also included and making up about 10 percent of this complex are areas of Orthents.

The Montecito soil is deep and well drained. It formed in material that derived from basalt and eolian sediment. Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown clay loam about 30 inches thick. The substratum is pale brown gravelly loam to a depth of 60 inches or more.

Permeability is moderately slow. The available water capacity is high. Runoff is medium. The hazard of water erosion is moderate, and the hazard of wind erosion is slight.

Rock outcrop consists of folded, broken, and exposed basalt flows. Runoff is rapid.

The dominant vegetation is pinyon pine and oneseed juniper. The understory is blue grama, big sagebrush, sideoats grama, and broom snakeweed.

The Montecito soil is suitable for use as woodland and for grazing by domestic livestock and wildlife. It produces pinyon pine, Rocky Mountain juniper, oneseed juniper, and understory vegetation consisting of western wheatgrass, blue grama, sideoats grama, muttongrass, and galleta.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. This system results in a balanced plant community of productive forage that helps to maintain the woodland.

Constructing fences, trails, and earthen ponds; installing pipelines; range seeding; and brush management are feasible in managing grazing land on the Montecito soil.

In most areas, this complex is used for wildlife habitat and for wood crops that are used for firewood and fenceposts. This complex has medium potential for use as habitat for woodland and rangeland wildlife.

NaD—Nambe cobbly loam, 0 to 15 percent slopes. This is a deep, well drained, level to strongly sloping soil that formed in colluvium. This soil is on broad mountaintops and benches at an elevation of 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Marosa soils, which make up about 15 percent of this map unit.

Typically, the surface layer is grayish brown cobbly loam about 5 inches thick. The subsurface layer is light yellowish brown very cobbly sandy loam about 11 inches thick. The subsoil is light brown very cobbly sandy loam about 16 inches thick. The substratum to a depth of 60 inches or more is brown very stony sandy loam.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is slow, and the hazard of water erosion is slight.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

This soil is used for timber and for wildlife habitat. It has medium potential for the production of Engelmann spruce and subalpine fir.

Conventional methods can be used to harvest trees. Regeneration of Engelmann spruce is hampered by the high intensity of light at high elevations and by frost

heaving. If stands are clear-cut, special management is needed to keep soil erosion to a minimum.

This soil has medium potential for use as habitat for woodland wildlife.

NaF—Nambe cobbly loam, 15 to 40 percent slopes. This is a very deep, well drained, moderately steep to steep soil that formed in colluvium. This soil is on mountain slopes at an elevation of 10,000 and 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Marosa soils, which make up about 15 percent of this map unit.

Typically, the surface layer is light yellowish brown cobbly loam about 5 inches thick. The subsurface layer is light yellowish brown very cobbly sandy clay loam about 11 inches thick. The subsoil is light brown cobbly sandy clay loam and pale brown and grayish brown very cobbly sandy loam about 39 inches thick. The substratum is yellowish brown extremely gravelly sandy loam to a depth of 60 inches or more.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is moderate, and the hazard of water erosion is moderate.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

This soil is used for timber and for wildlife habitat. It has medium potential for the production of Engelmann spruce and subalpine fir.

Conventional methods can be used to harvest trees. Regeneration of Engelmann spruce is hampered by the high intensity of light at high elevations and by frost heaving. If stands are clear-cut, special management is needed to keep soil erosion to a minimum. Because of the moderately steep to steep slopes, management should be designed to prevent accelerated erosion. The risk of erosion is serious on steep slopes because of the high elevation and the slow regeneration rate.

This soil has medium potential for use as habitat for woodland wildlife.

NaF2—Nambe cobbly loam, 15 to 40 percent slopes, eroded. This is a deep, well drained, moderately steep to steep soil that formed in colluvium. This soil is on mountain slopes at an elevation of 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Marosa soils and areas of uneroded Nambe cobbly loam, which make up about 25 percent of this map unit.

Typically, the light brown cobbly loam subsoil is exposed as a result of erosion. It is 24 inches thick. The substratum, to a depth of 60 inches or more, is brown very stony sandy loam.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is moderate, and the hazard of water erosion is high.

The dominant vegetation is rose pussytoes, sedges, western yarrow, kinnikinnick, grouse whortleberry, and mountain brome.

This soil has low potential for timber. The native Engelmann spruce-subalpine fir forest has been replaced by sparse grasses, forbs, and sedges as a result of fire. The regeneration of coniferous trees will be extremely slow, partly because the original surface layer, as much as 8 inches thick, has been lost through erosion.

Management is restricted because of the environment and the limited potential of this eroded Nambe soil. Severe sheet and gully erosion is prevalent throughout this map unit. Increased runoff from this soil has resulted in damage to stream channels, mainly through streambank cutting and sediment deposition. Intensive management can help to stabilize this soil.

This soil has low potential for use as habitat for woodland wildlife.

NaG—Nambe cobbly loam, 40 to 80 percent slopes. This is a deep, well drained, very steep soil that formed in colluvium. This soil is on mountain slopes at an elevation of 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Marosa soils, which make up about 15 percent of this map unit.

Typically, the surface layer is grayish brown cobbly loam about 5 inches thick. The subsurface layer is light yellowish brown very cobbly sandy loam about 11 inches thick. The subsoil is light brown very cobbly sandy loam about 16 inches thick. The substratum to a depth of 60 inches or more is brown very stony sandy loam.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is rapid, and the hazard of water erosion is high.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

This soil is used for timber and for wildlife habitat. It has medium potential for the production of Engelmann spruce and subalpine fir.

Conventional methods cannot be used to harvest trees because of the very steep slopes and the high erosion hazard. The risk of erosion is increased by the slow regeneration of trees.

This soil has medium potential for use as habitat for woodland wildlife.

NaG2—Nambe cobbly loam, 40 to 80 percent slopes, eroded. This is a deep, well drained, very steep soil that formed in colluvium. This soil is on mountain

slopes at an elevation of 10,000 and 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Marosa soils and areas of uneroded Nambe cobbly loam, which make up about 25 percent of this map unit.

Typically, the light brown cobbly loam subsoil is exposed as a result of erosion. It is 24 inches thick. The substratum to a depth of 60 inches or more is brown very stony sandy loam.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is low to moderate. Runoff is very rapid, and the hazard of water erosion is very high.

The dominant vegetation is rose pussytoes, sedges, western yarrow, kinnikinnick, grouse whortleberry, and mountain brome.

This soil has low potential for timber production. The native Engelmann spruce-subalpine fir forest has been replaced by sparse grasses, forbs, and sedges as a result of fire. The regeneration of coniferous trees will be extremely slow, partly because the original surface layer, as much as 8 inches thick, has been lost through erosion.

Management is severely restricted because of the environment and the limited potential of this soil. The soil can be stabilized through intensive management; however, because of the climate, slope, and extent of erosion, stabilization will be extremely expensive and slow. Increased runoff from this soil has resulted in severe damage to stream channels through streambank cutting and sediment deposition.

This soil has low potential for the development of habitat for woodland wildlife.

NRG—Nambe-Rock outcrop complex, very steep. This complex consists of small areas of Nambe cobbly loam and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days. About 60 percent of this complex is Nambe cobbly loam, and 25 percent is Rock outcrop.

Included in mapping are areas of Marosa soils which make up about 15 percent of this complex.

The Nambe soil is deep and well drained. It formed in colluvium on mountain slopes. Typically, the surface layer is grayish brown cobbly loam about 5 inches thick. The subsurface layer is light yellowish brown very cobbly sandy loam about 11 inches thick. The subsoil is light brown very cobbly sandy loam about 16 inches thick. The substratum to a depth of 60 inches or more is brown very stony sandy loam.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches, and the available water capacity is low to moderate. Runoff is rapid, and the hazard of water erosion is high.

Rock outcrop consists of scattered areas of Precambrian and igneous rock.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

This complex has low potential for timber.

Management is severely restricted because of the very steep slopes and the rock outcrops. Conventional methods of harvesting trees cannot be used.

This complex has low potential for use as habitat for woodland wildlife.

NRG2—Nambe-Rock outcrop complex, very steep, eroded. This complex consists of small areas of an eroded Nambe soil and Rock outcrop that are so intermingled that they could not be mapped separately at the scale selected. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the average annual temperature is 34 degrees F. The frost-free season is less than 60 days. About 50 percent of this complex is an eroded Nambe soil, and 25 percent is Rock outcrop.

Included in mapping are areas of uneroded Nambe cobbly loam, which make up about 10 percent of this complex, and areas of Marosa soils, which make up about 15 percent.

Typically, the subsoil is exposed as a result of erosion. The subsoil is light brown very cobbly sandy loam about 16 inches thick. The substratum to a depth of 60 inches or more is brown very stony sandy loam.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is rapid, and the hazard of water erosion is very high.

Rock outcrop consists of scattered areas of igneous and metamorphic rock.

The dominant vegetation is rose pussytoes, sedges, kinnikinnick, grouse whortleberry, mountain brome, and a few scattered Engelmann spruce and subalpine fir.

This complex has low potential for timber.

The native vegetation on this soil was characteristic of the Engelmann spruce-subalpine fir forest. Because of fire, the present vegetation is mainly grasses, forbs, and sedges.

Management is severely restricted because of the very steep slopes, the rock outcrops, and the severe erosion.

This complex has low potential for use as habitat for woodland wildlife.

OeF—Orejas stony loam, 15 to 40 percent slopes. This is a shallow, well drained, moderately steep to steep soil that formed in residuum of basalt. This soil is on hills at an elevation of 7,000 to 7,800 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F. The frost-free season is 120 to 130 days.

Included in mapping are soils that are similar to this Orejas soil except that they are moderately deep and calcareous. They make up about 20 percent of this map unit and are mainly in the vicinity of Cerro Mojino and Tres Orejas.

Typically, the surface layer is pale brown very stony loam about 2 inches thick. The subsoil is light brown cobbly clay loam and pinkish gray very gravelly clay loam about 12 inches thick. Basalt bedrock is at a depth of about 14 inches.

Permeability is slow. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium, and the hazard of water erosion is moderate.

This soil is suitable for use as woodland and for grazing by domestic livestock and wildlife. It produces pinyon pine, oneseed juniper, and understory vegetation consisting of blue grama, big sagebrush, western wheatgrass, broom snakeweed, and sideoats grama.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. This system results in a balanced plant community of productive forage that can help to maintain the woodland.

Access roads and trails can be constructed to facilitate grazing-land management. The use of machinery for other purposes is not feasible because the soil is shallow and stony.

This soil has medium potential for use as habitat for rangeland wildlife.

OMD—Orejas-Montecito association, strongly sloping. This association consists of soils on the sides of old volcanic cones at an elevation of 7,000 to 8,000 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F. The frost-free season is 120 to 130 days. Orejas very stony loam makes up about 40 percent of this association; slopes range from 9 to 30 percent. Montecito loam makes up about 25 percent of this association; slopes range from 5 to 15 percent.

Included in mapping are areas of Rock outcrop, which make up about 20 percent of this association. Also included are Petaca, Prieta, and Silva soils, each making up 5 percent of this association.

The Orejas soil is shallow and well drained. It formed in residuum of basalt. Typically, the surface layer is pale brown very stony loam about 2 inches thick. The subsoil is light brown cobbly clay loam and pinkish gray very gravelly clay loam about 14 inches thick. Basalt bedrock is at a depth of 16 inches.

Permeability is slow. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium, and the hazard of water erosion is moderate.

The Montecito soil is deep and well drained. It formed in alluvium that derived from basalt. Typically, the surface layer is light yellowish brown loam about 6 inches thick. The subsoil is brown clay loam about 24 inches thick. The substratum, to a depth of 60 inches or more, is light gray cobbly sandy loam.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is moderate to high. Runoff is medium. The hazard of water erosion is moderate.

These soils are suitable for use as woodland and for grazing by domestic livestock and wildlife. They produce pinyon pine, oneseed juniper, and understory vegetation consisting of blue grama, big sagebrush, sideoats grama, and muttongrass.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue and helps prevent soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. This system results in a balanced plant community of productive forage that helps to maintain the woodland.

Brush management, range seeding, installing pipelines, and constructing fences and earthen ponds are feasible in managing grazing land on the Montecito soil. The use of machinery is not feasible on the Orejas soil.

This association has medium potential for the development of habitat for rangeland wildlife.

ORG—Orthents-Badland association, very steep. This association consists of very steep soils and Badland at an elevation of 6,800 feet to 8,000 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 50 degrees F. The frost-free season is 130 to 140 days. Orthents that have 40 to 80 percent slopes make up about 50 percent of the association, and Badland makes up 30 percent.

Included in mapping are areas of Calciorthids and Silva soils, which make up about 20 percent of the association.

Orthents are deep, well drained soils on low hills and highly dissected plains. They formed in material that derived from the Santa Fe Formation, which consists of old mixed alluvium. Typically, these soils are very gravelly or cobbly loam about 10 inches thick over very gravelly loam or very gravelly clay loam that is 50 to 65 percent gravel.

Permeability is moderately rapid to moderate. The effective rooting depth is 60 inches or more. The available water capacity is very low. Runoff is rapid, and the erosion hazard is high.

Badland consists of exposures of very steep, dissected, nearly barren material of the Santa Fe Formation. The material varies in texture, in content of coarse fragments, and in the degree of cementation. Local relief is 100 to 500 feet. Runoff is very rapid, and geologic erosion is active.

Orthents are used mainly for wildlife habitat. The steep slopes, the high erosion hazard, and the low fertility of these soils are severe limitations to most uses. Orthents have an overstory of oneseed juniper and pinyon pine. The understory is mainly blue grama and sideoats grama. Badland has little vegetation. It is a major source of sediment in this survey area.

This association has low potential for use as habitat for rangeland wildlife.

OSG—Orthents-Calciorthids association, very steep. This association consists of strongly sloping to very steep soils adjacent to drainageways. These soils formed in mixed alluvium. The steep slopes were formed through a high degree of dissection on the old alluvial plain. The elevation ranges from 7,000 to 8,500 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F. The frost-free season is 120 to 140 days.

Orthents make up about 50 percent of this association; slopes range from 40 to 80 percent. Calciorthids make up 30 percent of the association; slopes range from 10 to 40 percent.

Included in mapping and making up about 20 percent of the association are areas of Lama and Montecito soils, mainly on the less steep slopes.

Orthents are deep and well drained. Typically, they are very gravelly or cobbly loam over very gravelly loam or very gravelly clay loam to a depth of 60 inches or more. The content of coarse fragments ranges from 50 to 65 percent.

Permeability is moderate to moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is very low. Runoff is rapid, and the hazard of water erosion is high.

Calciorthids are deep and well drained. Typically, they are gravelly loam, very gravelly loam, or very gravelly clay loam over very gravelly sandy loam or very gravelly sandy clay loam, to a depth of 60 inches or more. They are 15 to 30 percent calcium carbonate in the lower part. The content of coarse fragments ranges from 35 to 65 percent throughout.

Permeability is moderate to moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is very low. Runoff is rapid, and the hazard of water erosion is high.

The dominant vegetation is pinyon pine and oneseed juniper. The understory is mainly blue grama and sideoats grama.

This complex has medium potential for use as habitat for rangeland wildlife.

OTG—Orthents-Rock outcrop association, very steep. This association consists of very steep soils and Rock outcrop at an elevation of 6,400 to 7,000 feet. The areas are typical of canyons along the Rio Grande. These canyons grade to smaller canyons that dissect adjacent plains (fig. 3). The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F. The frost-free season is 130 to 140 days. Orthents make up about 50 percent of this association. Slopes range from 40 to 80 percent. Rock outcrop makes up 30 percent.

Included in mapping are areas of Montecito and Trampas soils, which make up about 20 percent of this association.

Orthents are deep, well drained soils on canyon slopes. They formed in material that derived from old alluvium of the Santa Fe Formation. The surface layer is very gravelly or cobbly loam about 10 inches thick. The underlying material is very gravelly loam or very gravelly clay loam to a depth of 60 inches or more. It is 5 to 15 percent calcium carbonate. The content of coarse fragments ranges from 50 to 65 percent.

Permeability varies from moderately rapid to moderate. The effective rooting depth is 60 inches or more. The available water capacity is very low. Runoff is rapid, and the water erosion hazard is high.

Rock outcrop consists of nearly vertical escarpments of basalt that form a protective cap over the alluvial sediment. The areas of Rock outcrop are along the borders of this association.

The dominant vegetation is pinyon pine and oneseed juniper. The understory is mainly blue grama and sideoats grama.

The erosion hazard, the slumping hazard, the steepness of slopes, and the stoniness restrict the use of this association.

This association is used mainly for wildlife habitat. It has low potential for the development of habitat for rangeland wildlife.

PAG—Paleboralfs-Cryochrepts-Rock outcrop association, very steep. This association consists of very steep soils and Rock outcrop at an elevation of 9,000 to 12,000 feet. The mean annual precipitation is 30 inches in areas of the Paleboralfs and 35 inches in areas of the Cryochrepts.

The mean annual temperature is 36 degrees F in areas of the Paleboralfs and 34 degrees F in areas of the Cryochrepts. Paleboralfs make up about 40 percent of this association; slopes range from 40 to 80 percent. Cryochrepts make up 30 percent; slopes range from 40 to 80 percent. Rock outcrop makes up 20 percent of this association.

Included in mapping are areas of Penitente soils, which make up about 10 percent of this association.

Paleboralfs are deep, well drained soils. Typically, the surface layer is very cobbly loam or sandy loam over very gravelly loamy sand. The subsoil is cobbly loam or sandy loam over very gravelly loamy sand. The subsoil is cobbly sandy clay loam or cobbly clay loam. The substratum, to a depth of 60 inches or more, consists of mixed cobbles, gravel, and stones, and a small amount of sandy clay loam.

Permeability is moderate to moderately slow. The available water capacity is low to moderate. Runoff is medium, and the hazard of water erosion is high.

Cryochrepts are deep, well drained soils. Typically, the surface layer is cobbly loam or cobbly sandy loam. The underlying material is very cobbly sandy loam and very stony sandy loam to a depth of 60 inches or more.

Permeability is moderately rapid. The effective rooting depth is more than 60 inches. The available water capacity is very low. Runoff is medium, and the hazard of water erosion is high.

Rock outcrop consists of scattered areas of Precambrian and igneous rock. In many areas, the Rock outcrop occurs as vertical escarpments.

The dominant vegetation on the Paleboralfs is Douglas-fir and Engelmann spruce with some scattered subalpine fir, white fir, and aspen. The understory is mainly kinnikinnick and grouse whortleberry. The dominant vegetation on the Cryochrepts is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

The soils in this association have low potential for the production of Engelmann spruce, Douglas-fir, or subalpine fir.

Conventional methods cannot be used to harvest trees because of the very steep slopes and the high erosion hazard. The slow regeneration of trees increases the risk of erosion.

This association has medium potential for use as habitat for woodland wildlife.

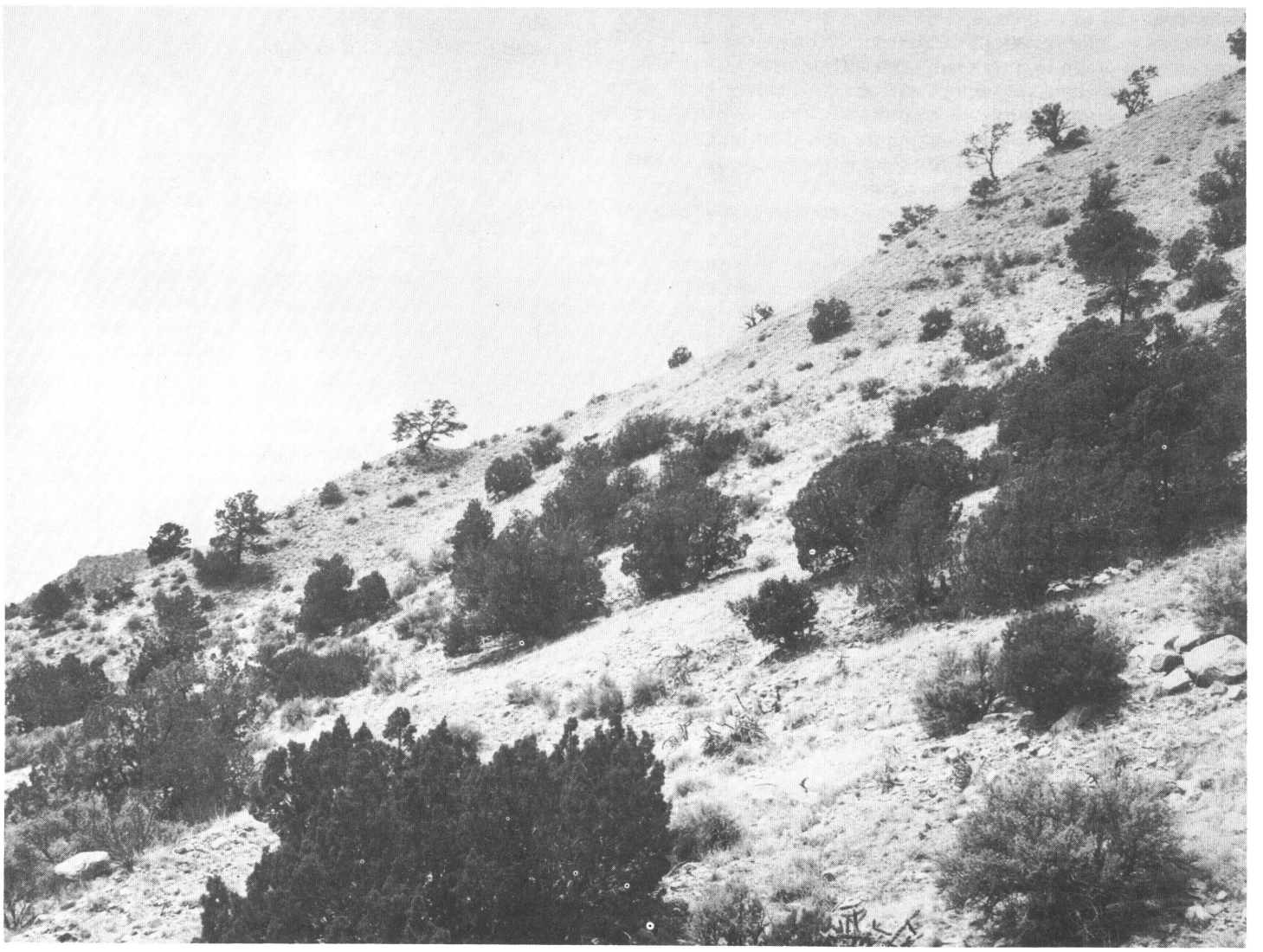


Figure 3.—An area of Orthents-Rock outcrop association, very steep.

PbD—Penitente gravelly loam, 5 to 15 percent slopes. This is a very deep, well drained soil that formed in colluvium and residuum of acid igneous and metamorphic rock. This soil is on mountain slopes at an elevation of 12,000 to 13,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 30 degrees F.

Included in mapping are soils that are similar to this Penitente soil except that they are moderately deep to bedrock or have finer textured subsoil. The soils make up about 15 percent of this map unit.

Typically, the surface layer is dark grayish brown gravelly loam and very gravelly loam about 11 inches thick. The subsoil is light brown very gravelly loam and very pale brown very cobbly sandy clay loam about 25 inches thick. The substratum to a depth of 60 inches or more is light gray extremely gravelly loamy sand.

Permeability is moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is medium, and the hazard of water erosion is slight.

This soil is suited to use as native grazing land for domestic livestock and for wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as sheep fescue, Thurber fescue, and muttongrass. If the condition of the plant community deteriorates, the proportion of desirable forage plants decreases. This deterioration generally results in accelerated soil erosion.

Fences and stock trails can be constructed to facilitate range management; however, erosion is a hazard.

This soil has medium potential for use as habitat for woodland and rangeland wildlife.

PbF—Penitente gravelly loam, 15 to 40 percent slopes. This is a very deep, well drained, moderately steep to steep soil on mountain slopes. This soil formed in colluvium and residuum of acid igneous and metamorphic rock. The elevation is 12,000 to 13,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 30 degrees F. The frost-free season is less than 60 days.

Included in mapping are soils that are similar to this Penitente soil except that they are moderately deep to bedrock or have a finer textured subsoil. These soils make up about 15 percent of the unit.

Typically, the surface layer is dark grayish brown gravelly loam and brown very gravelly loam about 11 inches thick. The subsoil is light brown very gravelly loam about 11 inches thick. The subsoil is light brown very gravelly loam and very pale brown very cobbly sandy clay loam about 25 inches thick. The substratum to a depth of 60 inches or more is light gray extremely gravelly loamy sand.

Permeability is moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is medium, and the hazard of water erosion is moderate.

This soil is suited to use as native grazing land for domestic livestock and for wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as sheep fescue, Thurber fescue, and muttongrass. If the condition of the plant community deteriorates, the proportion of desirable forage plants decreases. This deterioration generally results in accelerated soil erosion.

Constructing fences and stock trails and controlling noxious weeds to facilitate range management are feasible.

This soil has moderate potential for use as habitat for woodland and rangeland wildlife.

PeD—Petaca very stony loam, 1 to 15 percent slopes. This is a shallow, well drained, nearly level to rolling soil on uplands. This soil formed in material that weathered from basalt and mixed sediment. The elevation is 7,000 to 7,500 feet. The mean annual precipitation is 12 inches, and the mean annual air temperature is 49 degrees F. The frost-free season is 125 to 135 days.

Included in mapping are Hernandez soils, which make up about 10 percent of this map unit, Silva soils, which make up 5 percent, and Rock outcrop, which makes up 10 percent.

Typically, the surface layer is brown very stony loam about 2 inches thick. The underlying material, to a depth of 17 inches, is brown cobbly loam, pale brown cobbly clay loam, and pale brown very gravelly sandy loam. Fractured basalt is at a depth of 17 inches.

Permeability is moderate. The effective rooting depth is 12 to 20 inches. The available water capacity is very low. Runoff is medium, and the hazard of water erosion is moderate.

This soil is suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. This system results in a balanced plant community of big sagebrush and a variety of vigorous and productive forage plants such as western wheatgrass, sideoats grama, fourwing saltbush, and blue grama. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by rubber rabbitbrush, broom

snakeweed, and big sagebrush. This deterioration generally results in accelerated soil erosion.

The use of machinery to facilitate range management is not feasible because of the shallowness to bedrock and the very stony surface layer of this soil.

This soil has medium potential for use as habitat for rangeland wildlife.

PfC—Petaca-Prieta complex, 1 to 8 percent slopes. This complex consists of small areas of Petaca and Prieta soils that are so intermingled that they could not be mapped separately at the scale selected. The soils are shallow and are nearly level to moderately sloping. They are on basalt flows on uplands west of the Rio Grande at an elevation of 6,500 to 7,800 feet (fig. 4). The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days. Petaca stony loam makes up about 45 percent of this complex. It is on ridges and side slopes and has slopes of 3 to 8 percent. Prieta stony silty clay loam makes up about 30 percent of the complex. It is in the more level areas and has slopes of 1 to 5 percent. The areas are elongated and are parallel to arroyos. They are 160 to 640 acres in size. Drainage from these soils contributes to the Rio Grande watershed.

Included in mapping and making up about 15 percent of the complex are Servilleta soils in deep pockets and on nearly level ridgetops. Also included are areas of Manzano soils and basalt outcrops; those areas make up 10 percent of the complex.

The Petaca soil is shallow and well drained. It formed in material that weathered from basalt and eolian sediment. Typically, the surface layer is brown stony loam about 2 inches thick. The underlying material is pale brown and light gray stony loam about 13 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of 15 inches. The soil is strongly calcareous throughout.

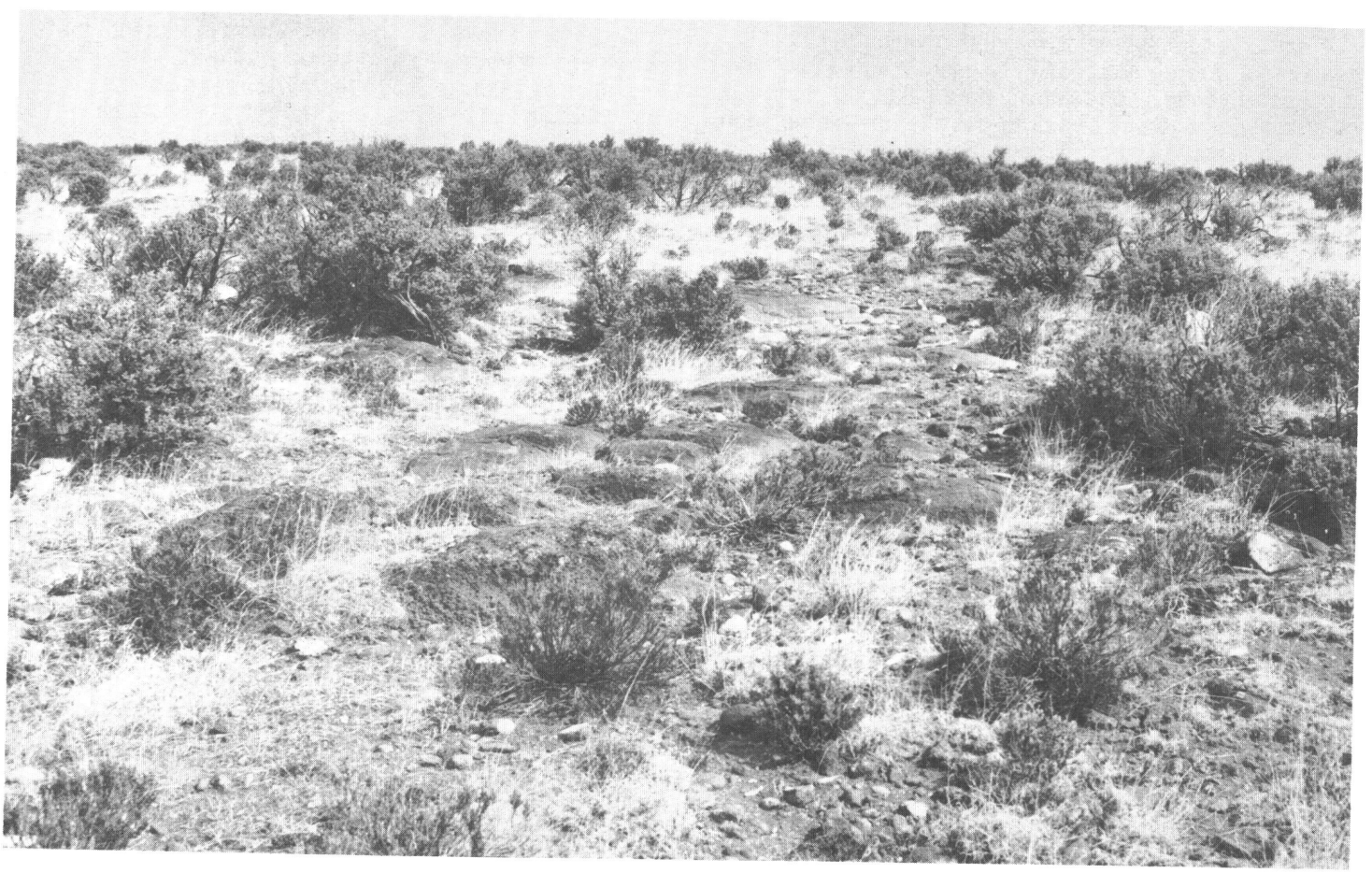


Figure 4.—Prieta stony silty clay loam in an area of Petaca-Prieta complex, 1 to 8 percent slopes.

The Petaca soil is moderately permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium. Water erosion and wind erosion are moderate hazards.

The Prieta soil is shallow and well drained. It formed in residuum and mixed eolian sediment. Typically, the surface layer is brown stony silty clay loam about 3 inches thick. The subsoil is brown and light brown stony silty clay loam about 7 inches thick. The substratum is pink stony clay loam about 4 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of about 14 inches.

The Prieta soil is slowly permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium. The hazard of water erosion is moderate, and the hazard of wind erosion is slight.

These soils are suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, sideoats grama, blue grama, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by big sagebrush, rubber rabbitbrush, and broom snakeweed. This deterioration generally results in accelerated soil erosion.

This complex has medium potential for use as habitat for rangeland wildlife.

PGC—Petaca-Silva association, gently sloping. This association consists of soils on uplands at an elevation of 6,500 to 7,800 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days.

This association is about 35 percent Petaca stony loam that has slopes of 3 to 8 percent; 25 percent Silva loam that has slopes of 1 to 5 percent; and 20 percent Prieta stony silty clay loam that has slopes of 3 to 5 percent. The Petaca soil is on the more stony side slopes and ridgetops. The Silva soil is in the deeper areas between basalt ridges. The Prieta soil generally is less sloping.

The Petaca and Prieta soils formed in material that weathered from basalt and in eolian sediment. The Silva soil formed in eolian and old alluvial sediment. The mapped areas mainly are rounded in shape and are 200 to 1,000 acres in size. Areas of each soil are as small as 5 acres and are oriented with the drainage pattern. Drainage from these soils contributes to the Rio Grande watershed.

Included in mapping are areas of Hernandez and Servilleta soils and basalt outcrops.

Typically, the surface layer of the Petaca soil is brown stony loam about 2 inches thick. The underlying material is pale brown and light gray stony loam about 13 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of about 15 inches. The soil is strongly calcareous and mildly alkaline to moderately alkaline.

The Petaca soil is moderately permeable. The effective rooting depth is 10 to 20 inches. Runoff is medium to rapid. The hazard of water erosion is moderate, and the wind erosion hazard is slight.

Typically, the surface layer of the Prieta soil is brown stony silty clay loam about 3 inches thick. The subsoil is brown and light brown stony silty clay loam about 7 inches thick. The substratum is pink stony silty clay loam about 4 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of about 14 inches. The soil is neutral in the surface layer, mildly alkaline to moderately alkaline in the subsoil, and strongly calcareous and moderately alkaline in the substratum.

The Prieta soil is slowly permeable. The effective rooting depth is 10 to 20 inches. Runoff is medium. The hazard of water erosion is moderate, and the hazard of wind erosion is slight.

Typically the surface layer of the Silva soil is brown loam about 2 inches thick. The subsoil is brown and light brown clay loam about 31 inches thick. The substratum to a depth of 60 inches or more is very pale brown clay loam.

The Silva soil is slowly permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate.

These soils are suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of big sagebrush and vigorous and productive forage plants such as western wheatgrass and blue grama. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by big sagebrush, rubber rabbitbrush, and broom snakeweed. This deterioration generally results in accelerated soil erosion.

In managing range on the Silva soil, constructing access roads, stock trails, and fences; range seeding; brush management; and installing pipelines are feasible. The use of machinery in range management is not feasible on the Petaca and Prieta soils because these soils are shallow and have a stony surface.

This association has medium potential for the development of habitat for rangeland wildlife.

PoB—Poganeab silty clay loam, nearly level. This is a deep, poorly drained, nearly level soil that formed in

mixed alluvium on valley floors and stream terraces. Slopes are smooth and concave. Individual areas are 3 to 60 acres in size. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches. The mean annual temperature is 49 degress F. The frost-free season is 125 to 135 days.

Included with this soil in mapping are a few areas of intermingled Caruso and Loveland soils. These soils make up about 10 percent of this map unit, but the areas of the soils generally are less than 1 acre in size.

Typically, the surface layer is gray silty clay loam about 17 inches thick. The underlying material is grayish brown silty clay loam and clay loam to a depth of about 50 inches. Below that is gray gravelly sandy loam to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. A seasonal water table is at a depth of 6 to 18 inches. The available water capacity is high. Runoff is very slow. The hazard of water erosion is slight.

Most areas of this soil are used as pasture or are vegas. The dominant vegetation on the vegas includes sedges, rushes, tufted hairgrass, Kentucky bluegrass, and clover. Adapted pasture plants include creeping foxtail, reed canarygrass, western wheatgrass, orchardgrass, alsike clover, and strawberry clover.

The major limitations to irrigation on this soil are poor drainage, a high water table, and a short growing season with cool nights. The choice of plants is limited to adapted grasses and legumes.

Fertilization and improved water-application practices help to maintain or increase the yield and quality of forage. Timely application of irrigation water in an amount adequate for crops without overirrigating is essential on this soil because it is poorly drained. Border, corrugation, and sprinkler irrigation systems are suitable. Generally, all grasses respond to nitrogen, and all legumes respond to phosphate fertilizer. Rotation grazing helps to increase the yield and quality of pasture. Timely harvesting improves the yield and quality of hay.

This soil has low potential for most urban uses because of the high water table and the hazard of flooding. These are continuing limitations to most urban uses.

This soil has high potential for use as habitat for wetland wildlife and medium potential for rangeland wildlife.

PrD—Presa cobbly loam, 0 to 15 percent slopes. This is a deep, well drained, level to strongly sloping soil on broad mountaintops and benches. It formed in material that weathered from sandstone and shale. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Angostura and Jaroso soils, which make up about 15 percent of this map unit.

Typically, the surface layer is yellowish brown cobbly loam about 7 inches thick. The subsoil is yellowish brown and pale brown stony loam, very gravelly loam, and stony sandy clay loam about 47 inches thick. The substratum to a depth of 60 inches or more is light yellowish brown extremely stony sandy loam.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is medium, and the hazard of water erosion is slight.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

This soil is used mainly for timber and for wildlife habitat. It has medium potential for the production of Engelmann spruce and subalpine fir. Conventional methods can be used to harvest trees, but they generally are restricted in rainy periods. The regeneration of Engelmann spruce is hampered by the high intensity of light at high elevations and by frost heaving. If stands are clear-cut, special management is needed to keep soil erosion to a minimum.

This soil has medium potential for use as habitat for openland and woodland wildlife.

PrF—Presa cobbly loam, 15 to 40 percent slopes. This is a deep, well drained, moderately steep to steep soil on mountain slopes. It formed in material that weathered from sandstone and shale. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is about 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Angostura and Jaroso soils, which make up about 15 percent of this map unit.

Typically, the surface layer is yellowish brown cobbly loam about 2 inches thick. The subsurface layer is light yellowish brown gravelly loam about 3 inches thick. The subsoil is about 47 inches thick. It is light yellowish brown very gravelly loam, very pale brown and pale yellow extremely cobbly loam, pale yellow extremely cobbly sandy clay loam, and light yellowish brown extremely stony sandy clay loam. The substratum to a depth of 60 inches or more is light yellowish brown extremely stony sandy loam.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is moderate, and the hazard of water erosion is moderate.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

This soil is used mainly for timber and for wildlife habitat. It has medium potential for the production of Engelmann spruce and subalpine fir. Conventional methods can be used to harvest trees, but the use of mechanical equipment is restricted to the drier periods.

Because the climate is severe and the erosion hazard is moderate, special emphasis on controlling the degree

of disturbance to this soil is essential. Special management practices are necessary to facilitate the regeneration of Engelmann spruce because of frost heaving and the high intensity of light.

This soil has medium potential for use as habitat for openland and woodland wildlife.

PrG—Presa cobbly loam, 40 to 80 percent slopes. This is a very deep, well drained, very steep soil on mountaintops, side slopes, and benches. It formed in material that weathered from sandstone and shale. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days.

Included in mapping are areas of Angostura and Jaroso soils, which make up about 15 percent of this map unit.

Typically, the surface layer is yellowish brown cobbly loam about 7 inches thick. The subsoil is yellowish brown to pale brown very gravelly loam, stony loam, and stony sandy clay loam about 47 inches thick. The substratum is light yellowish brown extremely stony sandy loam to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is moderate, and the hazard of water erosion is high.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

The Presa soil is used for timber and for wildlife habitat. It has medium to low potential for the production of Engelmann spruce and subalpine fir. Because of steep slopes and a high erosion hazard, conventional methods of tree harvest cannot be used.

This soil has medium potential for use as habitat for woodland wildlife.

PSG—Presa-Rock outcrop complex, very steep. This complex consists of small areas of Presa cobbly loam and Rock outcrop in small areas that are so intermingled that they could not be mapped separately at the scale selected. The areas are on mountaintops, side slopes, and benches at an elevation of 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days. Presa cobbly loam makes up 60 percent of the complex, and Rock outcrop makes up 25 percent.

Included in mapping are areas of Angostura and Jaroso soils, which make up about 15 percent of this complex.

The Presa soil is deep and well drained. It formed in material that weathered from sandstone and shale. Typically, the surface layer is yellowish brown cobbly loam about 7 inches thick. The subsoil is yellowish brown to pale brown very gravelly loam, stony loam, and stony sandy clay loam about 47 inches thick. The substratum is light yellowish brown extremely stony sandy loam to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is moderate, and the hazard of water erosion is high.

Rock outcrop is scattered throughout this complex as nearly vertical escarpments of interbedded and highly fractured sandstone and shale.

The dominant vegetation is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry.

The Presa soil is used for timber and for wildlife habitat. It has low potential for the production of Engelmann spruce and subalpine fir. Conventional methods cannot be used to harvest trees because of the very steep slopes and the rock escarpments, which restrict mobility of equipment. Road and trail construction is severely restricted.

This complex has medium potential for use as habitat for woodland wildlife.

PYF—Presa-Cryaquolls association, steep. This association consists of level to very steep soils on valley-train land adjacent to drainageways. The valley-train land, which resulted from glaciation, has a stairstep topography. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F. The frost-free season is less than 60 days. This association is about 50 percent Presa cobbly loam that has 5 to 50 percent slopes, and 30 percent Cryaquolls that have 0 to 5 percent slopes.

Included in mapping are areas of Nambe soils and Cryoborolls, which make up about 20 percent of this association. Most of the lakes and perennial streams of the high mountain areas are in this association.

The Presa soil is deep and well drained. It formed in colluvium and residuum of interbedded shale and sandstone. Typically, the surface layer is yellowish brown cobbly loam about 7 inches thick. The subsoil is yellowish brown to pale brown very gravelly loam, stony loam, and stony sandy clay loam 47 inches thick. The substratum is light yellowish brown extremely stony sandy loam to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is more than 60 inches. The available water capacity is moderate. Runoff is slow. The hazard of water erosion is slight where slopes are 5 to 15 percent and moderate where slopes are 15 to 50 percent.

Typically, Cryaquolls are dark colored in the upper 7 to 20 inches. The surface layer and subsoil are silty clay loam. The substratum is gravelly clay and gravelly loam to a depth of 60 inches or more. The seasonal water table is within a depth of 20 inches.

Cryaquolls are very slowly permeable. The effective rooting depth is 60 inches or more. The available water

capacity is moderate. Runoff is slow. The hazard of water erosion is slight.

The dominant vegetation on the Presa soil is Engelmann spruce and subalpine fir. The understory is mainly grouse whortleberry. The dominant vegetation on Cryaquolls is mountain willow, alder, shrubby cinquefoil, skunkcabbage, western yarrow, sedges, and Kentucky bluegrass.

The Presa soil is used mainly for timber and for wildlife habitat. It has medium potential for the production of Engelmann spruce and subalpine fir. Conventional methods can be used to harvest trees, but the use of machinery is restricted to the drier periods.

Because the climate is severe and the erosion hazard is moderate, special emphasis on controlling the degree of disturbance to this soil is essential. Special management practices are necessary to facilitate the regeneration of Engelmann spruce because of frost heaving and the high intensity of light.

Cryaquolls are used mainly for grazing and for wildlife habitat. The cold climate limits the grazing potential of these soils. The proximity of these soils to perennial streams further limits their use. Most of the sediment from these soils is deposited in the perennial streams and seriously damages the habitat for fish.

This association has medium potential for use as habitat for openland and woodland wildlife.

RaC—Raton very stony silt loam, 3 to 8 percent slopes. This is a shallow, well drained, gently sloping to moderately sloping soil. It formed in residuum of basalt on the top of old volcanic cones. The areas are 40 to 1,000 acres in size. The elevation is 8,000 to 9,000 feet. The mean annual precipitation is 15 inches, and the mean annual temperature is 41 degrees F. The frost-free season is 80 to 110 days. Drainage from this soil contributes to the Rio Grande watershed.

Included with this soil in mapping are areas of Rock outcrop, which make up about 20 percent of this map unit.

Typically, the surface layer is dark grayish brown very stony silt loam about 4 inches thick. The subsoil is dark brown very stony silty clay loam and very stony clay about 14 inches thick. Basalt bedrock is at a depth of 18 inches.

Permeability is slow. The available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is slow, and the erosion hazard is slight.

This soil is suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as Arizona fescue, mountain muhly, and sideoats grama. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by woody plants such as oak and broom snakeweed. This deterioration generally results in accelerated soil erosion.

Access roads and stock trails are needed for livestock distribution. The use of machinery for other range management needs is not feasible because of the stony surface, the shallowness of this soil, and the rock outcrops.

This soil has medium potential for use as habitat for rangeland wildlife.

RBE—Raton-Stunner association, moderately steep. This association consists of soils on the sides of old volcanic cones at an elevation of 7,600 to 10,000 feet. In areas of the Raton soil, the mean annual precipitation is 15 inches, and the mean annual temperature is 41 degrees F. In areas of the Stunner soils, the mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F. The frost-free season is 90 to 110 days. Raton cobbly silt loam that has 8 to 40 percent slopes makes up about 40 percent of this association, and Stunner cobbly loam that has 3 to 5 percent slopes makes up about 25 percent. Rock outcrop makes up 15 percent of this association. The strongly sloping to steep Raton soil is on side slopes. The gently sloping Stunner soil is on smooth foot slopes.

Included with these soils in mapping are Shawa and Antonito soils, each making up about 10 percent of the association.

The Raton soil is shallow and well drained. It formed in gravelly and cobbly material that weathered from basalt and in eolian sediment. Typically, the surface layer is dark grayish brown cobbly silt loam about 4 inches thick. The subsoil is dark brown very stony clay and very stony silty clay loam to a depth of about 14 inches. Basalt bedrock is at a depth of 18 inches.

The Raton soil is slowly permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is rapid, and the hazard of water erosion is high.

The Stunner soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown cobbly loam about 4 inches thick. The subsoil is light brown and brown clay loam about 15 inches thick. The substratum to a depth of 60 inches or more is pink and pinkish white loam and gravelly loam. The soil below the surface layer is strongly calcareous.

The Stunner soil is moderately permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow to medium. The hazard of water erosion is moderate.

The Raton soil is suited to use as grazable woodland, and the Stunner soil is suited to use as native grazing land. These soils produce forage for domestic livestock and for wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as bottlebrush squirreltail, western wheatgrass, blue grama, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by broom snakeweed, rubber rabbitbrush, and big sagebrush. This deterioration generally results in accelerated soil erosion. Fences, access roads, and stock trails are needed for livestock distribution.

The Raton soil has medium potential for use as habitat for woodland and rangeland wildlife, and the Stunner soil has medium potential for use as habitat for rangeland wildlife.

The Raton soil has medium potential for the production of wood crops for firewood and fenceposts.

RcG—Rock outcrop, very steep. This miscellaneous area is mainly along the sides of the Rio Grande Gorge. It consists mainly of escarpments of basalt that have some layers of terrace sediment. Slopes are very steep. The elevation is 6,000 to 7,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 48 degrees F. The frost-free season is 120 to 130 days.

Local relief is 50 to 600 feet. Runoff is very rapid, and the erosion hazard is slight. This miscellaneous area is used for wildlife habitat. It has low potential for this use.

RdG—Rock outcrop-Badland complex, very steep. This complex consists of Rock outcrop and Badland in small areas that are so intermingled that they could not be mapped separately at the scale selected. Rock outcrop and Badland are on steep to very steep mountain slopes. Badland formed through hydrothermal activity. This complex is almost bare of vegetation.

There are three distinct climatic regimes. The first climatic regime is at an elevation of 8,000 to 9,000 feet. The mean annual precipitation is 16 inches. A few oneseed junipers and pinyon pines are scattered along the edge of this area.

The second climatic regime is at an elevation of 8,000 to 10,500 feet. The mean annual precipitation is 25 inches. A few Douglas-firs, white firs, and ponderosa pines are scattered along the edge of this area.

The third climatic regime is at an elevation of 9,000 to 11,000 feet. The mean annual precipitation is 30 inches. A few Douglas-firs, Engelmann spruces, and subalpine firs are scattered along the edge of this area.

The sediment generated from this complex needs to be stabilized and contained. However, the extremely acid soil material and the unstable nature of Badland severely restrict the establishment of vegetation for stabilization. The amount of sediment generated increases with an increase in precipitation.

This complex has low potential for most uses.

RPG—Rock outcrop-Penitente complex, very steep. This complex is about 60 percent Rock outcrop and 30 percent Penitente cobbly loam. The Penitente soil is in widely scattered pockets surrounded by areas of Rock outcrop. The mean annual precipitation is 35 inches, and the mean annual temperature is 30 degrees F. The elevation is 12,000 to 13,000 feet.

Included in mapping and making up about 10 percent of this map unit are Nambe and Presa soils and soils that are similar to the Penitente soil but are shallow to bedrock. These make up about 10 percent of the complex.

Rock outcrop consists mainly of acid igneous or metamorphic rock. Slopes are steep to very steep.

The Penitente soil is deep and well drained. It formed in colluvium and residuum of acid igneous or metamorphic rock. Typically, the surface layer is dark brown cobbly loam about 10 inches thick. The subsoil is brown very cobbly sandy loam about 14 inches thick. The substratum is brown very cobbly loam to a depth of 60 inches or more.

Permeability is moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is medium, and the hazard of water erosion is severe.

The dominant vegetation is sheep fescue, Thurber fescue, clovers, kobresia, and dwarf goldenrod.

The Penitente soil is used for wildlife habitat. The very steep slopes and precipitous rock outcrops preclude most other uses.

This complex has medium potential for use as habitat for woodland and rangeland wildlife.

RRE—Rock outcrop-Raton complex, moderately steep. This complex consists of areas of Rock outcrop and Raton very stony silt loam that are so intermingled that they could not be mapped separately at the scale selected. The Raton soil is strongly sloping to moderately steep. Rock outcrop is steep to very steep. The elevation is 8,000 to 9,000 feet. The mean annual precipitation is 15 inches, and the mean annual temperature is 41 degrees F. The frost-free season is 90 to 110 days. Rock outcrop makes up about 45 percent of this complex, and the Raton soil makes up about 40 percent.

Included in mapping are Orthents and Stunner soils, which make up about 15 percent of this complex.

Rock outcrop consists of folded, broken, and exposed basalt flows. Runoff is rapid, and the erosion hazard is slight.

The Raton soil is shallow and well drained. It formed in residuum of basalt and in mixed eolian sediment. Typically, the surface layer is dark brown very stony silt loam about 4 inches thick. The subsoil is dark brown very stony clay about 14 inches thick. Basalt bedrock is at a depth of 18 inches.

The Raton soil is slowly permeable. The effective rooting depth is 10 to 20 inches. The available water

capacity is very low. Runoff is rapid. The hazard of water erosion is moderate, and the wind erosion hazard is slight.

The Raton soil is suitable for use as woodland and for grazing use for domestic livestock and wildlife. It produces pinyon pine, Rocky Mountain juniper, oneseed juniper, and understory vegetation consisting of mountain muhly, muttongrass, Arizona fescue, and western wheatgrass. Proper grazing of the understory vegetation maintains the woodland, improves the plant cover, results in the accumulation of plant residue, and helps prevent soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. The result will be a balanced plant community of productive forage that helps to maintain the woodland.

Access roads and trails are needed for livestock distribution. The use of machinery for other purposes is not feasible because of the shallow, stony soil and the many rock outcrops.

This complex has medium potential for use as habitat for rangeland wildlife and for the production of wood crops for firewood and fenceposts.

RUG—Rock outcrop-Ustorthents complex, very steep. This complex consists of small areas of Rock outcrop and Ustorthents that are so intermingled that they could not be mapped separately at the scale selected. The areas are on mountain slopes at an elevation of 8,000 to 10,000 feet. The mean annual precipitation is 20 inches, and the mean annual temperature is 42 degrees F. The frost-free season is 60 to 80 days. Rock outcrop makes up about 50 percent of this complex, and Ustorthents make up about 30 percent.

Included in mapping are areas of Mirabal and Marosa soils, which make up about 20 percent of this complex.

Rock outcrop consists of igneous and metamorphic rock, including granite, gneiss, schist, and rhyolite.

Ustorthents are deep and well drained. They consist of gravelly loam, very gravelly loam, or very gravelly clay loam to a depth of 60 inches or more. The content of rock fragments ranges from 25 to 60 percent.

Permeability is moderate to moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is very low. Runoff is rapid, and the hazard of water erosion is severe.

The dominant vegetation is Douglas-fir and ponderosa pine. The understory is mainly Gambel oak, mountain brome, and kinnikinnick.

This complex is used for wildlife habitat. It has medium potential for the development of habitat for woodland wildlife.

RvC—Royosa loamy sand, 1 to 8 percent slopes. This is a deep, somewhat excessively drained, gently undulating to gently rolling soil. It formed in eolian material on old dunes. Slopes are complex. The elevation is 6,800 to 7,200 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 43 degrees F. The frost-free season is 130 to 140 days.

Included with this soil in mapping are areas of Vibo, Petaca, and Manzano soils. Also included are a few small areas of barren sand dunes. Included in the Ojo Caliente area are some small areas of stratified sand and some areas that have a flood hazard. The soils that are included in mapping make up about 20 percent of this map unit, but the areas of these soils generally are less than 5 acres in size.

Typically, the surface layer is brown loamy sand about 8 inches thick. The underlying material is brown loamy sand to a depth of 60 inches or more.

Permeability is very rapid. The available water capacity is low. The effective rooting depth is 60 inches or more. Runoff is very slow. The hazard of water erosion is slight, and the wind erosion hazard is high.

This soil is suitable for use as woodland and for grazing by domestic livestock and by wildlife. It produces pinyon pine, oneseed juniper, and understory vegetation consisting of blue grama and Indian ricegrass. In the Ojo Caliente area, some small areas of this soil are used for farming.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. The result will be a balanced plant community of productive forage that helps to maintain the woodland.

Installing pipelines and constructing fences to facilitate grazing management are feasible.

This soil has medium potential for use as habitat for openland and rangeland wildlife.

RWE—Royosa-Orthents association, moderately steep. This association consists of moderately sloping to moderately steep, eroded soils along mesa and canyon breaks and on highly dissected hills. The elevation is 6,500 to 7,100 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 50 degrees F. The frost-free season is 125 to 135 days. The Royosa soil makes up about 55 percent of this association, and Orthents make up about 30 percent.

Included in mapping are areas of Montecito and Silva soils, which make up about 15 percent of this association.

The Royosa soil is deep and somewhat excessively drained. It formed in eolian material. Typically, the original surface layer has been lost through erosion. The exposed underlying material is brown loamy sand to a depth of more than 60 inches.

Permeability is very rapid. The effective rooting depth is 60 inches or more. The available water capacity is low.

Runoff is slow, and the hazard of water erosion is slight. The hazard of wind erosion is high.

Orthents are deep and well drained. Typically, the surface layer has been lost through erosion, and the subsoil is exposed. The subsoil is sandy clay loam, and it varies considerably in thickness. The substratum is heavy sandy loam to a depth of 60 inches or more. In many areas, the substratum is exposed at the surface.

Permeability is moderate. The effective rooting depth is 60 inches. The available water capacity is mainly moderate. Runoff is medium, and the hazard of water erosion is moderate.

These soils are suitable for use as woodland and for grazing by domestic livestock and wildlife. They produce pinyon pine and oneseed juniper and understory vegetation consisting of Indian ricegrass and blue grama.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. The result will be a balanced plant community of productive forage that helps to maintain the woodland.

Constructing fences and installing pipelines to facilitate grazing management are feasible. Disturbance of these soils can result in severe wind erosion.

RYD—Royosa-Vibo association, moderately sloping. This association consists of nearly level to strongly sloping soils on low dunes and hills at an elevation of 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 50 degrees F. The frost-free season is 125 to 135 days. Royosa loamy sand makes up about 60 percent of this association and Vibo sandy loam makes up 30 percent.

Included in mapping are areas of Montecito soils, which make up about 10 percent of this association.

The Royosa soil is deep and somewhat excessively drained. It formed in eolian material. Typically, the surface layer is brown loamy sand about 8 inches thick. The underlying material is brown loamy sand to a depth of 60 inches or more.

Permeability is very rapid. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is very slow. The hazard of wind erosion is high.

The Vibo soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is dark brown sandy loam about 2 inches thick. The subsoil is brown sandy clay loam about 16 inches thick. The substratum is brown sandy loam to a depth of 60 inches or more. The soil below a depth of 10 inches is moderately calcareous.

Permeability is moderate. The effective rooting depth is 60 inches. The available water capacity is moderate to high. Runoff is slow. The hazard of water erosion is slight, and the hazard of wind erosion is moderate.

These soils are suitable for use as woodland and for grazing by domestic livestock and wildlife. They produce pinyon pine, oneseed juniper, and understory vegetation consisting of sand dropseed, Indian ricegrass, and blue grama.

Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent accelerated soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. The result will be a balanced plant community of productive forage that helps to maintain the woodland.

Installing pipelines and constructing fences to facilitate grazing management are feasible on the Royosa soil. Brush management and range seeding are feasible on the Vibo soil.

These soils have medium potential for use as habitat for openland and rangeland wildlife and for the production of wood crops for firewood and fenceposts.

SaG—Sabe-Mirand complex, 15 to 80 percent slopes. This complex consists of areas of Sabe and Mirand soils that are so intermingled that they could not be separated at the scale selected. These moderately steep to very steep soils are on terraces at an elevation of 7,500 to 9,000 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 42 degrees F. These soils are in similar positions on the landscape. Sabe very cobbly sandy loam makes up about 60 percent of the complex. It is on the steeper slopes. Mirand cobbly loam makes up about 25 percent of the complex. It is on slopes that are less steep.

Included in mapping are areas of Trampas and Maes soils, which make up about 15 percent of this complex.

The Sabe soil is deep and somewhat excessively drained. It formed in mixed alluvium. Typically, the surface layer is light brownish gray very cobbly sandy loam about 6 inches thick. The subsurface layer is light gray very cobbly loamy sand and very pale brown extremely cobbly loamy sand about 19 inches thick. The subsoil is white extremely cobbly sand that has thin lamellae of pink sandy clay loam. It extends to a depth of 60 inches or more.

Permeability is rapid. The effective rooting depth is 60 inches or more. The available water capacity is very low to low. Runoff is low, and the hazard of water erosion is high.

The Mirand soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is grayish brown cobbly loam about 3 inches thick. The subsoil is brown and light brown clay and yellowish red cobbly clay about 42 inches thick. The substratum is light brown sandy clay to a depth of 60 inches or more.

Permeability is very slow. The effective rooting depth is 60 inches or more. The available water capacity is moderate. Runoff is slow, and the hazard of water erosion is moderate.

The dominant vegetation is ponderosa pine. The understory is mainly Gambel oak, mountainmahogany, and mountain muhly.

These soils are used mainly for timber and for wildlife habitat.

The Sabe soil has low potential for the production of ponderosa pine, and the Mirand soil has medium potential. On slopes of more than 40 percent, conventional methods cannot be used to harvest trees. The low available water capacity of the Sabe soil restricts seedling survival and reduces the production of ponderosa pine.

This complex has medium potential for use as habitat for woodland wildlife.

SbD—Sedillo cobbly loam, 3 to 12 percent slopes. This is a deep, well drained, gently sloping to strongly sloping soil. It formed in gravelly alluvium on alluvial fans along the western front of the Sangre de Cristo Mountains. Slopes are smooth and convex. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days. Drainage from this soil contributes to the Rio Grande watershed.

Included in mapping are Tenorio soils, which make up about 15 percent of this unit, and Fernando soils, which make up 10 percent.

Typically, the surface layer is brown cobbly loam about 10 inches thick. The subsoil is brown very cobbly loam about 15 inches thick. The substratum, to a depth of 60 inches or more, is pink and brown very cobbly sandy loam.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is low to moderate. Runoff is medium. The hazards of water and wind erosion are slight.

This soil is suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, Indian ricegrass, and blue grama. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by big sagebrush, rabbitbrush, and broom snakeweed. This deterioration generally results in accelerated soil erosion.

Practices to facilitate range management are restricted because of the cobbles.

This soil has medium potential for the development of wildlife habitat.

SDD—Sedillo-Orthents association, strongly sloping. This association consists of soils on the sides of major drains. Sedillo gravelly loam that has slopes of 9 to 15 percent makes up about 45 percent of the association. It is on narrow ridgetops and on the upper part of the slopes of narrow, extremely dissected ridges. Orthents that have slopes of 30 to 45 percent make up about 35 percent of the association. These soils are in extremely dissected areas. The elevation is 6,800 to 8,000 feet. The mean annual precipitation is 12 inches. The mean annual temperature is 49 degrees F, and the frost-free season is 125 to 135 days.

Included in mapping are Silva, Manzano, Fernando, and Hernandez soils, each making up about 5 percent of the association.

The Sedillo soil is deep and well drained. It formed in gravelly alluvium. Typically, the surface layer is brown gravelly loam about 3 inches thick. The subsoil is reddish brown and brown very gravelly clay loam about 8 inches thick. The substratum is pink and brown very gravelly sandy loam to a depth of 60 inches or more. The soil, below a depth of 11 inches, is slightly calcareous to strongly calcareous.

The Sedillo soil is moderately slowly permeable. The effective rooting depth is 60 inches or more. The available water capacity is low to moderate. Runoff is medium to rapid, and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

Orthents are deep, gravelly, and well drained. Typically, they have a very gravelly loam surface layer. The underlying material is very gravelly clay loam.

Permeability is moderate to moderately rapid. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is rapid, and the hazard of water erosion is high. The hazard of wind erosion is slight.

This association is suited to use as native grazing land for domestic livestock and for wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, galleta, and Indian ricegrass. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by ring muhly, broom snakeweed, and big sagebrush. This deterioration generally results in accelerated soil erosion.

In managing range, brush management, range seeding, constructing fences and livestock and wildlife trails, and installing pipelines are feasible.

These soils have medium potential for the development of habitat for rangeland wildlife.

SED—Sedillo-Silva association, strongly sloping. This association consists of soils on uplands that are mainly east of the Rio Grande. The elevation is 6,500 to

7,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 47 degrees F. The frost-free season is 125 to 135 days. Sedillo very gravelly loam makes up about 55 percent of this association, and Silva loam makes up about 25 percent. The strongly sloping Sedillo soil is on side slopes of narrow ridges. The nearly level to gently sloping Silva soil is on narrow ridge crests and on the adjacent breaks of upper slopes.

Included in mapping are Orthents and Manzano, Fernando, and Hernandez soils, each making up 5 percent of the association.

The Sedillo soil is deep and well drained. It formed in gravelly alluvium. Typically, the surface layer is brown very gravelly loam about 3 inches thick. The subsoil is reddish brown and brown very gravelly clay loam about 8 inches thick. The substratum is light brown and brown, very gravelly sandy loam to a depth of 60 inches or more. The soil in the upper 11 inches is noncalcareous to slightly calcareous, and it is strongly calcareous below that.

The Sedillo soil is moderately slowly permeable in the subsoil and moderately rapidly permeable in the substratum. The effective rooting depth is 60 inches or more. The available water capacity is low to moderate. Runoff is rapid, and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

The Silva soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown loam about 3 inches thick. The subsoil is reddish brown clay loam about 26 inches thick. The substratum is pinkish white clay loam to a depth of 60 inches or more.

The Silva soil is slowly permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow to medium, and the hazard of water erosion is slight to moderate. The hazard of wind erosion is slight.

These soils are suited to use as native grazing land for domestic livestock and for wildlife.

Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent erosion.

A resource management system is needed that can control brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and galleta. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by big sagebrush, broom snakeweed, threeawn, and cacti. This deterioration generally results in accelerated soil erosion.

Range seeding and constructing trails to facilitate range management are feasible. Care should be taken in using machinery in the areas of more sloping soils.

This association has medium potential for the development of habitat for rangeland wildlife.

SgC—Servilleta-Prieta complex, 1 to 5 percent slopes. This complex consists of small areas of Servilleta and Prieta soils that are so intermingled that they could not be separated in mapping at the scale selected. These soils are nearly level and gently sloping and are shallow and moderately deep. They are on basalt flows. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 12 inches. The mean annual temperature is 49 degrees F. The frost-free season is 125 to 145 days. Servilleta silty clay loam makes up about 50 percent of the complex, and Prieta stony silty clay loam makes up about 30 percent. The Servilleta soil is in the more nearly level areas and on the more gentle slopes. The Prieta soil is in the more sloping areas and on ridge crests.

Included in mapping and making up about 10 percent of the complex are areas of Petaca soils near ridgetops and basalt outcrops. Also included are Hernandez, Fernando, and Manzano soils and areas of basalt outcrops, each making up about 5 percent of this complex.

The Servilleta soil is moderately deep and well drained. It formed in material that weathered from basalt and in eolian material. Typically, the surface layer is brown silty clay loam about 3 inches thick. The subsoil is reddish brown and light brown silty clay loam about 22 inches thick. The substratum is light brown silty clay loam about 9 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of about 34 inches. The soil is moderately calcareous to strongly calcareous below a depth of 16 inches.

The Servilleta soil is slowly permeable. The effective rooting depth is 20 to 40 inches. The available water capacity is mainly moderate. Runoff is medium to slow. The hazard of water erosion is moderate, and the hazard of wind erosion is slight.

The Prieta soil is shallow and well drained. It formed in residuum in mixed eolian sediment. Typically, the surface layer is brown stony silty clay loam about 2 inches thick. The subsoil is brown and light brown stony silty clay loam about 8 inches thick. The substratum is pink very stony silty clay loam about 4 inches thick. Fractured, caliche-coated basalt bedrock is at a depth of about 14 inches. The soil material is noncalcareous in the surface layer and grades to strongly calcareous in the substratum.

The Prieta soil is slowly permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is medium. The hazard of water erosion is moderate, and the wind erosion hazard is slight.

These soils are suited to use as native grazing land for domestic livestock and for wildlife. Proper grazing use improves the plant cover, results in the accumulation of plant residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced

plant community of vigorous and productive forage plants such as western wheatgrass and blue grama. If the condition of the plant community deteriorates, the desirable plants decrease in number and are replaced by big sagebrush, broom snakeweed, and cacti. This deterioration generally results in accelerated soil erosion.

In managing range, installing pipelines, constructing fences, brush management, and range seeding are feasible on the Servilleta soil. The use of machinery, except in constructing trails, is not feasible on the Prieta soil.

This complex has medium potential for the development of habitat for rangeland wildlife.

ShB—Shawa clay loam, 0 to 3 percent slopes. This is a deep, well drained, level and nearly level soil. It formed in alluvium on playa bottoms along the Rio de los Pinos. Slopes are smooth and concave. The elevation is 7,500 to 8,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 43 degrees F. The frost-free season is 80 to 110 days.

Included with this soil in mapping are Luhon and Stunner soils, each making up about 5 percent of the map unit.

Typically, the upper part of the surface layer is dark grayish brown clay loam and very dark grayish brown silty clay loam about 16 inches thick, and the lower part is dark brown clay loam about 14 inches thick. The underlying material is brown, light brown, and pink clay loam to a depth of 60 inches or more.

Permeability is moderate. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is very slow, and the hazard of water erosion is slight.

This soil is suited to irrigated hay and pasture, to use as native grazing land, and to the development of wildlife habitat. It provides forage for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and fourwing saltbush. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by rubber rabbitbrush, annual grasses and forbs, and cacti. This deterioration generally results in accelerated soil erosion.

In managing range, constructing earthen ponds and fences, seeding, controlling noxious plants, and installing pipelines are feasible.

This soil is used for irrigated hay and pasture. It has high potential for these uses. Management concerns include the planting of adapted species, fertilization, and timely harvesting.

This soil can produce high quality range plants to support habitat for the pronghorn antelope and other rangeland wildlife.

SmB—Silva loam, 0 to 2 percent slopes. This is a deep, well drained, level to nearly level soil. It formed in mixed alluvium and eolian sediment on upland fans and ridges throughout the survey area. Slopes are smooth and convex. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days.

Included with this soil in mapping are Fernando and Sedillo soils, which make up about 10 percent of this map unit.

Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown clay loam about 25 inches thick. The substratum is pink clay loam to a depth of 60 inches or more.

Permeability is slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow. The hazard of water erosion is slight, and the hazard of wind erosion is moderate.

The major limitations to growing cultivated crops are the short growing season and cool nights, which limit the choice of crops and reduce crop yields. This soil is suitable for alfalfa, small grains, and cool-season grasses. Potatoes and vegetables that are adapted to the short growing season and cool nights also can be grown.

Growing mainly grasses or legumes or other high residue-producing crops helps to prevent water and wind erosion to maintain soil tilth. Fertilization and improved water-management practices help to maintain or increase yields. Generally, all crops except legumes respond to nitrogen, and all legumes respond to phosphate fertilizer. Border, furrow, corrugation, and sprinkler irrigation systems are suitable. Rotation grazing increases the yield and quality of pasture. Timely harvesting improves the quality of crops.

This soil has medium potential for most urban uses. Low strength and the high shrink-swell potential and slow permeability in the subsoil are limitations. The shrinking and swelling and the low strength can be overcome by good design and careful installation. The slow permeability, which is a limitation to the use of this soil for septic tank absorption fields, can be overcome by increasing the size of the absorption area or by modifying the filter field.

If this soil is irrigated, it can produce grains, grasses, legumes, and shrubs that provide a good habitat for ring-necked pheasant, cottontail rabbit, and other farmland wildlife.

SmD—Silva loam, 2 to 10 percent slopes. This is a deep, well drained, nearly level to strongly sloping soil. It formed in mixed alluvium and eolian sediment on upland fans. The elevation is 6,500 to 7,500 feet. The mean

annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 120 to 135 days.

Included with this soil in mapping are areas of Petaca, Vibo, and Royosa soils, which make up about 15 percent of this map unit.

Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown clay loam about 25 inches thick. The substratum, to a depth of 60 inches or more, is pink clay loam.

Permeability is slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate.

This soil is suited to use as native grazing land for domestic livestock and wildlife (fig. 5). Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control the brush species, allow variation in seasons of use, and provide for resting the forage species in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and galleta. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by big sagebrush, rubber rabbitbrush, and forbs. Deterioration of the plant community generally results in accelerated soil erosion.

Constructing earthen ponds and fences, installing pipelines, brush management, and range seeding are feasible in managing range.

SSC—Silva-Sedillo association, gently sloping. This association consists of soils on ridgetops and divides at an elevation of 6,500 to 7,500 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F. The frost-free season is 125 to 135 days. Silva loam makes up about 65 percent of this association, and Sedillo gravelly loam makes up about 20 percent. The Silva soil is nearly level to gently sloping. The Sedillo soil is gently sloping.

Included in mapping are Fernando and Manzano soils, which make up about 15 percent of the association.

Figure 5.—Silva loam, 2 to 10 percent slopes, is suited to grazing. The Sangre de Cristo Mountains are in the background.

The Silva soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown loam about 3 inches thick. The subsoil is reddish brown clay loam and clay about 28 inches thick. The substratum is pinkish white clay loam to a depth of 60 inches or more.

The Silva soil is slowly permeable. The available water capacity is high. The effective rooting depth is 60 inches or more. Runoff is slow to medium. The hazard of water erosion is slight to moderate, and the hazard of wind erosion is slight.

The Sedillo soil is deep and well drained. It formed in gravelly alluvium. Typically, the surface layer is brown gravelly loam about 3 inches thick. The subsoil is reddish brown and brown gravelly clay loam about 8 inches thick. The substratum to a depth of 60 inches or more is pink and brown very gravelly sandy loam. The soil is noncalcareous in the upper 11 inches and strongly calcareous below that.

The Sedillo soil is moderately slowly permeable in the subsoil and moderately permeable below. The effective rooting depth is 60 inches or more. The available water capacity is low to moderate. Runoff is medium to rapid. The hazard of water erosion is moderate, and the hazard of wind erosion is slight.

These soils are suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A resource management system is needed that can control brush, allow variation in seasons of use, and provide for resting of the forage plants in successive years. The result will be a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, galleta; and fourwing saltbush. If the condition of the plant community deteriorates, the desirable forage plants decrease and are replaced by big sagebrush, broom snakeweed, and threeawn. This deterioration generally results in accelerated soil erosion.

Installing pipelines, brush management, seeding, and constructing fences and trails are feasible in managing range.

The soils in this association have medium potential for use as habitat for rangeland wildlife.

StC—Stunner cobbly loam, 1 to 5 percent slopes. This is a deep, well drained, nearly level to gently sloping soil. It formed in mixed alluvium and eolian sediment on alluvial fans at the base of mountains and cones. Slopes are smooth and convex. The elevation is 7,600 to 8,500 feet. The mean annual precipitation is 11 inches, and the average annual temperature is 44 degrees F. The frost-free season is 90 to 110 days.

Included in mapping are Stunner loam, which makes up about 10 percent of this map unit, Luhon soils, which make up 15 percent of the unit, and Rock outcrop, which makes up 5 percent.

Typically, the surface layer is brown cobbly loam about 3 inches thick. The subsoil is brown and light brown clay loam about 20 inches thick. The substratum is light brown loam to a depth of 60 inches or more. Cobbles and gravel cover 15 to 35 percent of the surface.

Permeability is moderate. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow. The hazards of water and wind erosion are slight.

This soil is suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as winterfat and western wheatgrass. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by broom snakeweed, threeawn, and cacti. This deterioration generally results in accelerated soil erosion.

Practices to facilitate range management are restricted because of the cobbly surface; however, access roads, trails, and fences can be constructed.

This soil can produce high quality range plants that support habitat for the pronghorn antelope and other rangeland wildlife.

SUC—Stunner-Luhon association, gently sloping. This association consists of soils on uplands west of the Rio Grande. The elevation is 7,600 to 8,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F. The frost-free season is 90 to 110 days. Stunner loam makes up about 65 percent of the association; slopes range from 1 to 5 percent. Luhon gravelly clay loam makes up about 20 percent; slopes range from 3 to 8 percent.

Included in mapping are Travelers soils, which make up about 10 percent of this unit, and Antonito soils, which make up 5 percent.

The Stunner soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown loam about 4 inches thick. The subsoil is brown clay loam about 23 inches thick. The substratum is pale brown and pink loam to a depth of 60 inches or more. The soil is strongly calcareous below the surface layer.

The Stunner soil is moderately permeable. The available water capacity is high. Runoff is medium. The hazard of water erosion is moderate and the hazard of wind erosion is slight.

The Luhon soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is yellowish brown gravelly clay loam about 5 inches thick. The underlying material is light yellowish brown clay loam to a depth of 60 inches or more. The soil is strongly calcareous below the surface layer.

The Luhon soil is moderately permeable. The available water capacity is moderate to high. Runoff is medium.

The hazard of water erosion is moderate, and the hazard of wind erosion is slight.

These soils are suited to use as native grazing land for domestic livestock and wildlife. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by broom snakeweed, threeawn, and rubber rabbitbrush. This deterioration can result in accelerated soil erosion.

Constructing fences, access roads, and earthen ponds, installing pipelines, brush management, and range seeding are feasible in managing range.

This association has medium potential for use as habitat for rangeland wildlife.

SVC—Stunner-Travelers association, gently sloping. This association consists of soils on uplands. The elevation is 7,600 to 8,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F. The frost-free season is 90 to 110 days. Stunner cobbly loam and Travelers very stony loam each make up about 35 percent of the association, and Luhon gravelly clay loam makes up about 15 percent. The nearly level Stunner soil and the gently sloping Luhon soil are on side slopes between basalt ridges. The gently sloping to moderately sloping Travelers soil is on basalt ridges and breaks.

Included in mapping are Shawa soils, which make up about 10 percent of this map unit, and Rock outcrop, which makes up about 5 percent.

The Stunner soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown cobbly loam about 4 inches thick. The subsoil is brown and light brown clay loam about 15 inches thick. The substratum to a depth of 60 inches or more is pink loam and pinkish white gravelly loam.

The Stunner soil is moderately permeable. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is slow. The hazards of water and wind erosion are slight.

The Travelers soil is shallow and well drained. It formed in residuum of basalt and in eolian sediment. Typically, the surface layer is brown very stony loam about 4 inches thick. The substratum is pale brown very stony clay loam about 5 inches thick. Fractured, lime-coated basalt is at a depth of 13 inches.

The Travelers soil is moderately permeable. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is rapid. The hazards of water and wind erosion are slight.

The Luhon soil is deep and well drained. It formed in mixed alluvium and eolian sediment. Typically, the surface layer is brown gravelly clay loam about 6 inches thick. The underlying material is pale brown clay loam to a depth of 60 inches or more. The soil material below the surface layer is strongly calcareous.

The Luhon soil is moderately permeable. The effective rooting depth is 60 inches or more. The available water capacity is moderate to high. Runoff is slow. The hazards of water and wind erosion are slight.

These soils are suited to use as native grazing land. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by broom snakeweed, Douglas rabbitbrush, and threeawn. This deterioration generally results in accelerated soil erosion.

Installing pipelines, constructing fences and earthen ponds, brush management, and range seeding are feasible in managing grazing land on the Stunner soil. Access roads and trails should be constructed to help distribute livestock on the Travelers soil; however, the use of machinery for other purposes is not feasible on this soil because of the surface stones and the shallowness of the soil.

This association has medium potential for use as habitat for rangeland wildlife.

TeB—Tenorio loam, 0 to 3 percent slopes. This is a deep, well drained, level to nearly level soil. It formed in mixed alluvium on valley sides. Slopes are smooth and convex. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 48 degrees F. The frost-free season is 120 to 130 days.

Included with this soil in mapping are small areas of Fernando soils, which make up about 5 percent of this unit. Also included are areas of Tenorio soils that have a sandy loam subsoil.

Typically, the surface layer is brown loam about 3 inches thick. The upper part of the subsoil is dark brown loam 10 inches thick, and the lower part is dark brown extremely gravelly sandy loam 5 inches thick. The substratum is yellowish brown extremely gravelly sand to a depth of 60 inches or more.

Permeability is moderate in the subsoil and very rapid in the substratum. The available water capacity is very low. The effective rooting depth is 60 inches or more; however, the substratum restricts the rooting depth for many plants. Runoff is slow. The hazards of water and wind erosion are slight.

This soil is used as native grazing land and for irrigated hay, pasture, and annual crops. The dominant

native vegetation is big sagebrush, blue grama, sand dropseed, and western wheatgrass.

The major irrigated crops are alfalfa, small grains, and cool-season grasses. Potatoes and vegetables that are adapted to the short growing season and cool nights can be grown.

The short growing season and cool nights and the very low available water capacity of the soil limit the choice of crops and pasture plants and reduce crop yields.

Growing grasses and legumes or other high-residue producing crops and leaving the residue on the surface helps to prevent wind erosion. If low-residue producing crops are grown, a cover crop or manure is needed to control wind erosion after the crop is harvested. Fertilization and improved irrigation practices help to maintain or increase yields. All crops except legumes respond to nitrogen fertilizers, and legumes respond to phosphate fertilizer. This soil requires more frequent irrigation in smaller amounts than most soils in the area because it has low available water capacity. Although border, furrow, corrugation, and sprinkler irrigation systems are suitable, sprinkler irrigation is preferred.

This soil has high potential for most urban uses. However, seepage from septic tank filter fields can contaminate the underground water.

This soil has medium potential for the development of habitat for rangeland wildlife.

TeC—Tenorio loam, 1 to 5 percent slopes. This is a deep, well drained, nearly level to gently sloping soil. It formed in mixed alluvium on valley sides. Slopes are smooth and convex. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 48 degrees F. The frost-free season is 120 to 130 days.

Included in mapping and making up about 20 percent of this unit are small areas of Manzano, Fernando, and Hernandez soils and Orthents.

Typically, the surface layer is brown loam about 5 inches thick. The subsoil is brown sandy clay loam about 12 inches thick. The substratum, to a depth of 60 inches or more, is yellowish brown very gravelly sand.

Permeability is moderate in the subsoil and very rapid in the substratum. The available water capacity is low. The effective rooting depth is 60 inches or more; however, the substratum restricts the rooting depth for many plants. Runoff is slow to medium. The hazard of water erosion is slight to moderate. The hazard of wind erosion is slight.

This soil is suited to use as native grazing land. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed in which the seasons of grazing and resting of pasture vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass and blue grama. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by broom snakeweed, big sagebrush, and cacti. This deterioration can result in accelerated soil erosion.

Installing pipelines, constructing fences and earthen ponds, range seeding, and brush management are feasible in managing range on these soils.

This soil has high potential for most urban uses. However, seepage from septic tank filter fields can contaminate the underground water.

This soil has medium potential for use as habitat for rangeland wildlife.

TrF—Trampas cobbly sandy loam, 15 to 40 percent slopes. This is a deep, well drained soil that formed in alluvium on old alluvial fans and plains. The elevation is 7,500 to 9,000 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 45 degrees F. The frost-free season is 100 to 120 days.

Included in mapping are areas of Diamante and Mirand soils, which make up about 20 percent of this map unit.

Typically, the surface layer is grayish brown cobbly sandy loam about 2 inches thick. The subsurface layer is light gray gravelly sandy loam about 5 inches thick. The subsoil is brown, reddish brown, and yellowish red extremely gravelly clay and extremely cobbly sandy clay loam about 42 inches thick. The substratum to a depth of 60 inches or more is reddish brown extremely cobbly sandy clay loam.

Permeability is slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is ponderosa pine. The understory is mainly mountain muhly, Arizona fescue, and prairie junegrass.

This soil is used mainly for timber and for wildlife habitat. It has medium potential for the production of ponderosa pine. Conventional methods can be used to harvest trees, but they generally are restricted in rainy periods.

This soil has medium potential for the development of habitat for openland and woodland wildlife.

TsE—Trampas cobbly loam, 15 to 30 percent slopes. This is a deep, well drained soil that formed in alluvium on the sides of mountains and canyons. The elevation is 7,500 to 9,000 feet. The mean annual precipitation is 22 inches. The mean annual temperature is 45 degrees F. The frost-free season is 80 to 100 days.

Included in mapping are Maes soils, making up about 15 percent of the unit, and Trampas soils that have slopes of 5 to 15 percent, making up 10 percent.

Typically, the surface layer is light brownish gray and pink cobbly loam about 7 inches thick. The subsoil is brown and yellowish red very cobbly clay and very cobbly sandy clay loam about 42 inches thick. The

substratum to a depth of 60 inches or more is reddish yellow stony sandy clay loam.

Permeability is slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is moderate.

The dominant vegetation is ponderosa pine. The understory is mainly Arizona fescue and mountain muhly.

This soil has medium potential for the production of ponderosa pine. In managing woodland, the canopy should not be opened to a level that results in serious competition from Gambel oak. Equipment limitations are moderate.

This soil has medium potential for use as habitat for openland and rangeland wildlife.

TTF—Trampas-Diamante association, steep. This association consists of very steep soils on terrace slopes adjacent to drainageways. The elevation is 7,500 to 9,800 feet. The mean annual precipitation is 22 inches on the Trampas soil and 24 inches on the Diamante soil. The mean annual temperature is 45 degrees F. for the Trampas soil and 40 degrees F. for the Diamante soil. The frost-free season is 80 to 100 days. Trampas cobbly sandy loam makes up about 50 percent of this association, and Diamante cobbly sandy loam makes up 40 percent. Both soils have slopes of 40 to 80 percent. The Trampas soil has a southerly exposure, and the Diamante soil has a northerly exposure.

Included in mapping are areas of Jaroso and Mirand soils, which make up about 10 percent of this association.

The Trampas soil is deep and well drained. It formed in alluvium. Typically, the surface layer is grayish brown loam and light gray cobbly and gravelly sandy loam about 7 inches thick. The subsoil is brown very cobbly sandy clay loam and reddish brown very gravelly clay about 42 inches thick. The substratum is reddish brown very cobbly sandy clay loam to a depth of 60 inches or more.

Permeability is slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is high.

The Diamante soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is light brownish gray cobbly sandy loam and very gravelly sandy loam about 14 inches thick. The subsurface layer is very pale brown very gravelly sandy loam about 17 inches thick. The subsoil is light yellowish brown very gravelly sandy clay that extends to a depth of 60 inches or more.

Permeability is moderately slow. The effective rooting depth is 60 inches or more. The available water capacity is low. Runoff is medium, and the hazard of water erosion is high.

The dominant vegetation on the Trampas soil is ponderosa pine. The understory is mainly Arizona fescue and mountain muhly. The dominant vegetation on the Diamante soil is Douglas-fir and ponderosa pine and some scattered white fir, aspen, and limber pine. The understory is mainly Gambel oak, kinnikinnick, mountain muhly, and Arizona fescue.

These soils are used for timber and for wildlife habitat.

The Trampas soil has medium potential for the production of ponderosa pine. The Diamante soil has medium potential for the production of Douglas-fir, ponderosa pine, and white fir. The major limitations to the production or harvest of timber are the very steep slopes, which severely restrict the mobility of most equipment. Conventional harvesting methods should not be used because they cause excessive soil disturbance and severe erosion. The low available water capacity of the surface layer of the Diamante soil limits seedling survival.

These soils have low potential for the development of habitat for woodland wildlife.

TVC—Travelers very stony loam, 1 to 8 percent slopes. This is a shallow, well drained, nearly level to gently rolling soil. It formed in residuum and eolian material on the top and sides of ridges of basalt flows. Slopes are irregular and convex. The elevation is 7,600 to 8,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F. The frost-free season is 90 to 110 days.

Included with this soil in mapping are Antonito, Luhon, and Stunner soils, each making up about 5 percent of the map unit.

Typically, the surface layer is yellowish brown, very stony loam about 2 inches thick. The subsoil is yellowish brown, very stony loam about 8 inches thick. The substratum is very pale brown, very stony loam about 5 inches thick. Basalt bedrock is at a depth of 15 inches. The surface layer and subsoil are slightly calcareous, and the substratum is moderately calcareous.

Permeability is moderate. The effective rooting depth is 10 to 20 inches. The available water capacity is very low. Runoff is slow to moderate. The hazard of water erosion is slight to moderate. The wind erosion hazard is slight.

This soil is suited to use as native grazing land. Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion.

A management system is needed that defers grazing periodically so that plants can complete their growth cycle. The period of deferred grazing for cool-season plants such as western wheatgrass is spring and fall. For warm-season plants such as blue grama, it is summer. This grazing system results in a balanced plant community of vigorous and productive forage plants such as western wheatgrass, blue grama, and winterfat. If the condition of the plant community deteriorates, the desirable forage plants decrease and are replaced by broom snakeweed, Douglas rabbitbrush, and cacti. This deterioration generally results in accelerated soil erosion.

Practices to facilitate grazing management, such as access roads and trails, can be constructed to help distribute livestock. The use of machinery for other purposes is not feasible because the soil is stony and shallow.

This soil has medium potential for use as habitat for rangeland wildlife.

UTG—Ustorthents-Trampas complex, very steep. This complex consists of small areas of Ustorthents and Trampas cobbly loam that are so intermingled that they could not be mapped separately at the scale selected. These soils are on terrace slopes adjacent to natural drainageways. Slopes are 40 to 80 percent. The elevation is 8,000 to 9,800 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 45 degrees F. The frost-free season is 100 to 120 days. Ustorthents make up about 50 percent of this complex, and Trampas cobbly loam makes up 30 percent.

Included in mapping are Jaroso and Lama soils, which make up about 20 percent of this complex.

Ustorthents are deep and well drained. They formed in gravelly alluvium. The soil is gravelly loam, very gravelly loam, or very gravelly clay loam or cobbly loam to a depth of 60 inches or more. The content of coarse fragments ranges from 25 to 60 percent.

Permeability is moderately rapid to moderate. The effective rooting depth is 60 inches or more. The available water capacity is very low. Runoff is rapid, and the hazard of water erosion is severe.

The Trampas soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is grayish brown and light brownish gray cobbly loam about 7 inches thick. The upper 3 inches of the subsoil is brown very cobbly sandy clay loam. Below that, it is reddish brown very gravelly clay to a depth of about 49 inches. The substratum is reddish brown very cobbly sandy clay loam to a depth of 60 inches or more.

Permeability is slow. The effective rooting depth is 60 inches or more. The available water capacity is high. Runoff is medium, and the hazard of water erosion is high.

The dominant vegetation is ponderosa pine. The understory is mainly Arizona fescue, mountain muhly, and pine dropseed.

These soils are used mainly for timber and for wildlife habitat.

The Trampas soil has medium potential for the production of ponderosa pine, and Ustorthents have low potential. Because the Ustorthents are droughty, revegetation and production are limited. Conventional harvesting methods should not be used because they cause excessive soil disturbance and severe soil erosion. The very steep slopes, the high erosion hazard, and the unstable geologic material underlying these soils severely limit their use. Therefore, stabilizing vegetation and litter should be used to give maximum protection to these soils.

This complex has low potential for use as habitat for woodland wildlife.

VbD—Vibo sandy loam, 3 to 10 percent slopes. This is a deep, well drained soil that formed in mixed alluvium. The elevation is 6,400 to 7,400 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 50 degrees F. The frost-free season is 125 to 135 days. Drainage from this soil contributes to the Rio Grande watershed.

Included in mapping and making up about 20 percent of this unit are Silva soils.

Typically, the surface layer is brown sandy loam about 2 inches thick. The subsoil is brown sandy clay loam about 16 inches thick. The substratum is light brown sandy loam and brown loamy sand to a depth of 60 inches or more. The soil is calcareous below a depth of 10 inches.

Permeability is moderate. The effective rooting depth is 60 inches or more. The available water capacity is moderate to high. Runoff is slow. The hazards of water and wind erosion are moderate.

This soil is suitable for use as woodland and for grazing by domestic livestock and by wildlife. It produces pinyon pine, Rocky Mountain juniper, oneseed juniper, and understory vegetation of sand dropseed, Indian ricegrass, and blue grama. Proper grazing of the understory vegetation improves the plant cover, results in the accumulation of plant residue, and helps prevent soil erosion.

A management system is needed that provides periods of resting from grazing so that the key management plants can complete their growth cycle. The result will be a balanced plant community of productive forage that helps to maintain the woodland.

Constructing fences, installing pipelines, range seeding, and brush management are feasible in managing grazing land.

This soil has medium potential for use as habitat for openland and rangeland wildlife and for the production of wood crops for firewood and fenceposts.

WEF—Wellsville-Ess association, moderately steep. This association consists of soils on the sides of high mountain valleys at an elevation of 9,000 to 10,500 feet. The mean annual precipitation is 25 inches, and mean annual temperature is about 38 degrees F. The frost-free season is less than 60 days. Wellsville gravelly loam makes up about 55 percent of this association, and Ess gravelly loam makes up about 30 percent. The Wellsville soil is strongly sloping to moderately steep. The Ess soil is moderately steep to steep. Mapped areas generally are elongated and are parallel to drainageways.

Included in mapping are areas of Cryaquolls, Cryoborolls, and Rock outcrop, each making up about 5 percent of the association.

The Wellsville soil is deep and well drained. It formed in colluvium and alluvium that derived from acid igneous rock.

Typically, the surface layer is dark grayish brown gravelly loam about 8 inches thick. The subsoil is dark grayish brown and brown gravelly clay loam and gravelly sandy clay loam about 34 inches thick. The substratum is light brown very gravelly sandy clay loam to a depth of 60 inches or more.

Permeability is moderately slow. The available water capacity is moderate to high. The effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is moderate.

The Ess soil is deep and well drained. It formed in colluvium and alluvium that derived from acid igneous rock. Typically, the surface layer is brown gravelly loam about 8 inches thick. The subsoil is brown very gravelly sandy clay loam about 25 inches thick. The substratum is brown very gravelly sandy loam to a depth of 60 inches or more.

Permeability is moderately slow. The available water capacity is moderate. The effective rooting depth is 40 to 60 inches or more. Runoff is medium, and the hazard of water erosion is moderate.

These soils are suited to use as native grazing land for domestic livestock and for wildlife.

Proper grazing use improves the plant cover, results in the accumulation of residue, and helps prevent soil erosion. A management system is needed in which the seasons of grazing and resting of pastures vary in successive years. This system results in a balanced plant community of vigorous and productive forage plants such as Arizona fescue, mountain muhly, prairie junegrass, and bottlebrush squirreltail. If the condition of the plant community deteriorates, the desirable forage plants decrease in number and are replaced by oak, brush, and sedges.

Installing pipelines and constructing fences, trails, and access roads to facilitate grazing management are feasible in the less sloping areas of this association. In some places the use of machinery is not feasible because of the moderately steep slopes.

The mountain grasslands supported by these soils are important to the habitat of woodland wildlife, including elk, mule deer, blue grouse, and turkey.

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 avoid 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 behavior 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 woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for 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.

crops and pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Only a small percentage of the land in the Taos area is used for cultivated crops. Most of the cropland is on flood plains, terraces, and alluvial fans along streams that originate in the Sangre de Cristo Mountains. These streams provide water for irrigation. Other irrigated cropland is in an area between the foothills of the Sangre de Cristo Mountains and Ute Mountain in the northern part of the survey area. Here the water is supplied by deep wells.

The main crops are barley, alfalfa, and irrigated pasture. A few areas are used for gardens and orchards. The survey area has potential for the production of potatoes and vegetable crops such as lettuce, green peas, and carrots.

Successful, long-term cultivation of any soil depends on managing that soil according to its capabilities and limitations for cropland use and on providing adequate water to supply crop needs. Management objectives that can help to accomplish this include controlling wind and water erosion, conserving moisture, and maintaining soil tilth and fertility. These objectives can be met through the use of a sound conservation cropping system tailored to the properties of each soil or group of soils. Some soils, for example, Manzano soils, can be used for a single crop for many years without damaging the tilth of the soil. The tilth of other soils, for example, Fernando and Silva soils, deteriorates rapidly if the soil is used continuously for one crop, especially if that crop produces little residue. A cropping system based on the properties of a soil helps to maintain tilth; to reduce insect, disease, and weed infestations; and to control water and wind erosion. In most cases, such a cropping system also helps to conserve moisture and to maintain fertility.

The use of stubble mulching, minimum tillage, crop residue, green manure crops, and grasses and legumes in the cropping system helps to maintain soil tilth and structure. These measures and the application of barnyard manure and chemical fertilizer also help to maintain fertility.

In the Taos area, irrigation is needed to produce cultivated crops. Both natural moisture and irrigation water can be conserved by reducing evaporation, limiting runoff, reducing deep percolation, and controlling weeds.

Among the effective measures used to conserve water are minimum tillage, field windbreaks or barriers, land shaping or leveling, lining irrigation ditches, and timely tillage. Irrigation water can be conserved for crops by using a well designed irrigation system and by applying irrigation water uniformly to meet crop needs without overirrigating. Water is wasted and nutrients are leached below the root zone if more water is applied to a soil than the soil is capable of holding. Tenorio soils have sand and gravel at a depth of 12 to 20 inches, and Loveland soils have sand and gravel at a depth of 20 to 40 inches. These soils are subject to leaching if too much water is applied.

Wind erosion is a hazard on Fernando and Hernandez soils. This hazard can be minimized by growing high residue-producing crops and leaving the residue on the surface in winter and spring.

Water erosion is a hazard on Fernando clay loam, 3 to 5 percent slopes; on Fernando clay loam, 5 to 7 percent slopes; and on Manzano clay loam, 3 to 5 percent slopes. Growing grasses and legumes or close-grown crops such as barley helps to control water erosion.

Caruso, Loveland, and Poganeab soils are too wet for cultivation during parts of some years because of poor surface drainage or a high water table, or both. Reducing runoff from nearby slopes helps to prevent damage from overflow. Selecting crops suited to wet soils or saline-alkali conditions increases the residue and eventually improves the soil. Artificial drainage may be desirable or necessary to offset unfavorable soil characteristics such as wetness or saline-alkali conditions.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 3. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 3 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

rangeland

Henry W. Wall, Jr., range conservationist, Soil Conservation Service, helped prepare this section.

About 70 percent of the Taos area is range and grazable woodland. More than 80 percent of the farm income is derived from the production of cattle and sheep. Cow-calf-yearling is the dominant type of livestock operation, however, many sheep are raised for meat and wool. Ranches of approximately 10,000 acres and larger are common. There are many ranches that range from 20 to 400 acres in size.

The native vegetation in many parts of the survey area has changed due to continued excessive use. Many areas are now dominated by big sagebrush, pinyon pine, and oneseed juniper. Forage production on range can be increased through mechanical and conservation practices that are effective for specific soils and range sites.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the maximum production of vegetation, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

The major concern on most of the rangeland in the Taos area is seeding and controlling or reducing the undesirable brush plants. If sound range management based on soil survey information and rangeland inventories is applied, productivity increases and the hazards of water and wind erosion are minimized.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more

closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, reduction of undesirable brush species, conservation of water, and control of water erosion and soil blowing. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

woodland management and productivity

Table 4 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

In table 4, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This 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 woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

woodland understory vegetation

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

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. The density of the canopy determines the amount of light that understory plants receive.

Table 5 shows, for each soil suitable for woodland use, the potential for producing understory vegetation. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4 1/2 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Table 5 also lists the common names of the characteristic vegetation on each soil and the percentage composition, by air-dry weight, of each kind of plant. The table shows the kind 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.

recreation

The survey area supports an expanding all-season recreation industry, which is based on tourism and resident participation in a wide variety of outdoor recreation activities. The demand for recreation uses of land and water exceeds their availability. More and more land is being converted to recreation uses.

The soils of the survey area are rated in table 6 according to limitations that affect their suitability for recreation. The ratings 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 sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 6, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 6 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 9 and interpretations for dwellings without basements and for local roads and streets in table 8.

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 best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

wildlife habitat

Edwin A. Swenson, biologist, Soil Conservation Service, helped prepare this section.

The Taos area provides a diversity of wildlife habitats, some of which vary considerably in their quality.

The forested mountains and shrub woodlands of the foothills provide habitat for elk, mule deer, black bear, bobcat, and tree squirrels. Pronghorn antelope and jackrabbits and coyotes inhabit the sagebrush and grassland west of the Rio Grande.

Irrigated farmland in the valleys provides habitat for a small population of ring-necked pheasant. There are a few small wetlands that are mainly beaver ponds or are land that is seasonally flooded by irrigation tailwater.

Most of the indigenous wildlife is dependent, directly or indirectly, on the diversity, production, and availability of vegetation used as food or cover. To develop and maintain a significant wildlife population, these vegetative resources, which historically have been used mainly for crops, livestock forage, and forest products, must be managed to meet the needs of wildlife.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, inadequate, or inaccessible, wildlife will either be scarce or will not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by properly managing the existing plant cover, and by fostering the natural establishment of desirable plants.

In table 7 the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning the use of parks, wildlife refuges, nature study areas, and other developments for wildlife; in

selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; in determining the intensity of management needed for each element of the habitat; and in determining areas that are suitable for acquisition to manage for wildlife.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderate intensity of management and fairly frequent attention are required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. Examples are wheat, oats, rye, and barley. The major soil properties 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 flood hazard. Soil temperature and soil moisture are also considerations.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Examples are fescue, wheatgrass, bromegrass, orchardgrass, clover, and alfalfa. Major soil properties 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, flood hazard, and slope. Soil temperature and soil moisture are also considerations.

Wild herbaceous plants are native established rangeland grasses and forbs, including weeds, that provide food and cover for wildlife. Examples are little bluestem, vetches, globemallow, sedges, penstemon, sunflower, dandelion, goldenrod, stickseed, partridgepea, wheatgrass, fescue, and grama. Major soil properties 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 flood hazard. Soil temperature and soil moisture are also considerations.

Coniferous plants are cone-bearing trees and the associated vegetation that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Examples are ponderosa and pinyon pine, spruce, Douglas-fir and white fir, maple, boxelder, aspen, willow, and juniper. Major soil properties that affect the growth of coniferous plants are depth of the root zone, available water capacity, and wetness.

Shrubs are bushy woody plants that produce fruits, buds, twigs, bark, or foliage used by wildlife or that provide cover and shade for some species of wildlife. Examples are mountainmahogany, oak brush, fourwing saltbush, Apacheplume, winterfat, elder, redosier dogwood, shrubby cinquefoil, black sagebrush, and big sagebrush. Major soil properties that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and moisture.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Examples of wetland plants are smartweed, skunkcabbage, white clover, rushes, sedges, reeds, and cattail. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness.

Shallow water areas are bodies of surface water that have an average depth of less than 5 feet and are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control devices in marshes or streams. Examples are muskrat marshes, waterfowl feeding areas, beaver ponds, and other shallow wildlife ponds. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is essential if water areas are to be developed.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland and pasture that are associated with irrigated farms. These areas produce grain and seed crops, grasses and legumes, shrubs, and wild herbaceous plants. The kinds of wildlife attracted to these areas include ring-necked pheasant, meadowlark, field sparrow, cottontail rabbit, mourning dove, Brewer blackbird, skunk, and least chipmunk.

Woodland habitat consists of hardwoods or conifers or a mixture of conifers and hardwood trees with associated grasses, legumes, shrubs, and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, blue grouse, Steller's jay, thrushes, vireos, woodpeckers, mule deer, elk, and black bear.

Wetland habitat consists of water-tolerant plants in open, marshy, or swampy shallow water areas. Examples of wildlife attracted to this habitat are ducks, geese, herons, shore birds, kingfishers, muskrat, mink, and beaver.

Rangeland habitat consists of wild herbaceous plants and shrubs on grassland, shrubland, and pinyon pine and juniper communities. Examples of wildlife attracted to this habitat are antelope, mule deer, lark bunting, sage

thrasher, coyote, jackrabbit, prairie dog, marsh hawk, and turkey vultures.

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. The ratings are given in the following tables: 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 within a depth of 5 or 6 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 need to 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 grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, 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 kind 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 (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) 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

Table 8 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and 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 increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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 stabilized soil material, and a

flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

sanitary facilities

Table 9 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and 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 increases in construction costs, and possibly increased maintenance are required.

Table 9 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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 depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

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. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 9 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive 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.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the 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.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 9 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material

during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

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 final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of *good, fair,* or *poor*. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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 soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering properties and classifications provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high 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 engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering properties and classifications.

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.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

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.

water management

Table 11 gives information on the soil properties and site features that affect water management. The soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. This table also gives for each soil the restrictive features that affect drainage, irrigation, and terraces and diversions.

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. The information in this table applies 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.

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, to a cemented pan, or to 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 potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to 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, or 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 to 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 reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined 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 grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 15.

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 characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering properties and classifications

Table 12 gives estimates of the engineering properties and classifications for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

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 a soil contains particles coarser than sand, 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 (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-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, SP-SM.

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 grain-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 15.

Rock fragments larger than 3 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 oven-dry 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 grain-size distribution, liquid limit, and plasticity index are 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 omitted in the table.

physical and chemical properties

Table 13 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water 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, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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 major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. 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.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major 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.

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.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) 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 (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

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 resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.
5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.
6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.
7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.
8. Stony or gravelly soils and other soils not subject to wind erosion.

soil and water features

Table 14 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils 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 permanent 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.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 14 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

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 absence of distinctive horizons that form in soils that are not subject to flooding.

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.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 14 are the depth to the seasonal high water table and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 14.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential 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 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 mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves 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 creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel 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 is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

engineering test data

Table 15 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by the New Mexico State Highway Department.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); and Plasticity index—T 90 (AASHTO), D 424 (ASTM).

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*4*). 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. In table 16, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten 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 Boralf (*Bor*, meaning cool, 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; 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 Cryoboralfs, (*Cry*, indicating cool summers, plus *boralf*, the suborder of the Alfisols that have a cryic temperature regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Cryoboralfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, Typic Cryoboralfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other 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 (*3*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*4*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Amalia series

The Amalia series consists of deep, well drained soils. These soils formed on piedmonts and side slopes in mixed alluvium that derived from gneiss and granite. Slopes range from 30 to 50 percent. The elevation is 7,000 to 8,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 44 degrees F.

Amalia soils are similar to Stunner soils. They are near Manzano and Etoe soils. Stunner soils are less than 35 percent coarse fragments. Manzano soils have a mollic epipedon and are less than 35 percent coarse fragments. Etoe soils have a thick albic horizon, are

colder than Amalia soils, and have a udic moisture regime.

Typical pedon of Amalia very gravelly loam, in an area of Amalia-Manzano association, steep, about 3.1 miles northeast of Amalia on the north side of Ute Creek, 200 feet north of road:

A1—0 to 3 inches; brown (7.5YR 4/2) very gravelly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; many fine interstitial pores; 45 percent fine and medium gravel; neutral; clear smooth boundary.

B1t—3 to 6 inches; brown (7.5YR 4/2) very gravelly clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; common fine tubular pores; thin patchy clay films on faces of peds and on gravel; 50 percent fine and medium gravel; neutral; clear smooth boundary.

B21t—6 to 9 inches; reddish brown (5YR 4/4) very gravelly clay loam, reddish brown (5YR 4/3) moist; moderate fine subangular blocky structure; hard, very friable, sticky and plastic; many medium and fine roots; common fine tubular pores; thin continuous clay films on faces of peds and on gravel; 55 percent fine and medium gravel; neutral; clear smooth boundary.

B22t—9 to 17 inches; yellowish red (5YR 5/6) very gravelly clay loam, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; few fine roots; common fine tubular pores; thin patchy clay films on faces of peds and on gravel; 55 percent fine and medium gravel; neutral; abrupt smooth boundary.

Cca—17 to 60 inches; pink (5YR 7/4) very gravelly sandy loam, light reddish brown (5YR 6/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine tubular pores; 60 percent fine and medium gravel; strongly calcareous; thin patchy coatings of lime on the bottom of pebbles; mildly alkaline.

Calcareous material is at a depth of 13 to 20 inches. The solum is 16 to 28 inches thick.

The A horizon has hue of 10YR or 7.5YR; value of 4 or 5, dry, and 2 or 3, moist; and chroma of 2 through 4. It is very gravelly loam, very gravelly clay loam, or very gravelly sandy loam. It is 40 to 50 percent fine and medium gravel.

The B2t horizon has hue of 7.5YR or 5YR; value of 4 through 6, dry, and 3 or 4, moist; and chroma of 2 through 6. It is gravelly and very gravelly clay loam or very gravelly sandy clay loam. It is 45 to 65 percent fine and medium gravel. The reaction is neutral or mildly alkaline.

The C horizon has hue of 7.5YR or 5YR. It is 55 to 75 percent fine and medium gravel. It is moderately calcareous or strongly calcareous and mildly alkaline or moderately alkaline.

Angostura series

The Angostura series consists of deep, well drained soils. These soils formed on mountainsides in colluvium and residuum of shale and acid igneous rock. Slopes range from 5 to 80 percent. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 36 degrees F.

Angostura soils are similar to Presa soils. They are near Jaroso and Mascarenas soils. Presa soils do not have a mixed B and A horizon. Jaroso and Mascarenas soils are clayey-skeletal.

Typical pedon of Angostura cobbly loam, in an area of Jaroso-Angostura-Mascarenas complex, 40 to 80 percent slopes, in SW1/4SE1/4, sec. 4, T. 23 N., R. 14 E.

O1—2 inches to 0; decomposing forest litter, needles, and twigs.

A2—0 to 6 inches; light brownish gray (10YR 6/2) cobbly loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine interstitial pores; 10 percent gravel and 20 percent cobbles; medium acid; clear smooth boundary.

B&A—6 to 20 inches; 60 percent material from B2t horizon; pale brown (10YR 6/3) very cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; 40 percent material from A2 horizon; light brownish gray (10YR 6/2) cobbly loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine and few medium and coarse roots; common very fine and fine interstitial pores; 20 percent gravel, 20 percent cobbles, and 15 percent stones; medium acid; clear wavy boundary.

B2t—20 to 33 inches; pale brown (10YR 6/3) very stony sandy clay loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots; many very fine and fine tubular pores; few thin clay films on rock fragments; 15 percent gravel, 20 percent cobbles, and 20 percent stones; medium acid; clear wavy boundary.

B3t—33 to 60 inches; pale brown (10YR 6/3) very stony sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; few medium roots; few fine tubular pores; few thin clay films on rock fragments; 40 percent stones and 25 percent cobbles; medium acid.

Some pedons have a thin A1 horizon. The A2 horizon has hue of 7.5YR and 10YR and value of 6 or 7, dry, and 4 or 5, moist.

The Bt horizon is pale brown or light yellowish brown. Rock fragments make up 50 to 65 percent of the B&A and Bt horizons.

Antonito series

The Antonito series consists of moderately deep, well drained soils. These soils formed on mesas and basalt flows in material that weathered from basalt and in eolian material. Slopes range from 1 to 5 percent. The elevation is 7,500 to 8,000 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F.

Antonito soils are similar to Servilleta soils. They are near Travelers soils. Servilleta soils have a mesic soil temperature regime. Travelers soils are shallow and skeletal.

Typical pedon of Antonito loam, in an area of Antonito-Travelers association, gently sloping, in NE1/4NE1/4NE1/4, sec. 33, T. 30 N., R. 9 E.

A1—0 to 3 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable; common very fine roots; common very fine interstitial pores; moderately alkaline; clear smooth boundary.

B21t—3 to 6 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine interstitial pores; thin discontinuous clay films on faces of peds; moderately alkaline; clear smooth boundary.

B22t—6 to 12 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; few very fine roots; common very fine interstitial pores; thin continuous clay films on faces of peds; slightly calcareous; moderately alkaline; clear smooth boundary.

B3ca—12 to 16 inches; pinkish gray (7.5YR 7/2) clay loam, light brown (7.5YR 6/4) moist; moderate fine subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine interstitial pores; strongly calcareous; strongly alkaline; clear smooth boundary.

Cca—16 to 25 inches; pink (7.5YR 8/4) loam, pink (7.5YR 7/4) moist; massive; slightly hard, very friable; few very fine roots; few very fine interstitial pores; strongly calcareous; strongly alkaline; abrupt wavy boundary.

R—25 inches; basalt bedrock that has fractures and cobbles coated with lime.

Calcareous material is at a depth of 6 to 20 inches. The solum is 12 to 28 inches thick. Bedrock is at a depth of 20 to 40 inches.

The A horizon has hue of 10YR; value of 4 or 5, dry, and 3 or 4, moist; and chroma of 2 through 4. It is loam, sandy loam, or silt loam. Consistency is soft or slightly hard.

The B2t horizon has hue of 7.5YR or 5YR; value of 4 through 6, dry, and 3 or 4, moist; and chroma of 2 through 4. It is clay loam or silty clay loam. The structure is subangular blocky or prismatic. The reaction is mildly alkaline to strongly alkaline.

The Cca horizon has hue of 10YR through 5YR. It is moderately calcareous or strongly calcareous and moderately alkaline or strongly alkaline.

Caruso series

The Caruso series consists of deep, somewhat poorly drained soils. These soils formed in mixed alluvium on stream bottoms and terraces. Slopes range from 0 to 3 percent. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 49 degrees F.

Caruso soils are similar to Loveland soils. They are near Manzano soils. Loveland soils are poorly drained and are moderately deep to a substratum of sand, gravel, and cobbles. Manzano soils are well drained and are dark colored to a depth of more than 20 inches.

Typical pedon of Caruso silty clay loam, 0 to 3 percent slopes, 0.15 mile west of Plaza Supermarket, northwest corner of the low-cost housing project in Taos:

A11—0 to 5 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; hard, friable, sticky and plastic; common fine roots; common fine interstitial pores; slightly calcareous; moderately alkaline; clear smooth boundary.

A12—5 to 14 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; very hard, friable, sticky and plastic; common fine roots; common fine tubular pores; slightly calcareous; moderately alkaline; gradual smooth boundary.

AC—14 to 26 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; few medium faint very dark grayish brown (2.5Y 3/2) mottles, moist; weak medium subangular blocky structure; very hard, friable, sticky and plastic; common fine roots; few fine tubular pores; strongly calcareous; moderately alkaline; gradual smooth boundary.

C1—26 to 36 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; common medium distinct very dark gray (N 3/0) mottles, moist; massive; very hard, friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores;

strongly calcareous; moderately alkaline; gradual smooth boundary.
C2—36 to 60 inches; pale brown (10YR 6/3) stratified clay loam, silty clay loam, sandy clay loam, silt loam, and very fine sandy loam, dark brown (10YR 4/3) moist; many medium distinct grayish brown (2.5YR 5/2) and very dark gray (N 3/0) mottles, moist; massive; very hard, friable, slightly sticky and slightly plastic; strongly calcareous; moderately alkaline.

In most years, these soils have a water table within a depth of 30 inches late in winter, in spring, and early in summer. The reaction throughout the profile is mildly alkaline or moderately alkaline.

The A horizon has value of 4 or 5, dry, and 2 or 3, moist, and chroma of 1 or 2. It is clay loam or silty clay loam.

The C horizon has hue of 10YR or 2.5Y; value of 5 through 7, dry, and 4 or 5, moist; and chroma of 2 or 3.

Chimayo series

The Chimayo series consists of shallow, well drained soils. These soils formed on mountainsides in colluvium and in residuum of granite. Slopes range from 40 to 80 percent. The elevation is 7,000 to 8,200 feet. The mean annual precipitation is 18 inches, and the mean annual temperature is 48 degrees F.

Chimayo soils are near Mirabal soils. Mirabal soils are moderately deep.

Typical pedon of Chimayo stony sandy loam, in an area of Chimayo-Rock outcrop complex, very steep, about 5 miles southwest of Ranchos de Taos along New Mexico State Highway 68, about 3 miles south along Arroyo del Alamo:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) stony sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, friable; common very fine and fine roots; common very fine and fine interstitial pores; 25 percent stones and 20 percent gravel; neutral; clear smooth boundary.
C1—5 to 9 inches; light brownish gray (10YR 6/2) very stony sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, friable; common very fine and fine roots; common very fine and fine interstitial pores; 35 percent stones and 30 percent gravel; neutral; clear smooth boundary.
C2—9 to 15 inches; pale brown (10YR 6/3) very stony sandy loam, brown (10YR 5/3) moist; massive; common very fine and fine roots; common very fine and fine interstitial pores; 40 percent stones and 25 percent gravel; neutral; gradual smooth boundary.
R—15 inches; granite bedrock.

Bedrock is at a depth of 12 to 20 inches. The content of rock fragments is 40 to 80 percent. The fine earth fraction is loam or sandy loam.

Derecho series

The Derecho series consists of deep, well drained soils. These soils formed in colluvium and residuum of consolidated sandstone and shale on south-facing slopes of mountains and canyons. Slopes range from 15 to 80 percent. The elevation is 8,000 to 10,500 feet. The mean annual precipitation is 25 inches, and the mean annual temperature is 40 degrees F.

Derecho soils are similar to Etoe and Maes soils. They are near Angostura, Jaroso, and Trampas soils. Etoe and Maes soils have moist value of 4 or higher in the A11 horizon. Angostura soils are less than 35 percent clay in the argillic horizon. Jaroso and Trampas soils have moist value of 4 or higher in the A11 horizon.

Typical pedon of Derecho cobbly loam, 15 to 40 percent slopes, in NW1/4NE1/4, sec. 31, T. 24 N., R. 14 E.

O1—1 inch to 0; forest litter in varying degrees of decomposition.
A11—0 to 3 inches; grayish brown (10YR 5/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; many very fine interstitial pores; 20 percent gravel and 15 percent cobbles; neutral; abrupt smooth boundary.
A12—3 to 12 inches; grayish brown (10YR 5/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak very fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; many very fine interstitial pores; 35 percent gravel; neutral; abrupt smooth boundary.
B21t—12 to 21 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine and few coarse roots; many very fine tubular pores; many thin clay films on faces of peds; 40 percent gravel and 20 percent cobbles; mildly alkaline; clear smooth boundary.
B22t—21 to 36 inches; brown (10YR 5/3) extremely cobbly clay, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine and very few medium roots; many very fine tubular pores; many thin clay films on faces of peds; 40 percent gravel, 20 percent cobbles, and 10 percent stones; mildly alkaline; gradual smooth boundary.
B23t—36 to 51 inches; yellowish brown (10YR 5/4) extremely stony clay, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; very hard, very firm, sticky and plastic; very few very fine roots; common very fine tubular pores; many thin clay films on faces of peds; 30 percent gravel, 30 percent cobbles, and 20 percent stones; mildly alkaline; clear wavy boundary.

C—51 to 60 inches; grayish brown (10YR 5/2) extremely stony sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, sticky and plastic; 60 percent gravel, 20 percent cobbles, and 15 percent stones; mildly alkaline.

The solum is 40 to 60 inches thick. In most of the solum, the content of rock fragments is 40 to 80 percent. The reaction ranges from neutral to mildly alkaline.

The A1 horizon is loam, sandy clay loam, or clay loam.

The B2t horizon is clay, sandy clay, or clay loam.

The C horizon is grayish brown or gray. It ranges from sandy clay loam to clay loam.

Devisadero series

The Devisadero series consists of moderately deep, well drained soils. These soils formed on mountainsides in colluvium and residuum of consolidated shale and sandstone. Slopes range from 40 to 80 percent. The elevation is 7,000 to 8,500 feet. The mean annual precipitation is 16 inches, and the mean annual temperature is 52 degrees F.

Devisadero soils are similar to Lama soils. They are near Derecho and Trampas soils. Lama soils are less than 35 percent coarse fragments in the argillic horizon. Derecho and Trampas soils are colder than Devisadero soils. They have a frigid soil temperature regime and are deep.

Typical pedon of Devisadero gravelly loam, in an area of Devisadero-Rock outcrop complex, very steep, in NW1/4SW1/4, sec. 22, T. 24 N., R. 13 E.

A1—0 to 3 inches; brown (10YR 5/3) gravelly loam, brown (10YR 4/3) moist; moderate very fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; common very fine interstitial pores; 30 percent gravel; mildly alkaline; clear smooth boundary.

B21t—3 to 7 inches; brown (7.5YR 4/4) very gravelly clay, dark brown (10YR 4/2) moist; moderate fine subangular blocky structure; very hard, firm, sticky and plastic; few very fine and many fine roots; few fine tubular pores; common moderately thick clay films on faces of peds; 35 percent gravel; mildly alkaline; clear smooth boundary.

B22t—7 to 13 inches; brown (7.5YR 4/4) very gravelly clay, dry or moist; moderate medium subangular blocky structure; very hard, very firm, sticky and plastic; few medium and fine roots; few fine tubular pores; many moderately thick clay films on faces of peds; 35 percent gravel; mildly alkaline; clear smooth boundary.

B3ca—13 to 24 inches; brown (10YR 5/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few medium and fine roots; few fine tubular pores; few thin clay films on faces of peds; 50 percent gravel; moderately calcareous; fine irregular carbonate concretions; moderately alkaline; clear smooth boundary.

Cca—24 to 30 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, friable; few fine roots; 50 percent gravel; strongly calcareous; disseminated carbonates in fine irregular concretions; moderately alkaline.

R—30 inches; yellowish brown (10YR 5/4) weathered sandstone.

The solum is 15 to 25 inches thick.

The A1 horizon is dark grayish brown or brown. It is loam or clay loam.

The B2t horizon is dark grayish brown or brown heavy clay loam or clay. On the average, it is 35 to 60 percent coarse fragments.

The C horizon is sandy loam or loam.

Diamante series

The Diamante series consists of deep, well drained soils. These soils formed on terraces in mixed alluvium. Slopes range from 15 to 80 percent. The elevation is 8,000 to 9,800 feet. The mean annual precipitation is 24 inches, and the mean annual temperature is 40 degrees F.

Diamante soils are similar to Maes and Trampas soils. They are near Jaroso and Trampas soils. In Maes and Trampas soils, the upper boundary of the argillic horizon is at a depth of less than 24 inches. Jaroso soils are colder than Diamante soils. They have a cryic soil temperature regime.

Typical pedon of Diamante extremely gravelly loam, 15 to 40 percent slopes, in NE1/4SE1/4, sec. 7, T. 21 N., R. 12 E.

O1—1 inch to 0; forest litter in varying degrees of decomposition.

A11—0 to 2 inches; light brownish gray (10YR 6/2) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, friable; many very fine and fine roots; many very fine pores; 50 percent gravel and 20 percent cobbles; neutral; abrupt smooth boundary.

A12—2 to 14 inches; light gray (10YR 7/2) extremely gravelly sandy loam, light brownish gray (10YR 6/2) moist; weak very fine granular structure; soft, friable; many very fine and few medium and coarse roots; many very fine pores; 70 percent gravel and 15 percent cobbles; slightly acid; clear smooth boundary.

A2—14 to 31 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, light yellowish brown (10YR 6/4) moist; weak very fine granular structure; soft, friable; many very fine and fine and few

medium roots; many fine pores; 75 percent gravel and 10 percent cobbles; slightly acid; clear wavy boundary.

B21t—31 to 40 inches; light brown (7.5YR 6/4) very gravelly sandy clay, strong brown (7.5YR 5/6) moist; strong fine and very fine subangular blocky structure; very hard, very firm, sticky and plastic; few very fine and fine roots; common very fine pores; many moderately thick clay films on faces of peds; 50 percent gravel; medium acid; gradual wavy boundary.

B22t—40 to 60 inches; light brown (7.5YR 6/4) extremely gravelly sandy clay, brown (7.5YR 5/4) moist; weak medium and fine subangular blocky structure; very hard, very firm, sticky and plastic; few very fine pores; thin patchy clay films on faces of peds; 50 percent gravel and 15 percent cobbles; medium acid.

The solum is 45 to 85 percent coarse fragments.

The A1 horizon is sandy loam or loam.

The B2t horizon is light yellowish brown or light brown. It is sandy clay or clay.

Ess series

The Ess series consists of deep, well drained soils. These soils formed on mountainsides in acid igneous and metamorphic alluvium and colluvium. Slopes range from 15 to 45 percent. The elevation is 9,000 to 10,500 feet. The mean annual precipitation is 25 inches, and the mean annual temperature is 38 degrees F.

Ess soils are similar to and are near Wellsville soils. Wellsville soils are less than 35 percent coarse fragments in the control section.

Typical pedon of Ess gravelly loam, in an area of Wellsville-Ess association, moderately steep, about 10 miles southeast of Amalia, 1 mile north of Costilla Canyon Road:

A1—0 to 8 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many fine tubular pores; 30 percent gravel; mildly alkaline; clear smooth boundary.

B21t—8 to 16 inches; brown (7.5YR 4/4) very gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine tubular pores; few thin discontinuous clay films on peds and rock fragments; 50 percent gravel; mildly alkaline; clear smooth boundary.

B22t—16 to 33 inches; brown (7.5YR 5/4) very gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; few thin continuous clay films on peds and rock fragments; 40 percent gravel; mildly alkaline; clear smooth boundary.

C—33 to 60 inches; brown (7.5YR 5/4) very gravelly sandy loam, dark brown (7.5YR 4/4) moist; single grain; loose, dry or wet; few very fine and fine roots; many fine interstitial pores; 55 percent gravel; mildly alkaline.

The A horizon has hue of 7.5YR or 10YR and value of 4 or 5, dry, and 2 or 3, moist. It is gravelly loam or gravelly clay loam. Rock fragments make up 15 to 50 percent of the A horizon.

The B horizon has hue of 7.5YR or 10YR; value of 4 through 6, dry; and chroma of 2, 3, or 4.

The C horizon has hue of 10YR or 7.5YR and value of 5 or 6, dry, and 4 or 5, moist. It ranges from gravelly or cobbly clay loam to very gravelly or cobbly loamy sand.

Weathered bedrock is at a depth of more than 40 inches to more than 60 inches. Rock fragments make up 35 to 65 percent of the control section.

Etoe series

The Etoe series consists of deep, well drained soils. These soils formed on mountainsides in colluvium and residuum of sandstone and shale. Slopes range from 0 to 80 percent. The elevation is 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F.

Etoe soils are similar to Marosa soils. They are near Maes soils. Marosa soils do not have a mixed A and B horizon. Maes soils are clayey-skeletal.

Typical pedon of Etoe cobbly loam, in an area of Maes-Etoe complex, 15 to 40 percent slopes, 4 miles east of U.S. Hill:

O1—1 inch to 0; decomposing needles, twigs, and leaves.

A21—0 to 9 inches; pale brown (10YR 6/3) cobbly loam, brown (10YR 4/3) moist; moderate fine and medium granular structure; soft, friable; common very fine and fine and few medium roots; many very fine and fine interstitial pores; 20 percent cobbles; neutral; clear smooth boundary.

A22—9 to 20 inches; pale brown (10YR 6/3) cobbly loam, brown (10YR 5/3) moist; weak very fine granular structure; soft, friable; common very fine and medium roots; many very fine and fine interstitial pores; 15 percent gravel and 15 percent cobbles; neutral; clear smooth boundary.

A&B—20 to 27 inches; (A) pale brown (10YR 6/3) cobbly loam, brown (10YR 5/3) moist; moderate fine and medium granular structure; soft, friable; (B) very pale brown (10YR 7/4) cobbly clay loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, firm,

slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine interstitial pores; few thin clay films on faces of peds; 15 percent gravel and 20 percent cobbles; medium acid; gradual wavy boundary.

B21t—27 to 38 inches; very pale brown (10YR 7/4) very cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few medium and coarse roots; few fine tubular pores; few thin clay films on faces of peds; 15 percent gravel and 20 percent cobbles; medium acid; gradual wavy boundary.

B22t—38 to 47 inches; very pale brown (10YR 7/4) extremely cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine interstitial pores; common moderately thick clay films on rock fragments; 60 percent cobbles, 10 percent stones, and 10 percent gravel; neutral; diffuse wavy boundary.

B3t—47 to 63 inches; very pale brown (10YR 7/4) extremely cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; few medium roots; common very fine interstitial pores; common moderately thick clay films on rock fragments; 65 percent cobbles, 10 percent stones, and 10 percent gravel; neutral.

The B2t horizon is at a depth of 24 to 35 inches. An A1 horizon is in some pedons.

The A2 horizon has hue of 7.5YR or 10YR and value of 6 or 7, dry, and 3 through 5, moist.

The B2t horizon has hue of 7.5YR or 10YR and value of 5 through 7, dry, and 4 through 6, moist. Rock fragments make up 35 to 85 percent of the B2t horizon.

Fernando series

The Fernando series consists of deep, well drained soils. These soils formed in mixed alluvium on alluvial fans. Slopes range from 0 to 7 percent. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Fernando soils are similar to and are near Hernandez soils. They are near Silva, Prieta, Sedillo, and Servilleta soils. Hernandez soils do not have an argillic horizon. Silva soils have more clay in the B horizon than Fernando soils. Prieta and Servilleta soils have bedrock within a depth of 40 inches. Sedillo soils have gravel throughout.

Typical pedon of Fernando silt loam, 0 to 7 percent slopes, 60 feet east of trail and 0.61 mile north of range well no. 2, along trail on Taos Pueblo tract:

A1—0 to 2 inches; light brown (7.5YR 6/4) silt loam, dark brown (7.5YR 4/2) moist; weak thin and very thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; moderately calcareous; moderately alkaline; abrupt smooth boundary.

B1—2 to 8 inches; brown (7.5YR 5/4) silt loam, dark brown (7.5YR 4/2) moist; weak fine and very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; few fine and very fine interstitial pores; strongly calcareous; moderately alkaline; clear smooth boundary.

B21t—8 to 13 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/2) moist; weak medium and coarse prismatic structure; hard, firm, slightly sticky and slightly plastic; many fine and medium roots; common fine and very fine interstitial pores; few thin discontinuous clay films on faces of peds and lining pores; strongly calcareous; few thin splotches of lime; moderately alkaline; clear smooth boundary.

B22t—13 to 24 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm, slightly sticky and slightly plastic; many fine and very fine roots; common very fine and fine interstitial pores; thin discontinuous clay film on faces of peds; strongly calcareous; common filaments and coatings of lime on faces of peds; moderately alkaline; abrupt wavy boundary.

B3t—24 to 36 inches; light reddish brown (5YR 6/4) clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to strong medium and coarse angular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots; common fine and very fine interstitial pores; thin discontinuous clay films on faces of peds, in pores, and in channels; the interior of peds is noncalcareous, and the surface of peds is strongly calcareous; common filaments and splotches of lime on faces of peds; moderately alkaline; clear smooth boundary.

C1ca—36 to 42 inches; pink (7.5YR 8/4) clay loam, pink (7.5YR 7/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; strongly calcareous; moderately alkaline; gradual smooth boundary.

C2ca—42 to 60 inches; pink (7.5YR 7/4) loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable; strongly calcareous; moderately alkaline.

The calcic horizon is at a depth of 25 to 40 inches. The soil ranges from moderately to strongly alkaline throughout.

The A1 horizon has hue of 10YR or 7.5YR; value of 4 through 6, dry, and 3 or 4, moist; and chroma of 2 through 4. It is loam, silt loam, clay loam, or cobbly loam.

The B2t horizon has hue of 10YR or 7.5YR and value of 4 through 6, dry, and 4 or 5, moist. It is silt loam, loam, clay loam, or silty clay loam.

The C horizon has hue of 7.5YR or 10YR and value of 6 through 8, dry. It is clay loam, loam, or silt loam. It is 15 to 25 percent calcium carbonate.

The B and C horizons are 0 to 5 percent gravel.

Hernandez series

The Hernandez series consists of deep, well drained soils. These soils formed in mixed alluvium and eolian sediment on alluvial fans and valley sides. Slopes range from 0 to 5 percent. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Hernandez soils are similar to Fernando soils. They are near Petaca, Kim, and Silva soils. Fernando soils have an argillic horizon. Petaca soils are shallow to basalt bedrock and are skeletal. Kim soils do not have either a B2 horizon or a calcic horizon. Silva soils are fine textured and have an argillic horizon.

Typical pedon of Hernandez loam, in an area of Hernandez-Kim association, gently sloping, 1.6 miles south of Colorado state line and 2 3/4 miles east of Rio Grande Gorge, 0.15 mile north of a road just north of Ute Mountain:

A1—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; moderately calcareous; mildly alkaline; clear smooth boundary.

B2—4 to 14 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; moderately calcareous; mildly alkaline; clear smooth boundary.

C1ca—14 to 45 inches; pink (7.5YR 8/4) clay loam, light brown (7.5YR 6/4) moist; massive; hard, very friable; common fine roots; common very fine and fine tubular pores; strongly calcareous with disseminated lime; moderately alkaline; gradual smooth boundary.

C2ca—45 to 60 inches; pink (7.5YR 7/4) clay loam, brown (7.5YR 5/4) moist; massive; hard, very friable; common very fine tubular pores; strongly calcareous with disseminated lime; moderately alkaline.

The Cca horizon is at a depth of 9 to 16 inches.

The A horizon has hue of 7.5YR or 10YR and value of 5 or 6, dry, and 3 through 5, moist. It is loam, gravelly loam, or clay loam.

The B2 horizon has hue of 7.5YR or 10YR; value of 5 or 6, dry, and 4 or 5, moist; and chroma of 2 or 3. It is loam or clay loam. It is mildly alkaline or moderately alkaline.

The Cca horizon has hue of 7.5YR or 10YR; value of 6 through 8, dry, and 5 through 7, moist; and chroma of 2 through 4. It is loam, clay loam, or gravelly sandy clay loam. It has many threads and soft masses of lime or has disseminated lime.

Jaroso series

The Jaroso series consists of deep, well drained soils. These soils formed on mountainsides in colluvium and residuum of interbedded shale and sandstone. Slopes range from 5 to 80 percent. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 36 degrees F.

Jaroso soils are similar to Angostura and Presa soils. They are near Etoe, Mascarenas, and Maes soils. Angostura, Presa, and Etoe soils are loamy-skeletal. Mascarenas soils have an argillic horizon below a depth of 24 inches. Maes soils are warmer in summer than Jaroso soils.

Typical pedon of Jaroso cobbly loam, in an area of Jaroso-Angostura-Mascarenas complex, 15 to 40 percent slopes, near the east quarter corner in SW1/4NE1/4, sec. T. 24 N., R. 15 E.

O1&O2—2 inches to 0; needles, leaves, and twigs in varying degrees of decomposition.

A21—0 to 4 inches; very pale brown (10YR 7/3) cobbly loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; many very fine and fine interstitial pores; 25 percent cobbles and 10 percent gravel; slightly acid; abrupt smooth boundary.

A22—4 to 16 inches; very pale brown (10YR 7/3) cobbly loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; few very fine tubular pores and many very fine interstitial pores; 5 percent stones, 15 percent cobbles, and 10 percent gravel; medium acid; clear smooth boundary.

B21t—16 to 26 inches; very pale brown (10YR 7/3) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; few medium, fine, and very fine roots; common very fine interstitial pores; common thin clay films on faces of peds and on rock fragments; 25 percent gravel and 10 percent cobbles; medium acid; gradual wavy boundary.

B22t—26 to 41 inches; very pale brown (10YR 7/4) very gravelly clay, yellowish brown (10YR 5/4) moist; strong medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine and very few medium roots; common very fine interstitial pores; many thick clay films on faces of peds and on rock fragments; 35 percent gravel, 10 percent cobbles, and 5 percent stones; medium acid; clear smooth boundary.

B23t—41 to 53 inches; very pale brown (10YR 7/4) extremely cobbly clay, yellowish brown (10YR 5/4) moist; moderate fine angular blocky structure; extremely hard, very firm, very sticky and very plastic; few very fine interstitial pores; many thick clay films on faces of peds and common clay films on rock fragments; 60 percent gravel, 30 percent cobbles, and 5 percent stones; medium acid; clear wavy boundary.

B3t—53 to 60 inches; very pale brown (10YR 7/4) extremely cobbly sandy clay, yellowish brown (10YR 5/4) moist; weak very fine subangular blocky structure; extremely hard, very firm, sticky and plastic; few very fine tubular pores; many thick clay films on faces of peds and common clay films on rock fragments; 60 percent gravel, 30 percent cobbles, and 5 percent stones; medium acid.

The solum is 60 to 80 inches thick. Rock fragments make up 30 to 90 percent of the solum. The reaction ranges from slightly acid to medium acid.

The A2 horizon is loam, very fine sandy loam, or clay loam.

The B2t horizon is clay loam, sandy clay, or clay. On the average, it is more than 35 percent clay in the fine earth fraction.

Kim series

The Kim series consists of deep, well drained soils. These soils formed in mixed alluvium on alluvial fans and valley sides. Slopes range from 1 to 3 percent. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Kim soils are similar to Hernandez soils. Hernandez soils have a calcic horizon.

Typical pedon of Kim loam, in an area of Hernandez-Kim association, gently sloping, 1 mile west and 2.5 miles north of Top of the World Farm headquarters:

A1—0 to 12 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine roots; common fine tubular pores; strongly calcareous; moderately alkaline; gradual smooth boundary.

C1ca—12 to 34 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common fine roots; common fine tubular pores; strongly calcareous; moderately alkaline; gradual smooth boundary.

C2ca—34 to 60 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; rnassive; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine tubular pores; strongly calcareous; moderately alkaline.

The A horizon has hue of 7.5YR or 10YR; value of 5 or 6, dry, and 3 through 5, moist; and chroma of 2 or 3. It is loam or silt loam.

The Cca horizon has value of 5 through 8, dry, and 4 through 7, moist; and chroma of 2 through 4. It is loam, clay loam, or gravelly loam. Calcium carbonate does not increase or decrease enough to qualify this horizon as a calcic horizon.

Lama series

The Lama series consists of deep, well drained soils. These soils formed on old terraces and plains in mixed alluvium that derived from sedimentary and igneous rocks. Slopes range from 0 to 20 percent. The elevation is 7,800 to 8,500 feet. The mean annual precipitation is 17 inches, and the mean annual temperature is 48 degrees F.

Lama soils are similar to Silva soils. They are near Montecito soils. Silva and Montecito soils have soft, powdery secondary carbonates within a depth of 3 inches.

Typical pedon of Lama loam, 0 to 20 percent slopes, SW1/4NE1/4, sec. 23, T. 28 N., R. 12 E.

A1—0 to 7 inches; brown (10YR 5/3) loam, dark brown (7.5YR 3/2) moist; weak fine and medium granular structure; slightly hard, friable, slightly sticky and plastic; many very fine and fine roots; many very fine interstitial pores; neutral; abrupt smooth boundary.

B21t—7 to 13 inches; reddish brown (5YR 5/4) clay, dark reddish brown (5YR 3/4) moist; moderate very fine and fine subangular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; many very fine tubular pores; many moderately thick clay films on faces of peds; mildly alkaline; gradual smooth boundary.

B22t—13 to 22 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; strong very fine and fine angular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; many very fine tubular pores; many moderately thick clay films on faces of peds; 5 percent gravel; mildly alkaline; gradual smooth boundary.

B23t—22 to 30 inches; brown (7.5YR 5/4) gravelly clay, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; very few very fine and few medium roots; many very fine tubular pores; common thin clay films on faces of peds; 25 percent gravel; mildly alkaline; clear smooth boundary.

B3t—30 to 41 inches; reddish yellow (5YR 6/6) very cobbly sandy clay, reddish brown (5YR 4/4) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; very few medium roots; many very fine tubular pores; few thin clay films on faces of peds; 20 percent cobbles and 30 percent gravel; mildly alkaline; abrupt smooth boundary.

C1ca—41 to 48 inches; light reddish brown (5YR 6/4) extremely gravelly sandy clay loam, reddish brown (5YR 5/4) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 20 percent cobbles and 50 percent gravel; slightly calcareous; coatings of carbonates on coarse fragments; moderately alkaline; clear smooth boundary.

IIC2—48 to 62 inches; yellow (10YR 7/6) extremely gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable; 70 percent gravel and 10 percent cobbles; mildly alkaline.

The A1 horizon is loam or clay loam. It is neutral or mildly alkaline.

The B2t horizon has value of 5 or 6, dry, and chroma of 3 or 4. It is clay loam, sandy clay, or clay. It is 35 to 50 percent clay.

Loveland series

The Loveland series consists of deep, poorly drained soils. These soils formed in mixed alluvium on valley bottoms and terraces. Slopes range from 0 to 3 percent. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 49 degrees F.

Loveland soils are similar to Caruso soils and are near Manzano soils. Caruso soils are deep to coarse fragments. Manzano soils are drier than Loveland soils and have few coarse fragments.

Typical pedon of Loveland clay loam, 0 to 3 percent slopes, 150 yards northeast of house, 0.15 mile northeast of Ranchitos:

A11—0 to 4 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable, sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; very high organic matter content; moderately calcareous; moderately alkaline; clear smooth boundary.

A12—4 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; hard, friable, sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; strongly calcareous; moderately alkaline; clear smooth boundary.

C1g—9 to 21 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; massive; very hard, firm, sticky and slightly plastic; many fine roots; common fine tubular pores; common medium distinct strong brown (7.5YR 5/6) and light gray (5Y 7/1) mottles, moist; strongly calcareous; moderately alkaline; clear smooth boundary.

IIC2—21 to 60 inches; waterworn mixed sand, gravel, and cobblestones.

The A horizon has hue of 2.5Y or 10YR; value of 4 or 5, dry; and chroma of 1 or 2. It is clay loam, loam, or silt loam.

The Cg horizon has hue of 2.5Y or 10YR and has distinct to prominent mottles. It is clay loam, loam, or silt loam. Sand and gravel are at a depth of 20 to 40 inches. The seasonal water table is at a depth of 6 to 18 inches.

Luhon series

The Luhon series consists of deep, well drained soils. These soils formed on basalt plains in mixed alluvium and eolian sediment. Slopes range from 1 to 5 percent. The elevation is 7,600 to 8,800 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F.

Luhon soils are similar to Hernandez soils. They are near Stunner, Travelers, and Antonito soils. Hernandez soils have a mesic soil temperature regime. Stunner and Antonito soils have an argillic horizon. Antonito soils have basalt at a depth of 20 to 40 inches. Travelers soils have basalt at a depth of less than 20 inches.

Typical pedon of Luhon loam, in an area of Luhon-Travelers complex, 3 to 7 percent slopes, 200 feet south of cattle guard and 40 feet west of road, in NW1/4NW1/4NW1/4, sec. 34, T. 30 N., R. 11 E.

A1—0 to 3 inches, brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine vesicular pores; moderately alkaline; clear smooth boundary.

C1—3 to 12 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine vesicular pores; slightly calcareous with mass speckled carbonates; moderately alkaline; clear smooth boundary.

C2ca—12 to 16 inches; pinkish gray (7.5YR 7/2) clay loam, light brown (7.5YR 6/4) moist; massive; slightly hard, very friable, sticky and plastic; common very fine vesicular pores; strongly calcareous; moderately alkaline; clear smooth boundary.

C3ca—16 to 32 inches; pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 5/2) moist; massive; hard, friable, sticky and plastic; common fine tubular pores; strongly calcareous; moderately alkaline; clear smooth boundary.

C4ca—32 to 60 inches; pinkish white (7.5YR 8/2) loam, pink (7.5YR 7/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine tubular pores; strongly calcareous; moderately alkaline.

The Cca horizon is at a depth of 10 to 18 inches.

The A horizon has hue of 7.5YR or 10YR; value of 4 or 5, dry, and 3 or 4, moist; and chroma of 3 or 4. It is

loam or sandy loam. It is mildly alkaline or moderately alkaline.

The C1 horizon has hue of 7.5YR or 10YR; value of 5 or 6, dry, and 4 or 5, moist; and chroma of 3 or 4.

Maes series

The Maes series consists of deep, well drained soils. These soils formed on mountainsides in colluvium and residuum of consolidated sandstone and shale. Slopes range from 0 to 75 percent. The elevation is 8,000 to 10,500 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 40 degrees F.

Maes soils are similar to Trampas soils. They are near Derecho, Etoe, and Jaroso soils. Trampas soils have a solum that is less than 50 inches thick. Derecho soils are in a mollic subgroup. Etoe soils have a loamy-skeletal control section. Jaroso soils have a cryic soil temperature regime.

Typical pedon of Maes cobbly loam, in an area of Maes-Etoe complex, 15 to 40 percent slopes, SE1/4SE1/4, sec. 36, T. 25 N., R. 14 E.

O1&O2—2 inches to 0; forest litter in varying degrees of decomposition.

A1—0 to 2 inches; light brownish gray (10YR 6/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure parting to moderate fine granular; soft, very friable; many very fine and fine roots; many fine and medium vesicular pores; 15 percent cobbles and 5 percent gravel; neutral; clear smooth boundary.

A2—2 to 7 inches; pale brown (10YR 6/3) cobbly sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, friable; many very fine and fine and few medium roots; many medium and few very fine and fine interstitial pores; 15 percent cobbles and 5 percent gravel; neutral; clear irregular boundary.

A&B—7 to 16 inches; (A) very pale brown (10YR 7/4) very cobbly sandy loam, yellowish brown (10YR 5/6) moist; (B) blocks of yellowish brown (10YR 4/4) moist; weak medium granular structure; soft, friable; common very fine and fine and few medium and coarse roots; many fine interstitial pores; 25 percent cobbles and 10 percent gravel; neutral; gradual wavy boundary.

B&A—16 to 35 inches; (B) yellowish brown (10YR 5/8) very cobbly sandy clay, dark yellowish brown (10YR 4/4) moist; (A) very pale brown (10YR 7/4) very cobbly sandy loam, yellowish brown (10YR 5/6) moist; weak medium and fine subangular blocky structure; hard, firm, sticky and plastic; few very fine, fine, and medium roots; common fine tubular pores; moderately thick clay films on faces of peds; 30 percent cobbles and 20 percent gravel; slightly acid; gradual wavy boundary.

B21t—35 to 57 inches; yellowish brown (10YR 5/8) very cobbly sandy clay, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few fine and medium roots; few fine tubular pores; thick clay films on faces of peds and patchy clay films on rock fragments; 40 percent cobbles and 10 percent gravel; slightly acid; clear wavy boundary.

B22t—57 to 67 inches; yellowish brown (10YR 5/8) very cobbly sandy clay, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; very hard, firm, sticky and plastic; very few fine roots; few fine tubular pores; thin patchy clay films on faces of peds and on rock fragments; 50 percent cobbles; slightly acid.

The A1 horizon is light brownish gray or pale brown.

The B2t horizon is clay loam, clay, or sandy clay. It is 35 to 60 percent rock fragments. It is neutral to slightly acid.

Manzano series

The Manzano series consists of deep, well drained soils. These soils formed in mixed alluvium on valley bottoms and alluvial fans. Slopes range from 0 to 5 percent. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 48 degrees F.

The Manzano soils are near Loveland and Caruso soils. Caruso and Loveland soils are wetter than Manzano soils and are not cumulic. Loveland soils have coarse fragments in the control section.

Typical pedon of Manzano clay loam, 3 to 5 percent slopes, 0.5 mile south and 0.5 mile west of San Cristobal Post Office:

A1—0 to 10 inches; brown (7.5YR 5/3) clay loam, dark brown (7.5YR 3/2) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; mildly alkaline; clear smooth boundary.

B21t—10 to 30 inches; dark brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/2) moist; moderate coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine and fine tubular pores; mildly alkaline; clear smooth boundary.

B22—30 to 43 inches; dark brown (10YR 4/3) clay loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine roots; few very fine tubular pores; slightly calcareous; mildly alkaline; clear wavy boundary.

C—43 to 60 inches; brown (10YR 5/3) clay loam, dark gray (10YR 4/1) moist; massive; hard, firm, sticky and plastic; few fine roots; few very fine tubular pores; slightly calcareous; mildly alkaline.

The A horizon has hue of 7.5YR or 10YR; value of 4 or 5, dry, and 2 or 3, moist; and chroma of 2 or 3. The A horizon is loam or clay loam.

The B21 horizon has hue of 7.5YR or 10YR and value of 4 or 5, dry, and 2 or 3, moist. The B horizon ranges from loam to clay loam.

The C horizon commonly is stratified with medium-textured and moderately fine-textured sediment. In places, strata of sand and gravel are below a depth of 40 inches.

Marosa series

The Marosa series consists of deep, well drained soils. These soils formed on mountainsides, mountaintops, and benches in colluvium and residuum of acid igneous and metamorphic rock. Slopes range from 0 to 80 percent. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 40 degrees F.

Marosa soils are similar to Etoe soils. They are near Nambe soils. Etoe soils have a mixed A and B horizon. Nambe soils are more acid than Marosa soils and do not have an argillic horizon.

Typical pedon of Marosa cobbly sandy loam, 40 to 80 percent slopes, SE1/4NE1/4, sec. 15, T. 29 N., R. 14 E.

O1—1 inch to 0; forest litter in varying degrees of decomposition.

A1—0 to 3 inches; light brownish gray (10YR 6/2) cobbly sandy loam, brown (10YR 5/3) moist; weak thin platy structure; soft, friable; many very fine and fine and few medium and coarse roots; many very fine and fine pores; 20 percent gravel and 15 percent cobbles; neutral; clear smooth boundary.

A21—3 to 16 inches; light gray and white (10YR 7/2 and 8/2) extremely gravelly loamy sand, light brownish gray (10YR 6/2) moist; weak fine granular structure; soft, friable; many very fine and fine and few medium and coarse roots; many very fine and fine pores; 60 percent gravel and 15 percent cobbles; neutral; gradual wavy boundary.

A22—16 to 34 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, friable; many very fine and fine and few medium and coarse roots; many very fine and fine pores; 60 percent gravel and 15 percent cobbles; neutral; gradual wavy boundary.

B2t—34 to 44 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm, slightly plastic; many very fine and fine and few medium roots; few fine pores; thin patchy clay films on faces of peds and on rock fragments; 40 percent gravel and 20 percent cobbles; neutral; clear wavy boundary.

C—44 to 72 inches; cobbles, gravel, and stones and some soil material from horizon above; rock fragments make up 95 percent of the horizon; 45 percent gravel, 35 percent cobbles, and 15 percent stones.

The solum is 40 to 60 inches thick.

The A1 horizon is light brownish gray or very pale brown sandy loam or loam. It is 20 to 60 percent rock fragments.

The B2t horizon is pinkish gray, light brown, pale brown, light yellowish brown, or yellow sandy clay loam or clay loam. It is 50 to 85 percent rock fragments.

Mascarenas series

The Mascarenas series consists of deep, well drained soils. These soils formed on smooth mountainsides in colluvium and residuum of interbedded shale and sandstone. Slopes range from 15 to 80 percent. The elevation is 9,000 to 11,000 feet. The mean annual precipitation is 30 inches, and the mean annual temperature is 36 degrees F.

Mascarenas soils are similar to Diamante soils. They are near Jaroso, Angostura, Derecho, Etoe, and Maes soils. Diamante soils are warmer in summer than Mascarenas soils. Angostura soils have a loamy-skeletal control section. Jaroso soils have an A horizon that is less than 24 inches thick. Derecho soils have a darker A horizon than Mascarenas soils. Etoe soils have a loamy-skeletal control section.

Typical pedon of Mascarenas cobbly sandy loam, in an area of Jaroso-Angostura-Mascarenas complex, 15 to 40 percent slopes, SE1/4SE1/4, sec. 12, T. 23 N., R. 13 E.

O1&O2—3 inches to 0; forest litter in varying degrees of decomposition.

A1—0 to 4 inches; light brownish gray (10YR 6/2) cobbly sandy loam, brown (10YR 4/3) moist; weak thin platy structure parting to moderate fine granular; soft, friable; many very fine and fine roots; many very fine and fine interstitial pores; 15 percent cobbles and 20 percent gravel; neutral; clear smooth boundary.

A2—4 to 30 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, friable, slightly plastic; common very fine and fine and few medium and coarse roots; many very fine and fine tubular pores; 30 percent gravel and 5 percent cobbles; neutral; gradual wavy boundary.

B2t—30 to 58 inches; brown (10YR 5/3) extremely gravelly sandy clay, dark brown (10YR 4/3) moist; strong fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine and medium roots; many fine tubular pores; many moderately thick clay films on faces of peds and on

rock fragments; 50 percent gravel, 25 percent cobbles, and 10 percent stones; neutral; gradual wavy boundary.
B3t—58 to 70 inches; light yellowish brown (10YR 6/4) extremely stony sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine tubular pores; many moderately thick clay films on coarse fragments; 30 percent gravel, 30 percent cobbles, and 30 percent stones; mildly alkaline.

Rock fragments are angular pebbles, cobbles, or stones of sandstone. In the A horizon, rock fragments are 20 to 50 percent gravel and 5 to 15 percent cobbles, and in the Bt horizon they are 30 to 80 percent gravel, 10 to 50 percent cobbles, and 5 to 30 percent stones.

The A1 horizon has value of 5 or 6, dry, and 4 or 5, moist, and chroma of 2 or 3. It is sandy loam or loam. Some pedons do not have an A1 horizon.

The A2 horizon has hue of 10YR or 7.5YR; value of 7 or 8, dry, and 4 through 6, moist; and chroma of 3 through 6. It is loam or sandy loam.

The B2t horizon has hue of 10YR or 7.5YR; value of 5 through 7, dry, and 4 or 5, moist; and chroma of 3 or 4. It is sandy clay or clay.

Mirabal series

The Mirabal series consists of moderately deep, well drained soils. These soils formed on mountain side slopes in residuum of granite. Slopes range from 40 to 80 percent. The elevation is 8,000 to 9,500 feet. The mean annual precipitation is 20 inches, and the mean annual temperature is 42 degrees F.

Mirabal soils are near Chimayo soils. Chimayo soils are shallow and have a mesic soil temperature regime.

Typical pedon of Mirabal stony loam, in an area of Mirabal-Rock outcrop association, very steep, in NW1/4SW1/4, sec. 18. T. 28 N., R. 9 E.

O1—1 inch to 0; decomposing needles and twigs.
A1—0 to 3 inches; grayish brown (10YR 5/2) stony loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, friable; many very fine and fine roots; common very fine and fine interstitial pores; 20 percent stones and 20 percent gravel; neutral; clear smooth boundary.
C1—3 to 11 inches; light brownish gray (10YR 6/2) stony loam, brown (10YR 4/3) moist; massive; common very fine and fine roots; common very fine and fine interstitial pores; 20 percent stones and 25 percent gravel; neutral; clear smooth boundary.
C2—11 to 16 inches; light brown (7.5YR 6/4) very stony sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable; common fine and medium roots; common very fine and fine interstitial pores; 20 percent stones and 35 percent gravel; neutral; clear smooth boundary.
C3—16 to 32 inches; pink (7.5YR 7/4) very stony sandy loam, brown (7.5YR 5/4) moist; massive; soft, friable; few fine and medium roots; common fine interstitial pores; 30 percent stones and 35 percent gravel; neutral; abrupt smooth boundary.
R—32 inches; granite bedrock.

Bedrock is at a depth of 20 to 35 inches. Rock fragments make up 35 to 80 percent of the pedon. The reaction is neutral to slightly acid.

The A horizon is grayish brown or brown sandy loam or loam.

Mirand series

The Mirand series consists of deep, well drained soils that formed in mixed alluvium in canyons and on mountains. Slopes range from 0 to 15 percent. The elevation is 7,500 to 9,000 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 42 degrees F.

Mirand soils are similar to Derecho soils. They are near Trampas, Chimayo, Etoe, Maes, Sabe, and Mirabal soils. Derecho and Trampas soils are clayey-skeletal. Chimayo and Mirabal soils do not have an argillic horizon. Etoe and Maes soils do not have a dark-colored A horizon and are skeletal. Sabe soils are sandy-skeletal.

Typical pedon of Mirand cobbly loam, 0 to 15 percent slopes, in NE1/4SE1/4, sec. 1, T. 23 N., R. 12 E.

O1&O2—1 inch to 0; needles, leaves, and twigs in varying degrees of decomposition.
A1—0 to 3 inches; grayish brown (10YR 5/2) cobbly loam, very dark brown (10YR 2/2) moist; weak thin platy structure parting to moderate fine granular; soft, friable; many very fine and fine and few medium roots; many very fine and fine interstitial pores; 20 percent cobbles; neutral; clear smooth boundary.
B21t—3 to 8 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/2) moist; moderate fine and medium subangular blocky structure; very hard, very firm, sticky and plastic; common very fine and fine and few medium roots; many very fine and fine interstitial pores; many moderately thick clay films on faces of peds; 10 percent gravel and 10 percent cobbles; neutral; clear wavy boundary.
B22t—8 to 21 inches; brown (7.5YR 5/4) cobbly clay, dark brown (7.5YR 4/2) moist; moderate medium and coarse angular blocky structure; extremely hard, extremely firm, sticky and very plastic; common very fine and fine and few medium roots; few fine tubular pores; continuous moderately thick clay films on faces of peds; 10 percent gravel and 5 percent cobbles; neutral; gradual wavy boundary.
B23t—21 to 32 inches; light brown (7.5YR 6/4) clay, brown (7.5YR 5/4) moist; moderate medium and

coarse subangular blocky structure; extremely hard, extremely firm, very sticky and very plastic; few very fine, fine, and medium roots; few very fine tubular pores; many moderately thick clay films on faces of peds; 10 percent gravel and 5 percent cobbles; neutral; gradual wavy boundary.

B3t—32 to 45 inches; yellowish red (5YR 5/6) cobbly clay, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; very hard, very firm, sticky and plastic; few very fine, fine, and medium roots; few very fine tubular pores; many moderately thick clay films on faces of peds; 10 percent gravel and 15 percent cobbles; neutral; abrupt smooth boundary.

C—45 to 68 inches; light brown (7.5YR 6/4) sandy clay, brown (7.5YR 5/4) moist; massive; very hard, very firm, sticky and plastic; very few fine roots; very few fine tubular pores; 5 percent gravel; neutral.

The solum is 40 to 60 inches thick. The A horizon is 0 to 10 percent gravel and 0 to 25 percent cobbles, and the B2t horizon is 5 to 15 percent gravel and 0 to 20 percent cobbles.

The A horizon has value of 4 or 5, dry, and 2 or 3, moist, and chroma of 1 or 2. It is loam or clay loam.

The B2t horizon has hue of 5YR, 7.5YR, or 10YR (commonly 7.5YR and 10YR); value of 5 through 7, dry, and 4 through 6, moist; and chroma of 2 through 6. It is clay, sandy clay, or clay loam. It is more than 35 percent clay.

The C horizon has hue of 7.5YR or 10YR and value of 5 or 6, dry. It is sandy clay or clay.

Montecito series

The Montecito series consists of deep, well drained soils. These soils formed on alluvial fans and lava plains in material that derived from basalt or old alluvium. Slopes range from 1 to 30 percent. The elevation is 6,500 to 8,000 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F.

Montecito soils are similar to Silva soils. They are near Hernandez, Orejas, and Lama soils. Silva soils have an ustic-aridic moisture regime. Hernandez soils do not have an argillic horizon. Lama soils have lime below a depth of 40 inches. Orejas soils are shallow over hard rock.

Typical pedon of Montecito loam, 1 to 15 percent slopes, in SW1/4NW1/4, sec. 22, T. 28 N., R. 12 E.

A11—0 to 2 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 3/4) moist; weak very fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine interstitial pores; 5 percent gravel; mildly alkaline; clear smooth boundary.

A12—2 to 6 inches; brown (10YR 5/3) loam, dark yellowish brown (10YR 3/4) moist; moderate very fine granular structure; slightly hard, very friable, sticky and slightly plastic; many very fine and fine roots; common very fine and fine interstitial pores; mildly alkaline; clear smooth boundary.

B21t—6 to 12 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and medium and few coarse roots; common very fine tubular pores; many thin clay films on faces of peds; moderately alkaline; gradual smooth boundary.

B22t—12 to 19 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; strong fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine and common medium roots; common very fine and fine tubular pores; common thin clay films on faces of peds; strongly calcareous; seams of lime; moderately alkaline; gradual smooth boundary.

B3ca—19 to 30 inches; light brown (7.5YR 6/4) gravelly clay loam, brown (7.5YR 5/4) moist; moderate fine and medium angular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; few very fine tubular pores; 10 percent gravel and 5 percent cobbles; strongly calcareous; medium irregular soft masses of carbonates; moderately alkaline; gradual smooth boundary.

C1ca—30 to 45 inches; white (10YR 8/1) very gravelly sandy loam, light gray (10YR 7/2) moist; massive; hard, friable; very few very fine roots; 50 percent gravel and 10 percent cobbles; strongly calcareous; fine irregular carbonate concretions; moderately alkaline; gradual smooth boundary.

C2ca—45 to 60 inches; light gray (7.5YR 7/2) extremely gravelly sandy loam, very pale brown (7.5YR 7/4) moist; massive; hard, very friable; 50 percent gravel and 20 percent cobbles; strongly calcareous; fine irregular carbonate concretions; moderately alkaline.

The solum is 20 to 30 inches thick. The reaction ranges from neutral to moderately alkaline. The calcic horizon is at a depth of 25 to 30 inches.

The A1 horizon has value of 4 through 6, dry, and 3 or 4, moist, and chroma of 3 or 4. It is loam or fine sandy loam.

The B2t horizon has hue of 10YR or 7.5YR; value of 3 through 5, moist; and chroma of 3 or 4. It is clay loam or clay.

The C horizon has value of 6 through 8, dry, and 5 through 7, moist. It is clay loam, sandy clay loam, loam, or sandy loam. Rock fragments make up 20 to 70 percent of the C horizon.

Nambe series

The Nambe series consists of deep, well drained soils. These soils formed on mountainsides in colluvium of

granite, gneiss, schist, or rhyolite. Slopes range from 0 to 80 percent. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F.

Nambe soils are near Marosa and Penitente soils. Marosa soils have an A horizon that is more than 24 inches thick. Penitente soils have a pergelic soil temperature regime.

Typical pedon of Nambe cobbly loam, 15 to 40 percent slopes, NW1/4NW1/4, sec. 2, T. 27 N., R. 14 E.

A1—0 to 5 inches; light yellowish brown (10YR 6/4) cobbly loam, brown (10YR 4/3) moist; weak thin platy structure parting to moderate very fine and fine granular; soft, friable; many very fine and fine roots; common very fine and fine interstitial pores; 20 percent gravel and 15 percent cobbles; very strongly acid; clear smooth boundary.

A2—5 to 16 inches; light yellowish brown (10YR 6/4) very cobbly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate very fine and fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine interstitial pores; 20 percent gravel and 40 percent cobbles; strongly acid; clear smooth boundary.

B21ir—16 to 24 inches; light brown (7.5YR 6/4) cobbly sandy clay loam, brown (7.5YR 4/4) moist; weak very fine and fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine interstitial pores; 20 percent gravel and 15 percent cobbles; reddish brown coatings of iron oxides on undersides of rock fragments; medium acid; clear smooth boundary.

B22—24 to 34 inches; pale brown (10YR 6/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine and fine interstitial pores; 15 percent gravel and 35 percent cobbles; strongly acid; gradual smooth boundary.

B3—34 to 55 inches; grayish brown (10YR 5/2) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, friable; few very fine and fine interstitial pores; 20 percent gravel and 35 percent cobbles; strongly acid; gradual smooth boundary.

C—55 to 65 inches; yellowish brown (10YR 5/4) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, friable; common very fine and fine interstitial pores; 60 percent gravel, 20 percent cobbles, and 10 percent stones; strongly acid.

The solum is 30 to 60 inches thick. Rock fragments make up 35 to 60 percent of the solum.

The A1 horizon has value of 5 or 6, dry, and 3 or 4, moist, and chroma of 2 through 4. It is loam or sandy loam.

The A2 horizon is sandy clay loam or sandy loam.

The B2 horizon ranges from sandy clay loam to sandy loam.

Orejas series

The Orejas series consists of shallow, well drained soils. These soils formed on cones and hills in material that derived from basalt. Slopes range from 9 to 40 percent. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 14 inches, and the mean annual temperature is 52 degrees F.

Orejas soils are near Montecito soils. Unlike Orejas soils, Montecito soils are deep.

Typical pedon of Orejas stony loam, 15 to 40 percent slopes, in NW1/4NE1/4, sec. 9, T. 26 N., R. 11 E.

A1—0 to 2 inches; pale brown (10YR 6/3) very stony loam, dark grayish brown (10YR 4/2) moist; moderate very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; 10 percent gravel, 10 percent cobbles, and 40 percent stones; neutral; abrupt smooth boundary.

B2t—2 to 9 inches; light brown (7.5YR 6/4) cobbly clay loam, brown (7.5YR 4/2) moist; moderate very fine and fine subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine and few medium roots; common very fine tubular pores; common thin clay films on faces of peds; 10 percent gravel, 20 percent cobbles, and 5 percent stones; mildly alkaline; clear smooth boundary.

B3t—9 to 14 inches; pinkish gray (7.5YR 6/2) very gravelly clay loam, brown (7.5YR 4/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; few fine interstitial pores; 40 percent gravel; mildly alkaline; abrupt wavy boundary.

R—14 inches; fractured basalt bedrock that has patchy coatings of lime.

The solum is 10 to 20 inches thick. Rock fragments make up 35 to 75 percent of the solum. Reaction is neutral or mildly alkaline.

The A1 horizon is light brownish gray, light brown, or pale brown. It ranges from loam to clay loam.

The B2t horizon is pinkish gray, light brown, or brown. It is clay loam or clay.

Penitente series

The Penitente series consists of deep, well drained soils. These soils formed on mountaintops in colluvium and residuum of granite, gneiss, schist, or rhyolite. Slopes range from 5 to 40 percent. The elevation is

12,000 to 13,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 30 degrees F.

Penitente soils are near Nambe soils. Nambe soils are warmer than Penitente soils and have a cryic soil temperature regime.

Typical pedon of Penitente gravelly loam, 15 to 40 percent slopes, in SE1/4NW1/4, sec. 28, T. 28 N., R. 14 E.

O1&O2—1 inch to 0; organic material consisting of undecomposed and partly decomposed plant roots and leafy parts of kobresia.

A11—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; soft, friable; many very fine and fine roots; common very fine interstitial pores; 30 percent gravel; medium acid; clear smooth boundary.

A12—4 to 11 inches; brown (10YR 4/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, friable; many very fine and fine roots; common very fine interstitial pores; 55 percent gravel; strongly acid; clear smooth boundary.

B21ir—11 to 23 inches; light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, friable; common very fine and fine and few medium roots; many very fine interstitial pores; 55 percent gravel; reddish brown coatings of iron oxides on the underside of pebbles; strongly acid; clear smooth boundary.

B22—23 to 36 inches; very pale brown (10YR 7/3) very cobbly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium and coarse subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine tubular pores; 40 percent gravel and 20 percent cobbles; strongly acid; gradual smooth boundary.

C—36 to 60 inches; light gray (2.5Y 7/2) extremely gravelly loamy sand, light yellowish brown (2.5Y 6/4) moist; massive; soft, very friable; common very fine and fine interstitial pores; 80 percent gravel; strongly acid.

The solum is 16 to 36 inches thick. Rock fragments make up 30 to 80 percent of the solum. The average content of rock fragments in the control section is more than 35 percent.

The A horizon has value of 3 or 4, dry, and 2 or 3, moist, and chroma of 1 through 3. It is loam or sandy loam.

The B2 horizon has value of 5 through 7, dry, and 3 through 5, moist, and chroma of 2 through 4. It is sandy loam, loam, or sandy clay loam.

The C horizon has hue of 10YR or 2.5Y and value of 5 through 7, dry, and 4 through 6, moist. It is loam, sandy loam, or loamy sand.

Petaca series

The Petaca series consists of shallow, well drained soils. These soils formed on ridges and breaks in material that derived from basalt and in eolian sediment. Slopes range from 1 to 15 percent. The elevation is 6,500 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Petaca soils are similar to Prieta soils. They are near Montecito, Silva, Vibo, and Hernandez soils. Prieta soils have an argillic horizon. Montecito, Silva, and Vibo soils have an argillic horizon and are deep. Hernandez soils are deep.

Typical pedon of Petaca very stony loam, 1 to 15 percent slopes, SW1/4NW1/4, sec. 19, T. 25 N., R. 11 E.

A1—0 to 2 inches; brown (10YR 5/3) very stony loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine interstitial pores; 30 percent stones, 20 percent cobbles, and 10 percent gravel; moderately calcareous; mildly alkaline; abrupt smooth boundary.

AC—2 to 5 inches; brown (10YR 5/3) cobbly loam, dark grayish brown (10YR 4/2) moist; massive; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine interstitial pores; 20 percent cobbles; moderately calcareous; moderately alkaline; clear wavy boundary.

C1ca—5 to 12 inches; pale brown (10YR 6/3) cobbly clay loam, brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and slightly plastic; many very fine and fine roots; common very fine and fine interstitial pores; 20 percent cobbles; strongly calcareous, with disseminated lime; moderately alkaline; clear irregular boundary.

C2ca—12 to 17 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; hard, firm; 40 percent lime-coated basalt gravel; strongly calcareous; common soft and hard masses of lime and disseminated lime between the masses; moderately alkaline; clear irregular boundary.

R—17 inches; very dark gray fractured basalt. The reaction is mildly alkaline or moderately alkaline.

The A1 horizon is light brownish gray or brown.

The C horizon is light brownish gray, light gray, pale brown, or brown.

Poganeab series

The Poganeab series consists of deep, poorly drained soils. These soils formed in mixed alluvium on alluvial bottoms and terraces. Slopes are 0 to 2 percent. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 49 degrees F.

Poganeab soils are similar to Loveland soils. They are near Manzano and Caruso soils. Loveland soils have sand and gravel at a depth of 20 to 40 inches. Manzano soils are well drained. Caruso soils are somewhat poorly drained.

Typical pedon of Poganeab silty clay loam, nearly level, 1.3 miles west and 0.25 mile north of Kit Carson Plaza in Taos:

O1—2 inches to 0; grass roots and partly decomposed grass roots and about 20 percent soil material.

A1g—0 to 17 inches; gray (N 5/0) silty clay loam, dark gray (N 4/0) moist; moderate very fine subangular blocky structure; hard, friable, sticky and plastic; common fine roots; few very fine tubular pores; mildly alkaline; clear smooth boundary.

C1g—17 to 26 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct yellowish brown (10YR 5/4) mottles, olive (5Y 4/3) moist; massive; very hard, friable, sticky and plastic; few fine roots; common very fine tubular pores; few fine threads of lime; moderately alkaline; gradual smooth boundary.

C2g—26 to 42 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; many coarse prominent yellowish brown (10YR 5/6) mottles, dark grayish brown (2.5Y 4/2) moist; massive; very hard, friable, sticky and plastic; common very fine tubular pores; moderately alkaline; gradual smooth boundary.

C3g—42 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; common coarse prominent yellowish brown (10YR 5/6) mottles, olive (5Y 4/6) moist; massive; very hard, friable, slightly sticky and plastic; common very fine tubular pores; moderately alkaline; clear wavy boundary.

IIC4g—50 to 60 inches; gray (5Y 5/1) gravelly sandy loam, dark gray (5Y 4/1) moist; many coarse prominent olive, brown, and yellow mottles; massive; hard, friable; mildly alkaline.

The A horizon is granular to subangular blocky in structure.

The C horizon has value of 4 through 6, dry, and 3 through 5, moist. Consistence ranges from hard to very hard. The seasonal water table is at a depth between 6 and 18 inches.

Presa series

The Presa series consists of deep, well drained soils. These soils formed on mountainsides and benches in material that weathered from sandstone and shale. Slopes range from 0 to 80 percent. The elevation is 10,000 to 12,000 feet. The mean annual precipitation is 35 inches, and the mean annual temperature is 34 degrees F.

Presa soils are similar to Angostura soils. They are near Jaroso, Mascarenas, and Penitente soils. Angostura soils have a mixed B and A horizon. Jaroso soils have a clayey-skeletal control section. Mascarenas soils have a thick A2 horizon. Penitente soils are colder than Presa soils and have a pergelic soil temperature regime.

Typical pedon of Presa cobbly loam, 15 to 40 percent slopes, in sec. 27, T. 24 N., R. 15 E.

O1&O2—2 inches to 0; forest litter in varying degrees of decomposition.

A1—0 to 2 inches; yellowish brown (10YR 5/4) cobbly loam, dark yellowish brown (10YR 4/4) moist; moderate thin platy structure parting to moderate fine granular; soft, very friable; common very fine, fine, and medium roots and few coarse roots; many very fine and fine interstitial pores; 20 percent gravel and 20 percent cobbles; strongly acid; abrupt smooth boundary.

A2—2 to 5 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; slightly hard, friable, nonsticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; many very fine and fine interstitial pores; 30 percent gravel and few cobbles; medium acid; clear smooth boundary.

B1t—5 to 13 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; many very fine and fine interstitial pores; many thin clay films on rock fragments; 45 percent gravel and 5 percent cobbles; medium acid; gradual very wavy boundary.

B21t—13 to 24 inches; very pale brown (10YR 7/4) extremely cobbly loam, light olive brown (2.5Y 5/4) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; many thin clay films on rock fragments; 50 percent gravel, 25 percent cobbles, and 10 percent stones; medium acid; clear wavy boundary.

B22t—24 to 34 inches; pale yellow (2.5Y 7/4) extremely cobbly loam, light olive brown (2.5Y 5/4) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; few very fine

and common medium roots; many very fine and fine interstitial pores; many thin clay films on rock fragments; 45 percent gravel, 30 percent cobbles, and 20 percent stones; medium acid; clear wavy boundary.

B23t—34 to 43 inches; pale yellow (2.5Y 7/4) extremely cobbly sandy clay loam, light olive brown (2.5Y 5/4) moist; weak fine subangular blocky structure; slightly hard, very friable; few very fine roots; many very fine and fine interstitial pores; common thin clay films on faces of peds, many moderately thick clay films on rock fragments; 45 percent gravel, 30 percent cobbles, and 20 percent stones; medium acid; clear wavy boundary.

B3t—43 to 52 inches; light yellowish brown (2.5Y 6/4) extremely stony sandy clay loam, olive brown (2.5Y 4/4) moist; very weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; very few very fine roots; many very fine and fine interstitial pores; many moderately thick clay films on faces of peds and rock fragments; 5 percent gravel, 15 percent cobbles, and 70 percent stones; slightly acid; clear wavy boundary.

C—52 to 76 inches; light yellowish brown (2.5Y 6/4) extremely stony sandy loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, very friable; very few very fine roots; many very fine and fine interstitial pores; 25 percent cobbles and 60 percent stones; medium acid.

The solum is 40 to 90 inches thick. Rock fragments of angular gravel, cobbles, and stones make up 10 to 40 percent of the A1 and A2 horizons, 40 to 95 percent of the B2t horizon, and 40 to 90 percent of the B3t and C horizons.

The A1 horizon has value of 4 through 6, dry, and 3 or 4, moist and chroma of 2 through 4, moist. It is loam or sandy loam.

The B2t horizon has hue of 7.5YR, 10YR, and 2.5Y; value of 5 through 7, dry, and 4 or 5, moist; and chroma of 3 or 4. It is loam, sandy clay loam, and clay loam. It is 20 to 30 percent clay.

The B3t horizon has hue of 10YR or 2.5Y; value of 5 or 6, and 4 or 5, moist; and chroma of 3 or 4. It is sandy loam, sandy clay loam, or clay loam.

The C horizon has hue of 2.5Y or 5Y. It is sandy loam, sandy clay loam, or clay loam.

Prieta series

The Prieta series consists of shallow, well drained soils. These soils formed on basalt flows in residuum of basalt and in mixed eolian sediments. Slopes range from 1 to 5 percent. The elevation is 6,500 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Prieta soils are near Petaca, Servilleta, and Travelers soils. Petaca soils do not have an argillic horizon and are less than 35 percent clay. Servilleta soils have bedrock at a depth of 20 to 40 inches. Travelers soils are less than 35 percent clay and do not have an argillic horizon.

Typical pedon of Prieta stony silty clay loam, in an area of Servilleta-Prieta complex, 1 to 5 percent slopes, 0.35 mile south of the northeast corner of sec. 6, T. 27 N., R. 10 E. and 20 feet west of trail:

A1—0 to 2 inches; brown (10YR 5/3) stony silty clay loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; common fine interstitial pores; 5 percent angular basalt gravel, 15 percent cobbles, and 25 percent stones; neutral; clear smooth boundary.

B2t—2 to 7 inches; brown (7.5YR 5/2) stony silty clay loam, dark brown (7.5YR 4/2) moist; moderate fine subangular blocky structure; very hard, firm, very sticky and plastic; common fine roots; common fine tubular pores; common thin patchy clay films on faces of peds; 5 percent angular basalt gravel, 10 percent cobbles, and 20 percent stones; mildly alkaline; clear wavy boundary.

B3tca—7 to 10 inches; light brown (7.5YR 6/4) stony silty clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; very hard, friable, sticky and plastic; common fine roots; common fine tubular pores; few thin patchy clay films on faces of peds; 5 percent angular basalt gravel, 10 percent cobbles, and 20 percent stones; strongly calcareous; few fine distinct threads of lime; caliche coatings on the under side of rock fragments; moderately alkaline; clear wavy boundary.

Cca—10 to 14 inches; pink (7.5YR 7/4) very stony silty clay loam, brown (7.5YR 5/4) moist; weak coarse subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; 15 percent angular basalt gravel, 15 percent cobbles, and 20 percent stones; strongly calcareous, with disseminated lime; caliche coatings on rock fragments; moderately alkaline; abrupt wavy boundary.

R—14 inches; fractured, caliche-coated basalt bedrock.

The solum is 10 to 20 inches thick. Rock fragments make up 35 to 50 percent of the solum.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, moist, and chroma of 2 or 3. It is loam to silty clay loam. Structure generally is granular but ranges to platy.

The B2t horizon has value of 5 or 6, dry, and 4 or 5, moist, and chroma of 2 or 3. It ranges from silty clay loam to clay.

Raton series

The Raton series consists of shallow, well drained soils. These soils formed on old basalt flows in material

that weathered from basalt and in eolian sediment. Slopes range from 3 to 25 percent. The elevation is 7,600 to 10,000 feet. The mean annual precipitation is 15 inches, and the mean annual temperature is 41 degrees F.

Raton soils are near Stunner soils. Stunner soils are deep and are less than 35 percent coarse fragments.

Typical pedon of Raton very stony silt loam, 3 to 8 percent slopes, SW1/4SE1/4SW1/4, sec. 9, T. 29 N., R. 11 E.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very stony silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine roots; few fine interstitial pores; 50 percent basalt cobbles and stones; neutral; clear smooth boundary.

B1—4 to 10 inches; dark brown (10YR 3/3) very stony silty clay loam, very dark brown (10YR 2/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many fine roots; many fine vesicular and tubular pores; 70 percent stones; neutral; clear smooth boundary.

B2t—10 to 18 inches; dark brown (10YR 4/3) very stony clay, dark brown (10YR 3/3) moist; strong medium angular blocky structure; very hard, firm, sticky and plastic; few fine roots; few very fine interstitial pores; common thin clay films on faces of peds and on rock fragments; 70 percent basalt stones; neutral; abrupt smooth boundary.

R—18 inches; basalt bedrock.

The A horizon has value of 3 or 4, dry, and 2 or 3, moist. It is 40 to 60 percent rock fragments.

The B1 horizon has hue of 7.5YR to 10YR; value of 3 or 4, dry, and 2 or 3, moist; and chroma of 2 or 3.

The B2t horizon has hue of 7.5YR or 10YR; value of 3 through 5, dry, and 2 or 3, moist; and chroma of 3 or 4, dry, and 2 through 4, moist.

Bedrock is at a depth of 10 to 20 inches.

Royosa series

The Royosa series consists of deep, somewhat excessively drained soils. These soils formed on dunes in eolian materials that derived from a variety of sources. Slopes range from 1 to 15 percent. The elevation is 6,500 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 52 degrees F.

Royosa soils are near Montecito and Vibo soils. Montecito and Vibo soils are finer textured than Royosa soils.

Typical pedon of Royosa loamy sand, 1 to 8 percent slopes, NW1/4SW1/4, sec. 36, T. 23 N., R. 10 E.

A1—0 to 8 inches; brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; single grain; loose, dry or moist; few very fine and fine roots; many fine interstitial pores; neutral; gradual wavy boundary.

C—8 to 60 inches; brown (7.5YR 5/4) loamy sand, dark reddish brown (5YR 3/4) moist; single grain; loose, dry or moist; few fine roots; many fine interstitial pores; mildly alkaline.

The soil material is neutral to mildly alkaline throughout.

The A1 horizon has value of 5 or 6, dry, and 3 through 5, moist, and chroma of 3 or 4. It is loamy sand, fine sand, or sand.

The C horizon has hue of 5YR, 7.5YR, or 10YR; value of 4 through 6, dry, and 3 through 5, moist; and chroma of 3 or 4. It is loamy sand, fine sand, or sand.

Sabe series

The Sabe series consists of deep, somewhat excessively drained soils. These soils formed in mixed alluvium on terraces. Slopes range from 15 to 80 percent. The elevation is 7,500 to 9,000 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 42 degrees F.

Sabe soils are near Etoe, Mirand, Maes, and Trampas soils. In Etoe, Mirand, Maes, and Trampas soils, the upper boundary of the argillic horizon is within a depth of 24 inches.

Typical pedon of Sabe very cobbly sandy loam, in an area of Sabe-Mirand complex, 15 to 80 percent slopes, SW1/4SW1/4, sec. 5, T. 23 N., R. 13 E.

O1&O2—1 inch to 0; forest litter in varying degrees of decomposition.

A1—0 to 6 inches; light brownish gray (10YR 6/2) very cobbly sandy loam, brown (10YR 4/3) moist; weak thin platy structure parting to moderate fine granular; soft, very friable; common very fine and few medium roots; many very fine and fine interstitial pores; 25 percent gravel, 20 percent cobbles, and 5 percent stones; neutral; clear smooth boundary.

A21—6 to 18 inches; light gray (10YR 7/2) very cobbly loamy sand, brown (10YR 5/3) moist; very weak fine granular structure; soft, very friable; common very fine and fine and many medium roots; many very fine and fine and common medium interstitial pores; 30 percent gravel, 20 percent cobbles, and 10 percent stones; neutral; gradual smooth boundary.

A22—18 to 25 inches; very pale brown (10YR 7/3) extremely cobbly loamy sand, light yellowish brown (10YR 6/4) moist; very weak very fine and fine granular structure; soft, friable; few very fine and common fine roots; many very fine and common medium interstitial pores; 30 percent gravel, 30 percent cobbles, and 10 percent stones; neutral; gradual smooth boundary.

B2t—25 to 60 inches; matrix is white (10YR 8/2) extremely cobbly sand, light yellowish brown (10YR

6/4) moist; single grain; loose, dry or moist; few very fine and fine roots; many fine and medium interstitial pores; lamellae of pink (7.5YR 7/4) sandy clay loam, light brown (7.5YR 6/4) moist; slightly hard, friable; few very fine and fine roots; few very fine and fine interstitial pores; common thin clay films bridging some sand grains; lamellae are 1/4- to 1/2-inch thick and are discontinuous; 15 percent gravel, 60 percent cobbles, and 15 percent stones; neutral.

The solum is 40 to more than 60 inches thick. Rock fragments make up 40 to 90 percent of the solum.

Sedillo series

The Sedillo series consists of deep, well drained soils. These soils formed on terraces in gravelly alluvium. Slopes range from 3 to 15 percent. The elevation is 6,800 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Sedillo soils are near Orthents and Silva soils. Silva soils have fewer or no coarse fragments. Orthents do not have an argillic horizon.

Typical pedon of Sedillo very gravelly loam, in an area of Silva-Sedillo association, gently sloping; at edge of gravel pit in SE1/4NW1/4SW1/4, sec. 30, T. 27 N., R. 12 E.

A11—0 to 3 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine tubular pores; 40 percent gravel and 5 percent cobbles; mildly alkaline; clear smooth boundary.

B21t—3 to 8 inches; reddish brown (5YR 5/4) very gravelly clay loam, dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and slightly plastic; many fine roots; common fine tubular pores; common thin clay films on faces of peds and gravel; 35 percent gravel and 5 percent cobbles; moderately alkaline; clear smooth boundary.

B22t—8 to 11 inches; brown (7.5YR 5/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist; weak fine subangular blocky structure; hard, friable, sticky and slightly plastic; common fine roots; common fine tubular pores; common thin clay films on faces of peds and gravel; 30 percent gravel and 5 percent cobbles; slightly calcareous; moderately alkaline; clear wavy boundary.

C1ca—11 to 24 inches; light brown (7.5YR 6/4) very gravelly sandy loam, brown (7.5YR 5/4) moist; massive; hard, friable, slightly sticky and nonplastic; many very fine tubular pores; 50 percent gravel and 5 percent cobbles; strongly calcareous; moderately thick coatings of lime on gravel; moderately alkaline; gradual wavy boundary.

C2—24 to 60 inches; brown (7.5YR 5/4) very gravelly sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, very friable; common very fine tubular pores; 60 percent gravel and 10 percent cobbles; strongly calcareous; thin coatings of lime on gravel; moderately alkaline.

The solum is 10 to 25 inches thick. Rock fragments make up 35 to 75 percent of the pedon.

The A horizon has hue of 7.5YR or 10YR; value of 4 or 5, dry, and 3 or 4, moist; and chroma of 3 or 4. It is gravelly loam, cobbly loam, very gravelly sandy clay loam.

The C horizon has value of 5 through 7, dry, and chroma of 2 through 4. It is very gravelly sandy loam or very gravelly sandy clay loam. The calcium carbonate equivalent is 15 to 30 percent.

Servilleta series

The Servilleta series consists of moderately deep, well drained soils. These soils formed on broad mesas and lava flows in material that weathered from basalt and in eolian material. Slopes range from 1 to 5 percent. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Servilleta soils are similar to Fernando and Silva soils. They are near Prieta soils. Fernando and Silva soils are deep. Prieta soils are shallow to bedrock and are more than 35 percent rock fragments.

Typical pedon of Servilleta silty clay loam, in an area of Servilleta-Prieta complex, 1 to 5 percent slopes, 80 feet southwest of the northeast corner of sec. 6, T. 27 N., R. 10 E.

A1—0 to 3 inches; brown (7.5YR 5/4) silty clay loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, sticky and plastic; common fine roots; common fine interstitial pores; 5 percent basalt gravel and cobbles; neutral; clear smooth boundary.

B21t—3 to 10 inches; reddish brown (5YR 5/4) silty clay loam, dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure; very hard, firm, very sticky and very plastic; common fine roots; common very fine and fine tubular pores; many thin clay films on faces of peds; neutral; clear smooth boundary.

B22t—10 to 16 inches; reddish brown (5YR 5/4) silty clay loam, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; very hard, firm, very sticky and plastic; common fine roots; common fine tubular pores; thin patchy clay films on faces of peds; mildly alkaline; clear wavy boundary.

B3ca—16 to 25 inches; light brown (7.5YR 6/4) silty clay loam, dark brown (7.5YR 4/4) moist; moderate

medium prismatic structure parting to weak fine subangular blocky; very hard, firm, very sticky and plastic; few fine roots; common fine and medium tubular pores; moderately calcareous; irregularly shaped, medium-sized soft masses and filaments of segregated lime; moderately alkaline; clear wavy boundary.

Cca—25 to 34 inches; light brown (7.5YR 6/4) silty clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; very hard, friable, sticky and plastic; few fine roots; common very fine tubular pores; strongly calcareous, with disseminated lime; strongly alkaline; abrupt wavy boundary.

R—34 inches; patchy, lime-coated, fractured basalt bedrock.

Calcareous material is at a depth of 13 to 28 inches. The solum is 16 to 28 inches thick. Bedrock is at a depth of 20 to 40 inches.

The A horizon has hue of 10YR or 7.5YR and value of 4 or 5, dry, and 2 through 4, moist. It is loam, silt loam, or silty clay loam. Structure is dominantly granular, but in some pedons it is platy. Consistency is soft to slightly hard.

The B2t horizon has hue of 7.5YR or 5YR; value of 4 through 6, dry, and 3 or 4, moist; and chroma of 2 through 4. It is heavy silty clay loam or clay. Structure is angular or subangular blocky. Consistency is hard or very hard.

The Cca horizon has hue of 10YR through 5YR. It is moderately calcareous to strongly calcareous and moderately alkaline to strongly alkaline.

Shawa series

The Shawa series consists of deep, well drained soils. These soils formed in alluvium in concave positions on the landscape. Slopes range from 0 to 3 percent. The elevation is 7,500 to 8,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 43 degrees F.

Shawa soils are similar to Manzano soils. They are near Stunner and Luhon soils. In the Manzano soils the organic matter content decreases irregularly with depth; Manzano soils are warmer than Shawa soils. Stunner soils have an argillic horizon, are high in lime, and do not have a thick, dark-colored A horizon. Luhon soils are high in lime and do not have a thick, dark-colored A horizon.

Typical pedon of Shawa clay loam, 0 to 3 percent slopes, in northwest corner of NE1/4NE1/4, sec. 15, T. 30 N., R. 8 E.

A11—0 to 12 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine vesicular pores; neutral; clear smooth boundary.

A12—12 to 16 inches; very dark grayish brown (10YR 3/2) silty clay loam, very dark brown (10YR 2/2) moist; weak fine granular structure; hard, friable, sticky and plastic; few very fine roots; few very fine tubular pores; neutral; clear smooth boundary.

A13—16 to 30 inches; dark brown (10YR 3/3) clay loam, dark brown (10YR 3/3) moist; massive; hard, friable, sticky and plastic; few very fine vesicular pores; neutral; clear smooth boundary.

C1—30 to 40 inches; brown (7.5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; massive; hard, friable, sticky and plastic; few very fine tubular pores; neutral; clear smooth boundary.

C2—40 to 50 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; neutral; clear smooth boundary.

C3—50 to 65 inches; pink (7.5YR 7/4) clay loam, light brown (7.5YR 6/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine interstitial pores; 30 percent ash and cinders, cinders break out as gravel size; neutral.

The mollic epipedon is 20 to 30 inches thick. The A horizon has value of 2 or 3, moist, and chroma of 2 or 3. It is loam, clay loam, or silty clay loam.

The C horizon has hue of 7.5YR or 10YR and chroma of 3 or 4. It is loam, clay loam, or sandy clay loam.

Silva series

The Silva series consists of deep, well drained soils. These soils formed in mixed alluvium and eolian sediment on upland fans and valley sides. Slopes range from 0 to 10 percent. The elevation is 6,500 to 8,000 feet. The mean annual precipitation is 12 inches, and the mean annual temperature is 49 degrees F.

Silva soils are similar to Fernando and Servilleta soils. They are near Petaca, Hernandez, and Prieta soils. Fernando and Hernandez soils have less clay in the B horizon than Silva soils. Servilleta soils have basalt at a depth of 20 to 40 inches. Petaca and Prieta soils are shallow to basalt.

Typical pedon of Silva loam, in an area of Petaca-Silva association, gently sloping, 0.35 mile east and 200 feet north of the southwest corner of sec. 22, T. 28 N., R. 10 E.

A1—0 to 2 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable; many fine roots; common fine interstitial pores; mildly alkaline; clear smooth boundary.

B21t—2 to 10 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine roots; common fine tubular pores; thin patchy clay films on faces of peds; mildly alkaline; clear wavy boundary.

B22t—10 to 18 inches; light brown (7.5YR 6/4) clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine roots; common fine tubular pores; thin patchy clay films on faces of peds; slightly calcareous; moderately alkaline; clear wavy boundary.

B3ca—18 to 33 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; few fine roots; common fine interstitial pores; strongly calcareous; few medium faint mottles of lime; moderately alkaline; clear wavy boundary.

Cca—33 to 60 inches; very pale brown (10YR 7/4) clay loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, sticky and plastic; few fine roots; few very fine pores; 10 percent angular, caliche-coated basalt cobbles; strongly calcareous; lime finely divided with few medium faint mottles of lime; moderately alkaline.

The solum is 30 to 40 inches thick. Gravel and cobblestones make up 0 to 15 percent of the pedon.

The A horizon has hue of 7.5YR or 10YR; value of 5 or 6, dry, and 3 through 5, moist; and chroma of 3 or 4. Consistency ranges from soft to slightly hard.

The B2t horizon has hue of 7.5YR or 10YR; value of 3 through 5, moist; and chroma of 3 or 4. It is clay loam, silty clay loam, or clay.

The C horizon has value of 6 through 8, dry, and 5 or 6, moist, and chroma of 2 through 4.

Some soils that have hue of 5YR and some that have a calcic horizon between depths of 30 and 40 inches are similar enough to Silva soils in behavior that nothing would be gained by assigning them to another series.

Stunner series

The Stunner series consists of deep, well drained soils. These soils formed in mixed alluvium and eolian sediment on the top of basalt mesas, on foot slopes, and on alluvial fans. Slopes range from 1 to 5 percent. The elevation is 7,600 to 8,500 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F.

Stunner soils are similar to Luhon and Antonito soils. They are near Luhon, Raton, and Travelers soils. Luhon soils do not have an argillic horizon. Antonito soils are moderately deep to basalt, and Travelers soils are shallow to basalt. Raton soils are clayey-skeletal.

Typical pedon of Stunner cobbly loam, in an area of Stunner-Travelers association, gently sloping, in the northeast corner of SE1/4, sec. 16, T. 30 N., R. 11 E., 50 feet west of road:

A1—0 to 4 inches; brown (7.5YR 5/4) cobbly loam, dark brown (7.5YR 3/4) moist; soft, very friable, slightly sticky and nonplastic; many fine roots; many fine and very fine vesicular pores; the surface is 15 percent angular basalt stones and cobbles, mildly alkaline; clear smooth boundary.

B1t—4 to 9 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine vesicular pores; thin discontinuous clay films on faces of peds; 5 percent basalt cobbles; strongly calcareous; moderately alkaline; clear smooth boundary.

B2t—9 to 19 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many fine and very fine roots; many very fine vesicular pores; very thin discontinuous clay films on faces of peds; 10 percent basalt cobbles; strongly calcareous; common coarse distinct soft mottles of lime; moderately alkaline; clear smooth boundary.

C1ca—19 to 28 inches; pink (7.5YR 7/4) loam, brown (7.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; many very fine vesicular pores; 10 percent basalt gravel and 5 percent basalt cobbles; strongly calcareous; moderately alkaline; abrupt smooth boundary.

C2ca—28 to 60 inches; pinkish white (7.5YR 8/2) gravelly loam, pinkish gray (7.5YR 7/2) moist; massive; soft, very friable, slightly sticky; many very fine vesicular pores; 10 percent basalt gravel and 5 percent basalt cobbles; 5 percent volcanic ash; strongly calcareous; moderately alkaline.

The Cca horizon is at a depth of 18 to 36 inches.

The A horizon has hue of 7.5YR or 10YR; value of 5 or 6, dry, and 3 or 4 moist; and chroma of 3 or 4. It is loam or clay loam that is 5 to 30 percent gravel and cobbles.

The B2t horizon has value of 5 or 6, dry, and 4 or 5, moist, and chroma of 3 or 4. It is clay loam or silty clay loam that is 5 to 10 percent basalt gravel and cobbles.

The C horizon has hue of 7.5YR or 10YR and value of 6 through 8, dry. It is loam or clay loam that is 5 to 15 percent basalt gravel or cobbles.

Tenorio series

The Tenorio series consists of deep, well drained soils. These soils formed in mixed gravelly alluvium in valley fill on side slopes. Slopes range from 0 to 5 percent. The elevation is 7,000 to 8,000 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 48 degrees F.

Tenorio soils are similar to Sedillo soils and are near Fernando soils. Sedillo soils have gravel throughout the pedon. Fernando soils have little or no gravel.

Typical pedon of Tenorio loam, 0 to 3 percent slopes, in NE1/4NE1/4, sec. 10, T. 30 N., R. 12 E.

A1—0 to 3 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable; many medium roots; many very fine pores; neutral; abrupt smooth boundary.
B1—3 to 9 inches; dark brown (7.5YR 4/4) loam, reddish brown (5YR 4/3) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many medium roots; many very fine pores; neutral; clear smooth boundary.
B2t—9 to 13 inches; dark brown (7.5YR 4/4) loam, reddish brown (5YR 4/3) moist; weak fine subangular blocky structure; very hard, friable, sticky and plastic; many fine roots; many very fine pores; 10 percent gravel; neutral; clear smooth boundary.
IIB3—13 to 18 inches; dark brown (7.5YR 4/4) extremely gravelly sandy loam, reddish brown (5YR 4/3) moist; weak fine subangular blocky structure; hard, friable, sticky and plastic; many fine roots; many fine interstitial pores; 80 percent gravel; neutral; clear smooth boundary.
IIC—18 to 60 inches; yellowish brown (10YR 5/4) extremely gravelly sand, brown (10YR 4/3) moist; single grain; loose, dry or moist; few fine roots; 70 percent gravel; slightly calcareous; mildly alkaline.

Skeletal material is at a depth of 12 to 20 inches.

The A horizon has value of 4 or 5, dry, and 3 or 4, moist. It is loam, sandy loam, or sandy clay loam.

The B2t horizon has hue of 5YR, 7.5YR, or 10YR and value of 4 or 5, dry, and 3 or 4, moist. It is loam, clay loam, or sandy clay loam. The IIB3 horizon is 10 to 85 percent rock fragments.

The IIC horizon is 40 to 70 percent rock fragments.

Trampas series

The Trampas series consists of deep, well drained soils. These soils formed in alluvium on old alluvial fans and plains. Slopes range from 15 to 80 percent. The elevation is 7,500 to 9,800 feet. The mean annual precipitation is 22 inches, and the mean annual temperature is 45 degrees F.

Trampas soils are near Etoe, Maes, Diamante, Derecho, and Mirand soils. Etoe soils are loamy-skeletal. Maes and Diamante soils have a thick A2 horizon. Derecho soils have a darker colored A horizon than Trampas soils. Mirand soils are less than 35 percent coarse fragments.

Typical pedon of Trampas cobbly sandy loam, 15 to 40 percent slopes, in NW1/4SE1/4, sec. 30, T. 22 N., R. 11 E.

O1&O2—1 inch to 0; needles, leaves, and twigs in varying degrees of decomposition.
A1—0 to 2 inches; grayish brown (10YR 5/2) cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine and fine granular structure; soft, friable; many very fine and fine roots; many very fine interstitial pores; 20 percent cobbles and 30 percent gravel; neutral; abrupt smooth boundary.
A2—2 to 7 inches; light gray (10YR 7/2) gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak very fine and fine granular structure; soft, friable; many very fine and fine roots; many very fine interstitial pores; 30 percent gravel; slightly acid; clear smooth boundary.
B1t—7 to 11 inches, brown (10YR 5/3) extremely cobbly sandy clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine, medium, and coarse roots; many very fine interstitial pores; many thin clay films on faces of peds and common thin clay films on rock fragments; 30 percent cobbles and 40 percent gravel; slightly acid; clear smooth boundary.
B2t—11 to 35 inches; reddish brown (5YR 5/3) extremely gravelly clay, reddish brown (5YR 4/3) moist; moderate fine and medium subangular blocky structure; very hard, very firm, sticky and plastic; few very fine, fine, and medium roots; many very fine tubular pores; common thick clay films on faces of peds and on rock fragments; 60 percent gravel and 20 percent cobbles; slightly acid; gradual smooth boundary.
B3t—35 to 49 inches; yellowish red (5YR 5/6) extremely cobbly sandy clay loam, reddish brown (5YR 4/4) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; very few very fine roots; common very fine tubular pores; common thick clay films on faces of peds and on rock fragments; 40 percent gravel and 40 percent cobbles; medium acid; gradual smooth boundary.
C—49 to 61 inches; reddish brown (5YR 5/4) extremely cobbly sandy clay loam, reddish brown (5YR 4/4) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 55 percent cobbles and 40 percent gravel; medium acid.

The solum is 40 to 60 inches thick. Rock fragments make up 20 to 60 percent of the A1 and A2 horizons, 50 to 80 percent of the B horizon, and 75 to 95 percent of the C horizon.

The A1 horizon has value of 5 through 7 and chroma of 2 or 3, dry, and value of 3 through 5 and chroma of 2 through 4, moist. It is sandy loam or loam.

The B2t horizon has hue of 5YR or 7.5YR; value of 4 or 5, dry or moist; and chroma of 3 through 6. It is clay or sandy clay.

The C horizon has hue of 5YR or 7.5YR; value of 5 or 6, dry; and chroma of 4 through 6. It is sandy clay loam or clay loam.

Travelers series

The Travelers series consists of shallow, well drained soils. These soils formed on old basalt flows in material that weathered from basalt and in eolian sediment. Slopes range from 1 to 8 percent. The elevation is 7,600 to 8,800 feet. The mean annual precipitation is 11 inches, and the mean annual temperature is 44 degrees F.

Travelers soils are near Antonito, Stunner, and Luhon soils. Stunner and Luhon soils are deep. Antonito soils are 20 to 40 inches deep to bedrock and are less than 15 percent rock fragments.

Typical pedon of Travelers very stony loam, in an area of Stunner-Travelers association, gently sloping, 25 feet east and 42 feet south of northwest corner of sec. 22, T. 30 N., R. 11 E.

A1—0 to 4 inches; brown (7.5YR 5/4) very stony loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine roots; common very fine tubular pores; 55 percent basalt cobbles and stones; slightly calcareous; mildly alkaline; clear smooth boundary.

B2—4 to 8 inches; brown (7.5YR 4/4) very stony loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; common fine and very fine tubular pores; 60 percent basalt cobbles and stones; slightly calcareous; moderately alkaline; clear smooth boundary.

Cca—8 to 13 inches; pale brown (10YR 6/3) very stony clay loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; common fine and very fine interstitial pores; 55 percent basalt cobbles and stones; moderately calcareous; moderately alkaline; abrupt irregular boundary.

R—13 inches; fractured, lime-coated basalt.

Bedrock is at a depth of 10 to 20 inches. The A horizon has hue of 7.5YR or 10YR; value of 5 or 6, dry, and 3 or 4, moist; and chroma of 3 or 4. It is loam or clay loam that is 30 to 55 percent cobbles and stones.

The B2 horizon has hue of 7.5YR or 10YR; value of 4 or 5, dry, and 3 or 4, moist; and chroma of 3 or 4. It is loam or clay loam that is 50 to 70 percent cobbles and stones.

The C horizon has hue of 7.5YR through 2.5Y; value of 5 through 7, dry, and 4 through 6, moist; and chroma of 2 through 4. It is loam, clay loam, or silt loam that is 50 to 70 percent cobbles and stones.

Vibo series

The Vibo series consists of deep, well drained soils. These soils formed in mixed alluvium on alluvial fans. Slopes range from 3 to 10 percent. The elevation is 6,400 to 7,500 feet. The mean annual precipitation is 13 inches, and the mean annual temperature is 50 degrees F.

Vibo soils are near Montecito and Royosa soils. Montecito soils are fine textured. Royosa soils are sandy.

Typical pedon of Vibo sandy loam, 3 to 10 percent slopes, in SE1/4NE1/4, sec. 22, T. 24 N., R. 10 E.

A1—0 to 2 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; common very fine and fine roots; many very fine interstitial pores; neutral; abrupt smooth boundary.

B1—2 to 5 inches; brown (7.5YR 5/4) sandy loam, dark reddish brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine tubular pores; mildly alkaline; clear smooth boundary.

B2t—5 to 10 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many fine tubular pores; common thin clay films on faces of peds and some fine clay bridgings between sand grains; mildly alkaline; clear smooth boundary.

B3ca—10 to 18 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine tubular pores; strongly calcareous; fine soft masses and thin seams of lime; moderately alkaline; gradual wavy boundary.

C1ca—18 to 45 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable; few very fine and fine roots; common very fine interstitial pores; strongly calcareous; thin seams and soft masses of lime; moderately alkaline; gradual wavy boundary.

C2—45 to 60 inches; brown (7.5YR 5/4) loamy sand, dark brown (7.5YR 4/4) moist; massive; soft, very friable; common very fine interstitial pores; moderately alkaline.

The solum is 16 to 40 inches thick. The reaction ranges from neutral to moderately alkaline throughout. The solum has less than 15 percent calcium carbonate equivalent within a depth of 40 inches.

The A horizon has hue of 10YR or 7.5YR; value of 5 or 6, dry, and 3 or 4, moist; and chroma of 2 through 4. It is fine sandy loam or sandy loam.

The B2t horizon has a hue of 7.5YR or 5YR; value of 4 or 5, dry, and 3 or 4, moist; and chroma of 3 or 4.

The C horizon has hue of 7.5YR or 5YR and chroma of 2 through 4.

Wellsville series

The Wellsville series consists of deep, well drained soils. These soils formed on mountainsides in alluvium and colluvium that derived from acid igneous rock. Slopes range from 9 to 30 percent. The elevation is 9,000 to 10,500 feet. The mean annual precipitation is 25 inches, and the mean annual temperature is 38 degrees F.

Wellsville soils are similar to Ess soils. Ess soils are more than 35 percent rock fragments.

Typical pedon of Wellsville gravelly loam in an area of Wellsville-Ess association, moderately steep, 3.5 miles south of Costilla Lodge and 1 mile north of dam on Costilla Reservoir, on west side of ranch road:

A1—0 to 8 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; many fine discontinuous tubular pores; 20 percent gravel; neutral; gradual smooth boundary.

B1—8 to 19 inches; dark grayish brown (10YR 4/2) gravelly clay loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and nonplastic; common fine and very fine and few medium roots; few fine discontinuous tubular pores; thin discontinuous clay films on faces of peds and on rock fragments; 20 percent gravel; neutral; clear smooth boundary.

B21t—19 to 33 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine, very fine, and medium roots; few fine discontinuous tubular pores; thin discontinuous clay films on faces of peds and on rock fragments; 20 percent gravel; neutral; clear smooth boundary.

B22t—33 to 42 inches; brown (7.5YR 5/4) gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; discontinuous tubular pores; thin discontinuous clay films on faces of peds and on rock fragments; 20 percent gravel; neutral; gradual smooth boundary.

C—42 to 65 inches; light brown (7.5YR 6/4) very gravelly sandy clay loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; 50 percent gravel; mildly alkaline.

The A horizon has value of 4 or 5, dry, and 2 or 3, moist. It is loam or gravelly loam. It is 5 to 20 percent gravel.

The B horizon has hue of 7.5YR or 10YR and value of 5 or 6, dry, and 4 or 5 moist. It is clay loam, gravelly clay loam, or gravelly sandy clay loam.

The C horizon is 15 to 55 percent gravel.

formation of the soils

Soils are formed by weathering and other processes that act on the parent material. The characteristics of the soil at any given point depend on a combination of the following factors: physical and mineralogical composition of the parent material, climate, plant and animal life, relief, and time.

Climate and vegetation are the active factors in soil genesis. They act on the parent material that has accumulated through the weathering of rock and slowly change it into a natural body that has genetically related horizons. The effects of climate and vegetation are conditioned by relief. The parent material also affects the kind of soil that forms and, in extreme cases, determines it almost entirely. Time is needed for distinct horizons to develop.

The factors of soil genesis are so closely interrelated that few generalizations can be made about the effect of any one factor. The influence of each factor differs from place to place, and each factor modifies the effects of the other four. Many of the processes of soil formation are unknown.

parent material

Parent material influences the texture, mineralogy, structure, reaction, and color of the soils. The differences in these and other soil properties commonly relate to differences in parent material.

The soils in the Taos area formed in several kinds of parent material. Most of the soils formed in (1) recent alluvium; (2) old unconsolidated alluvium; (3) alluvium modified by wind; (4) alluvial-fan and piedmont sediment; or (5) material that weathered from basalt, granite, schist, limestone, sandstone, or shale bedrock.

The recent alluvium is along tributaries of the Rio Grande River. Loveland soil formed in loamy alluvium overlying gravel. Caruso and Manzano soils formed in loamy alluvium. The soils on irrigated cropland annually receive a small amount of silty sediment deposited by irrigation water.

Old unconsolidated alluvium is an extensive parent material in the Taos area. Much of this old alluvium was deposited by the ancestral Rio Grande and its tributaries. Soils such as Hernandez and Fernando soils formed in mixed alluvium. Tenorio soils formed in gravelly alluvium.

Sandy alluvium commonly is modified by the wind, especially in the southwestern part of the United States. Royosa soils formed on piedmonts and mesas in sandy alluvium that has been modified by wind.

Alluvial-fan and piedmont sediment is along the western front of the Sangre de Cristo Mountains. Sedillo soils formed in mixed gravelly alluvium.

Several volcanic mountains and basalt flows are in the western part of the survey area. Servilleta and Petaca soils formed in material that weathered from basalt and that is somewhat modified by eolian sediment.

The Sangre de Cristo Mountains are made up of folded igneous, metamorphic, and sedimentary rock. Marosa soils formed in material that weathered from acid igneous and metamorphic rock. Maes and Etoe soils formed in material that weathered from sandstone and shale.

Most of the soils in the area have mixed clay minerals such as montmorillonite, vermiculite, illite, kaolinite, and chlorite.

climate

The valley part of the Taos area has a mean annual precipitation of 12 inches. The foothills of the Sangre de Cristo Mountains receive 15 to 20 inches of precipitation annually. The Sangre de Cristo Mountains receive 25 to 40 inches of precipitation annually. The average annual air temperature ranges from 30 degrees F. in the Sangre de Cristo Mountains to 49 degrees F. in the Rio Grande Valley.

Climate directly influences soil formation. Precipitation and temperature greatly determine the kind and amount of vegetation in an area. Precipitation affects the leaching of bases and the movement of clay colloids in the soil. Organic matter decomposes more rapidly in a warmer climate. Parent material is weathered more rapidly in regions that are warmer and more moist.

Because of limited precipitation, much of the valley area has a sparse grassland vegetation. Many soils, including Silva and Fernando soils, have a light-colored surface horizon that is about 0.75 percent organic matter. The soils in the Sangre de Cristo Mountains have a more dense stand of grasses and scattered trees and shrubs or a dense stand of trees and scattered grasses. Soils such as Wellsville and Ess soils formed under grass vegetation. They have a dark-colored surface horizon that is more than 1 percent organic matter. Soils such as Angostura and Jaroso soils formed under timber vegetation. They have a light-colored surface horizon and are more acid than other soils in the Taos area.

Many soils in the survey area have a slight to distinct zone of calcium carbonate accumulation. Hernandez and

Petaca soils formed in areas that have an annual precipitation of 12 inches, and they are mildly to moderately alkaline and have a distinct zone of calcium carbonate accumulation that has a 15 to 30 percent calcium carbonate equivalent. Penitente soils formed in areas that have an annual precipitation of 35 inches, and they are medium acid to strongly acid and have no zone of calcium carbonate accumulation.

Basalt bedrock weathers fairly rapidly in a humid climate and is resistant to weathering in arid areas. Prieta soils are shallow to basalt.

plant and animal life

Plants and animals, mainly plants, are active in soil formation. Plant roots penetrate the parent material, break up the soil, rearrange soil particles, force openings into the soil, and thus make the soil more porous. They also transfer plant nutrients from the lower horizons to the upper horizons. Animals burrow in the soil and mix the soil material. Man changes the soil by leveling the land, tilling the soil, irrigating, and planting different crops. Earthworms, bacteria, and fungi live in the soil, feed on the organic matter, and recycle plant nutrients. The organic matter is added to the soil as plants and animals die and decompose.

Silva and Hernandez soils formed under a sparse stand of grass. They have a light-colored surface horizon that is low in organic matter. Manzano soils formed under a moderate stand of grass. They have a dark-colored surface horizon that has a moderate organic matter content. Presa and Angostura soils formed under a dense stand of coniferous trees. They have a light-colored surface horizon that is low in organic matter and is strongly leached.

relief

Relief refers to the shape of the landscape or differences in elevation of a land surface. It influences soil formation by affecting runoff, drainage, erosion, and soil temperature. Because these elements vary, the thickness of the surface horizon and of the solum, the degree of horizon differentiation, and the nature of the parent material differ.

The relief in the Taos area varies widely. In the Rio Grande Valley slopes are mainly less than 2 percent, and the elevation is 7,000 to 8,000 feet. In the Sangre de Cristo Mountains, slopes are mainly 15 to 75 percent, and the elevation is 8,000 to 13,160 feet.

In many places, Stunner and Luhon soils are associated geographically. Because Stunner soils commonly are on slightly concave slopes and Luhon soils commonly are on slightly convex slopes, Stunner soils receive slightly more moisture and have a stronger degree of horizon differentiation than Luhon soils.

time

Time is needed for soils to form from parent material. The length of time needed for soil formation is dependent on the other soil-forming factors. The soils in the Taos area range from young soils, which have little or no development, to older soils, which have distinct horizonation.

Loveland and Caruso soils are young soils. They formed on flood plains in stratified loamy, silty, and gravelly sediment. They retain most of the characteristics of the parent material, except for the darker surface horizon and some weak structure that has replaced the thin platy stratification.

Silva soils are older soils. They formed in mixed alluvium and eolian sediment. They are leached of carbonates to a depth of about 18 inches and have a well developed B2t horizon.

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glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils 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—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

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.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

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.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay 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 vegetation. 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 fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, 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 constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil 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 are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

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.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

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.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly

pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

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 the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

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.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 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 (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

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 upper case letter represents the major horizons. Numbers or lower case 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 at the surface of a mineral soil.

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.

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. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

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 A or B horizon. 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, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

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.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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 and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

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.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

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. Mottling generally indicates poor aeration and impeded drainage. 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).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 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. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

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.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

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.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike

plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range 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.

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 degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts 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 ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

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-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. 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 runoff water.

Shrink-swell. 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.

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.

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 feet.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally 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.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent

material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
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 and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. 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.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

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.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

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."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

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.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

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 sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1932-60 at Cerro, Taos County, New Mexico]

Month	Temperature				Precipitation				
			2 years in 10 will have at least 4 days with--			1 year in 10 will have--		Average number of days with precipitation	
	Average daily maximum	Average daily minimum	Maximum temperature equal to or higher than--	Minimum temperature equal to or lower than--	Average monthly total	less than--	more than--	0.10 inch or more	0.25 inch or more
	°F	°F	°F	°F	In	In	In		
January----	37	7	52	-15	0.6	0.1	1.4	2	1
February---	41	12	57	-7	0.6	0.3	1.0	2	1
March------	49	20	63	6	0.6	0.2	1.0	2	1
April------	60	27	71	17	1.0	0.1	1.4	3	2
May--------	68	35	78	26	1.4	0.3	2.3	4	2
June-------	78	43	88	34	0.9	0.1	1.6	3	1
July-------	82	48	91	43	1.7	0.8	2.4	5	3
August-----	80	48	90	41	1.9	0.8	3.7	5	3
September--	76	41	87	33	1.4	0.1	2.7	3	2
October----	65	31	76	20	1.2	0.3	2.5	3	2
November---	51	17	62	-1	0.6	(3)	0.9	2	1
December---	40	10	55	-9	0.6	(3)	1.3	2	1
Year-------	61	28	[1]91	[2]-18	12.5	9.5	16.4	36	20

[1]Average annual highest temperature.
[2]Average annual lowest temperature.
[3]Less than 0.05 inches.

TABLE 2.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Taos county	Rio Arriba county	Mora county	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Acres	Pct
AMF	Amalia-Manzano association, steep	35,305	0	0	35,305	2.3
ATC	Antonito-Travelers association, gently sloping	8,048	5,615	0	13,663	0.9
CaB	Caruso silty clay loam, 0 to 3 percent slopes	4,075	0	0	4,075	0.3
CHG	Chimayo-Rock outcrop complex, very steep	28,213	290	0	28,503	1.8
CRG	Cryoboralfs-Rock outcrop association, very steep	8,312	1,500	685	10,497	0.7
CSC	Cryoborolls, 0 to 8 percent slopes	7,172	135	225	7,532	0.5
CTC	Cryoborolls-Cryaquolls complex, 0 to 8 percent slopes	4,094	0	0	4,094	0.3
CUB	Cumulic Haplaquolls, nearly level	2,951	560	0	3,511	0.2
CYB	Cumulic Haploborolls, nearly level	1,866	425	0	2,291	0.1
DeF	Derecho cobbly loam, 15 to 40 percent slopes	9,296	0	150	9,446	0.6
DeG	Derecho-Rock outcrop complex, 40 to 80 percent slopes	16,963	0	875	17,838	1.1
DFG	Devisadero-Rock outcrop complex, very steep	24,095	0	0	24,095	1.5
DmF	Diamante extremely gravelly loam, 15 to 40 percent slopes	1,988	1,295	0	3,283	0.2
EGG	Eutroboralfs-Glossoboralfs-Rock outcrop association, very steep	8,422	70	70	8,562	0.6
FaC	Fernando cobbly loam, 1 to 7 percent slopes	10,720	0	0	10,720	0.7
FbC	Fernando silt loam, 0 to 7 percent slopes	13,290	0	0	13,290	0.9
FeB	Fernando clay loam, 1 to 3 percent slopes	21,540	0	0	21,540	1.4
FeC	Fernando clay loam, 3 to 5 percent slopes	7,640	640	0	8,280	0.5
FfC	Fernando clay loam, 5 to 7 percent slopes	4,120	275	0	4,395	0.3
FHB	Fernando-Hernandez association, nearly level	43,160	30	0	43,190	2.8
FLB	Fluvents, nearly level	3,203	480	0	3,683	0.2
HaB	Hernandez gravelly loam, 0 to 5 percent slopes	575	0	0	575	*
HKC	Hernandez-Kim association, gently sloping	7,430	0	0	7,430	0.5
HPC	Hernandez-Petaca association, gently sloping	30,370	0	0	30,370	2.0
HSC	Hernandez-Silva association, gently sloping	3,235	0	0	3,235	0.2
JaD	Jaroso-Angostura complex, 5 to 15 percent slopes	4,918	0	770	5,688	0.4
JaF	Jaroso-Angostura-Mascarenas complex, 15 to 40 percent slopes	24,673	140	340	25,153	1.6
JaG	Jaroso-Angostura-Mascarenas complex, 40 to 80 percent slopes	40,889	160	2,005	43,054	2.8
JRG	Jaroso-Angostura-Rock outcrop complex, very steep	10,196	715	1,230	12,141	0.8
LaE	Lama loam, 0 to 20 percent slopes	4,604	0	0	4,604	0.3
LoB	Loveland clay loam, 0 to 3 percent slopes	5,105	145	0	5,250	0.3
LtC	Luhon-Travelers complex, 3 to 7 percent slopes	75,875	10,916	0	86,791	5.6
MaF	Maes cobbly loam, 15 to 40 percent slopes	2,196	0	850	3,046	0.2
MeD	Maes-Etoe complex, 0 to 15 percent slopes	1,505	0	25	1,530	0.1
MeF	Maes-Etoe complex, 15 to 40 percent slopes	21,794	0	255	22,049	1.4
MeG	Maes-Etoe complex, very steep	28,046	0	830	28,876	1.9
MFG	Maes-Etoe-Rock outcrop complex, very steep	20,647	0	925	21,572	1.4
MNC	Manzano clay loam, 0 to 5 percent slopes	4,125	0	0	4,125	0.3
MnA	Manzano clay loam, 0 to 1 percent slopes	1,910	0	0	1,910	0.1
MnB	Manzano clay loam, 1 to 3 percent slopes	2,245	10	0	2,255	0.1
MnC	Manzano clay loam, 3 to 5 percent slopes	4,330	530	0	4,860	0.3
MrD	Marosa cobbly sandy loam, 0 to 15 percent slopes	1,637	0	0	1,637	0.1
MrF	Marosa cobbly sandy loam, 15 to 40 percent slopes	1,788	0	0	1,788	0.1
MrG	Marosa cobbly sandy loam, 40 to 80 percent slopes	5,206	0	0	5,206	0.3
MSG	Marosa-Rock outcrop complex, very steep	39,489	320	0	39,809	2.5
MSG2	Marosa-Rock outcrop complex, very steep, eroded	15,482	0	0	15,482	1.0
MTE	Marosa-Nambe association, moderately steep	52,779	190	0	52,969	3.4
MUG	Mirabal-Rock outcrop association, very steep	5,557	715	0	6,272	0.4
MwD	Mirand cobbly loam, 0 to 15 percent slopes	8,911	3,000	0	11,911	0.8
MxD	Montecito loam, 1 to 15 percent slopes	4,917	2,730	0	7,647	0.5
MxE	Montecito-Rock outcrop complex, moderately steep	5,890	0	0	5,890	0.4
NaD	Nambe cobbly loam, 0 to 15 percent slopes	802	0	0	802	0.1
NaF	Nambe cobbly loam, 15 to 40 percent slopes	55,178	120	0	55,298	3.6
NaF2	Nambe cobbly loam, 15 to 40 percent slopes, eroded	1,192	0	0	1,192	0.1
NaG	Nambe cobbly loam, 40 to 80 percent slopes	11,915	1,210	0	13,125	0.8
NaG2	Nambe cobbly loam, 40 to 80 percent slopes, eroded	4,406	0	0	4,406	0.3
NRG	Nambe-Rock outcrop complex, very steep	28,385	870	0	29,255	1.9
NRG2	Nambe-Rock outcrop complex, very steep, eroded	3,299	0	0	3,299	0.2
OeF	Orejas stony loam, 15 to 40 percent slopes	6,207	0	0	6,207	0.4
OMD	Orejas-Montecito association, strongly sloping	10,545	0	0	10,545	0.7
ORG	Orthents-Badland association, very steep	4,295	2,500	0	6,795	0.4
OSG	Orthents-Calciorthids association, very steep	28,020	1,103	0	29,123	1.9
OTG	Orthents-Rock outcrop association, very steep	14,346	0	0	14,346	0.9

See footnote at end of table.

TABLE 2.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Taos county	Rio Arriba county	Mora county	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Acres	Pct
PAG	Paleboralfs-Cryochrepts-Rock outcrop association, very steep	26,328	1,951	0	28,279	1.8
PbD	Penitente gravelly loam, 5 to 15 percent slopes	299	0	0	299	*
PbF	Penitente gravelly loam, 15 to 40 percent slopes	1,719	190	0	1,909	0.1
PeD	Petaca very stony loam, 1 to 15 percent slopes	8,860	0	0	8,860	0.6
PfC	Petaca-Prieta complex, 1 to 8 percent slopes	13,980	0	0	13,980	0.9
PGC	Petaca-Silva association, gently sloping	6,000	0	0	6,000	0.4
PoB	Poganeab silty clay loam, nearly level	1,110	0	0	1,110	0.1
PrD	Presa cobbly loam, 0 to 15 percent slopes	1,342	0	295	1,637	0.1
PrF	Presa cobbly loam, 15 to 40 percent slopes	15,600	4,590	1,000	21,190	1.4
PrG	Presa cobbly loam, 40 to 80 percent slopes	9,107	700	1,775	11,582	0.7
PSG	Presa-Rock outcrop complex, very steep	4,934	1,350	1,180	7,464	0.5
PYF	Presa-Cryaquolls association, steep	6,712	880	130	7,722	0.5
RaC	Raton very stony silt loam, 3 to 8 percent slopes	1,875	0	0	1,875	0.1
RBE	Raton-Stunner association, moderately steep	6,025	765	0	6,790	0.4
RcG	Rock outcrop, very steep	10,460	500	0	10,960	0.7
RdG	Rock outcrop-Badland complex, very steep	6,614	0	0	6,614	0.4
RPG	Rock outcrop-Penitente complex, very steep	24,040	1,410	0	25,450	1.6
RRE	Rock outcrop-Raton complex, moderately steep	41,025	5,090	0	46,115	3.0
RUG	Rock outcrop-Ustorthents complex, very steep	35,155	235	0	35,390	2.3
RvC	Royosa loamy sand, 1 to 8 percent slopes	11,145	1,255	0	12,400	0.8
RWE	Royosa-Orthents association, moderately steep	17,950	1,005	0	18,955	1.2
RYD	Royosa-Vibo association, moderately sloping	19,880	695	0	20,575	1.3
SaG	Sabe-Mirand complex, 15 to 80 percent slopes	9,459	0	0	9,459	0.6
SbD	Sedillo cobbly loam, 3 to 12 percent slopes	1,337	0	0	1,337	0.1
SDD	Sedillo-Orthents association, strongly sloping	9,855	545	0	10,400	0.7
SED	Sedillo-Silva association, strongly sloping	24,500	215	0	24,715	1.6
SgC	Servilleta-Prieta complex, 1 to 5 percent slopes	34,900	0	0	34,900	2.2
ShB	Shawa clay loam, 0 to 3 percent slopes	960	900	0	1,860	0.1
SmB	Silva loam, 0 to 2 percent slopes	10,300	900	0	11,200	0.7
SmD	Silva loam, 2 to 10 percent slopes	4,540	0	0	4,540	0.3
SSC	Silva-Sedillo association, gently sloping	24,100	0	0	24,100	1.5
StC	Stunner cobbly loam, 1 to 5 percent slopes	14,115	6,770	0	20,885	1.3
SUC	Stunner-Luhon association, gently sloping	10,040	555	0	10,595	0.7
SVC	Stunner-Travelers association, gently sloping	46,985	2,095	0	49,080	3.2
TeB	Tenorio loam, 0 to 3 percent slopes	24,480	0	0	24,480	1.6
TeC	Tenorio loam, 1 to 5 percent slopes	17,235	45	0	17,280	1.1
TrF	Trampas cobbly sandy loam, 15 to 40 percent slopes	7,192	4,025	0	11,217	0.7
TsE	Trampas cobbly loam, 15 to 30 percent slopes	4,519	0	0	4,519	0.3
TTF	Trampas-Diamante association, steep	8,025	6,750	0	14,775	0.9
TVC	Travelers very stony loam, 1 to 8 percent slopes	154	14,315	0	14,469	0.9
UTG	Ustorthents-Trampas complex, very steep	11,760	2,843	0	14,603	0.9
VbD	Vibo sandy loam, 3 to 10 percent slopes	19,265	1,235	0	20,500	1.3
WEF	Wellsville-Ess association, moderately steep	21,232	0	0	21,232	1.4
	Total	1,444,500	98,498	13,615	1,556,613	100.0

* Less than 0.1 percent.

TABLE 3.--YIELDS PER ACRE OF IRRIGATED CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Alfalfa hay		Grass hay		Barley		Oats		Wheat		Pasture	
	N	I	N	I	N	I	N	I	N	I	N	I
	Ton	Ton	Ton	Ton	Bu	Bu	Bu	Bu	Bu	Bu	AUM*	AUM*
CaB---------- Caruso	---	---	---	2.0	---	---	---	---	---	---	---	7.0
FeB---------- Fernando	---	4.5	---	3.2	---	80	---	75	---	50	---	7.0
FeC, FfC---------- Fernando	---	3.5	---	3.0	---	70	---	70	---	40	---	6.0
LoB---------- Loveland	---	---	---	2.0	---	---	---	---	---	---	---	6.0
MnA---------- Manzano	---	4.5	---	3.5	---	90	---	80	---	55	---	7.0
MnB---------- Manzano	---	4.0	---	3.2	---	80	---	75	---	50	---	7.0
MnC---------- Manzano	---	3.5	---	3.0	---	70	---	65	---	40	---	6.0
PoB---------- Poganeab	---	---	---	2.0	---	---	---	---	---	---	---	6.0
ShB---------- Shawa	---	2.0	---	2.5	---	---	---	---	---	---	---	6.0
SmB---------- Silva	---	4.2	---	3.0	---	75	---	70	---	48	---	7.0
TeB---------- Tenorio	---	3.0	---	2.5	---	70	---	70	---	40	---	6
TeC---------- Tenorio	---	---	---	---	---	---	---	---	---	---	---	3

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Management concerns					Potential productivity		Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
AMF*:								
Amalia	---	---	---	---	---	Pinyon	---	
						Oneseed juniper	---	
Manzano.								
CHG*								
Chimayo	---	---	---	---	---	Pinyon	---	
						Oneseed juniper	---	
Rock outcrop.								
DeF	Moderate	Moderate	Slight	Slight	Severe	Douglas-fir	72	Douglas-fir,
Derecho						Ponderosa pine	70	ponderosa pine.
						White fir	72	
						Quaking aspen	---	
						Limber pine	---	
DeG*:								
Derecho	Severe	Severe	Slight	Slight	Severe	Douglas-fir	67	Douglas-fir,
						Ponderosa pine	65	ponderosa pine.
						White fir	67	
						Quaking aspen	---	
						Limber pine	---	
Rock outcrop.								
DFG*:								
Devisadero	---	---	---	---	---	Pinyon	---	
						Oneseed juniper	---	
Rock outcrop.								
DmF	Moderate	Moderate	Slight	Slight	Moderate	Douglas-fir	68	Douglas-fir,
Diamante						Ponderosa pine	70	ponderosa pine,
						White fir	68	white fir.
						Quaking aspen	---	
						Limber pine	---	
JaD*:								
Jaroso	Slight	Moderate	Slight	Slight	Slight	Douglas-fir	78	Douglas-fir,
						Engelmann spruce	74	Engelmann spruce,
						Subalpine fir	---	white fir.
						White fir	74	
						Quaking aspen	---	
Angostura	Slight	Moderate	Moderate	Slight	Moderate	Engelmann spruce	74	Engelmann spruce,
						Douglas-fir	78	Douglas-fir,
						White fir	74	white fir.
JaF*:								
Jaroso	Moderate	Moderate	Slight	Slight	Slight	Douglas-fir	78	Douglas-fir,
						Engelmann spruce	74	Engelmann spruce,
						Subalpine fir	---	white fir.
						White fir	74	
						Quaking aspen	---	
Angostura	Moderate	Moderate	Moderate	Slight	Moderate	Engelmann spruce	74	Engelmann spruce,
						Douglas-fir	78	Douglas-fir,
						White fir	74	white fir.

See footnote at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns					Potential productivity		Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
JaF*:								
Mascarenas	Moderate	Moderate	Slight	Slight	Slight	Douglas-fir	70	Douglas-fir,
						Engelmann spruce	68	Engelmann spruce,
						Subalpine fir	---	white fir.
						White fir	70	
						Quaking aspen	---	
JaG*:								
Jaroso	Severe	Severe	Slight	Slight	Slight	Douglas-fir	73	Douglas-fir,
						Engelmann spruce	69	Engelmann spruce,
						Subalpine fir	---	white fir.
						White fir	69	
						Quaking aspen	---	
Angostura	Severe	Severe	Moderate	Slight	Moderate	Engelmann spruce	69	Engelmann spruce,
						Douglas-fir	73	Douglas-fir,
						White fir	69	white fir.
Mascarenas	Severe	Severe	Slight	Slight	Slight	Douglas-fir	65	Douglas-fir,
						Engelmann spruce	63	Engelmann spruce,
						Subalpine fir	---	white fir.
						White fir	65	
						Quaking aspen	---	
JRG*:								
Jaroso	Severe	Severe	Slight	Slight	Slight	Douglas-fir	73	Douglas-fir,
						Engelmann spruce	69	Engelmann spruce,
						Subalpine fir	---	white fir.
						White fir	69	
						Quaking aspen	---	
Angostura	Severe	Severe	Moderate	Slight	Moderate	Engelmann spruce	69	Engelmann spruce,
						Douglas-fir	73	Douglas-fir,
						White fir	69	white fir.
Rock outcrop.								
LaE	---	---	---	---	---	Pinyon	---	
Lama						Oneseed juniper	---	
MaF	Moderate	Moderate	Slight	Slight	Moderate	Douglas-fir	70	Douglas-fir,
Maes						Ponderosa pine	68	ponderosa pine,
						White fir	70	white fir.
						Limber pine	---	
						Quaking aspen	---	
MeD*:								
Maes	Slight	Moderate	Slight	Slight	Moderate	Douglas-fir	70	Douglas-fir,
						Ponderosa pine	68	ponderosa pine,
						White fir	70	white fir.
						Limber pine	---	
						Quaking aspen	---	
Etoe	Slight	Slight	Moderate	Slight	Moderate	Douglas-fir	65	Douglas-fir,
						Ponderosa pine	---	ponderosa pine,
						White fir	---	white fir.
MeF*:								
Maes	Moderate	Moderate	Slight	Slight	Moderate	Douglas-fir	70	Douglas-fir,
						Ponderosa pine	68	ponderosa pine,
						White fir	70	white fir.
						Limber pine	---	
						Quaking aspen	---	
Etoe	Moderate	Slight	Moderate	Slight	Moderate	Douglas-fir	62	Douglas-fir,
						Ponderosa pine	---	ponderosa pine,
						White fir	---	white fir.

See footnote at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns					Potential productivity		Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
MeG*:								
Maes	Severe	Severe	Slight	Slight	Moderate	Douglas-fir	65	Douglas-fir, ponderosa pine, white fir.
						Ponderosa pine	63	
						White fir	65	
						Limber pine	---	
						Quaking aspen	---	
Etoe	Severe	Severe	Moderate	Slight	Moderate	Douglas-fir	56	Douglas-fir, ponderosa pine, white fir.
						Ponderosa pine	---	
						White fir	---	
MFG*:								
Maes	Severe	Severe	Slight	Slight	Moderate	Douglas-fir	65	Douglas-fir, ponderosa pine, white fir.
						Ponderosa pine	63	
						White fir	65	
						Limber pine	---	
						Quaking aspen	---	
Etoe	Severe	Severe	Moderate	Slight	Moderate	Douglas-fir	56	Douglas-fir, ponderosa pine, white fir.
						Ponderosa pine	---	
						White fir	---	
Rock outcrop.								
MrD	Slight	Moderate	Slight	Slight	Slight	Douglas-fir	64	Douglas-fir, Engelmann spruce, white fir.
Marosa						Engelmann spruce	66	
						Subalpine fir	---	
						White fir	60	
						Quaking aspen	---	
MrF	Moderate	Moderate	Slight	Slight	Slight	Douglas-fir	64	Douglas-fir, Engelmann spruce, white fir.
Marosa						Engelmann spruce	66	
						Subalpine fir	---	
						White fir	60	
						Quaking aspen	---	
MrG	Severe	Severe	Slight	Slight	Slight	Douglas-fir	59	Douglas-fir, Engelmann spruce, white fir.
Marosa						Engelmann spruce	61	
						Subalpine fir	56	
						White fir	60	
						Quaking aspen	---	
MSG*, MSG2*:								
Marosa	Severe	Severe	Slight	Slight	Slight	Douglas-fir	59	Douglas-fir, Engelmann spruce, white fir.
						Engelmann spruce	61	
						Subalpine fir	56	
						White fir	60	
						Quaking aspen	---	
Rock outcrop.								
MTE*:								
Marosa	Moderate	Moderate	Slight	Slight	Slight	Douglas-fir	64	Douglas-fir, Engelmann spruce, white fir.
						Engelmann spruce	66	
						Subalpine fir	---	
						White fir	60	
						Quaking aspen	---	
Nambe	Moderate	Moderate	Moderate	Slight	Moderate	Engelmann spruce	60	Engelmann spruce.
						Subalpine fir	---	
MUG*:								
Mirabal	Severe	Severe	Slight	Slight	Moderate	Ponderosa pine	45	Ponderosa pine.
Rock outcrop.								

See footnote at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns					Potential productivity		Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
MwD---- Mirand	Slight	Moderate	Slight	Slight	Moderate	Ponderosa pine------	76	Ponderosa pine.
MxD---- Montecito	---	---	---	---	---	Oneseed juniper-----	---	
						Pinyon-------------	---	
MxE*: Montecito---	---	---	---	---	---	Oneseed juniper-----	---	
						Pinyon-------------	---	
Rock outcrop.								
NaD---- Nambe	Slight	Slight	Moderate	Slight	Moderate	Engelmann spruce----	70	Engelmann spruce.
						Subalpine fir-------	---	
NaF---- Nambe	Moderate	Moderate	Moderate	Slight	Moderate	Engelmann spruce----	60	Engelmann spruce.
						Subalpine fir-------	---	
NaF2---- Nambe	Severe	Moderate	Severe	Slight	Severe	Engelmann spruce----	---	
						Subalpine fir-------	---	
NaG---- Nambe	Severe	Severe	Moderate	Slight	Moderate	Engelmann spruce----	50	Engelmann spruce.
						Subalpine fir-------	---	
NaG2---- Nambe	Severe	Severe	Severe	Slight	Severe	Engelmann spruce----	---	
						Subalpine fir-------	---	
NRG*: Nambe---	Severe	Severe	Moderate	Slight	Moderate	Engelmann spruce----	50	Engelmann spruce.
						Subalpine fir-------	---	
Rock outcrop.								
NRG2*: Nambe---	Severe	Severe	Severe	Slight	Severe	Engelmann spruce----	---	
						Subalpine fir-------	---	
Rock outcrop.								
OeF---- Orejas	---	---	---	---	---	Oneseed juniper-----	---	
						Pinyon-------------	---	
OMD*: Orejas---	---	---	---	---	---	Oneseed juniper-----	---	
						Pinyon-------------	---	
Montecito---	---	---	---	---	---	Oneseed juniper-----	---	
						Pinyon-------------	---	
PrD---- Presa	Slight	Moderate	Moderate	Slight	Slight	Engelmann spruce----	70	Engelmann spruce.
						Subalpine fir-------	---	
PrF---- Presa	Moderate	Moderate	Moderate	Moderate	Slight	Engelmann spruce----	70	Engelmann spruce.
						Subalpine fir-------	---	
PrG---- Presa	Severe	Severe	Severe	Moderate	Slight	Engelmann spruce----	65	Engelmann spruce.
						Subalpine fir-------	---	
PSG*: Presa---	Severe	Severe	Severe	Moderate	Slight	Engelmann spruce----	65	Engelmann spruce.
						Subalpine fir-------	---	
Rock outcrop.								

See footnote at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns					Potential productivity		Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	
PYF*:								
Presa	Moderate	Moderate	Moderate	Moderate	Slight	Engelmann spruce	70	Engelmann spruce.
						Subalpine fir	---	
Cryaquolls.								
RBE*:								
Raton	---	---	---	---	---	Oneseed juniper	---	
						Pinyon	---	
Stunner.								
RRE*:								
Rock outcrop.								
Raton	---	---	---	---	---	Rocky Mt. juniper	---	
						Pinyon	---	
RvC	---	---	---	---	---	Oneseed juniper	---	
Royosa						Pinyon	---	
RWE*:								
Royosa	---	---	---	---	---	Oneseed juniper	---	
						Pinyon	---	
Orthents.								
RYD*:								
Royosa	---	---	---	---	---	Oneseed juniper	---	
						Pinyon	---	
Vibo	---	---	---	---	---	Oneseed juniper	---	
						Pinyon	---	
SaG*:								
Sabe	Severe	Severe	Severe	Moderate	Moderate	Ponderosa pine	52	Ponderosa pine.
Mirand	Moderate	Moderate	Slight	Slight	Moderate	Ponderosa pine	76	Ponderosa pine.
TrF, TsE	Moderate	Moderate	Moderate	Slight	Moderate	Ponderosa pine	60	Ponderosa pine.
Trampas								
TTF*:								
Trampas	Severe	Severe	Severe	Slight	Moderate	Ponderosa pine	57	Ponderosa pine.
Diamante	Moderate	Moderate	Slight	Slight	Moderate	Douglas-fir	68	Douglas-fir,
						Ponderosa pine	70	ponderosa pine,
						White fir	68	white fir.
						Quaking aspen	---	
						Limber pine	---	
UTG*:								
Ustorthents.								
Trampas	Severe	Severe	Severe	Slight	Moderate	Ponderosa pine	57	Ponderosa pine.
VbD	---	---	---	---	---	Oneseed juniper	---	
Vibo						Pinyon	---	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed]

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
AMF*:				
Amalia	Favorable	700	Western wheatgrass	20
	Normal	350	Mountain muhly	15
	Unfavorable	100	Big sagebrush	10
			Blue grama	10
			Bottlebrush squirreltail	10
			Prairie junegrass	10
			True mountainmahogany	10
			Arizona fescue	10
			Indian ricegrass	5
Manzano.				
CHG*:				
Chimayo	Favorable	200	Indian ricegrass	25
	Normal	100	Oneseed juniper	25
	Unfavorable	50	Needleandthread	10
Rock outcrop.				
DeF	Favorable	350	Gambel oak	50
Derecho	Normal	250	True mountainmahogany	20
	Unfavorable	150	Prairie junegrass	10
			Mountain muhly	10
			Mountain brome	5
			Muttongrass	5
DeG*:				
Derecho	Favorable	300	Gambel oak	40
	Normal	200	True mountainmahogany	20
	Unfavorable	100	Prairie junegrass	10
			Muttongrass	10
			Oregon-grape	5
			Mountain brome	5
			Snowberry	5
			Mountain muhly	5
Rock outcrop.				
DFG*:				
Devisadero	Favorable	300	Blue grama	20
	Normal	200	Broom snakeweed	15
	Unfavorable	135	Sideoats grama	15
			Engelmann pricklypear	10
			Yucca	10
			Sand dropseed	10
			Pingue	5
			Western wheatgrass	5
			Indian ricegrass	5
			Bottlebrush squirreltail	5
Rock outcrop.				
DmF	Favorable	400	Kinnikinnick	25
Diamante	Normal	300	Arizona fescue	20
	Unfavorable	200	Mountain muhly	15
			Pine dropseed	15
			Carex	10
			Gambel oak	5
			Common yarrow	5
			Muttongrass	5

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
JaD*:				
Jaroso	Favorable	400	Grouse whortleberry	50
	Normal	275	Snowberry	10
	Unfavorable	175	Arizona fescue	10
			Nodding bromegrass	10
			Oregon-grape	5
			Kinnikinnick	5
			Common yarrow	5
			Kentucky bluegrass	5
Angostura	Favorable	350	Grouse whortleberry	20
	Normal	250	Thurber fescue	15
	Unfavorable	150	Muttongrass	15
			Tufted hairgrass	10
			Columbia needlegrass	10
			Mountain brome	5
			Kinnikinnick	5
			Nodding bromegrass	5
			Sheep fescue	5
JaF*:				
Jaroso	Favorable	350	Grouse whortleberry	50
	Normal	250	Kinnikinnick	10
	Unfavorable	150	Kentucky bluegrass	10
			Nodding bromegrass	10
			Oregon-grape	5
			Snowberry	5
			Common yarrow	5
			Arizona fescue	5
Angostura	Favorable	300	Grouse whortleberry	25
	Normal	200	Thurber fescue	15
	Unfavorable	100	Muttongrass	15
			Tufted hairgrass	10
			Kinnikinnick	10
			Columbia needlegrass	10
			Mountain brome	5
			Nodding bromegrass	5
			Sheep fescue	5
Mascarenas	Favorable	350	Kinnikinnick	25
	Normal	250	Snowberry	20
	Unfavorable	150	Kentucky bluegrass	15
			Oregon-grape	10
			Western thimbleberry	5
			Grouse whortleberry	5
			Common yarrow	5
			Silverweed cinquefoil	5
			Nodding bromegrass	5
			Timber oatgrass	5
JaG*:				
Jaroso	Favorable	250	Grouse whortleberry	50
	Normal	150	Kentucky bluegrass	15
	Unfavorable	50	Kinnikinnick	10
			Snowberry	10
			Nodding bromegrass	10
			Common yarrow	5
Angostura	Favorable	250	Grouse whortleberry	45
	Normal	150	Thurber fescue	10
	Unfavorable	50	Muttongrass	10
			Kinnikinnick	10
			Mountain brome	5
			Tufted hairgrass	5
			Nodding bromegrass	5
			Columbia needlegrass	5
			Sheep fescue	5

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
JaG*:				
Mascarenas	Favorable	350	Kinnikinnick	25
	Normal	250	Snowberry	20
	Unfavorable	150	Kentucky bluegrass	15
			Oregon-grape	10
			Western thimbleberry	5
			Grouse whortleberry	5
			Common yarrow	5
			Silverweed cinquefoil	5
			Nodding bromegrass	5
			Timber oatgrass	5
JRG*:				
Jaroso	Favorable	250	Grouse whortleberry	50
	Normal	150	Kentucky bluegrass	15
	Unfavorable	50	Kinnikinnick	10
			Snowberry	10
			Nodding bromegrass	10
			Common yarrow	5
Angostura	Favorable	250	Grouse whortleberry	45
	Normal	150	Thurber fescue	10
	Unfavorable	50	Muttongrass	10
			Kinnikinnick	10
			Mountain brome	5
			Tufted hairgrass	5
			Nodding bromegrass	5
			Columbia needlegrass	5
			Sheep fescue	5
Rock outcrop.				
LaE	Favorable	400	Pinyon	45
Lama	Normal	250	Oneseed juniper	20
	Unfavorable	150	Big sagebrush	10
			Oak	10
			Blue grama	5
			Bottlebrush squirreltail	5
			Bluegrass	5
MaF	Favorable	400	Grouse whortleberry	20
Maes	Normal	250	Snowberry	20
	Unfavorable	175	Mountain brome	20
			Timber oatgrass	15
			Kinnikinnick	10
			Silverweed cinquefoil	5
			Kentucky bluegrass	5
			Nodding bromegrass	5
MeD*:				
Maes	Favorable	450	Mountain brome	20
	Normal	300	Silverweed cinquefoil	10
	Unfavorable	200	Timber oatgrass	10
			Grouse whortleberry	10
			Kinnikinnick	10
			Snowberry	10
			Kentucky bluegrass	10
			Nodding bromegrass	10
			Common juniper	5
			Gambel oak	5

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
MeD*:				
Etoe	Favorable	450	Muttongrass	15
	Normal	300	Columbia needlegrass	15
	Unfavorable	200	Thurber fescue	15
			Sheep fescue	10
			Thurber needlegrass	10
			Nodding bromegrass	10
			Mountain brome	5
			Parish snowberry	5
			Kinnikinnick	5
			Grouse whortleberry	5
MeF*:				
Maes	Favorable	400	Grouse whortleberry	20
	Normal	250	Snowberry	20
	Unfavorable	175	Mountain brome	20
			Timber oatgrass	15
			Kinnikinnick	10
			Silverweed cinquefoil	5
			Kentucky bluegrass	5
			Nodding bromegrass	5
Etoe	Favorable	400	Columbia needlegrass	15
	Normal	250	Grouse whortleberry	15
	Unfavorable	150	Muttongrass	10
			Sheep fescue	10
			Thurber needlegrass	10
			Mountain brome	10
			Parish snowberry	10
			Thurber fescue	10
			Nodding bromegrass	5
			Kinnikinnick	5
MeG*:				
Maes	Favorable	350	Grouse whortleberry	25
	Normal	200	Snowberry	25
	Unfavorable	100	Timber oatgrass	15
			Mountain brome	15
			Silverweed cinquefoil	10
			Russet buffaloberry	5
			Kentucky bluegrass	5
Etoe	Favorable	350	Grouse whortleberry	25
	Normal	200	Columbia needlegrass	15
	Unfavorable	100	Parish snowberry	15
			Muttongrass	10
			Sheep fescue	10
			Thurber needlegrass	10
			Mountain brome	10
			Thurber fescue	5
MFG*:				
Maes	Favorable	350	Grouse whortleberry	25
	Normal	200	Snowberry	25
	Unfavorable	100	Timber oatgrass	15
			Mountain brome	15
			Silverweed cinquefoil	10
			Russet buffaloberry	5
			Kentucky bluegrass	5
Etoe	Favorable	350	Grouse whortleberry	25
	Normal	200	Columbia needlegrass	15
	Unfavorable	100	Parish snowberry	15
			Muttongrass	10
			Sheep fescue	10
			Thurber needlegrass	10
			Mountain brome	10
			Thurber fescue	5

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
MFG*:				
Rock outcrop.				
MrD, MrF, MrG------	Favorable	400	Kentucky bluegrass----------	30
Marosa	Normal	250	Common yarrow----------	20
	Unfavorable	175	Snowberry----------	10
			Grouse whortleberry----------	10
			Arizona fescue----------	10
			Mountain brome----------	10
			Oregon-grape----------	5
			Kinnikinnick----------	5
MSG*, MSG2*:				
Marosa----------	Favorable	400	Kentucky bluegrass----------	30
	Normal	250	Common yarrow----------	20
	Unfavorable	175	Snowberry----------	10
			Grouse whortleberry----------	10
			Arizona fescue----------	10
			Mountain brome----------	10
			Oregon-grape----------	5
			Kinnikinnick----------	5
Rock outcrop.				
MTE*:				
Marosa----------	Favorable	400	Kentucky bluegrass----------	30
	Normal	250	Common yarrow----------	20
	Unfavorable	175	Snowberry----------	10
			Grouse whortleberry----------	10
			Arizona fescue----------	10
			Mountain brome----------	10
Nambe----------	Favorable	300	Grouse whortleberry----------	30
	Normal	200	Western yarrow----------	15
	Unfavorable	100	Kinnikinnick----------	10
			Redfruit gooseberry----------	10
MUG*:				
Mirabal----------	Favorable	150	Mountain muhly----------	30
	Normal	100	Prairie junegrass----------	20
	Unfavorable	50	Bottlebrush squirreltail----------	20
			Pine dropseed----------	10
			Arizona fescue----------	5
			True mountainmahogany----------	5
			Oregon-grape----------	5
			Gambel oak----------	5
Rock outcrop.				
MwD----------	Favorable	400	Arizona fescue----------	40
Mirand	Normal	250	Mountain muhly----------	20
	Unfavorable	100	Prairie junegrass----------	10
			Muttongrass----------	10
			Gambel oak----------	5
			Bottlebrush squirreltail----------	5
			Pine dropseed----------	5
			Mountain brome----------	5
MxD----------	Favorable	350	Oneseed juniper----------	40
Montecito	Normal	200	Pinyon----------	15
	Unfavorable	150	Big sagebrush----------	10
			Broom snakeweed----------	5
			Sideoats grama----------	5
			Blue grama----------	5
			Bottlebrush squirreltail----------	5
			Muttongrass----------	5
			Pingue----------	5
			Gambel oak----------	5

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
MxE*:				
Montecito	Favorable	350	Oneseed juniper	40
	Normal	200	Pinyon	15
	Unfavorable	150	Big sagebrush	10
			Broom snakeweed	5
			Sideoats grama	5
			Blue grama	5
			Bottlebrush squirreltail	5
			Muttongrass	5
			Pingue	5
			Gambel oak	5
Rock outcrop.				
NaD, NaF, NaG-----	Favorable	200	Grouse whortleberry	50
Nambe	Normal	100	Tufted hairgrass	15
	Unfavorable	50	Kinnikinnick	10
			Western thimbleberry	10
			Redfruit gooseberry	10
			Oregon-grape	5
NaF2, NaG2---------	Favorable	300	Grouse whortleberry	30
Nambe	Normal	200	Western yarrow	15
	Unfavorable	100	Kinnikinnick	10
			Redfruit gooseberry	10
			Oregon-grape	10
			Mountain brome	5
			Tufted hairgrass	5
			Western thimbleberry	5
			Scarlet indian paintbrush	5
			Timber oatgrass	5
NRG, NRG2*:				
Nambe	Favorable	300	Grouse whortleberry	30
	Normal	200	Western yarrow	15
	Unfavorable	100	Kinnikinnick	10
			Redfruit gooseberry	10
			Oregon-grape	10
			Mountain brome	5
			Tufted hairgrass	5
			Western thimbleberry	5
			Scarlet indian paintbrush	5
			Timber oatgrass	5
Rock outcrop.				
OeF----------	Favorable	250	Oneseed juniper	30
Orejas	Normal	175	Pinyon	20
	Unfavorable	135	Blue grama	15
			Big sagebrush	10
			Sideoats grama	10
			Broom snakeweed	5
			Ring muhly	5
			Bottlebrush squirreltail	5
OMD*:				
Orejas	Favorable	250	Oneseed juniper	30
	Normal	175	Pinyon	20
	Unfavorable	135	Blue grama	15
			Big sagebrush	10
			Sideoats grama	10
			Broom snakeweed	5
			Ring muhly	5
			Bottlebrush squirreltail	5

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
OMD*:				
Montecito	Favorable	350	Oneseed juniper	40
	Normal	200	Pinyon	15
	Unfavorable	150	Big sagebrush	10
			Broom snakeweed	5
			Sideoats grama	5
			Blue grama	5
			Bottlebrush squirreltail	5
			Muttongrass	5
			Pingue	5
			Gambel oak	5
PrD, PrF, PrG	Favorable	200	Grouse whortleberry	50
Presa	Normal	100	Muttongrass	15
	Unfavorable	50	Kinnikinnick	10
			Western yarrow	5
			Arizona fescue	5
			Mountain brome	5
			Timber oatgrass	5
			Carex	5
PSG*:				
Presa	Favorable	200	Grouse whortleberry	50
	Normal	100	Muttongrass	15
	Unfavorable	50	Kinnikinnick	10
			Western yarrow	5
			Arizona fescue	5
			Mountain brome	5
			Timber oatgrass	5
			Carex	5
Rock outcrop.				
PYF*:				
Presa	Favorable	200	Grouse whortleberry	50
	Normal	100	Muttongrass	15
	Unfavorable	50	Kinnikinnick	10
			Western yarrow	5
			Arizona fescue	5
			Mountain brome	5
			Timber oatgrass	5
			Carex	5
Cryaquolls.				
RBE*:				
Raton	Favorable	400	Pinyon	35
	Normal	250	Western wheatgrass	15
	Unfavorable	150	Oneseed juniper	15
			Big sagebrush	10
			Arizona fescue	5
			Mountain muhly	5
			Prairie junegrass	5
			Muttongrass	5
			Pinyon ricegrass	5
Stunner.				
RRE*:				
Rock outcrop.				

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
RRE*:				
Raton	Favorable	400	Pinyon	35
	Normal	250	Rocky mountain juniper	20
	Unfavorable	150	Western wheatgrass	15
			Oneseed juniper	15
			Gambel oak	5
			Arizona fescue	5
			Mountain muhly	5
			Muttongrass	5
			Pinyon ricegrass	5
RvC	Favorable	250	Oneseed juniper	25
Royosa	Normal	175	Blue grama	15
	Unfavorable	100	Indian ricegrass	15
			Pinyon	10
			Sandhill muhly	10
			Threeawn	10
			Yucca	10
			Rubber rabbitbrush	5
RWE*:				
Royosa	Favorable	250	Oneseed juniper	25
	Normal	175	Blue grama	15
	Unfavorable	100	Indian ricegrass	15
			Pinyon	10
			Sandhill muhly	10
			Threeawn	10
			Yucca	10
			Rubber rabbitbrush	5
Orthents.				
RYD*:				
Royosa	Favorable	250	Oneseed juniper	25
	Normal	175	Blue grama	15
	Unfavorable	100	Indian ricegrass	15
			Pinyon	10
			Sandhill muhly	10
			Threeawn	10
			Yucca	10
			Rubber rabbitbrush	5
Vibo	Favorable	475	Oneseed juniper	25
	Normal	250	Pinyon	15
	Unfavorable	125	Blue grama	15
			Indian ricegrass	10
			Galleta	5
			Sand dropseed	5
			Needleandthread	5
			Rubber rabbitbrush	5
			Ring muhly	5
			Threeawn	5
			Plains pricklypear	5
SaG*:				
Sabe	Favorable	175	Bottlebrush squirreltail	50
	Normal	100	Prairie junegrass	20
	Unfavorable	50	Gambel oak	10
			True mountainmahogany	10
			Mountain muhly	10

See footnote at end of table.

TABLE 5.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
SaG*:				
Mirand	Favorable	400	Arizona fescue	40
	Normal	250	Mountain muhly	20
	Unfavorable	100	Prairie junegrass	10
			Muttongrass	10
			Gambel oak	5
			Bottlebrush squirreltail	5
			Pine dropseed	5
			Mountain brome	5
TrF, TsE	Favorable	300	Arizona fescue	40
Trampas	Normal	200	Mountain muhly	25
	Unfavorable	100	Prairie junegrass	10
			Pine dropseed	10
			Gambel oak	5
			Bottlebrush squirreltail	5
			Muttongrass	5
TTF*:				
Trampas	Favorable	250	Arizona fescue	40
	Normal	150	Mountain muhly	25
	Unfavorable	75	Muttongrass	10
			Pine dropseed	10
			Bottlebrush squirreltail	5
			Prairie junegrass	5
			Carex	5
Diamante	Favorable	200	Gambel oak	20
	Normal	100	Kinnikinnick	20
	Unfavorable	50	Pine dropseed	15
			Mountain muhly	15
			Arizona fescue	10
			Carex	10
			Nodding brome	5
			Muttongrass	5
UTG*:				
Ustorthents.				
Trampas	Favorable	250	Arizona fescue	40
	Normal	150	Mountain muhly	25
	Unfavorable	75	Muttongrass	10
			Pine dropseed	10
			Bottlebrush squirreltail	5
			Prairie junegrass	5
			Carex	5
VbD	Favorable	475	Oneseed juniper	25
Vibo	Normal	250	Pinyon	15
	Unfavorable	125	Blue grama	15
			Indian ricegrass	10
			Galleta	5
			Sand dropseed	5
			Needleandthread	5
			Rubber rabbitbrush	5
			Ring muhly	5
			Threeawn	5
			Plains pricklypear	5

* See description of the map unit for the composition and behavior characteristics of the map unit.

TABLE 6.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AMF*:				
Amalia	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Manzano	Severe: floods.	Moderate: floods.	Moderate: slope, floods.	Slight.
ATC*:				
Antonito	Moderate: dusty.	Moderate: dusty.	Moderate: depth to rock, slope, dusty.	Slight.
Travelers	Severe: small stones.	Severe: small stones.	Severe: depth to rock, small stones.	Severe: small stones.
CaB	Severe: floods.	Moderate: floods, wetness.	Severe: floods.	Moderate: too clayey.
Caruso				
CHG*:				
Chimayo	Severe: slope.	Severe: slope.	Severe: slope, depth to rock, large stones.	Severe: slope.
Rock outcrop.				
CRG*:				
Cryoboralfs.				
Rock outcrop.				
CSC*.				
Cryoborolls				
CTC*:				
Cryoborolls.				
Cryaquolls.				
CUB*.				
Cumulic Haplaquolls				
CYB*.				
Cumulic Haploborolls				
DeF	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Derecho				
DeG*:				
Derecho	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Rock outcrop.				
DFG*:				
Devisadero	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
DFG*: Rock outcrop.				
DmF---------- Diamante	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
EGG*: Eutroboralfs.				
Glossoboralfs.				
Rock outcrop.				
FaC---------- Fernando	Moderate: percs slowly, small stones.	Moderate: small stones, dusty.	Severe: small stones.	Moderate: small stones, dusty.
FbC---------- Fernando	Moderate: dusty, percs slowly.	Moderate: dusty.	Moderate: slope, percs slowly.	Moderate: dusty.
FeB, FeC---------- Fernando	Moderate: percs slowly, too clayey.	Moderate: too clayey.	Moderate: slope, percs slowly.	Moderate: too clayey.
FfC---------- Fernando	Moderate: percs slowly, too clayey.	Moderate: too clayey.	Severe: slope.	Moderate: too clayey.
FHB*: Fernando----------	Moderate: percs slowly, too clayey.	Moderate: too clayey.	Moderate: slope, percs slowly.	Moderate: too clayey.
Hernandez----------	Slight----------	Slight----------	Moderate: slope.	Slight.
FLB*. Fluvents				
HaB---------- Hernandez	Slight----------	Slight----------	Moderate: slope, small stones.	Slight.
HKC*: Hernandez----------	Slight----------	Slight----------	Moderate: slope.	Slight.
Kim----------	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
HPC*: Hernandez----------	Slight----------	Slight----------	Moderate: slope.	Slight.
Petaca----------	Moderate: large stones.	Moderate: large stones.	Severe: depth to rock, small stones.	Moderate: large stones.
HSC*: Hernandez----------	Slight----------	Slight----------	Moderate: slope, small stones.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
HSC*:				
Silva	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
JaD*:				
Jaroso	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.
Angostura	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.
JaF*, JaG*:				
Jaroso	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Angostura	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Mascarenas	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
JRG*:				
Jaroso	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Angostura	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Rock outcrop.				
LaE Lama	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
LoB Loveland	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.
LtC*:				
Luhon	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
Travelers	Severe: small stones.	Severe: small stones.	Severe: depth to rock, slope, small stones.	Severe: small stones.
MaF Maes	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
MeD*:				
Maes	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: small stones.
Etoe	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: small stones.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
MeF*, MeG*:				
Maes	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Etoe	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
MFG*:				
Maes	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Etoe	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Rock outcrop.				
MNC Manzano	Severe: floods.	Moderate: floods.	Moderate: slope, floods.	Slight.
MnA Manzano	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
MnB, MnC Manzano	Severe: floods.	Moderate: floods.	Moderate: slope, floods.	Slight.
MrD Marosa	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: small stones.
MrF, MrG Marosa	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
MSG*, MSG2*:				
Marosa	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Rock outcrop.				
MTE*:				
Marosa	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.
Nambe	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
MUG*:				
Mirabal	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Rock outcrop.				
MwD Mirand	Severe: percs slowly.	Slight	Severe: percs slowly, slope.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
MxD---------- Montecito	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
MxE*: Montecito----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Rock outcrop.				
NaD---------- Nambe	Severe: small stones.	Severe: small stones.	Severe: slope.	Severe: small stones.
NaF, NaF2, NaG, NaG2-- Nambe	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
NRG*, NRG2*: Nambe----------	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones.
Rock outcrop.				
OeF---------- Orejas	Severe: slope.	Severe: slope.	Severe: depth to rock, large stones, slope.	Severe: slope.
OMD*: Orejas----------	Severe: slope.	Severe: slope.	Severe: depth to rock, large stones, slope.	Moderate: large stones, slope.
Montecito----------	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
ORG*: Orthents.				
Badland.				
OSG*: Orthents.				
Calciorthids.				
OTG*: Orthents.				
Rock outcrop.				
PAG*: Paleboralfs.				
Cryochrepts.				
Rock outcrop.				
PbD---------- Penitente	Moderate: small stones, slope.	Moderate: slope, small stones.	Severe: small stones, slope.	Moderate: small stones.
PbF---------- Penitente	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Severe: slope.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
PeD--- Petaca	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: depth to rock, slope, small stones.	Moderate: large stones.
PfC*: Petaca---	Moderate: large stones.	Moderate: large stones.	Severe: depth to rock, small stones.	Moderate: large stones.
Prieta---	Severe: large stones, small stones.	Severe: large stones, small stones.	Severe: depth to rock, large stones, small stones.	Severe: large stones, small stones.
PGC*: Petaca---	Moderate: large stones.	Moderate: large stones.	Severe: depth to rock, small stones.	Moderate: large stones.
Silva---	Moderate: percs slowly.	Slight---	Moderate: slope, percs slowly.	Slight.
Prieta---	Severe: large stones, small stones.	Severe: large stones, small stones.	Severe: depth to rock, large stones, small stones.	Severe: large stones, small stones.
PoB--- Poganeab	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
PrD--- Presa	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: small stones.
PrF, PrG--- Presa	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
PSG*: Presa---	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Rock outcrop.				
PYF*: Presa---	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Cryaquolls.				
RaC--- Raton	Severe: large stones.	Severe: large stones.	Severe: large stones, depth to rock.	Severe: large stones.
RBE*: Raton---	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope.
Stunner---	Moderate: small stones, dusty.	Moderate: small stones, dusty.	Severe: small stones.	Moderate: small stones, dusty.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
RcG*. Rock outcrop				
RdG*: Rock outcrop.				
Badland.				
RPG*: Rock outcrop.				
Penitente	Severe: slope.	Severe: slope.	Severe: small stones, slope.	Moderate: small stones, slope.
RRE*: Rock outcrop.				
Raton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones, depth to rock.	Severe: large stones.
RUG*: Rock outcrop.				
Ustorthents.				
RvC Royosa	Severe: soil blowing, too sandy.	Severe: soil blowing, too sandy.	Severe: soil blowing, too sandy.	Severe: soil blowing, too sandy.
RWE*: Royosa	Severe: soil blowing, too sandy.	Severe: soil blowing, too sandy.	Severe: slope, soil blowing, too sandy.	Severe: soil blowing, too sandy.
Orthents.				
RYD*: Royosa	Severe: soil blowing, too sandy.	Severe: soil blowing, too sandy.	Severe: slope, soil blowing, too sandy.	Severe: soil blowing, too sandy.
Vibo	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
SaG*: Sabe	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.
Mirand	Severe: percs slowly, slope.	Severe: slope.	Severe: percs slowly, slope.	Severe: slope.
SbD Sedillo	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: small stones.
SDD*: Sedillo	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.
Orthents.				

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
SED*:				
Sedillo	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.
Silva	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
SgC*:				
Servilleta	Moderate: dusty, percs slowly.	Moderate: dusty.	Moderate: depth to rock, slope, dusty.	Moderate: dusty.
Prieta	Severe: large stones, small stones.	Severe: large stones, small stones.	Severe: depth to rock, large stones, small stones.	Severe: large stones, small stones.
ShB Shawa	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
SmB Silva	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight.
SmD Silva	Moderate: percs slowly.	Slight	Severe: slope.	Slight.
SSC*:				
Silva	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
Sedillo	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.
StC Stunner	Moderate: small stones, dusty.	Moderate: small stones, dusty.	Severe: small stones.	Moderate: small stones, dusty.
SUC*:				
Stunner	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
Luhon.				
SVC*:				
Stunner	Moderate: small stones, dusty.	Moderate: small stones, dusty.	Severe: small stones.	Moderate: small stones, dusty.
Travelers	Severe: small stones.	Severe: small stones.	Severe: depth to rock, small stones.	Severe: small stones.
Luhon	Moderate: small stones, dusty.	Moderate: small stones, dusty.	Severe: small stones.	Moderate: small stones, dusty.
TeB Tenorio	Slight	Slight	Slight	Slight.
TeC Tenorio	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
TrF---------- Trampas	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
TsE---------- Trampas	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: small stones, slope.
TTF*: Trampas----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Diamante----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
TVC---------- Travelers	Severe: small stones.	Severe: small stones.	Severe: depth to rock, small stones.	Severe: small stones.
UTG*: Ustorthents.				
Trampas----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
VbD---------- Vibo	Slight----------	Slight----------	Severe: slope.	Slight.
WEF*: Wellsville----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Ess----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
AMF*:											
Amalia	Very poor.	Very poor.	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
Manzano	Fair	Good	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Poor.
ATC*:											
Antonito	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Travelers	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
CaB	Fair	Fair	Good	---	Fair	Fair	Fair	Fair	---	Fair	Fair.
Caruso											
CHG*:											
Chimayo	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Rock outcrop.											
CRG*:											
Cryoboralfs.											
Rock outcrop.											
CSC*.											
Cryoborolls											
CTC*:											
Cryoborolls.											
Cryaquolls.											
CUB*.											
Cumulic Haplaquolls											
CYB*.											
Cumulic Haploborolls											
DeF	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Derecho											
DeG*:											
Derecho	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Rock outcrop.											
DFG*:											
Devisadero	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Rock outcrop.											
DmF	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Diamante											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
EGG*:											
Eutroboralfs.											
Glossoboralfs.											
Rock outcrop.											
FaC, FbC---------- Fernando	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
FeB---------- Fernando	Fair	Fair	Good	---	Poor	Good	Fair	Fair	---	Fair	---
FeC, FfC---------- Fernando	Fair	Fair	Good	---	Poor	Poor	Very poor.	Fair	---	Very poor.	---
FHB*:											
Fernando----------	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
Hernandez---------	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Fair.
FLB*.											
Fluvents											
HaB---------- Hernandez	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Fair.
HKC*:											
Hernandez---------	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Fair.
Kim----------	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
HPC*:											
Hernandez---------	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Fair.
Petaca----------	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
HSC*:											
Hernandez---------	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Fair.
Silva----------	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
JaD*:											
Jaroso----------	Poor	Poor	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Angostura---------	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
JaF*:											
Jaroso----------	Poor	Poor	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Angostura---------	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Mascarenas--------	Poor	Poor	Good	Poor	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
JaG*:											
Jaroso	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	---
JaG*:											
Angostura	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Mascarenas	Very poor.	Very poor.	Good	Poor	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
JRG*:											
Jaroso	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Angostura	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Rock outcrop.											
LaE Lama	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.	Fair.
LoB Loveland	Fair	Fair	---	---	---	---	---	Fair	---	---	---
LtC*:											
Luhon	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Travelers	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
MaF Maes	Poor	Poor	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	---
MeD*, MeF*:											
Maes	Poor	Poor	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Etoe	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---
MeG*:											
Maes	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Etoe	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
MFG*:											
Maes	Very poor.	Very poor.	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Etoe	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Rock outcrop.											
MNC, MnA, MnB, MnC- Manzano	Fair	Good	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Poor.
MrD, MrF Marosa	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
MrG---------- Marosa	Very poor.	Very poor.	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---
MSG*, MSG2*: Marosa----------	Very poor.	Very poor.	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Rock outcrop.											
MTE*: Marosa----------	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Nambe----------	Very poor.	Very poor.	Good	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
MUG*: Mirabal----------	Very poor.	Very poor.	Good	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Rock outcrop.											
MwD---------- Mirand	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---
MxD---------- Montecito	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.	Fair.
MxE*: Montecito---------	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.	Fair.
Rock outcrop.											
NaD, NaF, NaF2, NaG, NaG2--------- Nambe	Very poor.	Very poor.	Good	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
NRG*, NRG2*: Nambe----------	Very poor.	Very poor.	Good	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Rock outcrop.											
OeF---------- Orejas	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
OMD*: Orejas----------	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Montecito---------	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.	Fair.
ORG*: Orthents.											
Badland.											
OSG*: Orthents.											
Calciorthids.											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
OTG*:											
Orthents.											
Rock outcrop.											
PAG*:											
Paleboralfs.											
Cryochrepts.											
Rock outcrop.											
PbD, PbF---------- Penitente	Very poor.	Very poor.	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.	Fair.
PeD---------- Petaca	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
PfC*:											
Petaca----------	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Prieta----------	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
PGC*:											
Petaca----------	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Silva----------	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
Prieta----------	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
PoB---------- Poganeab	Very poor.	Poor	Poor	Very poor.	Poor	Fair	Fair	Poor	Poor	Fair	Poor.
PrD, PrF---------- Presa	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---
PrG---------- Presa	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
PSG*:											
Presa----------	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Rock outcrop.											
PYF*:											
Presa----------	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Cryaquolls.											
RaC---------- Raton	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
RBE*:											
Raton----------	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Stunner.											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
RcG*. Rock outcrop											
RdG*: Rock outcrop.											
Badland.											
RPG*: Rock outcrop.											
Penitente	Very poor.	Very poor.	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.	Fair.
RRE*: Rock outcrop.											
Raton	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
RUG*: Rock outcrop.											
Ustorthents.											
RvC Royosa	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
RWE*: Royosa	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
Orthents.											
RYD*: Royosa	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
Vibo	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
SaG*: Sabe	Very poor.	Very poor.	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Mirand	Very poor.	Very poor.	Good	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
SbD Sedillo	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
SDD*: Sedillo	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Orthents.											
SED*: Sedillo	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Silva	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
SgC*:											
Servilleta	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Prieta	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
ShB Shawa	Fair	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
SmB Silva	Fair	Fair	Good	---	Poor	Good	Fair	Fair	---	Fair	---
SmD Silva	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
SSC*:											
Silva	Poor	Poor	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
Sedillo	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
StC Stunner	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
SUC*:											
Stunner	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
Luhon	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
SVC*:											
Stunner	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
Travelers	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Luhon	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
TeB Tenorio	Poor	Poor	Fair	---	Fair	Fair	Poor	Poor	---	Fair	Fair.
TeC Tenorio	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
TrF, TsE Trampas	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
TTF*:											
Trampas	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Diamante	Very poor.	Very poor.	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	---
TVC Travelers	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
UTG*: Ustorthents.											
Trampas	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	---

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
VbD---------- Vibo	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
WEF*: Wellsville--------	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Ess----------	Very poor.	Poor	Good	Poor	Good	---	---	Poor	Poor	---	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
AMF*:					
Amalia	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Manzano	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, shrink-swell.
ATC*:					
Antonito	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, depth to rock, low strength.
Travelers	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
CaB---------- Caruso	Severe: floods, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.
CHG*:					
Chimayo	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Rock outcrop.					
CRG*:					
Cryoboralfs.					
Rock outcrop.					
CSC*:					
Cryoborolls					
CTC*:					
Cryoborolls.					
Cryaquolls.					
CUB*.					
Cumulic Haplaquolls					
CYB*.					
Cumulic Haploborolls					
DeF---------- Derecho	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DeG*:					
Derecho	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
DFG*:					
Devisadero	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Rock outcrop.					
DmF---- Diamante	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EGG*:					
Eutroboralfs.					
Glossoboralfs.					
Rock outcrop.					
FaC---- Fernando	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell.	Moderate: slope, shrink-swell, low strength.	Moderate: low strength, shrink-swell.
FbC, FeB---- Fernando	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Moderate: low strength, shrink-swell.
FeC, FfC---- Fernando	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell.	Moderate: slope, shrink-swell, low strength.	Moderate: low strength, shrink-swell.
FHB*:					
Fernando	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Moderate: low strength, shrink-swell.
Hernandez	Slight----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.
FLB*.					
Fluvents					
HaB---- Hernandez	Slight----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.
HKC*:					
Hernandez	Slight----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, shrink-swell.
Kim----	Slight----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.
HPC*:					
Hernandez	Slight----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.
Petaca----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
HSC*:					
Hernandez	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.
Silver	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
JaD*:					
Jaroso	Severe: small stones, too clayey.	Moderate: low strength, shrink-swell, slope.	Moderate: low strength, shrink-swell, slope.	Severe: slope.	Moderate: low strength, shrink-swell, slope.
Angostura	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	
JaF*, JaG*:					
Jaroso	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Angostura	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Mascarenas	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
JRG*:					
Jaroso	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Angostura	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Rock outcrop.					
LaE---------- Lama	Moderate: slope, too clayey.	Severe: low strength, shrink-swell.	Severe: shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.
LoB---------- Loveland	Severe: wetness, floods, cutbanks cave.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, frost action, low strength.
LtC*:					
Luhon	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
Travelers	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
MaF---------- Maes	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
MeD*:					
Maes	Severe: small stones, too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell, slope.	Severe: low strength.
Etoe	Moderate: small stones.	Slight	Slight	Moderate: slope.	Moderate: frost action.
MeF*, MeG*:					
Maes	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Etoe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MFG*:					
Maes	Severe: slope, small stones, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Etoe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
MNC, MnA, MnB, MnC Manzano	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods, shrink-swell.
MrD Marosa	Severe: small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action.
MrF, MrG Marosa	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MSG*, MSG*:					
Marosa	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
MTE*:					
Marosa	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Nambe	Severe: large stones, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
MUG*:					
Mirabal	Severe: depth to rock, slope, small stones.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
MwD Mirand	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
MxD---------- Montecito	Moderate: slope, too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell.
MxE*: Montecito--------	Severe: slope.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.
Rock outcrop.					
NaD---------- Nambe	Severe: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.
NaF, NaF2, NaG, NaG2---------- Nambe	Severe: large stones, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
NRG, NRG2*: Nambe----------	Severe: large stones, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
OeF---------- Orejas	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, low strength.
OMD*: Orejas----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, low strength.
Montecito--------	Moderate: slope, too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell.
ORG*: Orthents.					
Badland.					
OSG*: Orthents.					
Calciorthids.					
OTG*: Orthents.					
Rock outcrop.					
PAG*: Paleboralfs.					
Cryochrepts.					
Rock outcrop.					

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
PbD---------- Penitente	Moderate: small stones, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.
PbF---------- Penitente	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PeD---------- Petaca	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
PfC*:					
Petaca----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Prieta----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, low strength.
PGC*:					
Petaca----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Silva----------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Prieta----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, low strength.
PoB---------- Poganeab	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, frost action, low strength.
PrD---------- Presa	Severe: small stones.	Slight----------	Slight----------	Moderate: slope, frost action.	Moderate: frost action.
PrF, PrG---------- Presa	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PSG*:					
Presa----------	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
PYF*:					
Presa----------	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cryaquolls.					
RaC---------- Raton	Severe: too clayey, depth to rock, large stones.	Severe: shrink-swell, large stones, depth to rock.	Severe: shrink-swell, large stones, depth to rock.	Severe: shrink-swell, large stones, depth to rock.	Severe: depth to rock, shrink-swell, large stones.
RBE*:					
Raton----------	Severe: slope, depth to rock, large stones.	Severe: slope, shrink-swell, large stones.	Severe: slope, shrink-swell, depth to rock.	Severe: slope, shrink-swell, depth to rock.	Severe: slope, depth to rock, shrink-swell.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
RBE*:					
Stunner	Slight	Moderate: low strength.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength.	Moderate: shrink-swell, low strength.
RcG*.					
Rock outcrop					
RdG*:					
Rock outcrop.					
Badland.					
RPG*:					
Rock outcrop.					
Penitente	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
RRE*:					
Rock outcrop.					
Raton	Severe: slope, depth to rock, large stones.	Severe: slope, shrink-swell, large stones.	Severe: slope, shrink-swell, depth to rock.	Severe: slope, shrink-swell, depth to rock.	Severe: slope, depth to rock, shrink-swell.
RUG*:					
Rock outcrop.					
Ustorthents.					
RvC	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
Royosa					
RWE*:					
Royosa	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Orthents.					
RYD*:					
Royosa	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Vibo	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, shrink-swell, slope.
SaG*:					
Sabe	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mirand	Severe: slope, too clayey.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.	Severe: low strength, shrink-swell, slope.
SbD	Moderate: small stones,	Slight	Slight	Moderate: slope,	Slight.
Sedillo					
SDD*:					
Sedillo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
SDD*: Orthents.					
SED*: Sedillo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Silva	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
SgC*: Servilleta	Severe: depth to rock.	Moderate: shrink-swell, low strength, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, low strength, depth to rock.	Severe: low strength.
Prieta	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, low strength.
ShB Shawa	Slight	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, frost action.
SmB, SmD Silva	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
SSC*: Silva	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Sedillo	Moderate: slope, small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
StC Stunner	Slight	Moderate: low strength.	Moderate: low strength, shrink-swell.	Moderate: low strength.	Moderate: shrink-swell, low strength.
SUC*: Stunner	Slight	Moderate: low strength.	Moderate: low strength, shrink-swell.	Moderate: low strength.	Moderate: shrink-swell, low strength.
Luhon	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
SVC*: Stunner	Slight	Moderate: low strength.	Moderate: low strength, shrink-swell.	Moderate: low strength.	Moderate: shrink-swell, low strength.
Travelers	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Luhon	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.
TeB, TeC Tenorio	Severe: small stones, cutbanks cave.	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
TrF, TsE---------- Trampas	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
TTF*: Trampas----------	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Diamante---------	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
TVC---------- Travelers	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
UTG*: Ustorthents.					
Trampas----------	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
VbD---------- Vibo	Slight----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: frost action, shrink-swell, slope.	Moderate: frost action, low strength.
WEF*: Wellsville-------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ess----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AMF*:					
Amalia	Severe: slope.	Severe: slope, seepage, small stones.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
Manzano	Severe: percs slowly.	Severe: floods.	Moderate: floods.	Moderate: floods.	Fair: too clayey.
ATC*:					
Antonito	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Fair: thin layer, too clayey, area reclaim.
Travelers	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: depth to rock.	Slight	Poor: thin layer, large stones, area reclaim.
CaB Caruso	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: too clayey.
CHG*:					
Chimayo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, large stones.
Rock outcrop.					
CRG*:					
Cryoboralfs.					
Rock outcrop.					
CSC*. Cryoborolls					
CTC*:					
Cryoborolls.					
Cryaquolls.					
CUB*. Cumulic Haplaquolls					
CYB*. Cumulic Haploborolls					
DeF Derecho	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.
DeG*:					
Derecho	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
DeG*: Rock outcrop.					
DFG*: Devisadero	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
DmF---- Diamante	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, small stones.
EGG*: Eutroboralfs.					
Glossoboralfs.					
Rock outcrop.					
FaC, FbC, FeB, FeC, FfC---- Fernando	Severe: percs slowly.	Moderate: slope.	Slight----	Slight----	Fair: too clayey.
FHB*: Fernando----	Severe: percs slowly.	Moderate: slope.	Slight----	Slight----	Fair: too clayey.
Hernandez----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Fair: too clayey.
FLB*. Fluvents					
HaB---- Hernandez	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Fair: too clayey.
HKC*: Hernandez----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Fair: too clayey.
Kim----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Good.
HPC*: Hernandez----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Fair: too clayey.
Petaca----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----	Poor: area reclaim, thin layer.
HSC*: Hernandez----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----	Slight----	Fair: too clayey.
Silva----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----	Fair: too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
JaD*:					
Jaroso	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: small stones, too clayey.
Angostura	Severe: large stones.	Severe: slope, large stones, small stones.	Severe: large stones.	Moderate: slope.	Poor: large stones, area reclaim.
JaF*, JaG*:					
Jaroso	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.
Angostura	Severe: slope, large stones.	Severe: slope, large stones, small stones.	Severe: slope, large stones.	Severe: slope.	Poor: slope, large stones, area reclaim.
Mascarenas	Severe: percs slowly, slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Poor: slope, small stones.
JRG*:					
Jaroso	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.
Angostura	Severe: slope, large stones.	Severe: slope, large stones, small stones.	Severe: slope, large stones.	Severe: slope.	Poor: slope, large stones, area reclaim.
Rock outcrop.					
LaE Lama	Severe**: percs slowly.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, too clayey.
LoB Loveland	Severe: wetness, floods.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Poor: wetness, small stones.
LtC*:					
Luhon	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Travelers	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: depth to rock.	Slight	Poor: thin layer, large stones, area reclaim.
MaF Maes	Severe: percs slowly, slope.	Severe: slope, large stones.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.
MeD*:					
Maes	Severe: percs slowly.	Severe: slope, large stones.	Severe: too clayey.	Moderate: slope.	Poor: small stones, too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MeD*:					
Etoe	Slight	Severe: slope.	Moderate: small stones.	Slight	Poor: small stones, area reclaim.
MeF*, MeG*:					
Maes	Severe: percs slowly, slope.	Severe: slope, large stones.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.
Etoe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, small stones, area reclaim.
MFG*:					
Maes	Severe: percs slowly, slope.	Severe: slope, large stones.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, small stones, too clayey.
Etoe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, small stones, area reclaim.
Rock outcrop.					
MNC, MnA, MnB, MnC--Manzano	Severe: percs slowly.	Severe: floods.	Moderate: floods.	Moderate: floods.	Fair: too clayey.
MrD--Marosa	Moderate: percs slowly.	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
MrF, MrG--Marosa	Severe: slope.	Severe: slope, seepage, small stones.	Severe: seepage, slope.	Severe: slope, seepage.	Poor: slope, small stones.
MSG*, MSG2*:					
Marosa	Severe: slope.	Severe: slope, seepage, small stones.	Severe: seepage, slope.	Severe: slope, seepage.	Poor: slope, small stones.
Rock outcrop.					
MTE*:					
Marosa	Severe: slope.	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: slope, seepage.	Poor: slope, small stones.
Nambe	Severe: slope.	Severe: large stones, seepage, slope.	Severe: large stones, seepage, slope.	Severe: seepage, slope.	Poor: large stones, slope.
MUG*:					
Mirabal	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope, seepage.	Severe: seepage, slope.	Poor: slope, small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MUG*:					
Rock outcrop.					
MwD----------	Severe:	Severe:	Severe:	Slight----------	Poor:
Mirand	percs slowly.	slope.	too clayey.		too clayey.
MxD----------	Severe:	Severe:	Moderate:	Moderate:	Fair:
Montecito	percs slowly.	slope.	small stones, too clayey.	slope.	slope, too clayey.
MxE*:					
Montecito----------	Severe:	Severe:	Moderate:	Severe:	Poor:
	percs slowly, slope.	slope.	slope, small stones, too clayey.	slope.	slope.
Rock outcrop.					
NaD----------	Moderate:	Severe:	Severe:	Severe:	Poor:
Nambe	large stones.	large stones, seepage, slope.	large stones, seepage.	seepage.	large stones.
NaF, NaF2, NaG, NaG2----------	Severe:	Severe:	Severe:	Severe:	Poor:
Nambe	slope.	large stones, seepage, slope.	large stones, seepage, slope.	seepage, slope.	large stones, slope.
NRG*, NRG2*:					
Nambe----------	Severe:	Severe:	Severe:	Severe:	Poor:
	slope.	large stones, seepage, slope.	large stones, seepage, slope.	seepage, slope.	large stones, slope.
Rock outcrop.					
OeF----------	Severe:	Severe:	Severe:	Severe:	Poor:
Orejas	depth to rock, percs slowly, slope.	depth to rock, slope.	depth to rock, slope.	slope.	slope, thin layer, area reclaim.
OMD*:					
Orejas----------	Severe:	Severe:	Severe:	Severe:	Poor:
	depth to rock, percs slowly, slope.	depth to rock, slope.	depth to rock.	slope.	slope, thin layer, area reclaim.
Montecito----------	Severe:	Severe:	Moderate:	Moderate:	Fair:
	percs slowly.	slope.	small stones, too clayey.	slope.	slope, too clayey.
ORG*:					
Orthents.					
Badland.					
OSG*:					
Orthents.					
Calciorthids.					
OTG*:					
Orthents.					
Rock outcrop.					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PAG*: Paleboralfs. Cryochrepts. Rock outcrop.					
PbD---- Penitente	Moderate: slope.	Severe: seepage, slope, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
PbF---- Penitente	Severe: slope.	Severe: seepage, slope, small stones.	Severe: seepage.	Severe: seepage, slope.	Poor: slope, small stones.
PeD---- Petaca	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Moderate: slope.	Poor: area reclaim, thin layer.
PfC*: Petaca----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----	Poor: area reclaim, thin layer.
Prieta----	Severe: percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----	Poor: thin layer, large stones, area reclaim.
PGC*: Petaca----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----	Poor: area reclaim, thin layer.
Silva----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----	Fair: too clayey.
Prieta----	Severe: percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----	Poor: thin layer, large stones, area reclaim.
PoB---- Poganeab	Severe: wetness, percs slowly.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Poor: wetness.
PrD---- Presa	Slight----	Severe: seepage, slope, small stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: small stones.
PrF, PrG---- Presa	Severe: slope.	Severe: seepage, slope, small stones.	Severe: seepage, slope, large stones.	Severe: slope, seepage.	Poor: slope, small stones.
PSG*: Presa----	Severe: slope.	Severe: seepage, slope, small stones.	Severe: seepage, slope, large stones.	Severe: slope, seepage.	Poor: slope, small stones.
Rock outcrop.					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PYF*:					
Presa	Severe: slope.	Severe: seepage, slope, small stones.	Severe: seepage, slope, large stones.	Severe: slope, seepage.	Poor: slope, small stones.
Cryaquolls.					
RaC	Severe: percs slowly, depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: too clayey, depth to rock, large stones.	Slight	Poor: thin layer, large stones, area reclaim.
Raton					
RBE*:					
Raton	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, large stones, slope.	Severe: slope.	Poor: slope, thin layer, large stones.
Stunner	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
RcG*.					
Rock outcrop					
RdG*:					
Rock outcrop.					
Badland.					
RPG*:					
Rock outcrop.					
Penitente	Severe: slope.	Severe: seepage, slope, small stones.	Severe: seepage.	Severe: seepage, slope.	Poor: slope, small stones.
RRE*:					
Rock outcrop.					
Raton	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock, large stones.	Severe: too clayey, depth to rock, large stones.	Severe: slope.	Poor: slope, thin layer, large stones.
RUG*:					
Rock outcrop.					
Ustorthents.					
RvC	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
Royosa					
RWE*:					
Royosa	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
Orthents.					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RYD*:					
Royosa	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy.
Vibo	Moderate: slope.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: slope.
SaG*:					
Sabe	Severe: slope.	Severe: slope, seepage, large stones.	Severe: slope, too sandy, large stones.	Severe: slope, seepage.	Poor: slope, small stones, too sandy.
Mirand	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, too clayey.
SbD Sedillo	Slight	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: seepage.	Poor: small stones.
SDD*:					
Sedillo	Severe: slope.	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: slope, seepage.	Poor: small stones, slope.
Orthents.					
SED*:					
Sedillo	Severe: slope.	Severe: slope, seepage, small stones.	Severe: seepage.	Severe: slope, seepage.	Poor: small stones, slope.
Silva	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
SgC*:					
Servilleta	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: area reclaim, thin layer.
Prieta	Severe: percs slowly, depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: thin layer, large stones, area reclaim.
ShB Shawa	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
SmB Silva	Severe: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: too clayey.
SmD Silva	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
SSC*:					
Silva	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Sedillo	Moderate: slope.	Severe: slope, seepage, small stones.	Severe: seepage.	Moderate: slope.	Poor: small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
StC---------- Stunner	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
SUC*: Stunner----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
Luhon----------	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
SVC*: Stunner----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
Travelers----------	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: depth to rock.	Slight----------	Poor: thin layer, large stones, area reclaim.
Luhon----------	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
TeB, TeC---------- Tenorio	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer.
TrF---------- Trampas	Severe: slope, percs slowly.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Poor: slope, small stones.
TsE---------- Trampas	Severe: slope, percs slowly.	Severe: slope, small stones.	Severe: small stones.	Severe: slope.	Poor: slope, small stones.
TTF*: Trampas----------	Severe: slope, percs slowly.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Poor: slope, small stones.
Diamante----------	Severe: percs slowly, slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, small stones.
TVC---------- Travelers	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: depth to rock.	Slight----------	Poor: thin layer, large stones, area reclaim.
UTG*: Ustorthents.					
Trampas----------	Severe: slope, percs slowly.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Poor: slope, small stones.
VbD---------- Vibo	Slight----------	Moderate: seepage, slope.	Severe: seepage.	Slight----------	Good.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WEF*:					
Wellsville	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
Ess	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.
** The limitation is slight if the subsurface tiles or perforated pipe are placed below a depth of about 48 inches.

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AMF*:				
Amalia	Poor: slope.	Fair: excess fines.	Fair: excess fines.	Poor: slope, small stones.
Manzano	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
ATC*:				
Antonito	Poor: area reclaim, thin layer.	Unsuited	Unsuited	Fair: too clayey.
Travelers	Poor: thin layer.	Unsuited	Unsuited	Poor: large stones, small stones.
CaB	Fair: low strength.	Unsuited	Unsuited	Fair: too clayey.
Caruso				
CHG*:				
Chimayo	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope, thin layer, large stones.
Rock outcrop.				
CRG*:				
Cryoboralfs.				
Rock outcrop.				
CSC*.				
Cryoborolls				
CTC*:				
Cryoborolls.				
Cryaquolls.				
CUB*.				
Cumulic Haplaquolls				
CYB*.				
Cumulic Haploborolls				
DeF	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Derecho				
DeG*:				
Derecho	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DFG*:				
Devisadero	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: slope, small stones.
Rock outcrop.				
DmF: Diamante	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
EGG*:				
Eutroboralfs.				
Glossoboralfs.				
Rock outcrop.				
FaC, FbC, FeB, FeC, FfC: Fernando	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
FHB*:				
Fernando	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
Hernandez	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
FLB*.				
Fluvents				
HaB: Hernandez	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: small stones, too clayey.
HKC*:				
Hernandez	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
Kim	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Good.
HPC*:				
Hernandez	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
Petaca	Poor: area reclaim, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: area reclaim, large stones.
HSC*:				
Hernandez	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: small stones, too clayey.
Silva	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: thin layer.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
JaD*:				
Jaroso	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Poor: small stones.
Angostura	Poor: large stones, area reclaim.	Unsuited	Unsuited	Poor: large stones, small stones.
JaF*, JaG*:				
Jaroso	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Angostura	Poor: slope, large stones, area reclaim.	Unsuited	Unsuited	Poor: slope, large stones, small stones.
Mascarenas	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
JRG*:				
Jaroso	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Angostura	Poor: slope, large stones, area reclaim.	Unsuited	Unsuited	Poor: slope, large stones, small stones.
Rock outcrop.				
LaE Lama	Poor: low strength, shrink-swell.	Fair: excess fines, large stones.	Fair: excess fines, large stones.	Poor: thin layer.
LoB Loveland	Poor: wetness, frost action.	Good	Good	Fair: too clayey, wetness.
LtC*:				
Luhon	Fair: low strength.	Unsuited	Unsuited	Fair: thin layer.
Travelers	Poor: thin layer.	Unsuited	Unsuited	Poor: large stones, small stones.
MaF Maes	Poor: low strength, slope.	Unsuited	Unsuited	Poor: slope, small stones.
MeD*:				
Maes	Poor: low strength.	Unsuited	Unsuited	Poor: small stones.
Etoe	Fair: frost action.	Unsuited	Poor: excess fines, large stones.	Poor: small stones, area reclaim.
MeF*, MeG*:				
Maes	Poor: low strength, slope.	Unsuited	Unsuited	Poor: slope, small stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MeF*, MeG*: Etoe	Poor: slope.	Unsuited	Poor: excess fines, large stones.	Poor: slope, small stones, area reclaim.
MFG*: Maes	Poor: low strength, slope.	Unsuited	Unsuited	Poor: slope, small stones.
Etoe	Poor: slope.	Unsuited	Poor: excess fines, large stones.	Poor: slope, small stones, area reclaim.
Rock outcrop.				
MNC, MnA, MnB, MnC---- Manzano	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
MrD---- Marosa	Fair: frost action.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: small stones.
MrF, MrG---- Marosa	Poor: slope.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: slope, small stones.
MSG*, MSG2*: Marosa	Poor: slope.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: slope, small stones.
Rock outcrop.				
MTE*: Marosa	Fair: slope.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: slope, small stones.
Nambe	Poor: slope.	Unsuited: large stones.	Unsuited: large stones.	Poor: large stones, slope, small stones.
MUG*: Mirabal	Poor: slope, thin layer.	Unsuited: large stones, thin layer.	Unsuited: large stones, thin layer.	Poor: slope, large stones.
Rock outcrop.				
MwD---- Mirand	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: too clayey.
MxD---- Montecito	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: too clayey.
MxE*: Montecito	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
NaD---------- Nambe	Fair: area reclaim, frost action, large stones.	Unsuited: large stones.	Unsuited: large stones.	Poor: large stones, small stones.
NaF, NaF2, NaG, NaG2-- Nambe	Poor: slope.	Unsuited: large stones.	Unsuited: large stones.	Poor: large stones, slope, small stones.
NRG*, NRG2*: Nambe----------	Poor: slope.	Unsuited: large stones.	Unsuited: large stones.	Poor: large stones, slope, small stones.
Rock outcrop.				
OeF---------- Orejas	Poor: slope, thin layer, low strength.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: area reclaim, large stones, slope.
OMD*: Orejas----------	Poor: thin layer, low strength.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: area reclaim, large stones, slope.
Montecito----------	Poor: low strength, shrink-swell.	Unsuited----------	Unsuited----------	Poor: too clayey.
ORG*: Orthents.				
Badland.				
OSG*: Orthents.				
Calciorthids.				
OTG*: Orthents.				
Rock outcrop.				
PAG*: Paleboralfs.				
Cryochrepts.				
Rock outcrop.				
PbD---------- Penitente	Fair: frost action.	Unsuited----------	Unsuited----------	Poor: small stones.
PbF---------- Penitente	Poor: slope.	Unsuited----------	Unsuited----------	Poor: small stones, slope.
PeD---------- Petaca	Poor: area reclaim, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: area reclaim, large stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PfC*:				
Petaca	Poor: area reclaim, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: area reclaim, large stones.
Prieta	Poor: thin layer, low strength, area reclaim.	Unsuited	Unsuited	Poor: large stones, small stones, area reclaim.
PGC*:				
Petaca	Poor: area reclaim, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: area reclaim, large stones.
Silva	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: thin layer.
Prieta	Poor: thin layer, low strength, area reclaim.	Unsuited	Unsuited	Poor: large stones, small stones, area reclaim.
Po	Poor: wetness, frost action, low strength.	Unsuited	Unsuited	Poor: wetness, excess salt.
Poganeab				
PrD	Fair: frost action, large stones.	Unsuited	Unsuited	Poor: small stones.
Presa				
PrF, PrG	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Presa				
PSG*:				
Presa	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Rock outcrop.				
PYF*:				
Presa	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Cryaquolls.				
RaC	Poor: large stones, shrink-swell, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: large stones, area reclaim.
Raton				
RBE*:				
Raton	Poor: shrink-swell, slope, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: slope, large stones, area reclaim.
Stunner	Fair: low strength.	Unsuited	Unsuited	Poor: small stones.
RcG*.				
Rock outcrop				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RdG*:				
Rock outcrop.				
Badland.				
RPG*:				
Rock outcrop.				
Penitente	Fair: frost action, slope.	Unsuited	Unsuited	Poor: small stones, slope.
RRE*:				
Rock outcrop.				
Raton	Poor: large stones, shrink-swell, thin layer.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: slope, large stones, area reclaim.
RUG*:				
Rock outcrop.				
Ustorthents.				
RvC	Good	Poor: excess fines.	Unsuited	Poor: too sandy.
Royosa				
RWE*:				
Royosa	Good	Poor: excess fines.	Unsuited	Poor: too sandy.
Orthents.				
RYD*:				
Royosa	Good	Poor: excess fines.	Unsuited	Poor: too sandy.
Vibo	Fair: frost action, low strength, shrink-swell.	Poor: excess fines.	Unsuited	Fair: slope, too clayey.
SaG*:				
Sabe	Poor: slope.	Fair: excess fines, large stones.	Fair: excess fines, large stones.	Poor: small stones, slope, too sandy.
Mirand	Poor: low strength, shrink-swell, slope.	Unsuited	Unsuited	Poor: slope, too clayey.
SbD	Good	Poor: excess fines.	Fair: excess fines.	Poor: small stones.
Sedillo				
SDD*:				
Sedillo	Fair: slope.	Poor: excess fines.	Fair: excess fines.	Poor: slope, small stones.
Orthents.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SED*:				
Sedillo	Fair: slope.	Poor: excess fines.	Fair: excess fines.	Poor: slope, small stones.
Silva	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: thin layer.
SgC*:				
Servilleta	Poor: low strength, thin layer.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: thin layer.
Prieta	Poor: thin layer, low strength, area reclaim.	Unsuited	Unsuited	Poor: large stones, small stones, area reclaim.
ShB Shawa	Fair: low strength, frost action.	Unsuited	Unsuited	Fair: too clayey.
SmB, SmD Silver	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: thin layer.
SSC*:				
Silva	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: thin layer.
Sedillo	Good	Poor: excess fines.	Fair: excess fines.	Poor: small stones.
StC Stunner	Fair: low strength.	Unsuited	Unsuited	Poor: small stones.
SUC*:				
Stunner	Fair: low strength.	Unsuited	Unsuited	Fair: thin layer.
Luhon	Fair: low strength.	Unsuited	Unsuited	Poor: small stones.
SVC*:				
Stunner	Fair: low strength.	Unsuited	Unsuited	Poor: small stones.
Travelers	Poor: thin layer.	Unsuited	Unsuited	Poor: large stones, small stones.
Luhon	Fair: low strength.	Unsuited	Unsuited	Poor: small stones.
TeB, TeC Tenorio	Good	Good	Good	Fair: thin layer.
TrF Trampas	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
TsE Trampas	Fair: slope, area reclaim.	Unsuited	Unsuited	Poor: slope, small stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
TTF*:				
Trampas	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
Diamante	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
TVC				
Travelers	Poor: thin layer.	Unsuited	Unsuited	Poor: large stones, small stones.
UTG*:				
Ustorthents.				
Trampas	Poor: slope.	Unsuited	Unsuited	Poor: slope, small stones.
VbD				
Vibo	Fair: frost action, low strength, shrink-swell.	Poor: excess fines.	Unsuited	Fair: too clayey.
WEF*:				
Wellsville	Fair: slope, shrink-swell, low strength.	Unsuited	Unsuited	Poor: small stones, slope.
Ess	Poor: slope.	Unsuited	Unsuited	Poor: small stones, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
AMF*:						
Amalia	Seepage, slope.	Seepage	No water	Slope	Droughty, slope.	Slope, small stones.
Manzano	Slope	Low strength	No water	Complex slope, percs slowly.	Complex slope	Favorable.
ATC*:						
Antonito	Depth to rock	Low strength, piping, thin layer.	No water	Depth to rock	Rooting depth, droughty, erodes easily.	Depth to rock.
Travelers	Depth to rock, slope.	Thin layer, large stones, piping.	No water			Slope, large stones, depth to rock.
CaB---- Caruso	Favorable	Low strength	Favorable	Floods, wetness.	Floods	Floods.
CHG*:						
Chimayo	Slope, depth to rock.	Thin layer, large stones.	No water	Depth to rock, slope.	Droughty, rooting depth, slope.	Slope, depth to rock.
Rock outcrop.						
CRG*:						
Cryoboralfs.						
Rock outcrop.						
CSC*. Cryoborolls.						
CTC*:						
Cryoborolls.						
Cryaquolls.						
CUB*. Cumulic Haplaquolls.						
CYB*. Cumulic Haploborolls.						
DeF---- Derecho	Slope	Low strength	No water	Slope	Droughty, slope.	Slope, small stones.
DeG*:						
Derecho	Slope	Low strength	No water	Slope	Droughty, slope.	Slope, small stones.
Rock outcrop.						
DFG*:						
Devisadero	Slope, depth to rock.	Thin layer, low strength.	No water			Slope, small stones, depth to rock.
Rock outcrop.						

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
DmF---------- Diamante	Slope----------	Piping---------	No water-------			Slope, small stones.
EGG*: Eutroboralfs.						
Glossoboralfs.						
Rock outcrop.						
FaC, FbC---------- Fernando	Slope----------	Low strength, piping.	No water-------	Slope, percs slowly.	Erodes easily, slope.	Erodes easily, piping.
FeB---------- Fernando	Slope----------	Low strength, piping.	No water-------	Not needed-----	Erodes easily, slope.	Erodes easily, piping.
FeC, FfC---------- Fernando	Slope----------	Low strength, piping.	No water-------	Slope, percs slowly.	Erodes easily, slope.	Erodes easily, piping.
FHB*: Fernando---------	Slope----------	Low strength, piping.	No water-------	Slope----------	Erodes easily, slope.	Erodes easily, piping.
Hernandez--------	Seepage, slope.	Low strength---	No water-------	Slope----------	Erodes easily, soil blowing, slope.	Favorable.
FLB*. Fluvents.						
HaB---------- Hernandez	Seepage, slope.	Low strength---	No water-------	Slope----------	Erodes easily, soil blowing, slope.	Favorable.
HKC*: Hernandez--------	Seepage, slope.	Low strength---	No water-------	Slope----------	Erodes easily, soil blowing, slope.	Favorable.
Kim----------	Seepage, slope.	Piping, low strength.	No water-------	Slope----------	Slope----------	Slope, piping.
HPC*: Hernandez--------	Seepage, slope.	Low strength---	No water-------	Slope----------	Erodes easily, soil blowing, slope.	Favorable.
Petaca----------	Depth to rock	Depth to rock	No water-------			Depth to rock, slope.
HSC*: Hernandez--------	Seepage, slope.	Low strength---	No water-------	Slope----------	Erodes easily, soil blowing, slope.	Favorable.
Silva----------	Slope----------	Low strength---	No water-------	Percs slowly, slope.	Percs slowly, slope.	Percs slowly.
JaD*: Jaroso----------	Slope----------	Low strength, piping.	No water-------	Slope----------	Droughty, slope.	Slope, small stones.
Angostura--------	Slope----------	Large stones, piping.	No water-------	Slope----------	Droughty, slope.	Slope, large stones.
JaF*, JaG*: Jaroso----------	Slope----------	Low strength, piping.	No water-------	Slope----------	Droughty, slope.	Slope, small stones.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
JaF*, JaG*:						
Angostura	Slope	Large stones, piping.	No water	Slope	Droughty, slope.	Slope, large stones.
Mascarenas	Slope	Favorable	No water	Slope	Droughty, slope.	Slope, small stones.
JRG*:						
Jaroso	Slope	Low strength, piping.	No water	Slope	Droughty, slope.	Slope, small stones.
Angostura	Slope	Large stones, piping.	No water	Slope	Droughty, slope.	Slope, large stones.
Rock outcrop.						
LaE Lama	Slope	Low strength, hard to pack.	No water			Erodes easily, percs slowly, slope.
LoB Loveland	Seepage	Piping, low strength.	Favorable	Floods, wetness.	Wetness, floods.	Wetness.
LtC*:						
Luhon	Slope, seepage.	Piping, low strength, hard to pack.	No water	Slope, excess salts, percs slowly.	Slope, excess sodium, excess salts.	Percs slowly.
Travelers	Depth to rock, slope.	Thin layer, large stones, piping.	No water			Slope, large stones, depth to rock.
MaF Maes	Slope	Low strength, large stones.	No water	Slope	Droughty, slope.	Slope, small stones.
MeD*, MeF*, MeG*:						
Maes	Slope	Low strength, large stones.	No water	Slope	Droughty. slope.	Slope, small stones.
Etoe	Slope	Piping	No water	Slope	Droughty, slope.	Piping, slope, small stones.
MFG*:						
Maes	Slope	Low strength, large stones.	No water	Slope	Droughty, slope.	Slope, small stones.
Etoe	Slope	Piping	No water	Slope	Droughty, slope.	Piping, slope, small stones.
Rock outcrop.						
MNC Manzano	Slope	Low strength	No water	Complex slope, percs slowly.	Complex slope, percs slowly.	Favorable.
MnA Manzano	Favorable	Low strength	No water	Complex slope, percs slowly.	Complex slope, percs slowly.	Favorable.
MnB, MnC Manzano	Slope	Low strength	No water	Complex slope, percs slowly.	Complex slope, percs slowly.	Favorable.
MrD, MrF, MrG Marosa	Slope	Favorable	No water	Slope	Droughty, slope.	Slope, small stones.
MSG*, MSG2*:						
Marosa	Slope	Favorable	No water	Slope	Droughty, slope.	Slope, small stones.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
MSG*, MSG2*: Rock outcrop.						
MTE*: Marosa	Slope	Favorable	No water	Slope	Droughty, slope.	Slope, small stones.
MTE*: Nambe	Seepage, slope.	Large stones, piping.	No water	Slope	Large stones, droughty, slope.	Slope, large stones.
MUG*: Mirabal	Depth to rock, seepage, slope.	Thin layer, seepage, piping.	No water	Slope, depth to rock.	Droughty, rooting depth, slope.	Depth to rock, slope.
Rock outcrop.						
MwD---- Mirand	Slope	Hard to pack, low strength.	No water	Percs slowly, slope.	Erodes easily, percs slowly, slope.	Erodes easily, percs slowly, slope.
MxD---- Montecito	Slope	Low strength, hard to pack.	No water	Percs slowly, slope.	Slope, slow intake, soil blowing.	Erodes easily, percs slowly, slope.
MxE*: Montecito	Slope, seepage.	Low strength, hard to pack.	No water	Percs slowly, slope.	Slope, slow intake, soil blowing.	Erodes easily, percs slowly, slope.
Rock outcrop.						
NaD---- Nambe	Seepage, slope.	Large stones, piping.	No water	Slope	Large stones, droughty, slope.	Large stones.
NaF, NaF2, NaG, NaG2---- Nambe	Seepage, slope.	Large stones, piping.	No water	Slope	Large stones, droughty, slope.	Slope, large stones.
NRG*, NRG2*: Nambe	Seepage, slope.	Large stones, piping.	No water	Slope	Large stones, droughty, slope.	Slope, large stones.
Rock outcrop.						
OeF---- Orejas	Depth to rock, slope.	Depth to rock, large stones.	No water			Depth to rock, large stones, slope.
OMD*: Orejas	Depth to rock, slope.	Depth to rock, large stones.	No water			Depth to rock, large stones, slope.
Montecito	Slope	Low strength, hard to pack.	No water	Percs slowly, slope.	Slope, slow intake, soil blowing.	Erodes easily, percs slowly, slope.
ORG*: Orthents.						
Badland.						

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
OSG*: Orthents.						
Calciorthids.						
OTG*: Orthents.						
Rock outcrop.						
PAG*: Paleboralfs.						
Cryochrepts.						
Rock outcrop.						
PbD, PbF---- Penitente	Seepage, slope.	Large stones, seepage.	No water----	Slope----	Droughty, slope.	Small stones, slope.
PeD---- Petaca	Depth to rock, slope.	Depth to rock	No water----			Depth to rock, slope.
PfC*: Petaca----	Depth to rock	Depth to rock	No water----			Depth to rock, slope.
Prieta----	Depth to rock, slope.	Thin layer, large stones, piping.	No water----	Depth to rock--	Droughty, rooting depth.	Depth to rock, large stones, piping.
PGC*: Petaca----	Depth to rock	Depth to rock	No water----			Depth to rock, slope.
Silva----	Slope----	Low strength---	No water----	Percs slowly, slope.	Percs slowly, slope.	Percs slowly.
Prieta----	Depth to rock, slope.	Thin layer, large stones, piping.	No water----	Depth to rock--	Droughty, rooting depth.	Depth to rock, large stones, piping.
PoB---- Poganeab	Favorable----	Low strength---	Favorable----	Percs slowly, excess salts, poor outlets.	Percs slowly, excess salts, wetness.	Wetness, poor outlets, percs slowly.
PrD, PrF, PrG---- Presa	Slope, seepage.	Favorable----	No water----	Slope----	Droughty, slope.	Slope, small stones.
PSG*: Presa----	Slope, seepage.	Favorable----	No water----	Slope----	Droughty, slope.	Slope, small stones.
Rock outcrop.						
PYF*: Presa----	Slope, seepage.	Favorable----	No water----	Slope----	Droughty, slope.	Slope, small stones.
Cryaquolls.						
RaC---- Raton	Slope, depth to rock.	Large stones, thin layer.	No water----	Slope, depth to rock.	Large stones, droughty, rooting depth.	Depth to rock, slope, large stones.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
RBE*:						
Raton	Slope, depth to rock.	Large stones, thin layer.	No water	Slope, depth to rock.	Large stones, droughty, rooting depth.	Depth to rock, slope, large stones.
Stunner	Slope, seepage.	Low strength, piping.	No water	Favorable	Small stones	Slope, piping.
RcG*.						
Rock outcrop						
RdG*:						
Rock outcrop.						
Badland.						
RPG*:						
Rock outcrop.						
Penitente	Seepage, slope.	Large stones, seepage.	No water	Slope	Droughty, slope.	Small stones, slope.
RRE*:						
Rock outcrop.						
Raton	Slope, depth to rock.	Large stones, thin layer.	No water	Slope, depth to rock.	Large stones, droughty, rooting depth.	Depth to rock, slope, large stones.
RUG*:						
Rock outcrop.						
Ustorthents.						
RvC Royosa	Seepage, slope.	Piping, seepage.	No water	Favorable	Droughty, fast intake, soil blowing.	Complex slope, soil blowing.
RWE*:						
Royosa	Seepage, slope.	Piping, seepage.	No water	Favorable	Droughty, fast intake, soil blowing.	Complex slope, soil blowing.
Orthents.						
RYD*:						
Royosa	Seepage, slope.	Piping, seepage.	No water	Favorable	Droughty, fast intake, soil blowing.	Complex slope, soil blowing.
Vibo	Seepage, slope.	Low strength, piping.	No water	Slope	Erodes easily, slope, soil blowing.	Erodes easily, slope.
SaG*:						
Sabe	Seepage, slope.	Large stones, seepage.	No water	Slope	Droughty, slope.	Large stones, slope, too sandy.
Mirand	Slope	Hard to pack, low strength.	No water	Percs slowly, slope.	Erodes easily, percs slowly, slope.	Erodes easily, percs slowly, slope.
SbD Sedillo	Slope, seepage.	Seepage	No water	Slope	Droughty, slope.	Slope, small stones.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
SDD*: Sedillo	Slope, seepage.	Seepage	No water	Slope	Droughty, slope.	Slope, small stones.
Orthents.						
SED*: Sedillo	Slope, seepage.	Seepage	No water	Slope	Droughty, slope.	Slope, small stones.
Silva	Slope	Low strength	No water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly.
SgC*: Servilleta	Depth to rock	Low strength, depth to rock.	No water	Depth to rock, percs slowly.	Percs slowly, rooting depth, slow intake.	Depth to rock, percs slowly.
Prieta	Depth to rock, slope.	Thin layer, large stones, piping.	No water	Depth to rock	Droughty, rooting depth.	Depth to rock, large stones, piping.
ShB--- Shawa	Seepage	Low strength, piping.	Deep to water	Slope, poor outlets.	Slope	Piping.
SmB--- Silva	Favorable	Low strength	No water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly.
SmD--- Silva	Slope	Low strength	No water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly.
SSC*: Silva	Slope	Low strength	No water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly.
Sedillo	Slope, seepage.	Seepage	No water	Slope	Droughty, slope.	Slope, small stones.
StC--- Stunner	Slope, seepage.	Low strength, piping.	No water	Slope	Small stones	Slope, piping.
SUC*: Stunner	Slope, seepage.	Low strength, piping.	No water	Slope	Slope	Slope, piping.
Luhon	Slope, seepage.	Piping, low strength, hard to pack.	No water	Slope, excess salts, percs slowly.	Slope, excess sodium, excess salts.	Percs slowly.
SVC*: Stunner	Slope, seepage.	Low strength, piping.	No water	Favorable	Small stones	Slope, piping.
Travelers	Depth to rock, slope.	Thin layer, large stones, piping.	No water			Slope, large stones, depth to rock.
Luhon	Slope, seepage.	Piping, low strength, hard to pack.	No water	Slope, excess salts, percs slowly.	Slope, excess sodium, excess salts.	Percs slowly.
TeB--- Tenorio	Seepage	Seepage	No water	Favorable	Droughty, seepage.	Favorable.
TeC--- Tenorio	Seepage	Seepage	No water	Favorable	Droughty, seepage.	Favorable.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
TrF, TsE---------- Trampas	Slope, seepage.	Piping, low strength.	No water--------	Slope----------	Droughty, slope.	Slope, small stones.
TTF*: Trampas----------	Slope, seepage.	Piping, low strength.	No water--------	Slope----------	Droughty, slope.	Slope, small stones.
Diamante---------	Slope----------	Piping---------	No water--------			Slope, small stones.
TVC---------- Travelers	Depth to rock	Thin layer, large stones, piping.	No water--------			Large stones, depth to rock.
UTG*: Ustorthents.						
Trampas----------	Slope, seepage.	Piping, low strength.	No water--------	Slope----------	Droughty, slope.	Slope, small stones.
VbD---------- Vibo	Seepage, slope.	Low strength, piping.	No water--------	Slope----------	Erodes easily, slope, soil blowing.	Erodes easily, slope.
WEF*: Wellsville-------	Seepage, slope.	Low strength---	No water--------			Piping, slope.
Ess----------	Slope, seepage.	Low strength, large stones.	No water--------			Piping, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AMF*:											
Amalia	0-3	Very gravelly loam.	GM-GC, GC	A-1, A-2	0	40-50	35-45	30-45	20-35	25-35	5-15
	3-17	Very gravelly clay loam.	GC	A-2	0	30-45	25-40	20-40	10-30	25-35	10-15
	17-60	Very gravelly sandy loam.	GW-GM, GP-GM	A-1	0	20-35	15-30	10-20	5-10	20-25	NP-5
Manzano	0-10	Clay loam	CL	A-6	0	100	100	90-100	75-85	30-40	10-15
	10-60	Clay loam	CL-ML, CL	A-4, A-6	0	100	100	85-100	60-85	25-40	5-15
ATC*:											
Antonito	0-3	Loam	ML, CL-ML, CL	A-4	0	100	100	85-95	60-85	25-35	5-10
	3-16	Clay loam	ML, CL	A-6	0	100	100	90-100	70-85	35-40	10-15
	16-25	Loam	ML, CL-ML	A-4	0	100	100	85-95	60-75	25-35	5-10
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Travelers	0-13	Very stony loam	GM, ML	A-1, A-2, A-4	25-60	25-85	25-85	25-65	20-55	20-35	NP-5
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CaB	0-14	Silty clay loam	CL	A-6	0	100	100	95-100	75-85	30-40	10-20
Caruso	14-65	Clay loam, very fine sandy loam	CL, CL-ML	A-4, A-6	0	100	100	95-100	65-85	25-45	5-20
CHG*:											
Chimayo	0-5	Stony sandy loam	SM	A-2	25-50	60-75	55-70	50-65	25-35	---	NP
	5-15	Very stony loam, very stony sandy loam.	SM	A-2	50-65	60-75	55-70	50-65	25-35	---	NP
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
CRG*:											
Cryoboralfs.											
Rock outcrop.											
CSC*.											
Cryoborolls											
CTC*:											
Cryoborolls.											
Cryaquolls.											
CUB*.											
Cumulic Haplaquolls											
CYB*.											
Cumulic Haploborolls											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
DeF---------- Derecho	0-12	Cobbly loam-----	GM-GC, GC, CL-ML, CL	A-2, A-4, A-6	0-25	55-75	50-70	40-70	20-55	25-35	5-15
	12-51	Very cobbly clay loam, extremely cobbly clay, extremely stony clay.	GC	A-7, A-2,	30-75	35-55	30-50	30-50	25-45	40-55	15-30
	51-60	Extremely stony sandy clay loam	GC	A-2	45-75	30-50	25-45	20-45	10-35	25-40	10-15
DeG*:											
Derecho----------	0-17	Cobbly loam-----	GM-GC, GC, CL-ML, CL	A-2, A-4, A-6	10-55	55-75	50-70	40-70	20-55	25-35	5-15
	17-60	Very cobbly sandy clay.	GC	A-7, A-2	30-75	35-55	30-50	30-50	25-45	40-55	15-30
Rock outcrop.											
DFG*:											
Devisadero--------	0-3	Gravelly loam---	SM-SC, SC	A-2, A-4	0-10	70-90	55-70	45-65	30-50	25-30	5-10
	3-13	Gravelly clay, very gravelly clay.	GC, CL, CH	A-7	0-20	60-80	55-80	50-80	45-75	45-60	20-40
	13-30	Very gravelly sandy loam.	SM, GM	A-1	0-20	40-60	30-50	20-40	10-20	20-30	NP-5
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
DmF---------- Diamante	0-2	Extremely gravelly loam.	GM	A-1, A-2, A-4	15-30	30-55	25-50	20-50	15-40	20-30	NP-5
	2-31	Extremely gravelly sandy loam.	GP-GM, GM	A-1	15-45	20-50	15-45	10-30	5-15	---	NP
	31-60	Very gravelly sandy clay, extremely gravelly sandy clay.	GC	A-2-7	15-45	25-40	20-35	15-35	10-30	40-55	15-30
EGG*:											
Eutroboralfs.											
Glossoboralfs.											
Rock outcrop.											
FaC---------- Fernando	0-3	Cobbly loam-----	ML, CL-ML	A-4	20-50	95-100	90-100	80-95	55-75	25-35	5-10
	3-23	Loam, clay loam	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	60-80	25-40	5-15
	23-60	Loam----------	ML, CL-ML	A-4	0	100	95-100	90-100	60-80	25-35	5-10
FbC---------- Fernando	0-2	Silt loam-------	ML, CL-ML	A-4	0	100	100	85-100	60-80	25-35	5-10
	2-36	Silt loam, clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	60-80	25-40	5-15
	36-60	Clay loam, loam	ML, CL-ML	A-4	0	100	95-100	90-100	60-80	25-35	5-10
FeB---------- Fernando	0-6	Clay loam-------	ML, CL-ML	A-4	0	100	100	85-100	60-80	25-35	5-10
	6-29	Silty clay loam	CL-ML, CL	A-4, A-6	0	95-100	100	90-100	60-80	25-40	5-15
	29-60	Silt loam-------	ML, CL-ML	A-4	0	95-100	100	90-100	60-80	25-35	5-10

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
FeC---------- Fernando	0-7	Clay loam-------	ML, CL-ML	A-4	0	100	100	85-100	60-80	25-35	5-10
	7-25	Silty clay loam-	CL-ML, CL	A-4, A-6	0	95-100	100	90-100	60-80	25-40	5-15
	25-60	Silt loam-------	ML, CL-ML	A-4	0	95-100	100	90-100	60-80	25-35	5-10
FfC---------- Fernando	0-5	Clay loam-------	ML, CL-ML	A-4	0	100	100	85-100	60-80	25-35	5-10
	5-19	Silty clay loam-	CL-ML, CL	A-4, A-6	0	95-100	100	90-100	60-80	25-40	5-15
	19-60	Silt loam-------	ML, CL-ML	A-4	0	95-100	100	90-100	60-80	25-35	5-10
FHB*:											
Fernando----------	0-2	Clay loam-------	ML, CL-ML	A-4	0	100	100	85-100	60-80	25-35	5-10
	2-27	Silty clay loam-	CL-ML, CL	A-4, A-6	0	95-100	100	90-100	60-80	25-40	5-15
	27-60	Silt loam-------	ML, CL-ML	A-4	0	95-100	100	90-100	60-80	25-35	5-10
Hernandez----------	0-4	Loam------------	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	4-14	Clay loam-------	CL	A-4, A-6	0	80-100	80-100	70-100	55-80	25-40	5-15
	14-60	Clay loam-------	SM-SC, SC	A-4, A-6	0-15	65-95	60-90	50-90	35-50	25-40	5-15
FLB*. Fluvents											
HaB---------- Hernandez	0-10	Gravelly loam---	SM-SC, CL-ML	A-4	0	75-85	70-75	60-75	45-60	20-35	5-10
	10-15	Clay loam-------	CL	A-4, A-6	0	80-100	80-100	70-100	55-80	25-40	5-15
	15-60	Gravelly sandy clay loam.	SM-SC, SC	A-4, A-6	0-15	65-95	60-90	50-90	35-50	25-40	5-15
HKC*:											
Hernandez----------	0-4	Loam------------	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	4-14	Clay loam-------	CL	A-4, A-6	0	80-100	80-100	70-100	60-80	25-40	5-15
	14-60	Clay loam-------	SM-SC, SC	A-2, A-4, A-6	0-15	65-95	60-90	50-90	35-50	25-40	5-15
Kim----------	0-12	Loam------------	ML, SM	A-4, A-2	0-5	80-100	75-100	70-90	30-75	20-25	NP-5
	12-60	Loam------------	CL, CL-ML	A-4, A-6	0-5	80-100	75-100	70-95	60-75	25-40	5-15
HPC*:											
Hernandez----------	0-4	Loam------------	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	4-60	Clay loam-------	CL	A-4, A-6	0	80-100	80-100	70-100	60-80	25-40	5-15
Petaca----------	0-2	Stony loam------	SM, ML	A-4	60-70	75-85	70-80	60-75	45-60	20-30	NP-5
	2-15	Stony loam------	ML	A-6	25-35	90-100	85-95	80-95	60-75	20-30	NP-5
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
HSC*:											
Hernandez----------	0-10	Gravelly loam, loam.	SM-SC, CL-ML	A-4	0	75-90	70-85	60-75	45-60	20-35	5-10
	10-15	Clay loam-------	CL-ML, CL	A-4, A-6	0	80-100	80-100	70-100	60-80	25-40	5-15
	15-60	Very gravelly sandy clay loam	SM-SC, SC	A-2, A-4, A-6	0-15	45-55	40-50	40-50	20-40	25-40	5-15
Silva----------	0-2	Loam------------	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	2-32	Clay loam-------	CL	A-6, A-7	0	80-100	75-100	70-100	65-90	35-50	15-25
	32-60	Loam, very gravelly sandy loam.	SM-ML	A-4	0	55-100	50-100	50-100	35-85	15-30	NP-5

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
JaD*:											
Jaroso	0-16	Cobbly loam	SM, ML	A-2, A-4	25-40	75-95	70-90	45-85	25-65	20-30	NP-5
	16-41	Cobbly clay loam, cobbly clay.	GC, CL, CH	A-2, A-6, A-7	15-50	55-75	50-65	40-60	30-55	35-55	15-30
	41-60	Very cobbly sandy clay.	GC	A-2	15-50	35-55	30-50	25-50	15-35	35-55	15-30
Angostura	0-10	Cobbly loam	ML, SM	A-2, A-4	15-40	80-100	75-95	50-85	25-65	20-30	NP-5
	10-60	Very cobbly sandy clay loam	SC	A-2, A-6	15-40	65-90	50-85	35-80	20-50	25-30	10-15
JaF*:											
Jaroso	0-16	Cobbly loam	SM, ML	A-2, A-4	25-40	75-90	70-85	45-80	25-60	20-30	NP-5
	16-41	Gravelly clay loam, very gravelly clay.	GC, CL, CH	A-2, A-6, A-7	15-50	55-75	50-65	40-60	30-55	35-55	15-30
	41-60	Extremely cobbly clay, extremely cobbly sandy clay.	GC	A-2, A-6, A-7	15-50	20-55	15-50	15-50	10-45	35-55	15-30
Angostura	0-10	Cobbly loam	ML, SM	A-2, A-4	15-40	80-100	75-95	50-85	25-65	20-30	NP-5
	10-60	Very cobbly sandy clay loam	SC	A-2, A-6	15-40	65-90	50-85	35-80	20-50	25-30	10-15
Mascarenas	0-4	Cobbly sandy loam.	GM, SM	A-1	10-25	30-75	25-70	20-45	15-25	---	NP
	4-30	Gravelly loam	GM	A-1, A-2, A-4	10-20	40-60	35-70	20-50	10-40	25-35	NP-10
	30-58	Extremely gravelly sandy clay.	GC	A-2, A-7	25-60	35-60	30-55	25-55	15-50	40-55	15-30
	58-70	Extremely stony sandy clay loam	GM-GC, GC	A-2	50-75	25-60	20-55	15-50	10-30	25-40	5-15
JaG*:											
Jaroso	0-16	Cobbly loam	SM, ML	A-2, A-4	25-40	75-95	70-90	45-85	25-65	20-30	NP-5
	16-41	Cobbly clay loam, cobbly clay.	GC, CL, CH	A-2, A-6, A-7	15-50	55-75	50-65	40-60	30-55	35-55	15-30
	41-60	Very cobbly clay, very cobbly sandy clay.	GC	A-2, A-6, A-7	15-50	35-55	30-50	25-50	15-45	35-55	15-30
Angostura	0-6	Cobbly loam	ML, SM	A-2, A-4	15-40	80-100	75-95	50-85	25-65	20-30	NP-5
	6-20	Cobbly loam, very cobbly sandy clay loam.	SC	A-2, A-6	15-40	65-90	50-85	35-80	20-50	25-30	10-15
	20-60	Very stony sandy clay loam.	GC, SC	A-2, A-6	40-80	45-95	35-90	25-80	15-50	25-30	10-15
Mascarenas	0-4	Cobbly sandy loam.	GM, SM	A-1	10-25	30-75	25-70	20-45	15-25	---	NP
	4-30	Gravelly loam	GM	A-1, A-2, A-4	10-20	40-60	35-55	20-50	10-40	25-35	NP-10
	30-58	Stony sandy clay.	GC	A-2, A-7	25-60	35-60	30-55	25-55	15-50	40-55	15-30
	58-70	Stony sandy clay loam.	GM-GC, GC	A-2	50-75	25-60	20-55	15-50	10-30	25-40	5-15

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
JRG*:											
Jaroso	0-16	Cobbly loam	SM, ML	A-2, A-4	25-40	75-95	70-90	45-85	25-65	20-30	NP-5
	16-41	Cobbly clay loam, cobbly clay.	GC, CL, CH	A-2, A-6, A-7	15-50	55-75	50-65	40-60	30-55	35-55	15-30
	41-60	Very cobbly clay, very cobbly sandy clay.	GC	A-2, A-6, A-7	15-50	35-55	30-50	25-50	15-45	35-55	15-30
Angostura	0-10	Cobbly loam	ML, SM	A-2, A-4	15-40	80-100	75-95	50-85	25-65	20-30	NP-5
	10-60	Very cobbly sandy clay loam	SC	A-2, A-6	15-40	65-90	50-85	35-80	20-50	25-30	10-15
Rock outcrop.											
LaE	0-7	Loam	CL-ML, CL	A-4, A-6	0	90-100	85-100	75-95	55-75	25-35	5-15
Lama	7-30	Clay loam, gravelly clay.	CL, CH	A-7	0	70-100	65-100	60-90	50-85	40-55	15-30
	30-41	Very cobbly sandy clay.	GC, SC	A-2	15-30	40-60	35-55	30-50	20-35	40-50	15-25
	41-48	Extremely gravelly sandy clay loam.	GW-GC, GC, GM-GC	A-1, A-2	15-30	25-50	20-45	15-40	10-25	25-35	5-15
	48-60	Extremely gravelly loamy sand.	GW, GW-GM, GM, GP-GM	A-1	15-30	20-50	15-45	10-35	0-15	---	NP
LoB	0-9	Clay loam, loam	CL, CL-ML	A-4, A-6	0-5	90-100	80-100	80-90	50-80	25-40	5-20
Loveland	9-21	Loam	CL	A-6	0-5	90-100	85-100	80-90	65-80	25-40	10-20
	21-60	Very gravelly sand.	GP, SP	A-1	0-10	40-80	30-70	10-40	0-5	---	NP
LtC*:											
Luhon	0-12	Loam	ML	A-4	0-5	80-100	80-100	65-95	50-80	15-25	NP-5
	12-60	Loam, clay loam	ML	A-4	0-10	80-100	75-95	60-90	50-75	25-35	NP-10
Travelers	0-13	Very stony loam	GM, ML	A-1, A-2, A-4	25-75	25-85	25-85	25-65	20-55	20-35	NP-5
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MaF	0-2	Cobbly loam	SM, ML	A-4	15-25	85-95	80-90	60-85	35-65	20-30	NP-5
Maes	2-20	Cobbly sandy loam.	SM, ML	A-2, A-4	20-55	60-95	55-90	40-85	25-65	20-30	NP-5
	20-60	Very cobbly sandy clay.	SC	A-2, A-6, A-7	20-65	65-90	60-85	55-80	25-50	30-45	10-20
MeD*, MeG*:											
Maes	0-2	Cobbly loam	SM, ML	A-4	15-25	85-95	80-90	60-85	35-65	20-30	NP-5
	2-20	Cobbly sandy loam.	SM, ML	A-2, A-4	20-55	60-95	55-90	40-85	25-65	20-30	NP-5
	20-60	Very cobbly sandy clay.	SC	A-2, A-6, A-7	20-65	65-90	60-85	50-80	25-50	30-45	10-20
Etoe	0-26	Cobbly loam	SM, GM	A-2, A-4	15-50	70-100	65-100	55-75	30-45	20-30	NP-5
	26-60	Very cobbly sandy clay loam.	GC, SC, GM-GC, SM-SC	A-1, A-2	30-85	35-70	30-65	25-60	15-25	20-35	5-15

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MeF*:											
Maes	0-2	Cobbly loam	SM, ML	A-4	15-25	85-95	80-90	60-85	35-65	20-30	NP-5
	2-16	Very cobbly sandy loam.	SM, ML	A-2, A-4	20-45	75-95	70-90	45-85	25-65	20-30	NP-5
	16-67	Very cobbly sandy clay.	SC	A-2, A-6, A-7	25-65	65-90	60-85	50-80	25-50	30-45	10-20
Etoe	0-27	Cobbly loam	SM, GM	A-2, A-4	15-50	70-100	65-100	55-75	30-45	20-30	NP-5
	27-60	Very cobbly sandy clay loam, extremely cobbly sandy clay loam.	GC, GW-GC, GP-GC	A-1, A-2	30-85	35-70	30-60	25-60	15-25	20-35	5-15
MFG*:											
Maes	0-2	Cobbly loam	SM, ML	A-4	15-25	85-95	80-90	60-85	35-65	20-30	NP-5
	2-20	Cobbly sandy loam.	SM, ML	A-2, A-4	20-45	75-95	70-90	45-85	25-65	20-30	NP-5
	20-60	Very cobbly sandy clay.	SC, CL	A-2, A-6, A-7	20-65	65-90	60-85	50-80	25-50	30-45	10-20
Etoe	0-26	Cobbly loam	SM, GM	A-2, A-4	15-50	70-100	65-100	55-75	30-45	20-30	NP-5
	26-60	Very cobbly sandy clay loam.	GC, SC, GM-GC, SM-SC	A-1, A-2	30-85	35-70	30-65	25-60	15-25	20-35	5-15
Rock outcrop.											
MNC, MnB, MnC----- Manzano	0-10	Clay loam	CL	A-6	0	100	100	90-100	75-85	30-40	10-15
	10-60	Loam, clay loam, sandy clay loam	CL-ML, CL	A-4, A-6	0	100	100	85-100	60-85	25-40	5-15
MnA----- Manzano	0-11	Clay loam	CL	A-6	0	100	100	90-100	75-85	30-40	10-15
	11-60	Clay loam	CL-ML, CL	A-4, A-6	0	100	100	85-100	60-85	25-40	5-15
MrD, MrF----- Marosa	0-3	Cobbly sandy loam.	GM, SM	A-1	15-35	55-85	45-80	30-55	15-25	---	NP
	3-34	Very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	15-35	30-60	25-55	15-40	5-20	---	NP
	34-44	Very cobbly sandy clay loam	GM-GC, GC	A-2	25-55	25-60	20-55	20-45	10-25	25-35	5-15
	44-72	Extremely gravelly sandy clay loam, extremely cobbly sandy clay loam.	GP-GC	A-2	50-70	20-35	15-30	10-25	5-10	25-35	5-15
MrG----- Marosa	0-3	Cobbly sandy loam.	GM, SM	A-1	15-35	55-85	45-80	30-55	15-25	---	NP
	3-16	Extremely gravelly loamy sand.	GP-GM, GM SP-SM, SM	A-1	15-35	30-60	25-55	15-40	5-20	---	NP
	16-34	Extremely gravelly sandy loam.	GM	A-1, A-2 A-4	15-35	30-60	25-55	15-50	10-30	20-30	NP-5
	34-44	Extremely gravelly sandy clay loam.	GM-GC, GC	A-2	25-55	25-60	20-55	20-45	10-25	25-35	5-15
	44-72	Extremely gravelly sandy clay loam, extremely cobbly sandy clay loam.	GP-GC, GC, GM-GC	A-2	50-70	20-35	15-30	10-25	5-10	25-35	5-15

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MSG*:											
Marosa	0-3	Cobbly sandy loam.	GM, SM	A-1	15-35	55-85	45-80	30-55	15-25	---	NP
	3-34	Very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	15-35	30-60	25-55	15-40	5-20	---	NP
	34-44	Very cobbly sandy clay loam	GM-GC, GC	A-2	25-55	25-60	20-55	20-45	10-25	25-35	5-15
	44-72	Very gravelly sandy clay loam, very cobbly sandy clay loam.	GP-GC	A-2	50-70	20-35	15-30	10-25	5-10	25-35	5-15
Rock outcrop.											
MSG2*:											
Marosa	0-2	Cobbly sandy loam.	GM, SM	A-1	15-35	55-85	45-80	30-55	15-25	---	NP
	2-12	Very gravelly loamy sand.	GP-GM, GM, SP-SM, SM	A-1	15-35	30-60	25-55	15-40	5-20	---	NP
	12-22	Very cobbly sandy clay loam	GM-GC, GC	A-2	25-55	25-60	20-55	20-45	10-25	25-35	5-15
	22-60	Very gravelly sandy clay loam, very cobbly sandy clay loam.	GP-GC	A-2	50-70	20-35	15-30	10-25	5-10	25-35	5-15
Rock outcrop.											
MTE*:											
Marosa	0-26	Gravelly sandy loam.	GM, SM	A-1	15-35	55-85	45-80	30-55	15-25	---	NP
	26-44	Very gravelly clay loam.	GC	A-2	25-55	25-60	20-55	20-50	10-35	25-35	10-20
Nambe	0-15	Gravelly sandy loam.	SM	A-1, A-2	0-10	70-80	60-70	40-50	15-35	---	NP
	15-49	Cobbly sandy loam.	SM	A-2, A-4, A-1	40-85	75-85	65-75	40-50	15-40	30-40	5-10
	49-60	Very cobbly sandy loam.	SM	A-1, A-2	40-85	75-85	65-75	40-50	15-35	---	NP
MUG*:											
Mirabal	0-32	Stony loam, very stony sandy loam.	SM	A-1, A-2	30-80	65-90	50-70	25-40	15-30	---	NP
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
MwD	0-3	Cobbly loam	CL-ML, CL	A-4, A-6	0-35	90-100	85-100	75-100	55-80	25-40	5-20
Mirand	3-45	Clay, cobbly clay.	SC, CL, CH	A-7	0-30	80-95	75-90	65-90	35-85	40-55	20-30
	45-68	Sandy clay	SC, CL, CH	A-2, A-7	0-30	70-100	65-95	55-90	30-60	40-55	20-30

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MxD---------- Montecito	0-6	Loam----------	SM-SC, SM, CL-ML, ML	A-4	0	100	100	70-95	40-75	25-35	5-10
	6-30	Clay loam, gravelly clay loam.	CL, CH	A-6, A-7	0-10	85-100	80-100	75-100	60-95	35-55	15-30
	30-60	Very gravelly sandy loam, extremely gravelly sandy clay loam.	SM, SC, CL, SM-SC	A-2, A-4, A-6	20-40	40-95	35-90	30-70	15-60	20-40	NP-20
MxE*: Montecito---------	0-5	Loam----------	SM-SC, SM, CL-ML, ML	A-4	0	100	100	70-95	40-75	25-35	5-10
	5-35	Clay loam-------	CL, CH	A-6, A-7	0-10	85-100	80-100	75-100	60-95	35-55	15-30
	35-60	Gravelly loam---	SM, SC, CL, SM-SC	A-2, A-4, A-6	20-40	40-95	35-90	30-70	15-60	20-40	NP-20
Rock outcrop.											
NaD, NaG---------- Nambe	0-5	Cobbly loam-----	SM, SM-SC	A-4, A-2, A-1	25-40	50-80	40-70	35-55	15-50	25-35	5-10
	5-16	Very cobbly sandy loam.	SM	A-2, A-4, A-1	40-60	75-85	65-75	40-50	15-40	30-40	5-10
	16-60	Very stony sandy loam.	SM	A-1, A-2	40-85	75-85	65-75	40-50	15-35	---	NP
NaF2, NaG2--------- Nambe	0-24	Cobbly loam-----	SM, SM-SC	A-4, A-2, A-1	25-40	50-80	40-70	35-55	15-50	25-35	5-10
	24-60	Very stony sandy loam.	SM	A-1, A-2	40-60	75-85	65-75	40-50	15-35	---	NP
NaF----------	0-5	Cobbly loam-----	SM, SM-SC	A-4, A-2, A-1	25-40	50-80	40-70	35-55	15-50	25-35	5-10
	5-24	Very cobbly sandy clay loam, cobbly sandy clay loam	SC	A-1, A-2	25-40	50-80	40-70	35-55	15-50	25-35	5-15
	24-55	Very cobbly sandy loam.	SM	A-1, A-2	40-60	75-85	65-75	40-50	15-35	---	NP
	55-65	Extremely gravelly sandy loam.	GM, GP-GM	A-1	20-40	20-40	15-35	10-30	5-15	---	NP

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
NRG*:											
Nambe	0-5	Cobbly loam	SM, SM-SC	A-4, A-2, A-1	25-40	50-80	40-70	35-55	15-50	25-35	5-10
	5-16	Very cobbly sandy loam.	SM	A-2, A-4, A-1	40-60	75-85	65-75	40-50	15-40	30-40	5-10
	16-60	Very stony sandy loam, very cobbly sandy loam.	SM	A-1, A-2	40-85	75-85	65-75	40-50	15-35	---	NP
Rock outcrop.											
NRG2*:											
Nambe	0-16	Very cobbly sandy loam.	SM, SM-SC	A-4, A-2, A-1	25-40	50-80	40-70	35-55	15-50	25-35	5-10
	16-60	Very stony sandy loam.	SM	A-1, A-2	40-60	75-85	65-75	40-50	15-35	---	NP
Rock outcrop.											
OeF	0-2	Very stony loam-	GM-GC, GC,	A-4	15-65	40-65	35-60	30-55	20-40	25-40	5-15
Orejas	2-14	Cobbly clay loam, very gravelly clay loam.	GC, SC	A-2, A-6, A-7	0-50	25-55	20-50	20-45	15-30	35-55	15-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
OMD*:											
Orejas	0-2	Very stony loam-	GM-GC, GC	A-4	15-65	40-65	35-60	30-55	20-40	25-40	5-10
	2-16	Cobbly clay loam, very gravelly clay loam.	GC, SC	A-2, A-6, A-7	0-50	25-55	20-50	20-45	15-30	35-55	15-30
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Montecito	0-6	Loam	SM-SC, SM, CL-ML, ML	A-4	0	100	100	70-95	40-75	25-35	5-10
	6-30	Clay loam, clay, gravelly clay loam.	CL, CH	A-6, A-7	0-10	85-100	80-100	75-100	60-95	35-55	15-30
	30-60	Very gravelly sandy loam, cobbly sandy loam, cobbly clay loam.	SM, SC, CL, SM-SC	A-2, A-4, A-6	20-40	40-95	35-90	30-70	15-60	20-40	NP-20
ORG*:											
Orthents.											
Badland.											
OSG*:											
Orthents.											
Calciorthids.											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
OTG*:											
Orthents.											
Rock outcrop.											
PAG*:											
Paleboralfs.											
Cryochrepts.											
Rock outcrop.											
PbD, PbF----------	0-4	Gravelly loam, very gravelly loam.	GM, SM, SM-SC	A-4	0-20	45-65	40-60	40-55	35-50	20-30	NP-10
Penitente	4-36	Very cobbly sandy clay loam, very gravelly loam.	SM	A-1, A-2,	0-45	30-50	25-45	25-45	20-35	20-30	NP-5
	36-60	Extremely gravelly loamy sand.	GP	A-1	0-45	25-40	20-35	20-30	0-5	---	NP
PeD----------	0-2	Very stony loam	SM, ML	A-4	60-70	75-85	70-80	60-75	45-60	20-30	NP-5
Petaca	2-5	Cobbly loam-----	CL-ML, ML	A-4	25-35	90-100	85-95	75-90	55-70	25-35	5-10
	5-12	Cobbly clay loam	CL	A-6	25-35	90-100	85-95	80-95	60-75	30-40	10-15
	12-17	Very gravelly sandy loam.	GM, SM	A-2, A-4	25-35	50-100	45-95	40-65	30-40	---	NP
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
PfC*:											
Petaca----------	0-15	Stony loam------	SM, ML	A-4	60-70	75-85	70-80	60-75	45-60	20-30	NP-5
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Prieta----------	0-3	Stony silty clay loam.	ML	A-4, A-6	40-50	70-95	65-90	60-75	50-70	30-40	5-15
	3-14	Stony silty clay loam, very stony silty clay loam.	CL, CH	A-7	40-50	70-95	65-90	60-75	50-70	40-55	15-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
PGC*:											
Petaca----------	0-15	Stony loam------	SM, ML	A-4	60-70	75-85	70-80	60-75	45-60	20-30	NP-5
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Silva----------	0-2	Loam----------	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	2-33	Clay loam-------	CL	A-6, A-7	0	80-100	75-100	65-100	60-90	35-50	15-25
	33-60	Clay loam-------	CL	A-4, A-6	0	80-100	75-100	75-100	70-85	30-40	10-20
Prieta----------	0-3	Stony silty clay loam.	GM, ML	A-4, A-6	40-50	55-80	50-75	50-75	40-70	30-40	5-15
	3-14	Stony silty clay loam.	GC, CL, CH	A-7	40-50	55-80	50-75	50-75	40-70	40-55	15-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
PoB----------	0-17	Silty clay loam	CL	A-6	0	100	100	90-100	70-85	30-40	10-20
Poganeab	17-50	Silty clay loam, clay loam.	CL	A-6	0	100	100	90-100	70-85	30-40	10-20
	50-60	Gravelly sandy loam.	SM	A-2, A-4	0-5	60-80	55-75	50-70	30-45	20-30	NP-5

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PrD, PrG---------- Presa	0-7	Cobbly loam-----	GM-GC, GM, SM-SC, SM	A-2, A-4	0-30	65-90	60-85	45-65	30-50	25-35	5-10
	7-54	Very gravelly loam, stony loam, stony sandy clay loam.	GM-GC, GC, GP-GC	A-1, A-2	5-65	15-50	10-45	10-40	5-25	25-35	5-15
	54-76	Extremely stony sandy loam.	GM-GC, GM, GC, SM	A-1, A-2	45-90	70-85	65-75	30-60	15-35	20-30	NP-10
PrF---------- Presa	0-5	Cobbly loam-----	GM-GC, GM, SM-SC, SM	A-2, A-4	0-30	65-90	60-85	45-65	30-50	25-35	5-10
	5-43	Very gravelly loam, extremely cobbly loam, extremely cobbly sandy clay loam.	GM-GC, GC, GP-GC	A-1, A-2	5-65	10-50	30-45	10-40	5-25	25-35	5-15
	43-52	Extremely stony sandy clay loam.	GM-GC, GC, CL-ML, CL	A-2, A-4, A-6	45-90	60-85	65-75	40-65	25-55	25-35	5-15
	52-76	Extremely stony sandy loam.	GM-GC, GM, GC, SM	A-1, A-2	45-90	70-85	65-75	30-60	15-35	20-30	NP-10
PSG*: Presa----------	0-7	Cobbly loam-----	GM-GC, GM, SM-SC, SM	A-2, A-4	0-30	65-90	60-85	45-65	30-50	25-35	5-10
	7-54	Very gravelly loam, stony loam, stony sandy clay loam.	GM-GC, GC, GP-GC	A-1, A-2	5-65	15-50	10-45	10-40	5-25	25-35	5-15
	54-76	Extremely stony sandy loam.	GM-GC, GM, GC, SM	A-1, A-2	45-90	70-85	65-75	30-60	15-35	20-30	NP-10
Rock outcrop.											
PYF*: Presa----------	0-7	Cobbly loam-----	GM-GC, GM, SM-SC, SM	A-2, A-4	0-30	65-90	60-85	45-65	30-50	25-35	5-10
	7-54	Very gravelly loam, stony loam, stony sandy clay loam.	GM-GC, GC, GP-GC	A-1, A-2	5-65	15-50	10-45	10-40	5-25	25-35	5-15
	54-76	Extremely stony sandy loam.	GM-GC, GM, GC, SM	A-1, A-2	45-90	70-85	65-75	30-60	15-35	20-30	NP-10
Cryaquolls.											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RaC---------- Raton	0-4	Very stony silt loam.	CL, CL-ML	A-6, A-4	30-70	85-95	80-90	75-90	55-80	25-35	5-15
	4-18	Very stony clay, very stony silty clay loam.	CH, CL	A-7	50-80	85-95	80-90	75-90	65-85	45-55	20-30
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RBE*: Raton----------	0-4	Cobbly silt loam	CL, CL-ML	A-4, A-6	30-70	85-95	80-90	75-90	55-80	25-35	5-15
	4-18	Very stony clay, very stony silty clay loam.	CH, CL	A-7	50-80	85-95	80-90	75-90	65-85	45-55	20-30
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Stunner----------	0-4	Cobbly loam-----	ML	A-4	25-50	75-100	75-95	70-90	50-75	20-30	NP-5
	4-19	Clay loam-------	CL-ML, CL	A-6, A-4	0-10	90-100	85-100	75-100	60-80	25-35	5-20
	19-60	Loam, gravelly loam.	ML, SM-SC, CL-ML	A-4	0-10	70-100	65-95	55-90	45-70	20-30	NP-10
RcG*. Rock outcrop											
RdG*: Rock outcrop.											
Badland.											
RPG*: Rock outcrop.											
Penitente---------	0-10	Cobbly loam-----	SM, ML, CL-ML, SM-SC	A-4	30-55	85-95	80-90	65-85	45-70	20-30	NP-10
	10-60	Very cobbly sandy loam, very cobbly loam.	SM	A-1, A-2, A-4	55-85	75-90	70-85	45-75	20-50	20-30	NP-5
RRE*: Rock outcrop.											
Raton----------	0-4	Very stony silt loam.	CL, CL-ML	A-6, A-4	30-70	85-95	80-90	75-90	55-80	25-35	5-15
	4-18	Very stony clay-	CH, CL	A-7	50-80	85-95	80-90	75-90	65-85	45-55	20-30
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RUG*: Rock outcrop.											
Ustorthents.											
RvC, RWE*: Royosa----------	0-60	Loamy sand------	SP-SM, SM	A-2, A-3	0	100	100	50-80	5-35	---	NP
Orthents.											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RYD*:											
Royosa	0-60	Loamy sand	SP-SM, SM	A-2, A-3	0	100	100	50-80	5-35	---	NP
Vibo	0-2	Sandy loam	SM, ML	A-4	0	100	100	60-85	35-55	20-30	NP-5
	2-18	Sandy clay loam	SM-SC, SC, CL-ML, CL	A-4, A-6	0	100	100	80-90	35-55	25-35	5-15
	18-60	Sandy loam	SM	A-2, A-4	0	100	100	60-70	30-40	20-30	NP-5
SaG*:											
Sabe	0-6	Very cobbly sandy loam.	SM, GM	A-2, A-4, A-1	10-50	60-80	50-70	35-70	20-45	20-30	NP-5
	6-25	Very cobbly loamy sand, extremely cobbly loamy sand.	SM, SP-SM, GM, GP-GM	A-1, A-2	20-60	50-90	40-80	25-60	10-30	20-30	NP-5
	25-60	Extremely cobbly sand.	SM, SP-SM	A-1, A-2, A-3	50-85	70-90	60-80	35-60	5-25	---	NP
Mirand	0-3	Cobbly loam	CL-ML, CL	A-4, A-6	0-35	90-100	85-100	75-100	55-80	25-40	5-20
	3-45	Clay, cobbly clay.	SC, CL, CH	A-7	0-30	80-95	75-90	65-90	35-85	40-55	20-30
	45-68	Sandy clay	GC, SC, CL, CH	A-2, A-7	0-30	70-100	65-95	55-90	30-85	40-55	20-30
SbD	0-10	Cobbly loam	GM, SM	A-2	5-30	30-60	25-50	20-45	15-35	20-30	NP-5
Sedillo	10-25	Very cobbly loam.	GM, SM, GC, SC	A-1, A-2	10-55	40-60	30-55	20-50	15-35	30-40	5-15
	25-60	Very cobbly sandy loam.	GP-GM, GM, GP	A-1	10-55	25-60	20-55	10-35	0-20	---	NP
SDD*:											
Sedillo	0-3	Very gravelly loam.	GM, SM	A-2	5-30	30-60	25-50	20-45	15-35	20-30	NP-5
	3-11	Very cobbly loam.	GM, SM, GC, SC	A-1, A-2	10-55	40-60	30-55	20-50	15-35	30-40	5-15
	11-60	Very cobbly sandy loam.	GP-GM, GM, GP	A-1	10-55	25-60	20-55	10-35	0-20	---	NP
Orthents.											
SED*:											
Sedillo	0-3	Very gravelly loam.	GM, SM	A-2	5-30	30-60	25-50	20-45	15-35	20-30	NP-5
	3-11	Very gravelly clay loam.	GM, SM, GC, SC	A-1, A-2	10-55	40-60	30-55	20-50	15-35	30-40	5-15
	11-60	Very gravelly sandy loam.	GP-GM, GM, GP	A-1	10-55	25-60	20-55	10-35	0-20	---	NP
Silva	0-3	Loam	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	3-29	Clay loam	CL	A-6, A-7	0	80-100	75-100	65-100	55-90	35-50	15-25
	29-60	Clay loam	CL	A-6	0	80-100	75-100	75-100	70-85	30-40	10-20
SgC*:											
Servilleta	0-3	Silty clay loam	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	3-34	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SgC*:											
Prieta	0-2	Stony silty clay loam.	ML	A-4, A-6	40-50	70-95	65-90	60-75	50-70	30-40	5-15
	2-14	Stony silty clay loam, very stony silty clay loam.	CL, CH	A-7	40-50	70-95	65-90	60-75	50-70	40-55	15-30
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
ShB	0-16	Clay loam, silty clay loam.	ML	A-4, A-7	0	100	90-100	75-95	55-75	30-50	5-15
Shawa	16-60	Loam, clay loam	ML, CL	A-4, A-6	0	100	90-100	70-95	50-75	25-40	NP-15
SmB, SmD	0-5	Loam	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
Silva	5-30	Clay loam	CL	A-6, A-7	0	80-100	75-100	65-100	55-90	35-50	15-25
	30-60	Clay loam	CL	A-6	0	80-100	75-100	75-100	70-85	30-40	10-20
SSC*:											
Silva	0-3	Loam	CL-ML, ML	A-4	0	80-100	80-100	70-100	50-80	25-35	5-10
	3-31	Clay loam, clay	CL	A-6, A-7	0	80-100	75-100	65-100	55-90	35-50	15-25
	31-60	Clay loam	CL	A-4, A-6	0	80-100	75-100	75-100	70-85	30-40	10-20
Sedillo	0-3	Gravelly loam	GM, SM	A-2	5-30	30-60	25-50	20-45	15-35	20-30	NP-5
	3-11	Gravelly clay loam.	GM, SM, GC, SC	A-1, A-2	10-55	40-60	30-55	20-50	15-35	30-40	5-15
	11-60	Gravelly sandy loam.	GP-GM, GM, GP	A-1	10-55	25-60	20-55	10-35	0-20	---	NP
StC	0-3	Cobbly loam	ML	A-4	10-25	75-100	75-95	70-90	50-75	20-30	NP-5
Stunner	3-23	Clay loam	CL-ML, CL	A-6, A-4	0-5	90-100	85-100	75-100	60-80	25-35	5-20
	23-60	Loam	ML, SM-SC, CL-ML	A-4	0-10	85-100	75-100	65-95	45-75	20-30	NP-10
SUC*:											
Stunner	0-4	Loam	ML, CL-ML	A-4	0-10	90-100	80-100	70-90	50-75	20-30	NP-10
	4-27	Clay loam	CL-ML, CL	A-6, A-4	0-5	90-100	85-100	75-100	60-80	25-35	5-20
	27-60	Loam	ML, SM-SC, CL-ML	A-4	0-10	85-100	75-100	65-95	45-75	20-30	NP-10
Luhon	0-5	Gravelly loam	GM, ML	A-4	5-15	60-80	55-75	50-75	40-60	25-35	NP-10
	5-60	Clay loam	ML	A-4	0-10	80-100	75-95	60-90	50-75	25-35	NP-10
SVC*:											
Stunner	0-4	Cobbly loam	ML	A-4	25-50	75-100	75-95	70-90	50-75	20-30	NP-5
	4-19	Clay loam	CL-ML, CL	A-6, A-4	0-10	90-100	85-100	75-100	60-80	25-35	5-20
	19-60	Loam, gravelly loam.	ML, SM-SC, CL-ML	A-4	0-10	70-100	65-95	55-90	45-75	20-30	NP-10
Travelers	0-13	Very stony loam, very stony clay loam.	GM, ML	A-1, A-2, A-4	25-60	25-85	25-85	25-65	20-55	20-35	NP-5
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Luhon	0-6	Gravelly clay loam.	GM, ML	A-4	5-15	60-80	55-75	50-75	40-60	25-35	NP-10
	6-60	Clay loam	ML	A-4	0-10	80-100	75-95	60-90	50-75	25-35	NP-10

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TeB---------- Tenorio	0-3	Loam----------	SM-SC, SC, CL-ML, CL	A-4	0	100	100	65-90	40-70	20-30	5-10
	3-13	Loam----------	SM-SC, SC CL-ML, CL	A-1, A-2, A-4	0	90-100	85-100	60-90	40-70	20-30	5-10
	13-18	Extremely gravelly sandy loam.	GP-GM, GM	A-1	0	20-60	15-50	10-40	5-25	20-30	NP-5
	18-60	Extremely gravelly sand.	GP, GP-GM	A-1	0	25-50	20-45	5-25	0-10	---	NP
TeC---------- Tenorio	0-5	Loam----------	SM-SC, SC, CL-ML, CL	A-4	0	100	100	65-90	40-70	20-30	5-10
	5-17	Sandy clay loam	SM-SC, SC	A-4	0	90-100	85-100	75-80	35-50	20-30	5-10
	17-60	Very gravelly sand.	GP, GP-GM	A-1	0	25-50	20-45	5-25	0-10	---	NP
TrF---------- Trampas	0-7	Cobbly sandy loam.	ML, CL-ML, SM, CL	A-2, A-4, A-1	10-30	50-90	40-80	30-60	20-55	20-30	NP-10
	7-11	Extremely cobbly sandy clay loam.	SM, SC	A-2	0-40	30-50	25-40	20-35	15-30	30-40	5-15
	11-35	Extremely gravelly clay.	GC, SC	A-2	10-30	20-45	15-40	15-35	10-30	40-60	20-40
	35-61	Extremely cobbly sandy clay loam.	GC, GP-GC	A-2	40-60	15-40	10-35	10-35	5-15	30-40	5-15
TsE---------- Trampas	0-7	Cobbly loam-----	ML, CL-ML, SM, CL	A-2, A-1, A-4	10-30	50-90	40-80	30-60	20-55	20-30	NP-10
	7-23	Very cobbly clay, very cobbly sandy clay loam.	GC, SC	A-2	10-30	20-45	15-40	15-35	15-30	40-60	20-40
	23-61	Stony sandy clay loam.	GC, GP-GC	A-2,	40-60	15-40	10-35	10-35	5-15	30-40	5-15
TTF*: Trampas----------	0-7	Cobbly sandy loam.	ML, CL-ML, SM, CL	A-2, A-4, A-1	10-30	50-90	40-80	30-60	20-55	20-30	NP-10
	7-11	Very cobbly sandy clay loam.	SM, SC	A-2	0-40	30-50	25-40	20-35	15-30	30-40	5-15
	11-49	Very gravelly clay.	CL, CH, GC	A-2	10-30	20-45	15-40	15-35	10-30	40-60	20-40
	49-61	Very cobbly sandy clay loam.	GC, GP-GC	A-2	40-60	15-40	10-35	10-35	5-15	30-40	5-15
Diamante----------	0-2	Cobbly sandy loam.	GM	A-1, A-2, A-4	15-30	30-55	25-50	20-50	15-40	20-30	NP-5
	2-31	Very gravelly sandy loam.	GP-GM, GM	A-1	15-45	20-50	15-45	10-30	5-15	---	NP
	31-60	Very gravelly sandy clay.	GC	A-2-7	15-45	25-40	20-35	15-35	10-30	40-55	15-30

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TVC---------- Travelers	0-15	Very stony loam	GM, ML	A-1, A-2, A-4	25-80	25-85	25-85	25-65	20-55	20-35	NP-5
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
UTG*: Ustorthents.											
Trampas----------	0-7	Cobbly loam-----	ML, CL-ML, SM, CL	A-2, A-4, A-1	10-30	50-90	40-80	30-60	20-55	20-30	NP-10
	7-11	Very cobbly sandy clay loam.	SM, SC	A-2, A-4, A-6	0-40	30-50	25-40	20-35	15-30	30-40	5-15
	11-49	Very gravelly clay.	GC	A-2	10-30	20-45	15-40	15-35	15-30	40-60	20-40
	49-61	Very cobbly sandy clay loam.	GC, GP-GC	A-2	40-60	15-40	10-35	10-35	5-15	30-40	5-15
VbD---------- Vibo	0-2	Sandy loam------	SM, ML	A-4	0	100	100	60-85	35-55	20-30	NP-5
	2-18	Sandy clay loam	SM-SC, SC, CL-ML, CL	A-4, A-6	0	100	100	80-90	35-55	25-35	5-15
	18-45	Sandy loam------	SM	A-2, A-4	0	100	100	60-70	30-40	20-30	NP-5
	45-60	Loamy sand------	SM	A-2	0	100	100	50-75	15-30	---	NP
WEF*: Wellsville--------	0-8	Gravelly loam---	ML, SM, GM, GM-GC	A-4, A-2	0-5	75-100	70-95	60-85	30-55	15-25	NP-10
	8-42	Gravelly clay loam, gravelly sandy clay loam	CL-ML, CL, GC, GM-GC	A-4, A-6	0-5	50-90	50-85	45-75	35-60	20-35	5-15
	42-60	Very gravelly sandy clay loam	CL-ML, CL, GC, GM-GC	A-2, A-4, A-6	0-5	50-75	40-75	40-70	30-55	20-35	5-15
Ess----------	0-8	Gravelly loam---	ML, CL-ML, GM, GM-GC	A-4	0-35	70-90	65-80	50-70	35-60	25-35	5-10
	8-34	Very gravelly sandy clay loam	GC	A-2, A-6	0-35	40-60	35-50	35-50	25-45	30-40	15-20
	34-60	Very gravelly sandy loam.	GM, SM	A-1, A-2	0-35	40-60	35-50	35-50	15-25	20-30	NP-5

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
AMF*:									
Amalia----------	0-3	0.6-2.0	0.10-0.17	6.6-7.3	<2	Low-------	0.15	5	8
	3-17	0.6-2.0	0.10-0.13	6.6-7.8	<2	Low-------	0.15		
	17-60	6.0-20	0.05-0.07	7.4-8.4	<2	Low-------	0.15		
Manzano---------	0-10	0.2-0.6	0.19-0.21	7.4-7.8	<2	Moderate	0.28	5	6
	10-60	0.2-0.6	0.16-0.21	7.4-7.8	<2	Moderate	0.32		
ATC*:									
Antonito--------	0-3	0.6-2.0	0.16-0.21	7.9-8.4	<2	Low-------	0.32	3	6
	3-16	0.2-0.6	0.19-0.21	7.4-9.0	<2	Moderate	0.32		
	16-25	0.6-2.0	0.16-0.18	7.9-9.0	<2	Low-------	0.28		
	25	---	---	---	---	----------	---		
Travelers-------	0-13	0.6-2.0	0.06-0.09	7.9-8.4	<2	Low-------	0.17	1	8
	13	---	---	---	---	----------	---		
CaB---------------	0-14	0.6-2.0	0.19-0.23	7.4-8.4	<2	Moderate--	0.37	5	4L
Caruso	14-65	0.2-0.6	0.16-0.22	7.4-8.4	<2	Moderate--	0.37		
CHG*:									
Chimayo---------	0-5	0.6-2.0	0.15-0.17	6.6-7.3	<2	Low-------	0.32	1	---
	5-15	0.6-2.0	0.08-0.10	6.6-7.3	<2	Low-------	0.24		
	15	---	---	---	---	----------	---		
Rock outcrop.									
CRG*:									
Cryoboralfs.									
Rock outcrop.									
CSC*.									
Cryoborolls									
CTC*:									
Cryoborolls.									
Cryaquolls.									
CUB*.									
Cumulic Haplaquolls									
CYB*.									
Cumulic Haploborolls									
DeF---------------	0-12	0.6-2.0	0.12-0.16	6.6-7.8	<2	Low-------	0.32	5	---
Derecho	12-51	0.2-0.6	0.07-0.10	6.6-7.8	<2	Moderate	0.17		
	51-60	0.6-2.0	0.07-0.10	6.6-7.8	<2	Low-------	0.15		
DeG*:									
Derecho---------	0-17	0.6-2.0	0.12-0.16	6.6-7.8	<2	Low-------	0.32	5	---
	17-60	0.2-0.6	0.07-0.10	6.6-7.8	<2	Moderate	0.17		
Rock outcrop.									
DFG*:									
Devisadero------	0-3	2.0-6.0	0.13-0.17	7.4-7.8	<2	Low-------	0.32	2	---
	3-13	0.2-0.6	0.11-0.14	7.4-7.8	<2	Moderate	0.17		
	13-30	2.0-6.0	0.05-0.08	7.9-8.4	<2	Low-------	0.15		
	30	---	---	---	---	----------	---		

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
DFG*:									
Rock outcrop.									
DmF----------	0-2	0.6-2.0	0.08-0.14	5.6-7.3	<2	Low-------	0.15	5	---
Diamante	2-31	2.0-6.0	0.04-0.08	5.6-7.3	<2	Low-------	0.15		
	31-60	0.2-0.6	0.05-0.08	5.6-7.3	<2	Moderate	0.15		
EGG*:									
Eutroboralfs.									
Glossoboralfs.									
Rock outcrop.									
FaC----------	0-3	0.6-2.0	0.14-0.17	7.9-9.0	<2	Low-------	0.28	5	5
Fernando	3-23	0.2-0.6	0.19-0.21	7.9-9.0	<2	Moderate	0.37		
	23-60	0.6-2.0	0.19-0.21	7.9-9.0	<2	Low-------	0.37		
FbC----------	0-2	0.6-2.0	0.16-0.21	7.9-9.0	<2	Low-------	0.37	5	5
Fernando	2-36	0.2-0.6	0.19-0.21	7.9-9.0	<2	Moderate	0.37		
	36-60	0.6-2.0	0.19-0.21	7.9-9.0	<2	Low-------	0.37		
FeB----------	0-6	0.6-2.0	0.16-0.21	7.9-9.0	<2	Low-------	0.37	5	5
Fernando	6-29	0.2-0.6	0.19-0.21	7.9-9.0	<2	Moderate	0.37		
	29-60	0.6-2.0	0.19-0.21	7.9-9.0	<2	Low-------	0.37		
FeC----------	0-7	0.6-2.0	0.16-0.21	7.9-9.0	<2	Low-------	0.37	5	5
Fernando	7-25	0.2-0.6	0.19-0.21	7.9-9.0	<2	Moderate	0.37		
	25-60	0.6-2.0	0.19-0.21	7.9-9.0	<2	Low-------	0.37		
FfC----------	0-5	0.6-2.0	0.16-0.21	7.9-9.0	<2	Low-------	0.37	5	5
Fernando	5-19	0.2-0.6	0.19-0.21	7.9-9.0	<2	Moderate	0.37		
	19-60	0.6-2.0	0.19-0.21	7.9-9.0	<2	Low-------	0.37		
FHB*:									
Fernando--------	0-2	0.6-2.0	0.16-0.21	7.9-9.0	<2	Low-------	0.37	5	5
	2-27	0.2-0.6	0.19-0.21	7.9-9.0	<2	Moderate	0.37		
	27-60	0.6-2.0	0.19-0.21	7.9-9.0	<2	Low-------	0.37		
Hernandez-------	0-4	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low-------	0.37	2	4L
	4-14	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.37		
	14-60	0.6-2.0	0.12-0.16	7.9-8.4	<2	Moderate	0.28		
FLB*.									
Fluvents									
HaB----------	0-10	0.6-2.0	0.14-0.16	7.4-7.8	<2	Low-------	0.28	2	5
Hernandez	10-15	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.37		
	15-60	0.6-2.0	0.12-0.16	7.9-8.4	<2	Moderate	0.28		
HKC*:									
Hernandez-------	0-4	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low-------	0.37	2	4L
	4-14	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.37		
	14-60	0.6-2.0	0.12-0.16	7.9-8.4	<2	Moderate	0.28		
Kim----------	0-12	0.6-2.0	0.16-0.18	7.9-8.4	<2	Low-------	0.32	5	4
	12-60	0.6-2.0	0.15-0.17	7.9-8.4	<2	Moderate	0.32		
HPC*:									
Hernandez-------	0-4	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low-------	0.37	2	4L
	4-60	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.37		
Petaca----------	0-2	0.6-2.0	0.10-0.15	7.4-8.4	<2	Low-------	0.17	1	---
	2-15	0.6-2.0	0.15-0.17	7.4-8.4	<2	Low-------	0.24		
	15	---	---	---	---	----------	---		

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
HSC*:									
Hernandez	0-10	0.6-2.0	0.14-0.16	7.4-7.8	<2	Low	0.28	2	5
	10-15	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.37		
	15-60	0.6-2.0	0.12-0.16	7.9-8.4	<2	Moderate	0.28		
Silva	0-2	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.32	5	5
	2-32	0.06-0.2	0.18-0.20	7.4-8.4	<2	High	0.32		
	32-60	0.2-0.6	0.16-0.18	7.9-8.4	<2	Low	0.32		
JaD*:									
Jaroso	0-16	0.6-2.0	0.07-0.14	5.6-6.5	<2	Low	0.20	5	---
	16-41	0.2-0.6	0.07-0.10	5.6-6.5	<2	Moderate	0.17		
	41-60	0.2-0.6	0.04-0.08	5.6-6.5	<2	Moderate	0.10		
Angostura	0-10	0.6-2.0	0.07-0.13	5.6-6.0	<2	Low	0.15	5	---
	10-60	0.6-2.0	0.07-0.11	5.6-6.0	<2	Low	0.10		
JaF*:									
Jaroso	0-16	0.6-2.0	0.07-0.14	5.6-6.5	<2	Low	0.20	5	---
	16-41	0.2-0.6	0.07-0.10	5.6-6.5	<2	Moderate	0.17		
	41-60	0.2-0.6	0.04-0.08	5.6-6.5	<2	Moderate	0.10		
Angostura	0-10	0.6-2.0	0.07-0.13	5.6-6.0	<2	Low	0.15	5	---
	10-60	0.6-2.0	0.07-0.11	5.6-6.0	<2	Low	0.10		
Mascarenas	0-4	2.0-6.0	0.07-0.09	6.6-7.3	<2	Low	0.20	5	---
	4-30	2.0-6.0	0.07-0.12	6.6-7.3	<2	Low	0.20		
	30-58	0.2-0.6	0.05-0.08	6.6-7.3	<2	Moderate	0.15		
	58-70	0.6-2.0	0.04-0.07	7.4-7.8	<2	Low	0.15		
JaG*:									
Jaroso	0-16	0.6-2.0	0.07-0.14	5.6-6.5	<2	Low	0.20	5	---
	16-41	0.2-0.6	0.07-0.10	5.6-6.5	<2	Moderate	0.17		
	41-60	0.2-0.6	0.04-0.08	5.6-6.5	<2	Moderate	0.10		
Angostura	0-6	0.6-2.0	0.07-0.13	5.6-6.0	<2	Low	0.15	5	---
	6-20	0.6-2.0	0.07-0.11	5.6-6.0	<2	Low	0.10		
	20-60	0.6-2.0	0.01-0.08	5.6-6.0	<2	Low	0.15		
Mascarenas	0-4	2.0-6.0	0.07-0.09	6.6-7.3	<2	Low	0.20	5	---
	4-30	2.0-6.0	0.07-0.12	6.6-7.3	<2	Low	0.20		
	30-58	0.2-0.6	0.05-0.08	6.6-7.3	<2	Moderate	0.15		
	58-70	0.6-2.0	0.04-0.07	7.4-7.8	<2	Low	0.15		
JRG*:									
Jaroso	0-16	0.6-2.0	0.07-0.14	5.6-6.5	<2	Low	0.20	5	---
	16-41	0.2-0.6	0.07-0.10	5.6-6.5	<2	Moderate	0.17		
	41-60	0.2-0.6	0.04-0.08	5.6-6.5	<2	Moderate	0.10		
Angostura	0-10	0.6-2.0	0.07-0.13	5.6-6.0	<2	Low	0.15	5	---
	10-60	0.6-2.0	0.07-0.11	5.6-6.0	<2	Low	0.10		
Rock outcrop.									
LaE	0-7	0.6-2.0	0.14-0.20	6.6-7.8	<2	Low	0.32	4	6
Lama	7-30	0.06-0.6	0.12-0.18	7.4-7.8	<2	High	0.28		
	30-41	0.2-0.6	0.07-0.10	7.4-7.8	<2	Moderate	0.17		
	41-48	0.6-2.0	0.07-0.10	7.9-8.4	<2	Low	0.15		
	48-60	6.0-20	0.03-0.05	7.4-7.8	<2	Low	0.10		
LoB	0-9	0.6-2.0	0.18-0.20	6.6-7.8	2-4	Moderate	0.32	3	6
Loveland	9-21	0.6-2.0	0.18-0.20	7.4-8.4	2-4	Moderate	0.32		
	21-60	>6.0	0.03-0.06	7.4-8.4	<2	Low	0.10		
LtC*:									
Luhon	0-12	0.6-2.0	0.16-0.20	7.3-8.4	2-4	Low	0.28	5	4L
	12-60	0.6-2.0	0.11-0.13	7.9-9.0	4-8	Low	0.28		

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
LtC*:									
Travelers	0-13	0.6-2.0	0.06-0.09	7.9-8.4	<2	Low	0.17	1	8
	13	---	---	---	---	---	---		
MaF	0-2	0.6-2.0	0.11-0.15	6.6-7.3	<2	Low	0.20	5	---
Maes	2-20	2.0-6.0	0.07-0.13	6.6-7.3	<2	Low	0.20		
	20-60	0.2-0.6	0.05-0.08	6.1-7.3	<2	Moderate	0.15		
MeD*:									
Maes	0-2	0.6-2.0	0.11-0.15	6.6-7.3	<2	Low	0.20	5	---
	2-20	2.0-6.0	0.07-0.13	6.6-7.3	<2	Low	0.20		
	20-60	0.2-0.6	0.05-0.08	6.1-6.5	<2	Moderate	0.15		
Etoe	0-26	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low	0.15	5	---
	26-60	0.6-2.0	0.05-0.11	6.1-7.3	<2	Low	0.15		
MeF*:									
Maes	0-2	0.6-2.0	0.11-0.15	6.6-7.3	<2	Low	0.20	5	---
	2-16	2.0-6.0	0.07-0.13	6.6-7.3	<2	Low	0.20		
	16-35	0.2-0.6	0.07-0.09	6.1-6.5	<2	Moderate	0.17		
	35-67	0.2-0.6	0.05-0.08	6.1-6.5	<2	Moderate	0.15		
Etoe	0-26	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low	0.15	5	---
	26-60	0.6-2.0	0.05-0.11	6.1-7.3	<2	Low	0.15		
MeG*:									
Maes	0-2	0.6-2.0	0.11-0.15	6.6-7.3	<2	Low	0.20	5	---
	2-20	2.0-6.0	0.07-0.13	6.6-7.3	<2	Low	0.20		
	20-60	0.2-0.6	0.05-0.08	6.1-6.5	<2	Moderate	0.15		
Etoe	0-26	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low	0.15	5	---
	26-60	0.6-2.0	0.05-0.11	6.1-7.3	<2	Low	0.15		
MFG*:									
Maes	0-2	0.6-2.0	0.11-0.15	6.6-7.3	<2	Low	0.20	5	---
	2-20	2.0-6.0	0.07-0.13	6.6-7.3	<2	Low	0.20		
	20-60	0.2-0.6	0.05-0.08	6.1-6.5	<2	Moderate	0.15		
Etoe	0-26	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low	0.15	5	---
	26-60	0.6-2.0	0.05-0.11	6.1-7.3	<2	Low	0.15		
Rock outcrop.									
MNC	0-10	0.2-0.6	0.19-0.21	7.4-7.8	<2	Moderate	0.28	5	6
Manzano	10-60	0.2-0.6	0.16-0.21	7.4-7.8	<2	Moderate	0.32		
MnA	0-11	0.2-0.6	0.19-0.21	7.4-7.8	<2	Moderate	0.28	5	6
Manzano	11-60	0.2-0.6	0.16-0.21	7.4-7.8	<2	Moderate	0.32		
MnB, MnC	0-10	0.2-0.6	0.19-0.21	7.4-7.8	<2	Moderate	0.28	5	6
Manzano	10-60	0.2-0.6	0.16-0.21	7.4-7.8	<2	Moderate	0.32		
MrD, MrF, MrG	0-3	2.0-6.0	0.07-0.09	6.6-7.3	<2	Low	0.20	4	---
Marosa	3-16	6.0-20	0.05-0.09	6.6-7.3	<2	Low	0.15		
	16-34	2.0-6.0	0.05-0.10	6.6-7.3	<2	Low	0.15		
	34-44	0.6-2.0	0.06-0.08	6.6-7.3	<2	Low	0.15		
	44-72	2.0-6.0	0.02-0.04	6.6-7.3	<2	Low	0.10		
MSG*:									
Marosa	0-3	2.0-6.0	0.07-0.09	6.6-7.3	<2	Low	0.20	4	---
	3-16	6.0-20	0.05-0.09	6.6-7.3	<2	Low	0.15		
	16-34	2.0-6.0	0.05-0.10	6.6-7.3	<2	Low	0.15		
	34-44	0.6-2.0	0.06-0.08	6.6-7.3	<2	Low	0.15		
	44-72	2.0-6.0	0.02-0.04	6.6-7.3	<2	Low	0.10		
Rock outcrop.									

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
MSG2*:									
Marosa	0-2	2.0-6.0	0.07-0.09	6.6-7.3	<2	Low	0.20	4	---
	2-12	6.0-20	0.05-0.09	6.6-7.3	<2	Low	0.15		
	12-22	0.6-2.0	0.06-0.08	6.6-7.3	<2	Low	0.15		
	22-60	2.0-6.0	0.02-0.04	6.6-7.3	<2	Low	0.10		
Rock outcrop.									
MTE*:									
Marosa	0-3	2.0-6.0	0.07-0.09	6.6-7.3	<2	Low	0.20	4	---
	3-16	6.0-20	0.05-0.09	6.6-7.3	<2	Low	0.15		
	16-26	2.0-6.0	0.05-0.10	6.6-7.3	<2	Low	0.15		
	26-44	0.6-2.0	0.06-0.08	6.6-7.3	<2	Low	0.15		
	44-60	2.0-6.0	0.02-0.04	6.6-7.3	<2	Low	0.10		
Nambe	0-15	2.0-6.0	0.10-0.12	4.5-5.5	<2	Low	0.15	5	---
	15-49	2.0-6.0	0.07-0.09	5.1-6.0	<2	Low	0.15		
	49-60	2.0-6.0	0.06-0.08	5.1-5.5	<2	Low	0.15		
MUG*:									
Mirabal	0-32	2.0-6.0	0.07-0.09	6.1-7.3	<2	Low	0.28	2	---
	32	---	---	---	---	---	---		
Rock outcrop.									
MwD	0-3	0.6-2.0	0.12-0.16	6.6-7.3	<2	Moderate	0.28	5	---
Mirand	3-45	<0.06	0.08-0.12	6.6-7.3	<2	High	0.32		
	45-68	<0.06	0.08-0.12	6.6-7.3	<2	High	0.32		
MxD	0-6	0.6-2.0	0.13-0.18	6.6-7.8	<2	Low	0.32	5	6
Montecito	6-30	0.2-0.6	0.14-0.20	7.9-8.4	<2	High	0.28		
	30-60	0.6-2.0	0.09-0.13	7.9-8.4	<2	Low	0.20		
MxE*:									
Montecito	0-5	0.6-2.0	0.13-0.18	6.6-7.8	<2	Low	0.32	5	6
	5-35	0.2-0.6	0.14-0.20	7.9-8.4	<2	High	0.28		
	35-60	0.6-2.0	0.09-0.13	7.9-8.4	<2	Low	0.20		
Rock outcrop.									
NaD, NaF	0-5	2.0-6.0	0.11-0.13	3.6-5.5	<2	Low	0.15	5	---
Nambe	5-16	2.0-6.0	0.07-0.09	3.6-5.5	<2	Low	0.15		
	16-60	2.0-6.0	0.06-0.08	3.6-5.5	<2	Low	0.15		
NaF2	0-24	2.0-6.0	0.11-0.13	3.6-5.5	<2	Low	0.15	5	---
Nambe	24-60	2.0-6.0	0.06-0.08	3.6-5.5	<2	Low	0.15		
NaG	0-5	2.0-6.0	0.11-0.13	3.6-5.5	<2	Low	0.15	5	---
Nambe	5-16	2.0-6.0	0.07-0.09	3.6-5.5	<2	Low	0.15		
	16-60	2.0-6.0	0.06-0.08	3.6-5.5	<2	Low	0.15		
NaG2	0-24	2.0-6.0	0.11-0.13	3.6-5.5	<2	Low	0.15	5	---
Nambe	24-60	2.0-6.0	0.06-0.08	3.6-5.5	<2	Low	0.15		
NRG*:									
Nambe	0-5	2.0-6.0	0.11-0.13	3.6-5.5	<2	Low	0.15	5	---
	5-16	2.0-6.0	0.07-0.09	3.6-5.5	<2	Low	0.15		
	16-60	2.0-6.0	0.06-0.08	3.6-5.5	<2	Low	0.15		
Rock outcrop.									
NRG2*:									
Nambe	0-16	2.0-6.0	0.11-0.13	3.6-5.5	<2	Low	0.15	5	---
	16-60	2.0-6.0	0.06-0.08	3.6-5.5	<2	Low	0.15		
Rock outcrop.									

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
OeF----------	0-2	0.2-2.0	0.08-0.12	6.6-7.8	<2	Low-------	0.17	1	---
Orejas	2-14	0.06-0.2	0.07-0.11	6.6-7.8	<2	Moderate	0.17		
	14	---	---	---	---	----------	---		
OMD*:									
Orejas----------	0-2	0.2-2.0	0.08-0.12	6.6-7.8	<2	Low-------	0.17	1	---
	2-16	0.06-0.2	0.07-0.11	6.6-7.8	<2	Moderate	0.17		
	16	---	---	---	---	----------	---		
Montecito-------	0-6	0.6-2.0	0.13-0.18	6.6-7.8	<2	Low-------	0.32	5	6
	6-30	0.2-0.6	0.14-0.20	7.9-8.4	<2	High------	0.28		
	30-60	0.6-2.0	0.09-0.13	7.9-8.4	<2	Low-------	0.20		
ORG*:									
Orthents.									
Badland.									
OSG*:									
Orthents.									
Calciorthids.									
OTG*:									
Orthents.									
Rock outcrop.									
PAG*:									
Paleboralfs.									
Cryochrepts.									
Rock outcrop.									
PbD, PbF----------	0-4	2.0-6.0	0.08-0.10	3.6-5.5	<2	Low-------	0.15	5	---
Penitente	4-36	2.0-6.0	0.06-0.09	4.5-6.0	<2	Low-------	0.15		
	36-60	6.0-20	0.02-0.04	5.1-5.5	<2	Low-------	0.15		
PeD----------	0-2	0.6-2.0	0.10-0.15	7.4-8.4	<2	Low-------	0.17	1	---
Petaca	2-5	0.6-2.0	0.13-0.15	7.4-8.4	<2	Low-------	0.24		
	5-12	0.6-2.0	0.15-0.17	7.4-8.4	<2	Low-------	0.24		
	12-17	2.0-6.0	0.05-0.08	7.4-8.4	<2	Low-------	0.17		
	17	---	---	---	---	----------	---		
PfC*:									
Petaca----------	0-15	0.6-2.0	0.10-0.15	7.4-8.4	<2	Low-------	0.17	1	---
	15	---	---	---	---	----------	---		
Prieta----------	0-3	0.06-0.2	0.08-0.11	6.6-7.8	<2	Moderate	0.17	1	8
	3-14	0.06-0.2	0.08-0.11	7.4-8.4	<2	High------	0.17		
	14	---	---	---	---	----------	---		
PGC*:									
Petaca----------	0-15	0.6-2.0	0.10-0.15	7.4-8.4	<2	Low-------	0.17	1	---
	15	---	---	---	---	----------	---		
Silva----------	0-2	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low-------	0.32	5	5
	2-33	0.06-0.2	0.18-0.20	7.4-8.4	<2	High------	0.32		
	33-60	0.2-2.0	0.16-0.18	7.9-8.4	<2	Low-------	0.32		
Prieta----------	0-3	0.06-0.2	0.08-0.11	6.6-7.8	<2	Moderate	0.17	1	8
	3-14	0.06-0.2	0.08-0.11	7.4-8.4	<2	High------	0.17		
	14	---	---	---	---	----------	---		
PoB----------	0-17	0.2-0.6	0.13-0.15	7.9-9.0	4-16	Moderate	0.28	5	8
Poganeab	17-50	0.2-0.6	0.13-0.15	7.9-9.0	4-16	Moderate	0.37		
	50-60	0.2-6.0	0.07-0.09	7.9-9.0	4-16	Low-------	0.17		

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
PrD----------	0-7	0.6-2.0	0.12-0.15	5.1-6.0	<2	Low-------	0.20	5	---
Presa	7-54	0.6-2.0	0.09-0.12	5.6-6.0	<2	Low-------	0.15		
	54-76	2.0-6.0	0.04-0.07	5.6-6.5	<2	Low-------	0.15		
PrF----------	0-5	0.6-2.0	0.12-0.15	5.1-6.0	<2	Low-------	0.20	5	---
Presa	5-43	0.6-2.0	0.09-0.12	5.6-6.0	<2	Low-------	0.15		
	43-52	0.6-2.0	0.05-0.08	5.6-6.5	<2	Low-------	0.15		
	52-76	2.0-6.0	0.04-0.07	5.6-6.5	<2	Low-------	0.15		
PrG----------	0-7	0.6-2.0	0.12-0.15	5.1-6.0	<2	Low-------	0.20	5	---
Presa	7-54	0.6-2.0	0.09-0.12	5.6-6.0	<2	Low-------	0.15		
	54-76	2.0-6.0	0.04-0.07	5.6-6.5	<2	Low-------	0.15		
PSG*:									
Presa----------	0-7	0.6-2.0	0.12-0.15	5.1-6.0	<2	Low-------	0.20	5	---
	7-54	0.6-2.0	0.09-0.12	5.6-6.0	<2	Low-------	0.15		
	54-76	2.0-6.0	0.04-0.07	5.6-6.5	<2	Low-------	0.15		
Rock outcrop.									
PYF*:									
Presa----------	0-7	0.6-2.0	0.12-0.15	5.1-6.0	<2	Low-------	0.20	5	---
	7-54	0.6-2.0	0.09-0.12	5.6-6.0	<2	Low-------	0.15		
	54-76	2.0-6.0	0.04-0.07	5.6-6.5	<2	Low-------	0.15		
Cryaquolls.									
RaC----------	0-4	0.2-0.6	0.10-0.12	6.6-7.3	<2	Low-------	0.28	1	8
Raton	4-18	0.06-0.2	0.08-0.09	6.6-7.3	<2	High------	0.20		
	18	---	---	---	---	----------	---		
RBE*:									
Raton----------	0-4	0.2-0.6	0.10-0.12	6.6-7.3	<2	Low-------	0.28	1	8
	4-18	0.06-0.2	0.08-0.09	6.6-7.3	<2	High------	0.20		
	18	---	---	---	---	----------	---		
Stunner--------	0-4	0.6-2.0	0.14-0.16	7.4-8.4	<2	Low-------	0.20	5	8
	4-19	0.6-2.0	0.17-0.20	7.4-8.4	<4	Moderate	0.28		
	19-60	0.6-2.0	0.14-0.16	7.9-8.4	<2	Low-------	0.28		
RcG*.									
Rock outcrop									
RdG*:									
Rock outcrop.									
Badland.									
RPG*:									
Rock outcrop.									
Penitente-------	0-10	2.0-6.0	0.08-0.10	3.6-5.5	<2	Low-------	0.15	5	---
	10-60	2.0-6.0	0.06-0.09	4.5-6.0	<2	Low-------	0.15		
RRE*:									
Rock outcrop.									
Raton----------	0-4	0.2-0.6	0.10-0.12	6.6-7.3	<2	Low-------	0.28	1	8
	4-18	0.06-0.2	0.08-0.09	6.6-7.3	<2	High------	0.20		
	18	---	---	---	---	----------	---		
RUG*:									
Rock outcrop.									
Ustorthents.									

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
RvC----------	0-60	>20	0.05-0.08	6.6-7.8	<2	Low--------	0.17	5	1
Royosa									
RWE*:									
Royosa----------	0-60	>20	0.05-0.08	6.6-7.8	<2	Low--------	0.17	5	1
Orthents.									
RYD*:									
Royosa----------	0-60	>20	0.05-0.08	6.6-7.8	<2	Low--------	0.17	5	1
Vibo----------	0-2	2.0-6.0	0.11-0.15	6.6-8.4	<2	Low--------	0.24	5	3
	2-18	0.6-2.0	0.14-0.16	6.6-8.4	<2	Moderate	0.32		
	18-60	2.0-6.0	0.11-0.13	6.6-8.4	<2	Low--------	0.24		
SaG*:									
Sabe----------	0-6	2.0-6.0	0.07-0.15	6.6-7.4	<2	Low--------	0.24	5	---
	6-25	2.0-6.0	0.03-0.07	6.6-7.4	<2	Low--------	0.17		
	25-60	6.0-20	0.03-0.07	6.6-7.4	<2	Low--------	0.15		
Mirand----------	0-3	0.6-2.0	0.12-0.16	6.6-7.3	<2	Moderate	0.28	5	---
	3-45	<0.06	0.08-0.12	6.6-7.3	<2	High-------	0.32		
	45-68	<0.06	0.08-0.12	6.6-7.3	<2	High-------	0.32		
SbD----------	0-10	0.6-2.0	0.10-0.12	7.4-7.8	<2	Low--------	0.24	4	---
Sedillo	10-25	0.2-0.6	0.07-0.11	7.9-8.4	<2	Low--------	0.17		
	25-60	2.0-6.0	0.05-0.07	7.9-8.4	<2	Low--------	0.17		
SDD*:									
Sedillo----------	0-3	0.6-2.0	0.10-0.12	7.4-7.8	<2	Low--------	0.24	4	---
	3-11	0.2-0.6	0.07-0.11	7.9-8.4	<2	Low--------	0.17		
	11-60	2.0-6.0	0.05-0.07	7.9-8.4	<2	Low--------	0.17		
Orthents.									
SED*:									
Sedillo----------	0-3	0.6-2.0	0.10-0.12	7.4-7.8	<2	Low--------	0.24	4	---
	3-11	0.2-0.6	0.07-0.11	7.9-8.4	<2	Low--------	0.17		
	11-60	2.0-6.0	0.05-0.07	7.9-8.4	<2	Low--------	0.17		
Silva----------	0-3	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low--------	0.32	5	5
	3-29	0.06-0.2	0.18-0.20	7.4-8.4	<2	High-------	0.32		
	29-60	0.2-2.0	0.16-0.18	7.9-8.4	<2	Low--------	0.32		
SgC*:									
Servilleta------	0-3	0.2-0.6	0.19-0.21	6.6-7.3	<2	High-------	0.43	3	4
	3-34	0.06-0.2	0.14-0.21	6.6-9.0	<2	Moderate	0.43		
	34	---	---	---	---	----------	---		
Prieta----------	0-2	0.06-0.2	0.08-0.11	6.6-7.4	<2	Moderate	0.17	1	8
	2-14	0.06-0.2	0.08-0.11	7.4-8.4	<2	High-------	0.17		
	14	---	---	---	---	----------	---		
ShB----------	0-16	0.6-2.0	0.16-0.18	6.6-7.4	<2	Moderate	0.28	5	5
Shawa	16-60	0.6-2.0	0.14-0.16	6.6-7.4	<2	Moderate	0.32		
SmB, SmD----------	0-5	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low--------	0.32	5	5
Silva	5-30	0.06-0.2	0.18-0.20	7.4-8.4	<2	High-------	0.32		
	30-60	0.2-0.6	0.16-0.18	7.9-8.4	<2	Low--------	0.32		

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
SSC*:									
Silva	0-3	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low	0.32	5	5
	3-31	0.06-0.2	0.18-0.20	7.4-8.4	<2	High	0.32		
	31-60	0.2-0.6	0.16-0.18	7.9-8.4	<2	Low	0.32		
Sedillo	0-3	0.6-2.0	0.10-0.12	7.4-7.8	<2	Low	0.24	4	---
	3-11	0.2-0.6	0.07-0.11	7.9-8.4	<2	Low	0.17		
	11-60	2.0-6.0	0.05-0.07	7.9-8.4	<2	Low	0.17		
StC	0-3	0.6-2.0	0.14-0.16	6.6-7.3	<2	Low	0.20	5	8
Stunner	3-23	0.6-2.0	0.17-0.20	6.6-8.4	<4	Moderate	0.28		
	23-60	0.6-2.0	0.14-0.16	7.9-8.4	<2	Low	0.28		
SUC*:									
Stunner	0-4	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low	0.24	5	5
	4-27	0.6-2.0	0.17-0.20	6.6-8.4	<4	Moderate	0.28		
	27-60	0.6-2.0	0.14-0.16	7.9-8.4	<2	Low	0.28		
Luhon	0-5	0.6-2.0	0.13-0.15	7.9-8.4	2-4	Low	0.32	5	6
	5-60	0.6-2.0	0.11-0.13	8.5-9.0	4-8	Low	0.28		
SVC*:									
Stunner	0-4	0.6-2.0	0.14-0.16	6.6-7.3	<2	Low	0.20	5	8
	4-19	0.6-2.0	0.17-0.20	6.6-8.4	<4	Moderate	0.28		
	19-60	0.6-2.0	0.14-0.16	7.9-8.4	<2	Low	0.28		
Travelers	0-13	0.6-2.0	0.06-0.09	7.9-8.4	<2	Low	0.17	1	8
	13	---	---	---	---	---	---		
Luhon	0-6	0.6-2.0	0.13-0.15	7.9-8.4	2-4	Low	0.32	5	6
	6-60	0.6-2.0	0.11-0.13	8.5-9.0	4-8	Low	0.28		
TeB	0-3	0.6-2.0	0.14-0.18	6.6-7.3	<2	Low	0.32	2	5
Tenorio	3-13	0.6-2.0	0.13-0.18	6.6-7.3	<2	Low	0.28		
	13-18	2.0-6.0	0.05-0.07	6.6-7.8	<2	Low	0.17		
	18-60	>20	0.03-0.05	7.4-7.8	<2	Low	0.10		
TeC	0-5	0.6-2.0	0.14-0.18	6.6-7.3	<2	Low	0.32	2	5
Tenorio	5-17	0.6-2.0	0.13-0.18	6.6-7.3	<2	Low	0.28		
	17-60	>20	0.03-0.05	7.4-7.8	<2	Low	0.10		
TrF	0-7	0.6-2.0	0.07-0.09	6.1-7.3	<2	Low	0.32	5	---
Trampas	7-11	0.6-2.0	0.06-0.08	6.1-6.5	<2	Low	0.17		
	11-35	0.06-0.2	0.06-0.08	6.1-6.5	<2	Moderate	0.15		
	35-61	0.6-2.0	0.06-0.08	5.6-6.0	<2	Low	0.17		
TsE	0-7	0.6-2.0	0.07-0.09	6.1-7.3	<2	Low	0.32	5	---
Trampas	7-23	0.06-0.2	0.06-0.08	6.1-6.5	<2	Moderate	0.15		
	23-61	0.6-2.0	0.06-0.08	5.6-6.0	<2	Low	0.17		
TTF*:									
Trampas	0-7	0.6-2.0	0.07-0.09	6.1-7.3	<2	Low	0.32	5	---
	7-11	0.6-2.0	0.06-0.08	6.1-6.5	<2	Low	0.17		
	11-49	0.06-0.2	0.06-0.08	6.1-6.5	<2	Moderate	0.15		
	49-61	0.6-2.0	0.06-0.08	5.6-6.0	<2	Low	0.17		
Diamante	0-2	0.6-2.0	0.08-0.14	5.6-7.3	<2	Low	0.15	5	---
	2-31	2.0-6.0	0.04-0.08	5.6-7.3	<2	Low	0.15		
	31-60	0.2-0.6	0.05-0.08	5.6-7.3	<2	Moderate	0.15		
TVC	0-15	0.6-2.0	0.06-0.09	7.9-8.4	<2	Low	0.17	1	8
Travelers	15	---	---	---	---	---	---		

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group
							K	T	
	In	In/hr	In/in	pH	Mmhos/cm				
UTG*:									
Ustorthents.									
Trampas	0-7	0.6-2.0	0.07-0.09	6.1-7.3	<2	Low	0.32	5	---
	7-11	0.6-2.0	0.06-0.08	6.1-6.5	<2	Low	0.17		
	11-49	0.06-0.2	0.06-0.08	6.1-6.5	<2	Moderate	0.15		
	49-61	0.6-2.0	0.06-0.08	5.6-6.0	<2	Low	0.17		
VbD	0-5	2.0-6.0	0.11-0.15	6.6-8.4	<2	Low	0.24	5	3
Vibo	5-18	0.6-2.0	0.14-0.16	6.6-8.4	<2	Moderate	0.32		
	18-45	0.6-2.0	0.11-0.13	6.6-8.4	<2	Low	0.24		
	45-60	6.0-20	0.06-0.08	6.6-8.4	<2	Low	0.17		
WEF*:									
Wellsville	0-8	0.6-6.0	0.14-0.16	6.1-7.3	<2	Low	0.17	5	8
	8-42	0.2-0.6	0.12-0.15	6.1-7.3	<2	Moderate	0.15		
	42-60	0.6-2.0	0.10-0.13	7.4-7.8	<2	Moderate	0.15		
Ess	0-8	0.6-2.0	0.13-0.17	7.4-7.8	<2	Low	0.24	5	---
	8-60	0.2-0.6	0.07-0.09	7.4-7.8	<2	Moderate	0.24		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "occasional," and "very brief" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
AMF*:											
Amalia	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Manzano	C	Rare to common.	Very brief	May-Oct	>6.0	---	>60	---	---	High	Low.
ATC*:											
Antonito	B	None	---	---	>6.0	---	20-40	Hard	Low	High	Low.
Travelers	D	None	---	---	>6.0	---	10-20	Hard	Low	High	Low.
CaB	C	Occasional	Very brief	Apr-Sep	2.0-6.0	Mar-Jun	>60	---	Moderate	High	Moderate.
Caruso											
CHG*:											
Chimayo	D	None	---	---	>6.0	---	12-20	Hard	Low	Low	Low.
Rock outcrop.											
CRG*:											
Cryoboralfs.											
Rock outcrop.											
CSC*.											
Cryoborolls											
CTC*:											
Cryoborolls.											
Cryaquolls.											
CUB*.											
Cumulic Haplaquolls											
CYB*.											
Cumulic Haploborolls											
DeF	C	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
Derecho											

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
DeG*:											
Derecho	C	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
Rock outcrop.											
DFG*:											
Devisadero	C	None	---	---	>6.0	---	20-40	Hard	Moderate	High	Low.
Rock outcrop.											
DmF	B	None	---	---	>6.0	---	>60	---	Moderate	High	Moderate.
Diamante											
EGG*:											
Glossoboralfs.											
Rock outcrop.											
FaC, FbC, FeB, FeC, FfC	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Fernando											
FHB*:											
Fernando	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Hernandez	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
FLB*.											
Fluvents											
HaB	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Hernandez											
HKC*:											
Hernandez	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Kim	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
HPC*:											
Hernandez	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Petaca	D	None	---	---	>6.0	---	10-20	Hard	Moderate	High	Low.
HSC*:											
Hernandez	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Silva	C	None	---	---	>6.0	---	>60	---	Low	High	Low.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
JaD*:											
Jaroso	C	None	---	---	>6.0	---	>60	---	Moderate	High	Moderate.
Angostura	B	None	---	---	>6.0	---	>60	---	Moderate	Moderate	Moderate.
JaF*, JaG*:											
Jaroso	C	None	---	---	>6.0	---	>60	---	Moderate	High	Moderate.
Angostura	B	None	---	---	>6.0	---	>60	---	Moderate	Moderate	Moderate.
Mascarenas	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
JRG*:											
Jaroso	C	None	---	---	>6.0	---	>60	---	Moderate	High	Moderate.
Angostura	B	None	---	---	>6.0	---	>60	---	Moderate	Moderate	Moderate.
Rock outcrop.											
LaE Lama	C	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
LoB Loveland	C	Common	Very brief	Mar-Sep	1.5-2.5	Jan-Dec	>60	---	High	High	Low.
LtC*:											
Luhon	B	None	---	---	>6.0	---	>60	---	Low	High	Moderate.
Travelers	D	None	---	---	>6.0	---	10-20	Hard	Low	High	Low.
MaF Maes	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
MeD*, MeF*, MeG*:											
Maes	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
Etoe	B	None	---	---	>6.0	---	>60	---	Moderate	Low	Low.
MFG*:											
Maes	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
Etoe	B	None	---	---	>6.0	---	>60	---	Moderate	Low	Low.
Rock outcrop.											
MNC, MnA, MnB, MnC Manzano	C	Rare to common.	Very brief	May-Oct	>6.0	---	>60	---	---	High	Low.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
MrD, MrF, MrG----- Marosa	B	None--------	---	---	>6.0	---	>60	---	Moderate---	Moderate	Low.
MSG*, MSG2*: Marosa----------	B	None--------	---	---	>6.0	---	>60	---	Moderate---	Moderate	Low.
Rock outcrop.											
MTE*: Marosa----------	B	None--------	---	---	>6.0	---	>60	---	Moderate---	Moderate	Low.
Nambe----------	B	None--------	---	---	>6.0	---	>60	---	Moderate---	High-----	High.
MUG*: Mirabal----------	C	None--------	---	---	>6.0	---	20-35	Hard	Moderate---	Low------	Moderate.
Rock outcrop.											
MwD---------- Mirand	D	None--------	---	---	>6.0	---	>60	---	Low--------	High-----	Low.
MxD---------- Montecito	C	None--------	---	---	>6.0	---	>60	---	Low--------	High-----	Low.
MxE*: Montecito--------	C	None--------	---	---	>6.0	---	>60	---	Low--------	High-----	Low.
Rock outcrop.											
NaD, NaF, NaF2, NaG, NaG2-------- Nambe	B	None--------	---	---	>6.0	---	>60	---	Moderate---	High-----	High.
NRG*, NRG2*: Nambe----------	B	None--------	---	---	>6.0	---	>60	---	Moderate---	High-----	High.
Rock outcrop.											
OeF---------- Orejas	D	None--------	---	---	>6.0	---	10-20	Hard	Low--------	High-----	Low.
OMD*: Orejas----------	D	None--------	---	---	>6.0	---	10-20	Hard	Low--------	High-----	Low.
Montecito--------	C	None--------	---	---	>6.0	---	>60	---	Low--------	High-----	Low.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
ORG*:											
Orthents.											
Badland.											
OSG*:											
Orthents.											
Calciorthids.											
OTG*:											
Orthents.											
Rock outcrop.											
PAG*:											
Paleboralfs.											
Cryochrepts.											
Rock outcrop.											
PbD, PbF---------- Penitente	B	None--------	---	---	>6.0	---	>60	---	Moderate---	High-----	High.
PeD---------- Petaca	D	None--------	---	---	>6.0	---	10-20	Hard	Moderate---	High-----	Low.
PfC*:											
Petaca----------	D	None--------	---	---	>6.0	---	10-20	Hard	Moderate---	High-----	Low.
Prieta----------	D	None--------	---	---	>6.0	---	10-20	Hard	Low--------	High-----	Low.
PGC*:											
Petaca----------	D	None--------	---	---	>6.0	---	10-20	Hard	Moderate---	High-----	Low.
Silva----------	C	None--------	---	---	>6.0	---	>60	---	Low--------	High-----	Low.
Prieta----------	D	None--------	---	---	>6.0	---	10-20	Hard	Low--------	High-----	Low.
PoB---------- Poganeab	C	Rare--------	---	---	0.5-1.5	Apr-Sep	>60	---	High-------	High-----	High.
PrD, PrF, PrG----- Presa	B	None--------	---	---	>6.0	---	>60	---	Moderate---	Moderate	High.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
PSG*:											
Presa	B	None	---	---	>6.0	---	>60	---	Moderate	Moderate	High.
Rock outcrop.											
PYF*:											
Presa	B	None	---	---	>6.0	---	>60	---	Moderate	Moderate	High.
Cryaquolls.											
RaC	D	None	---	---	>6.0	---	10-20	Hard	Moderate	High	Low.
Raton											
RBE*:											
Raton	D	None	---	---	>6.0	---	10-20	Hard	Moderate	High	Low.
Stunner	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
RcG*.											
Rock outcrop											
RdG*:											
Rock outcrop.											
Badland.											
RPG*:											
Rock outcrop.											
Penitente	B	None	---	---	>6.0	---	>60	---	Moderate	High	High.
RRE*:											
Rock outcrop.											
Raton	D	None	---	---	>6.0	---	10-20	Hard	Moderate	High	Low.
RUG*:											
Rock outcrop.											
Ustorthents.											
RvC	A	None	---	---	>6.0	---	>60	---	Low	Low	Low.
Royosa											
RWE*:											
Royosa	A	None	---	---	>6.0	---	>60	---	Low	Low	Low.
Orthents.											

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
RYD*:											
Royosa	A	None	---	---	>6.0	---	>60	---	Low	Low	Low.
Vibo	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
SaG*:											
Sabe	B	None	---	---	>6.0	---	>60	---	Moderate	Low	Low.
Mirand	D	None	---	---	>6.0	---	>60	---	Low	High	Low.
SbD Sedillo	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
SDD*:											
Sedillo	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Orthents.											
SED*:											
Sedillo	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Silva	C	None	---	---	>6.0	---	>60	---	Low	High	Low.
SgC*:											
Servilleta	C	None	---	---	>6.0	---	20-40	Hard	Low	High	Low.
Prieta	D	None	---	---	>6.0	---	10-20	Hard	Low	High	Low.
ShB Shawa	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
SmB, SmD Silva	C	None	---	---	>6.0	---	>60	---	Low	High	Low.
SSC*:											
Silva	C	None	---	---	>6.0	---	>60	---	Low	High	Low.
Sedillo	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
StC Stunner	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
SUC*:											
Stunner	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Luhon	B	None	---	---	>6.0	---	>60	---	Low	High	Moderate.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft		In				
SVC*:											
Stunner	B	None	---	---	>6.0	---	>60	---	Low	High	Low.
Travelers	D	None	---	---	>6.0	---	10-20	Hard	Low	High	Low.
Luhon	B	None	---	---	>6.0	---	>60	---	Low	High	Moderate.
TeB, TeC Tenorio	B	None	---	---	>6.0	---	>60	---	Low	Moderate	Low.
TrF, TsE Trampas	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
TTF*:											
Trampas	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
Diamante	B	None	---	---	>6.0	---	>60	---	Moderate	High	Moderate.
TVC Travelers	D	None	---	---	>6.0	---	10-20	Hard	Low	High	Low.
UTG*:											
Ustorthents.											
Trampas	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
VbD Vibo	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
WEF*:											
Wellsville	B	None	---	---	>6.0	---	>60	---	Moderate	High	Low.
Ess	B	None	---	---	>4.0	---	>40	---	Moderate	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING TEST DATA

Soil name and location	Report no.	Depth	Estimated coarse fraction greater than 3 inches (by weight)	Mechanical analyses[1] Percentage passing sieve-- 3 in.	2 in.	1 in.	3/4 in.	3/8 in.	No. 4	No. 10	No. 40	No. 200	Liquid limit	Plasticity index	Classification AASHTO[2]	Unified
		In	Pct										Pct			
Jaroso cobbly loam: near the east quarter corner, SW1/4NE1/4 of sec. 14, T. 24 N., R. 15 E.	71-15724	4-16	30							100	68	47	NP[3]	NP	A-4(3)	SM-2
	71-15725	26-41	25	100	95	94	91	85	74	52	42	31	24	5	A-2-4(0)	SM-SC
Marosa cobbly sandy loam: SE1/4NE1/4 of sec. 15, T. 29 N., R. 14 E.	71-15728	16-34	25	100	98	68	66	53	41	31	20	10	NP	NP	A-1-a(0)	GP-GM
	71-15729	34-44	30	100	97	80	75	61	50	37	22	13	25	7	A-2-4(0)	
Presa cobbly loam: sec. 27, T. 24 N., R. 15 E.	71-15726	5-13	10	100	92	87	87	79	68	53	37	21	NP	NP	A-1-b(0)	SM-1
	71-15727	24-34	65	100	81	66	60	52	45	37	27	17	NP	NP	A-1-b(0)	GM
Sedillo gravelly loam: SE1/4NW1/4SW1/4 of sec. 30 T. 27 N., R. 12 E.	71-15720	3-11	10	100	85	79	77	74	71	67	57	35	41	9	A-2-5(0)	SM-1
	71-15721	11-24	10	100	79	62	53	35	27	20	10	4	NP	NP	A-1-a(0)	GP
Servilleta silty clay loam: 80 feet southwest of the northeast corner of sec. 6, T. 27 N., R. 10 E.	71-15733	3-10	-							100	93	73	37	10	A-4(8)	ML
	71-15734	16-25	-							100	90	65	38	10	A-4(6)	ML

[1]Mechanical analyses according to AASHTO Designation T 88. Results by this procedure frequently differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

[2]Based on AASHTO Designation M 145-49.

[3]NP = Nonplastic

TABLE 16.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Amalia	Loamy-skeletal, mixed Borollic Haplargids
Angostura	Loamy-skeletal, mixed Typic Cryoboralfs
Antonito	Fine-loamy, mixed Borollic Haplargids
Caruso	Fine-loamy, mixed, mesic Fluvaquentic Haplustolls
Chimayo	Loamy-skeletal, mixed, nonacid, mesic Lithic Ustorthents
Derecho	Clayey-skeletal, mixed Mollic Eutroboralfs
Devisadero	Clayey-skeletal, mixed, mesic Aridic Haplustalfs
Diamante	Clayey-skeletal, mixed Typic Paleboralfs
Ess	Loamy-skeletal, mixed Argic Cryoborolls
Etoe	Loamy-skeletal, mixed Typic Paleboralfs
Fernando	Fine-loamy, mixed, mesic Ustollic Haplargids
Hernandez	Fine-loamy, mixed, mesic Ustollic Calciorthids
Jaroso	Clayey-skeletal, mixed Typic Cryoboralfs
Kim	Fine-loamy, mixed (calcareous), mesic Ustic Torriorthents
Lama	Fine, mixed, mesic Typic Haplustalfs
Loveland	Fine-loamy over sandy or sandy-skeletal, mixed (calcareous), mesic Typic Haplaquolls
Luhon	Fine-loamy, mixed Borollic Calciorthids
Maes	Clayey-skeletal, mixed Eutric Glossoboralfs
Manzano	Fine-loamy, mixed, mesic Cumulic Haplustolls
Marosa	Loamy-skeletal, mixed Typic Paleboralfs
Mascarenas	Clayey-skeletal, mixed Typic Paleboralfs
Mirabal	Loamy-skeletal, mixed, nonacid, frigid Typic Ustorthents
Mirand	Fine, mixed Mollic Eutroboralfs
Montecito	Fine, mixed, mesic Typic Haplustalfs
Nambe	Loamy-skeletal, mixed Typic Cryochrepts
Orejas	Clayey, mixed, mesic Lithic Haplustalfs
Penitente	Loamy-skeletal, mixed Pergelic Cryumbrepts
Petaca	Loamy, mixed, mesic Lithic Calciorthids
Poganeab	Fine-loamy, mixed (calcareous), mesic Typic Fluvaquents
Presa	Loamy-skeletal, mixed Typic Cryoboralfs
Prieta	Clayey-skeletal, mixed, mesic Lithic Ustollic Haplargids
Raton	Clayey-skeletal, mixed Lithic Argiborolls
Royosa	Mixed, mesic Typic Ustipsamments
Sabe	Sandy-skeletal, mixed Psammentic Eutroboralfs
Sedillo	Loamy-skeletal, mixed, mesic Ustollic Haplargids
Servilleta	Fine, mixed, mesic Ustollic Haplargids
Shawa	Fine-loamy, mixed Pachic Haploborolls
Silva	Fine, mixed, mesic Ustollic Haplargids
Stunner	Fine-loamy, mixed Borollic Haplargids
Tenorio	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Ustollic Haplargids
Trampas	Clayey-skeletal, mixed Typic Eutroboralfs
Travelers	Loamy-skeletal, mixed Borollic Lithic Camborthids
Vibo	Fine-loamy, mixed, mesic Aridic Haplustalfs
Wellsville	Fine-loamy, mixed Argic Cryoborolls

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