United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with New Mexico Agricultural Experiment Station And City of Santa Fe, Santa Fe County, National Park Service, and Department of Defense

Soil Survey of Santa Fe County Area, New Mexico

How To Use This Soil Survey

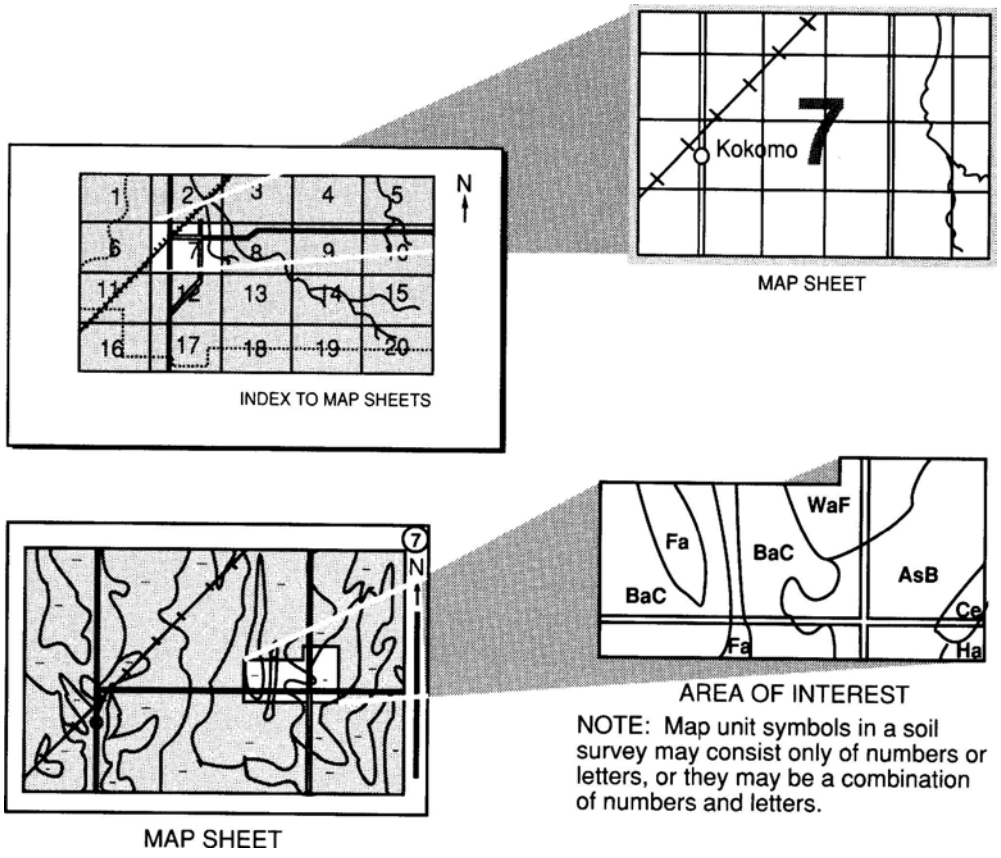
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

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

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

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



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

Major fieldwork for this soil survey was completed in September, 2005. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2004. This survey was made cooperatively by the Natural Resources Conservation Service, the National Park Service, and the New Mexico Agricultural Experiment Station.

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Cover: Typical area of map unit 208—Alire-Urban land complex, 2 to 8 percent slopes. The homes in this area are all Santa Fe or Southwest style architecture, typified by flat roofs, earth tone stucco walls, and viega ceilings. The Sangre de Cristo Mountains are in the background, toward the left is Santa Fe Baldy, which at 12,622 feet elevation, is the highest peak in Santa Fe County.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov

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2008

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

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

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

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

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

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Soil Survey of Santa Fe County Area, New Mexico

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In cooperation with the
New Mexico Agricultural Experiment Station, City of Santa Fe, Santa Fe County, National Park Service, and Department of Defense

This soil survey updates the Soil Survey of Santa Fe Area, New Mexico published in 1975 (USDA, SCS). It provides additional information and has larger maps, which show the soils in greater detail.

The survey area is in north central New Mexico (fig. 1) and includes all of Santa Fe County except for lands administered by the U.S. Forest Service, which are geographically in the northeast and west central part of the county. The survey covers an area of 951,000 acres, or about 1,500 square miles. The survey area is bordered by the U.S. Forest Service on the northwest and northeast side, by Rio Arriba County to the north, Los Alamos County on the far northwest corner, Sandoval County to the west, Bernallio County on the southwest corner, Torrance County to the south, and San Miguel County to the east.

The survey area includes portions of three Major Land Resource Areas (MLRA's): New Mexico and Arizona Plateaus and Mesas—MLRA 36, Southern Rocky Mountains—MLRA 48A, and Pecos-Canadian Plains and Valleys—MLRA 70. *(23)*

Within the survey area, some in part, are seven pueblo reservations, including Tesuque, Pojoaque, Nambe, San Ildefonso, Santa Clara, Santo Domingo, and Cochiti.

Elevations range from a low of 5,380 feet where the Rio Grande enters U.S. Forest Service land in White Rock Canyon, to a high point of 9,121 feet on top of Atalaya Mountain in the eastern side of the survey area, just east of Santa Fe. Most stream systems in Santa Fe County flow from the east, out of the Sangre De Cristo Mountains, feeding into the Rio Grande river which flows from the northwest. The Santa Cruz River flows through Chimayo and Espanola in the northern part of the survey. The Nambe River and Rio En Medio combine to form the Pojoaque River, and flows through the towns of Nambe, Pojoaque, Jacona, Jaconita, and El Rancho. Rio Tesuque flows through the town of Tesuque in a northwesterly direction until entering the Pojoaque River just west of the town of Pojoaque. The Santa Fe River flows westward through Santa Fe, Agua Fria, and La Cienega before entering the Rio Grande River at Cochiti Reservoir. Glorieta Creek flows southward from Glorieta

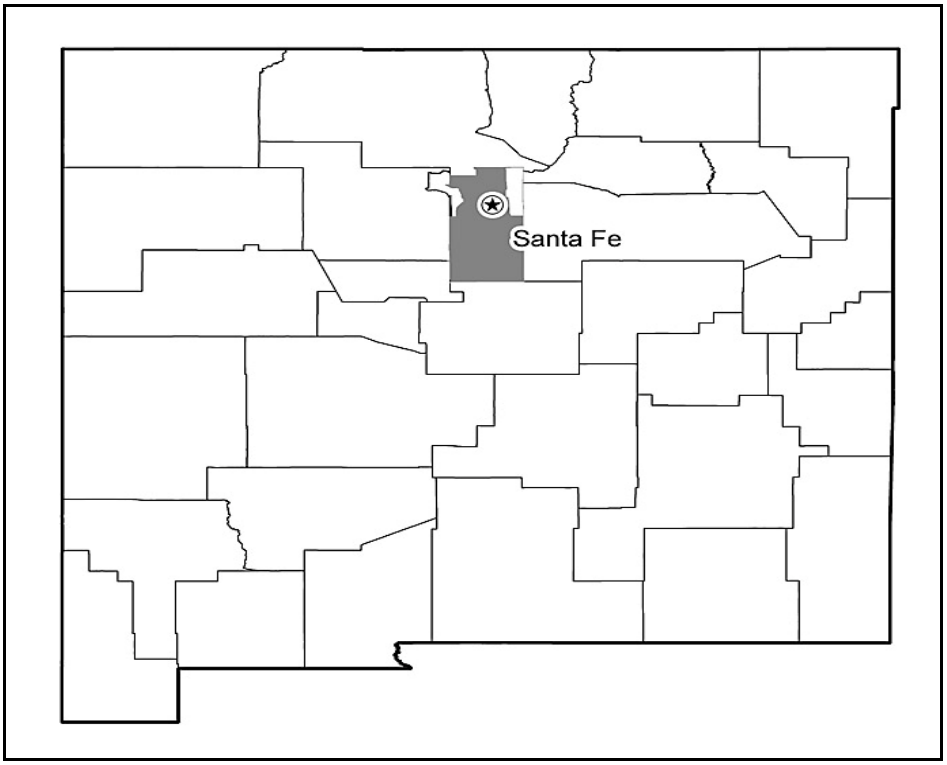

Figure 1.—Location of Santa Fe Area, New Mexico.

Baldy to the town of Glorieta, where it flows eastward until it joins the Pecos River just east of the survey boundary. Galisteo Creek is semi-perennial and flows southwestward from Glorieta Baldy before turning westward at the town of Galisteo.

Soil scientists have determined that there are about 172 different kinds of soils in the survey area that comprise a total of 182 individual map units. Of these 172 soils, 134 are new series proposed within the survey boundary. The soils vary widely in their texture, color, natural drainage, slope, and other characteristics. The climate in which these soils occur also varies widely. The soils in the northern portion of the survey area are at the lowest elevations. These soils, which are gently sloping to rolling with steep breaks occurring in some areas, support mostly scattered juniper with the exception of the riparian areas along the perennial/semi-perennial streams and along the Rio Grande. These areas support a variety of deciduous/evergreen trees that often form a closed canopy.

The soils in the eastern portion of the survey area exist at higher elevations and are generally steeply sloping and high in rock fragments. These soils occur in climates with enough soil moisture to foster the growth of woodland and maintain forest plant communities.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent survey areas. These discrepancies are the result of different scales and intensities of mapping, varying knowledge of the soils, modifications in soil series concepts, or the extent of soils within the survey area.

General Nature of the Survey Area

This section contains general information concerning the Santa Fe County area. It briefly discusses the history and development; physiography, geology, and geomorphology; and climate of the survey area.

History and Development

Although Paleo-Indian and Archaic peoples' nomadic wanderings may have occurred near and in the Santa Fe County area as early as 8,000 and 10,000 B.C., the earliest evidence of human occupation of the area by Archaic-phase hunter-gatherers is around 1750 B.C. *(12)* Evidence is sporadic up to and during the Developmental Pueblo Phase of 600 to 1100 A.D, however, there was a major influx of humans during the Coalition Phase beginning about 1075 A.D. *(12)*, probably from groups migrating from the Chaco Canyon, Aztec, and Mesa Verde areas. Santa Fe itself was originally occupied by a number of Pueblo Indian villages with founding dates between 1050 and 1150 A.D. The Classic Phase ranging from 1200 to 1600 A.D marks the time period of the widest range of artifacts discovered. During this period, the first appearance of glazed pottery instead of carbon-painted pottery occurred. *(12)* This, as well as differences in technology, patterns of settlement, and social organization, indicates that a different population replaced the Coalition-phase settlers south of Frijoles Canyon during this time period. This group is classed as Uto-Aztecan and uses the Keres native language. They presently live in the pueblos of Cochiti, Santo Domingo, and San Felipe, as well as other southern pueblos west of the Rio Grande. *(12)* The original Coalition-phase settlers that continued to occupy land north of Frijoles are of the Kiowa-Tanoan family, and speak the Tewa native language. They are now located in the northern pueblos of Nambe, Pojoaque, Tesuque, San Ildefonso, Santa Clara, and San Juan. It would appear that this total abandonment of the Pajarito Plateau to the Rio Grande Valley floor occurred before 1600 A.D. and prior to the earliest Spanish expeditions into the area (Coronado in 1540 and Onate in 1598). *(12)* The east end of Frijoles Canyon close to the survey boundary was reoccupied briefly during the Pueblo Revolt of 1680. *(12)*

Spanish settlements occurred in the Rio Grande Valley and Santa Fe in the late 1500's, Juan de Onate establishing the first Spanish capital at the Tewa village of Ohke (San Juan) just north of present day Española in 1598. This was later moved to San Gabriel in 1600, which is at the confluence of the Rio Grande and Rio Chama, then established in Santa Fe in 1610 by Governor Pedro de Peralta, making Santa Fe the second oldest continuously occupied European city in the USA. It is the highest elevation capital city (7,000 feet) and also is the oldest capital city.

Following the pueblo revolt of 1680, the Spanish settlers were driven from Santa Fe and indeed from New Mexico, and spent the next 12 years around the area of El Paso, Texas. Re-conquest of Santa Fe occurred in 1692, when Don Diego de Vargas, with many of the ousted settlers, journeyed up the Camino Real and re-settled Santa Fe. Don Diego then began to expand outside of Santa Fe, and the village of Santa Cruz became colonized around 1695, and a group of families also settled in the area of present day Chimayo about the same time period.

At the same time as Mexico declared independence from Spain, the old Santa Fe Trail was established in 1821 and traveled westward from Kansas City, terminating at the Santa Fe Plaza. Although explored by Rivera in 1765 and attempted by Escalante in 1776, the first documented round trips of the Old Spanish Trail did not occur until 1829. It originated in Santa Fe and traveled northward or northwestward before turning west through Colorado and Utah toward the west coast at Los Angeles. A later trail was developed that took a more westward route that strattled the Arizona-Utah line and joined the Old Spanish Trail southwest of Green River, Utah.

A skirmish of the Civil War was fought in Santa Fe County near the town of Glorieta in 1862.

The railroad arrived into the Lamy area, just south of Santa Fe in the late 1800's. A spur was then created that traveled northward to Santa Fe, and continued

northward through the town of Española to Antonito, Colorado. This northward spur was called “The Chili Line”.

Physiography, Geology, and Geomorphology

Santa Fe County encompasses several major physiographic provinces within its boundaries: the Espanola Basin, Galisteo Basin, and Estancia Basin part of the Basin and Range physiographic province, the Glorieta Slope part of the Pecos Valley section of the Great Plains physiographic province, and the southwestern Sangre de Cristo part of the Southern Rocky Mountains province. *(11, 15)*

The oldest rocks in the survey area, located in the northeast, are the Precambrian age granite, gneiss, and schist that form the core of the Sangre de Cristo Mountains. Although much of this geology is at higher elevations and in forest service lands out of the survey area, there is significant acreage at lower elevations around the towns of Cundiyo in the northeast corner of the survey area, Hyde Park to the east of Santa Fe, and Canada de los Alamos to the southeast of Santa Fe. This formation constitutes the basement rock of much of New Mexico, but is exposed at the surface and indeed has been uplifted several thousand feet above the surrounding areas. In these mountains because of the tremendous uplifting of the Laramide Orogeny from the late cretaceous period, and consequent shedding of its material is largely resultant in the formations of huge water bearing aquifers to the south and east (Ogallala Formation).

Adjacent to the granite, gneiss, and schist just east of Santa Fe and north of the Santa Fe River are smaller outcroppings of limestone, sandstone, and shale of the Pennsylvanian Age Magdalena Group.

Around the town of Glorieta are sandstones and shales with some conglomerate of the early Permian Age Sangre de Cristo Formation.

The Glorieta Slope is composed of sandstone and limestone with minor amounts of mudstone formations of Triassic and Permian age redbeds. These formations include the Santa Rosa Sandstone, the Bernal Formation, the San Andres Limestone, the Glorieta Sandstone, and the Yeso Formation.

The Galisteo Basin is composed mainly of shales and sandstones of the Cretaceous Age Mancos Shale and Dakota Sandstone Formations.

The Jemez Volcanic Pile flanks the east side of the Jemez Mountains and was formed from the process of magma buildup beginning about 13 million years ago. This buildup occurred as a result of the formation of the Rio Grande Rift, a separation of the earth’s crust in the North American Tectonic plate. As this separation progressed, giant blocks of crust settled into the mantle, forming a series of basins that stretch from Leadville, Colorado to El Paso, Texas that in some places contain more than 20,000 feet of alluvial sediment. *(10)* A continuance of these eruptions formed the Cerros del Rio Basalt Lava Field around 3 million years ago. Two giant eruptions ejecting over 165 cubic miles of volcanic material occurred about 1.6 and again 1.2 million years ago, forming the Otowi and Tshirege Members of the Bandelier Tuff. Several subsequent eruptions occurred since that time until about 50,000 years ago.

Rocks of comparable age to the Jemez Volcanic Pile are from intrusive igneous eruptions yielding rocks (monzonite) that form high hills and mountains including the Ortiz, San Pedro, and South Mountains and the Cerrillos Hills, and igneous extrusive flows that make up the Espinaso Formation. *(16)* Next in age is the latite and dacite of the Tschicoma Formation which form the high mountains including Cerro Grande and Parajarito Mountain west of the survey area. The western edge of the survey area also contains exposures of Cerros del Rio Basalt which form mostly structural benches or mesas above White Rock Canyon through which flows the Rio Grande. *(16)* This part of the survey area also contains the thick deposits of Bandelier Tuff,

composed of rhyolitic volcanic ash, which has been highly dissected by deep southeast trending canyons that have given the area distinct plateau/canyon topography. The plateaus are wide enough that interfluves occur between canyons; these interfluves exhibit landscapes that are similar to hills, whereby hillslope positions were identified. The canyons are bounded by cliffs that grade to steep escarpments, grading to footslope positions below. Some valleys in the bottom of the canyons are wide enough to contain some or all components of valley floors, flood plain steps, and flood plains. High stream terrace surfaces are greatly eroded, but do exist in small, localized areas.

The central and north-central part of the survey area is composed primarily of outwash alluvium. This material is derived from granite, gneiss, and schist of the Sangre de Cristo Mountains, and to a lesser extent, river alluvium composed mostly of quartzite and basalt deposited by the ancestral Rio Grande and Rio Chama. In most instances, the former material has buried the latter by piedmonts that slope generally to the west and south, and represent several thousand feet of weakly consolidated alluvium.

Climate

Santa Fe County is located in a region of the U.S. that is continental and rugged in topography in that the climate is represented by considerable variations in both temperature and precipitation. The moisture regimes range from aridic ustic to typic ustic and the temperature regimes from mesic to frigid. Additionally, in areas with measurable slope, aspect can account for great variability in climate.

Summers are warm to hot and the winters are moderately cool to cold with mean annual temperatures ranging from about 40 to 54 degrees F. *(3)* The diurnal range of temperatures is quite large and may exceed 30 degrees F. The average number of days without freezing temperatures is about 100 in the higher elevations, and 170 in the lower elevation areas.

The temperatures are mild (warmer) than usual for the elevation. This is because of a phenomenon known locally as the Rio Grande Box Effect. At night, cold air drains from northern mountains over 13,000 feet elevation down the Rio Grande Valley, which in turn displaces warmer air at lower elevations. The warm air moves northward up the valley, like water flowing uphill, riding above the stream of cold air towards Santa Fe and Los Alamos. *(4)* This box effect is what makes Albuquerque famous for its balloon fiesta; with just the right conditions, balloonists can move southward with the cold draft, change their elevation, and catch the northward movement from the warm draft and return close to the point of liftoff. The result of this effect to the Santa Fe-Los Alamos area is much warmer nighttime temperatures whereby Santa Fe, sitting at an elevation 2,000 feet above Albuquerque, often has similar nighttime temperatures.

Mean annual precipitation ranges from 9 to 20 inches, which falls with great variability from month to month and year to year. Seasonal precipitation patterns exhibit a slight maximum in the summer with over one-third of the annual average falling in the months of July to September. *(4)* The primary source of moisture during the summer monsoon season is air from over the Gulf of Mexico. Southeast winds caused by the circulation patterns around the Bermuda high-pressure area shift westward in the summer. This brings moisture-laden tropical air into the southwestern United States. Occasionally, an influx of moisture from the eastern subtropical Pacific occurs in late summer as weakened storm systems from the Gulf of California disintegrate over Arizona and New Mexico. Most summer precipitation falls as heavy rain from brief, isolated, high-intensity convective thunderstorms which are usually accompanied by strong, gusty winds and occasionally bursts of hail. Flash flooding in normally dry arroyos is common during this time of the year. During

the winter, precipitation falls in a widespread pattern and is produced by Pacific Ocean storm-fronts moving inland from the west. Winter precipitation is much heavier in the higher elevations, where the storm systems are orographically lifted as they pass over the mountains.

Annually, sunshine occurs at an average of 70 percent of the daylight hours with 80 percent during the summer and 60 percent in winter. The average relative humidity in mid-afternoon is about 35 percent. Humidity is higher at night, and the average at dawn is about 65 percent. In late spring and early summer afternoons, humidity drops to as low as 15 to 20 percent. WETS tables provide weather information including temperature and precipitation for the Los Alamos and Santa Fe sites.

Climate Data

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Climate tables are created from climate station Santa Fe 2 New Mexico.

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Santa Fe, New Mexico.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Santa Fe 2 in the period 1971 to 2000.

Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 32.4 degrees F and the average daily minimum temperature is 20.2 degrees. The lowest temperature on record, which occurred at Santa Fe 2 on December 23, 1990, is -17 degrees. In summer, the average temperature is 68.8 degrees and the average daily maximum temperature is 83.9 degrees. The highest temperature, which occurred at Santa Fe 2 on June 29, 1998, is 99 degrees.

Growing degree days are shown in Table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 14.29 inches. Of this, about 8.52 inches, or 60 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.00 inches at Santa Fe 2 on August 12, 1981. Thunderstorms occur on about 47 days each year, and most occur in July.

The average seasonal snowfall is 17.0 inches. The greatest snow depth at any one time during the period of record was 16.0 inches recorded on November 23, 1986. On an average, 10 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 16.0 inches recorded on November 23, 1986.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 40 percent. The sun shines 74 percent of the time in summer and 65 percent in winter. The prevailing wind is from the southeast. Average wind speed is highest, 8.2 miles per hour, in March.

Table 1.—Temperature and Precipitation

(Recorded for the period 1971-2000 at Santa Fe 2, NM)

Month	Temperature (Degrees F)						Precipitation (Inches)				
				2 years in 10 will have				2 years in 10 will have			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than	Average number of growing degree days*	Average	less than	more than	Average number of days w/0.1 or more	Average snowfall
January	42.4	18.3	30.3	59	-4	0	0.63	0.14	1.12	2	3.2
February	48.1	23.2	35.6	66	1	1	0.53	0.13	0.92	2	2.7
March	55.2	27.6	41.4	72	11	7	0.91	0.39	1.40	2	2.7
April	63.8	33.4	48.6	80	16	71	0.73	0.09	1.29	1	0.9
May	72.7	42.1	57.4	88	26	242	1.28	0.38	2.16	3	0.0
June	82.8	51.0	66.9	95	37	508	1.28	0.21	2.25	3	0.0
July	85.7	55.6	70.7	96	44	636	2.16	1.03	3.24	5	0.0
August	83.3	54.4	68.8	94	44	581	2.16	1.39	2.87	6	0.0
September	77.1	47.6	62.3	90	31	368	1.64	0.66	2.59	4	0.0
October	66.6	36.9	51.8	82	17	117	1.29	0.34	2.12	3	0.9
November	52.7	26.1	39.4	71	6	6	1.04	0.37	1.64	2	2.8
December	43.8	19.0	31.4	60	-3	0	0.65	0.09	1.10	2	3.8
Yearly:	---	---	---	---	---	---	---	---	---	---	---
Average	64.5	36.2	50.4	---	---	---	---	---	---	---	---
Extreme	99	-17	---	97	-8	---	---	---	---	---	---
Total	---	---	---	---	---	2,537	14.29	11.45	16.33	35	17.0

Average number of days per year with at least 1 inch of snow on the ground: 10

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Santa Fe 2, NM)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 3	May 14	May 21
2 year in 10 later than--	April 27	May 8	May 17
5 year in 10 later than--	April 15	April 25	May 8
First freezing temperature in fall:			
1 year in 10 earlier than--	October 16	October 1	September 23
2 years in 10 earlier than--	October 21	October 7	September 28
5 years in 10 earlier than--	October 31	October 19	October 9

Table 3.—Growing Season

(Recorded for the period 1971-2000 at Santa Fe 2, NM)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	Days	Days	Days
9 years in 10	169	148	129
8 years in 10	179	157	137
5 years in 10	197	173	153
2 years in 10	215	190	169
1 year in 10	225	199	177

Climate tables are created from climate station Los Alamos, New Mexico

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Santa Fe, New Mexico.

Table 4 gives data on temperature and precipitation for the survey area as recorded at Los Alamos in the period 1971 to 2000.

Table 5 shows probable dates of the first freeze in fall and the last freeze in spring. Table 6 provides data on the length of the growing season.

In winter, the average temperature is 30.5 degrees F and the average daily minimum temperature is 19.5 degrees. The lowest temperature on record, which occurred at Los Alamos on January 13, 1963, is -16 degrees. In summer, the average temperature is 65.9 degrees and the average daily maximum temperature is 78.9 degrees. The highest temperature, which occurred at Los Alamos on June 28, 1998, is 95 degrees.

Growing degree days are shown in Table 4. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 18.95 inches. Of this, about 11.24 inches, or 59 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.47 inches at Los Alamos on July 31, 1968. Thunderstorms occur on about 45 days each year, and most occur in July.

The average seasonal snowfall is 58.8 inches. The greatest snow depth at any one time during the period of record was 40 inches recorded on January 16, 1987. On an average, 48 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 22.0 inches recorded on January 15, 1987 and December 6, 1978.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 40 percent. The sun shines 74 percent of the time in summer and 65 percent in winter. The prevailing wind is from the south-southwest. Average wind speed is highest, 7.7 miles per hour, in March.

Table 4.—Temperature and Precipitation

(Recorded for the period 1971-2000 at Los Alamos, NM)

Month	Temperature (Degrees F)						Precipitation (Inches)				
				2 years in 10 will have		Average number of growing degree days*		2 years in 10 will have		Average number of days w/0.1 or more	Average snowfall
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than		Average	less than	more than		
January	39.5	17.7	28.6	57	-4	0	0.96	0.23	1.68	2	14.2
February	44.2	21.8	33.0	62	0	0	0.76	0.17	1.21	2	9.1
March	50.8	27.0	38.9	68	9	5	1.28	0.50	2.04	3	10.4
April	58.8	33.1	45.9	75	16	43	1.05	0.23	1.82	2	4.9
May	67.9	41.7	54.8	83	27	182	1.43	0.39	2.55	3	0.9
June	78.4	51.1	64.7	91	36	442	1.44	0.47	2.21	3	0.0
July	80.6	54.6	67.6	91	46	544	2.97	1.73	4.26	7	0.0
August	77.6	53.1	65.4	88	43	476	3.32	2.12	4.41	8	0.0
September	71.7	47.0	59.3	85	30	288	2.08	1.12	3.02	4	0.0
October	61.2	36.7	48.9	77	17	76	1.54	0.34	2.64	3	2.9
November	48.2	25.9	37.0	66	6	2	1.19	0.34	1.96	2	5.3
December	40.5	19.0	29.8	57	-2	0	0.92	0.17	1.55	2	11.2
Yearly:	---	---	---	---	---	---	---	---	---	---	---
Average	59.9	35.7	47.8	---	---	---	---	---	---	---	---
Extreme	95	-16	---	92	-8	---	---	---	---	---	---
Total	---	---	---	---	---	2,059	18.95	15.85	21.86	41	58.8

Average number of days per year with at least 1 inch of snow on the ground: 48

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

Table 5.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Los Alamos, NM)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 29	May 13	May 27
2 years in 10 later than--	April 24	May 8	May 22
5 year in 10 later than--	April 13	April 28	May 10
First freezing temperature in fall:			
1 year in 10 earlier than--	October 15	September 27	September 19
2 years in 10 earlier than--	October 20	October 3	September 25
5 years in 10 earlier than--	October 30	October 16	October 6

Table 6.—Growing Season

(Recorded for the period 1971-2000 at Los Alamos, NM)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	Days	Days	Days
9 years in 10	175	145	125
8 years in 10	183	153	133
5 years in 10	199	170	148
2 years in 10	216	186	163
1 year in 10	224	195	170

Climate tables are created from climate station Stanley 1 NNE New Mexico

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Santa Fe, New Mexico.

Table 7 gives data on temperature and precipitation for the survey area as recorded at Stanley 1 NNE in the period 1971 to 2000. Table 8 shows probable dates of the first freeze in fall and the last freeze in spring. Table 9 provides data on the length of the growing season.

In winter, the average temperature is 31.4 degrees F and the average daily minimum temperature is 17.3 degrees. The lowest temperature on record, which occurred at Stanley 1 NNE on January 7, 1971, is -30 degrees. In summer, the average temperature is 68.1 degrees and the average daily maximum temperature is 84.9 degrees. The highest temperature, which occurred at Stanley 1 NNE on June 24, 1971, is 101 degrees.

Growing degree days are shown in Table 7. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 13.80 inches. Of this, about 9.11 inches, or 66 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.55 inches at Stanley 1 NNE on October 30, 1959. Thunderstorms occur on about 45 days each year, and most occur in July.

The average seasonal snowfall is 20.7 inches. The greatest snow depth at any one time during the period of record was 29 inches recorded on December 31, 2006 and the following day. On an average, 25 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 14.1 inches recorded on December 30, 2006.

The average relative humidity in mid-afternoon is about 59 percent. Humidity is higher at night, and the average at dawn is about 40 percent. The sun shines 74 percent of the time in summer and 65 percent in winter. The prevailing wind is from the southeast. Average wind speed is highest, 8.2 miles per hour, in March.

Table 7.—Temperature and Precipitation

(Recorded for the period 1971-2000 at Stanley, NM)

Month	Temperature (Degrees F)						Precipitation (Inches)				
				2 years in 10 will have				2 years in 10 will have			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than	Minimum temperature less than	Average number of growing degree days*	Average	less than	more than	Average number of days w/0.1 or more	Average snowfall
January	42.9	15.9	29.4	62	-10	0	0.50	0.17	0.85	2	4.5
February	49.3	20.0	34.7	67	-5	0	0.35	0.12	0.58	1	3.6
March	57.0	24.9	41.0	74	6	10	0.61	0.18	0.92	2	2.7
April	64.8	30.7	47.7	81	13	61	0.59	0.10	1.02	1	1.5
May	74.2	39.6	56.9	88	22	230	1.12	0.25	1.99	2	0.1
June	84.0	48.2	66.1	97	35	483	1.50	0.30	2.45	3	0.0
July	86.7	53.5	70.1	97	37	622	2.20	1.16	3.28	5	0.0
August	83.9	52.4	68.1	94	42	561	2.74	1.58	3.90	6	0.0
September	77.9	44.8	61.4	90	27	345	1.55	0.74	2.37	4	0.0
October	67.6	33.4	50.5	83	15	95	1.40	0.23	2.36	3	0.7
November	53.7	23.6	38.7	71	1	5	0.70	0.18	1.22	2	2.9
December	44.3	15.9	30.1	62	-6	0	0.51	0.07	0.87	1	4.7
Yearly:	---	---	---	---	---	---	---	---	---	---	---
Average	65.5	33.6	49.6	---	---	---	---	----	----	---	---
Extreme	101	-30	---	98	-14	---	---	----	----	---	---
Total	---	---	---	---	---	2,412	13.80	10.66	16.63	32	20.7

Average number of days per year with at least 1 inch of snow on the ground: 25

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 50.0 degrees F)

Table 8.—Freeze Dates in Spring and Fall

(Recorded for the period 1971-2000 at Stanley, NM)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 10	May 21	May 27
2 years in 10 later than--	May 4	May 15	May 23
5 years in 10 later than--	April 22	May 4	May 15
First freezing temperature in fall:			
1 year in 10 earlier than--	September 30	September 24	September 19
2 years in 10 earlier than--	October 6	September 28	September 23
5 years in 10 earlier than--	October 17	October 7	October 1

Table 9.—Growing Season

(Recorded for the period 1971-2000 at Stanley, NM)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	Days	Days	Days
9 years in 10	156	132	119
8 years in 10	163	140	125
5 years in 10	177	155	138
2 years in 10	190	170	150
1 year in 10	198	178	157

How This Survey Was Made

This survey was made as an update to the Santa Fe County Area Soil Survey to provide recent and higher resolution information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location as well as a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the types of native plants; and the kinds of bedrock. Many soil profiles were carefully studied, observing the sequence of natural layers, or horizons, in a soil profile. The profile extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been altered by biological activity.

The soils and miscellaneous areas in the survey area exist in an orderly pattern related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform (fig. 2 and fig. 3). By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed (fig. 4). Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

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

Soil scientists recorded the characteristics of the soil profiles studied. Observations were recorded on soil color, depth, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that facilitate the identification and classification of the soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. These divisions are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the soil profile. After the soils are classified and named in the survey area, they are compared with similar soils in the same taxonomic class in other areas in order to confirm, revise, and update data based on experience and research.

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

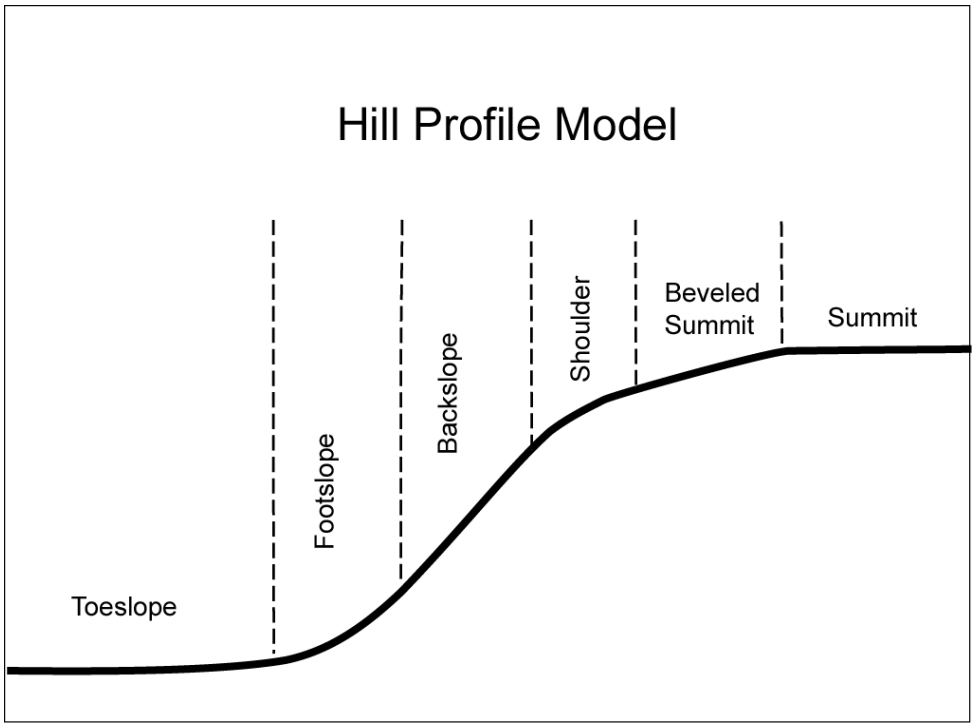

Figure 2.—Cross-section diagram of a hill. Many soils in this report are defined as being on a specific landform position. This simple hill profile model shows landforms.

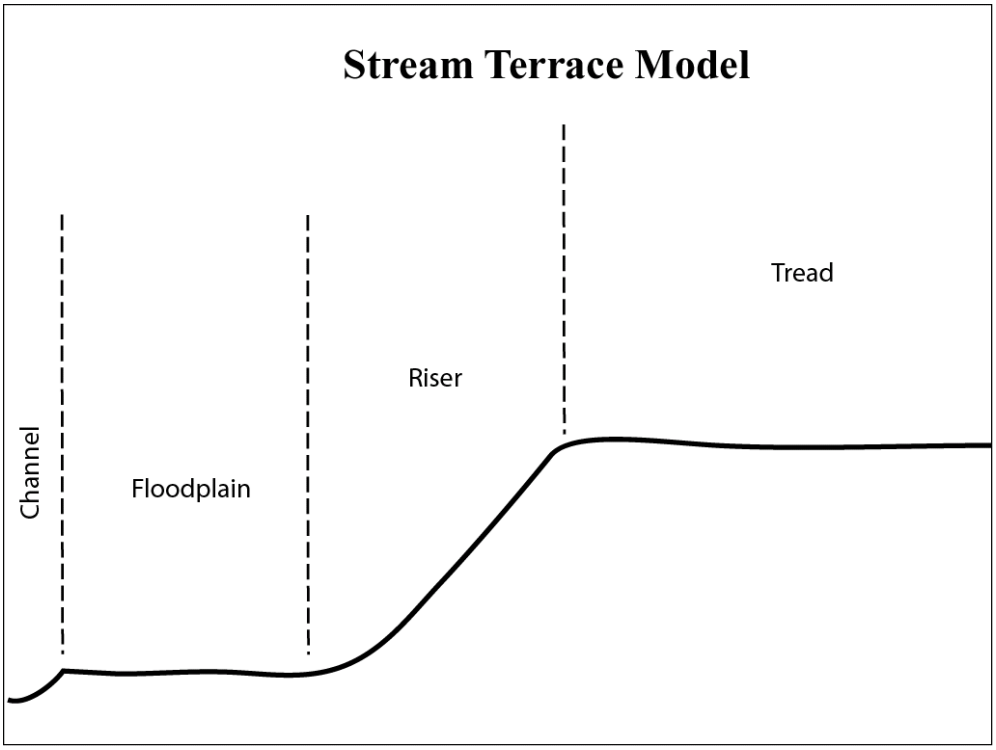

Figure 3.—Cross-section diagram of a stream terrace. The individual soils are defined as being on either the tread (flat part of the stream terrace), or the steep riser part.

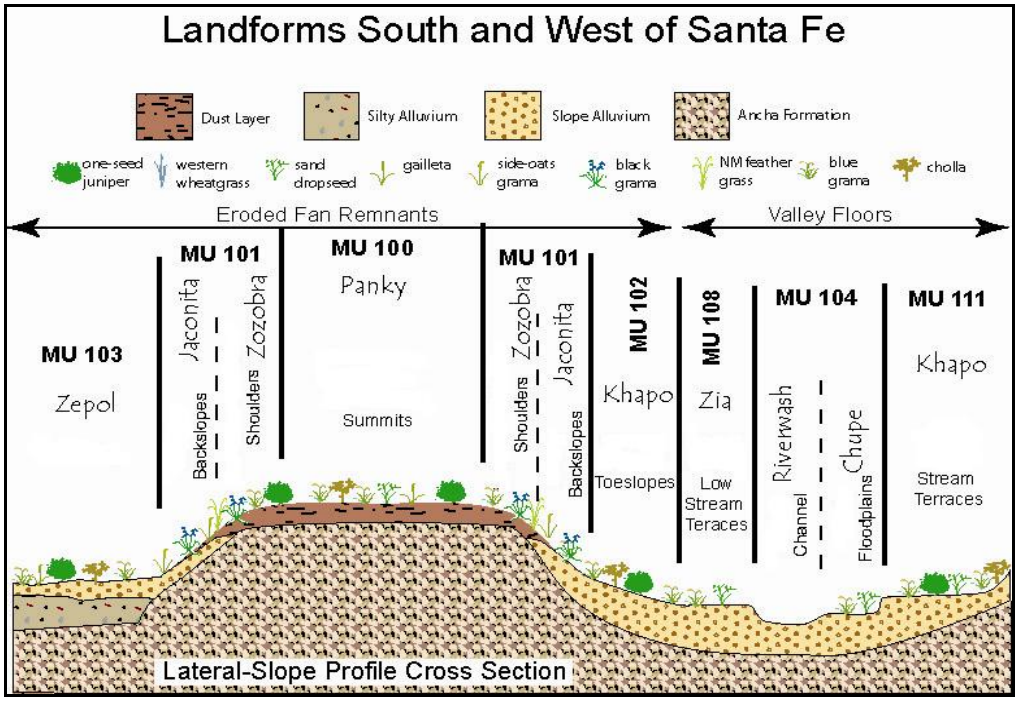

Figure 4.—Cross-section diagram of landforms and landform position for map units south and west of Santa Fe.

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

After locating and identifying the significant natural bodies of soil in the survey area, the boundaries of these bodies were drawn on aerial photographs and each labeled as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately. The use of overlapping vertical aerial photographs and optical devices known as stereoscopes enabled the soil scientists to see landscapes and individual landforms in three dimensions. This technique is known as stereoscopy and is an essential tool for the accurate placement of soil delineations (boundaries) in areas of medium to high relief. Different tonal patterns on aerial photographs are often related to distinct differences in soil, slope, vegetation, moisture, erosion, and geology. Tonal differences are additional tools used by soil scientists to make accurate soil maps on aerial photographs.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas, or soils in the previous survey of this area. *(8)* Differences are the result of a better knowledge of soils, modifications in soil series concepts, variations in the intensity of mapping or in the extent of the soils in the survey areas, or differences in map unit design.

Detailed Soil Map Units

The map unit delineation on a soil map represents an area dominated by one or several major kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects and characteristically have variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and usually some inclusions or included soils that belong to other taxonomic classes.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be reasonably separated on the soil maps at the desired map resolution. Inclusions are therefore mentioned in the map unit descriptions.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of soil data. The objectives of soil mapping are not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

Each map unit is identified with a map unit symbol and a map unit description which includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

A collection of soils with similar properties make up a soil *series.* Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example *Panky loam, 1 to 4 percent slopes* is a phase of the *Panky* series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. *Zozobra-Jaconita complex, 5 to 25 percent slopes* is an example. Sometime all components of a complex have the same surface texture. If such is the case, the word complex is substituted by the surface phase. *Hyer-Witt complex, 1 to 3 percent slopes* is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or

anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Since this survey was done at a high intensity, all components that were large enough were separated into map unit consociations, therefore, there were not any associations in this survey area.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. *Morenda, Fiesta, and Espanola soils, 1 to 85 percent slopes, flooded* is an undifferentiated group in this survey area.

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

Table 10 lists the acreage and proportionate extent of each map unit. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Table 10.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
100	Panky loam, 1 to 4 percent slopes	20,755	2.1
101	Zozobra-Jaconita complex, 5 to 25 percent slopes	12,712	1.3
102	Khapo sandy loam, 3 to 8 percent slopes	15,784	1.6
103	Zepol silt loam, 0 to 2 percent slopes, flooded	4,534	0.5
104	Chupe-Riverwash complex, 1 to 3 percent slopes, flooded	5,198	0.5
105	Dumps, sanitary landfill	349	*
106	Pits	1,469	0.1
107	Riverwash, flooded	123	*
108	Zia fine sandy loam, 0 to 2 percent slopes	2,146	0.2
109	Tetilla loam, 1 to 5 percent slopes	3,612	0.4
110	Calabasas loam, 1 to 3 percent slopes	6,666	0.7
111	Khapo fine sandy loam, 1 to 3 percent slopes	1,166	0.1
112	Riovista gravelly loamy sand, 0 to 1 percent slopes	346	*
113	Delvalle-Urban land complex, 0 to 2 percent slopes	1,747	0.2
114	Devargas-Urban land complex, 1 to 3 percent slopes	2,964	0.3
115	Panky-Urban land complex, 1 to 4 percent slopes	2,977	0.3
116	Arents-Urban land-Orthents complex, 1 to 60 percent slopes	6,334	0.6
117	Agua Fria-Paraje complex, 1 to 8 percent slopes	7,073	0.7
118	Golondrina-Paraje complex, 8 to 45 percent slopes	4,891	0.5
119	Vitrina-Haozous complex, 5 to 15 percent slopes, flooded	2,421	0.2
120	Quarteles-Rock outcrop complex, 25 to 90 percent slopes	11,694	1.2
121	El Rancho silt loam, 1 to 3 percent slopes	1,383	0.1
122	Cuyamungue-Riverwash complex, 0 to 2 percent slopes, flooded	1,710	0.2
123	Koshare very fine sandy loam, 2 to 8 percent slopes	7,108	0.7
124	Camelrock silty clay loam, 0 to 2 percent slopes	283	*
125	Mirada-Bosquecito complex, 0 to 2 percent slopes, flooded	785	*
126	Walkibout-Innacutt complex, 2 to 80 percent slopes, flooded	2,746	0.3
127	Ojito-Koshare-Quarteles complex, 5 to 50 percent slopes	17,400	1.7
128	Koshare-Urban land complex, 2 to 8 percent slopes	3,864	0.4
129	El Rancho-Urban land complex, 1 to 3 percent slopes	1,237	0.1
130	Jaralosa very fine sandy loam, 0 to 2 percent slopes, flooded	1,123	0.1
131	Jaconita-Xenmack complex, 25 to 60 percent slopes	3,780	0.4
132	Depolvo-Sueleros complex, 2 to 15 percent slopes	1,119	0.1
133	Chupe fine sandy loam, 1 to 3 percent slopes	1,855	0.2
134	Bosquecito fine sandy loam, 0 to 2 percent slopes, flooded	346	*
135	Tsinat gravelly loam, 1 to 6 percent slopes	5,873	0.6
136	Churipa very cobbly sandy loam, 5 to 15 percent slopes	3,622	0.4
137	Medrano extremely gravelly loam, 5 to 65 percent slopes	1,728	0.2
138	Andanada very gravelly loam, 5 to 15 percent slopes	2,208	0.2
139	Ildefonso-Rock outcrop-Rubble land complex, 30 to 70 percent slopes	4,366	0.4
140	Truehill very cobbly loam, 25 to 45 percent slopes	1,221	0.1
141	Truehill-Penistaja family-Rock outcrop complex, 4 to 50 percent slopes	3,192	0.3
142	Parida gravelly loam, 3 to 10 percent slopes	527	*
143	Scogg very fine sandy loam, 0 to 2 percent slopes, flooded	509	*
144	Los Alamos fine sandy loam, 1 to 5 percent slopes	1,520	0.2
145	Romberg very gravelly sandy loam, 25 to 55 percent slopes	1,445	0.1
200	Predawn loam, 1 to 4 percent slopes	6,452	0.6
201	Tanoan-Encantado complex, 5 to 25 percent slopes	18,246	1.8
202	Alire loam, 2 to 6 percent slopes	8,623	0.9
203	Buckhorse-Altazano complex, 2 to 8 percent slopes, flooded	9,130	0.9
204	Altazano loamy sand, 0 to 2 percent slopes, flooded	1,596	0.2
205	Nazario gravelly loam, 2 to 8 percent slopes	2,321	0.2
206	Encantado very cobbly sandy loam, 25 to 45 percent slopes	14,594	1.5
207	Urban land	2,495	0.2
208	Alire-Urban land complex, 2 to 8 percent slopes	8,988	0.9
209	Dondiego-Urban land complex, 1 to 3 percent slopes	854	*
210	Urban land-Buckhorse-Altazano complex, 2 to 8 percent slopes	1,425	0.1
211	Tanoan-Encantado-Urban land complex, 5 to 25 percent slopes	5,513	0.5
212	Junebee gravelly sandy loam, 5 to 15 percent slopes	6,426	0.6
213	Levante-Riverwash complex, 1 to 3 percent slopes, flooded	4,325	0.4
214	Nazario-Urban land complex, 2 to 8 percent slopes	1,111	0.1

Table 10.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
215	Predawn-Urban land complex, 1 to 4 percent slopes	2,652	0.3
216	Dondiego loam, 1 to 3 percent slopes	2,302	0.2
217	Ohke sandy loam, 1 to 3 percent slopes	1,771	0.2
218	Pedregal very gravelly loam, 2 to 15 percent slopes	3,241	0.3
219	Ohke sandy loam, 2 to 8 percent slopes	313	*
220	Horcado-Nazario complex, 2 to 35 percent slopes	11,146	1.1
221	Latierra-Lamesilla-Levante complex, 2 to 15 percent slopes, flooded	9,301	0.9
222	Sipapu-Yuzarra-Kachina complex, 5 to 65 percent slopes	13,416	1.3
223	Kachina fine sandy loam, 5 to 15 percent slopes	4,041	0.4
224	Portillo extremely gravelly sandy loam, 25 to 50 percent slopes	2,562	0.3
225	Encantado-Resolana complex, 35 to 70 percent slopes	2,824	0.3
226	Crucitas gravelly fine sandy loam, 2 to 10 percent slopes	242	*
300	Arnor gravelly sandy loam, 2 to 8 percent slopes	1,795	0.2
301	Enmedio-Atalaya-Rock outcrop complex, 5 to 60 percent slopes	13,432	1.3
302	Setonville-Antonchico complex, 3 to 15 percent slopes	8,429	0.8
303	Morenda, Fiesta, and Espanola soils, 1 to 85 percent slopes, flooded	1,956	0.2
304	Legate-Yohalem-Zarmand complex, 5 to 50 percent slopes	2,073	0.2
305	Chimayo-Rock outcrop-Quapaw complex, 50 to 90 percent slopes	1,172	0.1
306	Adellern gravelly sandy loam, 50 to 90 percent slopes	2,176	0.2
307	Urban land-Ustorthents-Ustarents complex, 1 to 65 percent slopes	443	*
308	Enmedio-Zafarano-Rock outcrop complex, 35 to 60 percent slopes	8,969	0.9
309	Lazaro complex, 5 to 45 percent slopes	2,189	0.2
310	Santa Fe-Rock outcrop complex, 25 to 45 percent slopes	890	*
400	Chiminet-Canuela-Rock outcrop complex, 2 to 20 percent slopes	1,539	0.2
401	Rock outcrop-Abrojo-Chiminet complex, 25 to 65 percent slopes	4,305	0.4
402	Navajita complex, 2 to 15 percent slopes	2,344	0.2
403	Piojillo paragravelly ashy loamy coarse sand, 3 to 15 percent slopes	1,789	0.2
404	Totavi ashy loamy coarse sand, 1 to 3 percent slopes	1,215	0.1
405	Espiritu-Pedregal complex, 3 to 50 percent slopes	265	*
406	Rock outcrop-Zacaton-Chiminet complex, 25 to 60 percent slopes	2,989	0.3
407	Rock outcrop-Chiminet complex, 20 to 50 percent slopes	594	*
408	Adornado very paragravelly ashy coarse sandy loam, 8 to 15 percent slopes	42	*
409	Hackroy-Nyjack complex, 2 to 12 percent slopes	34	*
410	Chiminet-Canuela-Rock outcrop complex, low precipitation, 3 to 20 percent slopes	556	*
412	Canuela-Hackroy complex, 1 to 8 percent slopes	37	*
413	Armenta very paragravelly ashy coarse sand, 3 to 20 percent slopes	306	*
414	Metate loam, 0 to 3 percent slopes	44	*
500	Sedillo very gravelly loam, 2 to 6 percent slopes	7,169	0.7
501	Truehill extremely gravelly loam, 25 to 55 percent slopes	17,133	1.7
502	Khapo fine sandy loam, 1 to 3 percent slopes	4,141	0.4
503	Espinos very gravelly coarse sandy loam, 5 to 40 percent slopes	6,426	0.6
504	Sandoval-Badland complex, 15 to 45 percent slopes	7,576	0.8
505	Puertecito-Paraje complex, 15 to 50 percent slopes	7,851	0.8
506	Ildefonso-Sandoval complex, 5 to 35 percent slopes	4,610	0.5
507	Ildefonso extremely gravelly sandy loam, 5 to 15 percent slopes	1,214	0.1
508	Charalito-Riverwash complex, 1 to 3 percent slopes, flooded	1,080	0.1
509	Puertecito-Wandurn-Rock outcrop complex, 30 to 60 percent slopes	5,808	0.6
510	Cerrillos-Sedillo complex, 1 to 5 percent slopes	20,390	2.0
511	Wandurn-Alchonzo-Rubble land complex, 35 to 90 percent slopes	12,425	1.2
512	Cochiti extremely cobbly loam, 15 to 35 percent slopes	3,379	0.3
513	Pedregal very cobbly loam, 8 to 15 percent slopes	13,328	1.3
514	Pegasus extremely cobbly loam, 20 to 50 percent slopes	1,857	0.2
515	Pastorius very cobbly loam, 3 to 5 percent slopes	1,344	0.1
516	Cerrillos fine sandy loam, 1 to 4 percent slopes	3,900	0.4
517	Puertecito extremely gravelly fine sandy loam, 15 to 25 percent slopes	2,452	0.2
518	Rock outcrop-Skyvillage complex, 5 to 35 percent slopes	5,350	0.5
519	Cumacho fine sandy loam, 2 to 8 percent slopes	18,818	1.9
520	Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes	1,046	0.1
521	Devargas-Riovista-Riverwash complex, 0 to 5 percent slopes, flooded	8,001	0.8
522	Penistaja family fine sandy loam, 1 to 3 percent slopes	13,026	1.3

Table 10.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
523	Kech-Cerropelon-Rock outcrop complex, 5 to 50 percent slopes	23,168	2.3
524	Zia-Gullied land complex, 2 to 10 percent slopes	5,861	0.6
525	Hagerman-Cabreros complex, 2 to 6 percent slopes	1,573	0.2
526	Penistaja family-Truehill complex, 3 to 15 percent slopes	7,463	0.7
527	Musofare-Asparas complex, 20 to 50 percent slopes	1,684	0.2
528	Penistaja family loam, 3 to 8 percent slopes	12,218	1.2
530	Jaralosa-Chupe-Riverwash complex, 0 to 1 percent slopes, flooded	3,716	0.4
531	Sena very fine sandy loam, 0 to 2 percent slopes	4,591	0.5
532	Galisteo silty clay loam, 0 to 2 percent slopes	1,822	0.2
534	Oelop-Charalito complex, 1 to 3 percent slopes	10,671	1.1
550	Pits, mine	538	*
600	Hyer-Witt complex, 1 to 3 percent slopes	63,724	6.3
601	Harvey loam, 3 to 12 percent slopes	13,302	1.3
602	Palma fine sandy loam, 3 to 8 percent slopes	10,312	1.0
603	Lazarus silt loam, 0 to 2 percent slopes, flooded	17,931	1.8
604	Desario-Espadon complex, 5 to 50 percent slopes	9,146	0.9
605	Lazarus-Manzano complex, 0 to 8 percent slopes, flooded	3,830	0.4
606	Pastura-Nala complex, 3 to 15 percent slopes	16,931	1.7
607	Davishat-Palma complex, 1 to 8 percent slopes	12,851	1.3
608	Davishat loamy very fine sand, 3 to 8 percent slopes	1,072	0.1
610	Arojomil-Tapia complex, 1 to 5 percent slopes	40,565	4.0
611	Spyglass silt loam, 0 to 2 percent slopes	1,988	0.2
612	Trofes loam, 0 to 2 percent slopes	3,281	0.3
613	Kinsell silt loam, 0 to 2 percent slopes, flooded	4,374	0.4
614	Tamarindo loam, 1 to 3 percent slopes	3,133	0.3
615	Kwahe-Stanley complex, 0 to 1 percent slopes, ponded	733	*
616	Triane silty clay loam, 1 to 3 percent slopes	664	*
617	Ranchos fine sandy loam, 3 to 8 percent slopes	3,006	0.3
618	Davishat-Chupadera complex, 3 to 8 percent slopes	4,987	0.5
619	Villario-Puertecito complex, 25 to 45 percent slopes	4,239	0.4
621	Kech-Horchata complex, 1 to 8 percent slopes	8,234	0.8
622	Arojomil silt loam, 1 to 3 percent slopes	8,593	0.9
623	Clovis loam, 3 to 8 percent slopes	13,693	1.4
624	Clovis very fine sandy loam, 1 to 3 percent slopes	3,245	0.3
625	Raydawn very cobbly sandy loam, 15 to 35 percent slopes	4,953	0.5
626	Horchata loam, 3 to 8 percent slopes	1,744	0.2
627	Palabria-Frajillo complex, 1 to 8 percent slopes	1,254	0.1
628	Nala gravelly fine sandy loam, 3 to 8 percent slopes	3,391	0.3
629	Frajillo-Chilerojo complex, 5 to 15 percent slopes	7,895	0.8
630	Tamarindo loam, 3 to 8 percent slopes	2,541	0.3
632	Travessilla-Raydawn-Sandoval-Rock outcrop complex, 5 to 45 percent slopes	2,572	0.3
700	Aliante-Altega complex, 1 to 10 percent slopes	8,611	0.9
701	Sabroso-Verano complex, 35 to 65 percent slopes	11,485	1.1
702	Estrada-Chacuaco complex, 2 to 8 percent slopes	6,584	0.7
703	Estrada loam, 2 to 15 percent slopes	770	*
704	Aliante loam, 0 to 3 percent slopes	2,674	0.3
705	Margosa-Condesa complex, 2 to 8 percent slopes	9,831	1.0
706	Verano-Altezita complex, 45 to 90 percent slopes	2,106	0.2
707	Altezita-Esquila-Rock outcrop complex, 2 to 10 percent slopes	4,511	0.4
708	Uva-Herrada complex, 3 to 15 percent slopes	19,651	2.0
709	Moriartche clay loam, 0 to 3 percent slopes	3,633	0.4
710	Predawn fine sandy loam, 1 to 4 percent slopes	2,205	0.2
711	Fangio-Ortiz complex, 15 to 50 percent slopes	3,888	0.4
712	Altega very fine sandy loam, 3 to 8 percent slopes	2,554	0.3
713	Lomapedro-Skyute complex, 2 to 10 percent slopes	949	*
715	Lomapedro gravelly sandy clay loam, 25 to 50 percent slopes	3,003	0.3
717	Glorieta-Ribera complex, 1 to 15 percent slopes	2,548	0.3
718	Bernal-Cueva complex, 10 to 50 percent slopes	13,720	1.4
W	Water	506	*
	Total	1,006,446	100.0

100—Panky loam, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,900 to 6,700 feet (1,798 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Panky and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Panky soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Alluvium derived from granite, gneiss, schist, loess, and volcanic ash
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 1 to 5 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 9.4 inches (high)
Shrink-swell potential: About 2.4 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 30 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, broom snakeweed, galleta, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

AE—0 to 3 inches; loam
Bt—3 to 8 inches; clay loam
Btk1—8 to 11 inches; clay loam
Btk2—11 to 17 inches; loam
Bk1—17 to 36 inches; loam
Bk2—36 to 53 inches; loam
Bkq1—53 to 66 inches; loam
Bkq2—66 to 88 inches; loam
BCk—88 to 115 inches; loam

Minor Components Composition

Tetilla and similar soils*:* About 5 percent
Zozobra and similar soils*:* About 2 percent
Khapo and similar soils*:* About 2 percent
Urban land*:* About 1 percent

101—Zozobra-Jaconita complex, 5 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,900 feet (1,646 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Zozobra and similar soils: 45 percent
Jaconita and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Zozobra soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Shoulders
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 5 to 12 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent rounded cobbles; about 25 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 20 to 35 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, galleta, sideoats grama, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6c

Typical Profile

ABk—0 to 3 inches; gravelly sandy loam
Bk1—3 to 7 inches; loam
Bk2—7 to 15 inches; loam
Bk3—15 to 24 inches; sandy loam
2Bk4—24 to 28 inches; gravelly loamy sand
2Bk5—28 to 35 inches; gravelly loamy coarse sand
2Bk6—35 to 46 inches; loamy coarse sand

2Bk7—46 to 54 inches; gravelly coarse sand
2Bk8—54 to 67 inches; very gravelly loamy coarse sand
2C—67 to 88 inches; gravelly coarse sand

Jaconita soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 10 to 25 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded cobbles; about 40 percent rounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 6e

Typical Profile

ABk—0 to 2 inches; very gravelly coarse sandy loam
Bk1—2 to 6 inches; very gravelly coarse sandy loam
Bk2—6 to 14 inches; extremely gravelly loamy coarse sand
Bk3—14 to 45 inches; very gravelly coarse sand
Bk4—45 to 56 inches; very gravelly loamy coarse sand
C1—56 to 78 inches; gravelly coarse sand
C2—78 to 92 inches; very gravelly coarse sand
C3—92 to 104 inches; loamy fine sand
C4—104 to 118 inches; fine sand

Minor Components Composition

Khapo and similar soils*:* About 6 percent
Haozous and similar soils*:* About 4 percent
Churipa and similar soils*:* About 3 percent
Urban land*:* About 2 percent

102—Khapo sandy loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,700 feet (1,646 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Khapo and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Khapo soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, schist, loess, and volcanic ash
Slope: 3 to 8 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.1 inches (moderate)
Shrink-swell potential: About 1.8 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; sandy loam
BA—2 to 5 inches; sandy loam
Bt—5 to 11 inches; sandy clay loam
Btk1—11 to 29 inches; fine sandy loam
Btk2—29 to 43 inches; fine sandy loam
Bk1—43 to 72 inches; fine sandy loam
Bk2—72 to 89 inches; sandy loam
Bkb—89 to 120 inches; loam

Minor Components Composition

Jaconita and similar soils*:* About 5 percent
Panky and similar soils*:* About 4 percent

Chupe and similar soils*:* About 3 percent
Zepol and similar soils*:* About 2 percent
Urban land*:* About 1 percent

103—Zepol silt loam, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 7,000 feet (1,768 to 2,134 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Zepol and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Zepol soils

Landscape: Fan piedmonts
Landform: Narrow flood plains on eroded fan remnants
Parent material: Alluvium derived from loess, volcanic ash, pumice, basalt lapilli, granite, and schist
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Flooding hazard: Occasional
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

AC1—0 to 3 inches; silt loam
AC2—3 to 6 inches; silt loam
Bt1—6 to 12 inches; silt loam
Bt2—12 to 22 inches; silty clay loam
Bt3—22 to 27 inches; silt loam
Btk1—27 to 35 inches; silt loam
Btk2—35 to 46 inches; silt loam
Bk1—46 to 75 inches; silt loam
Bk2—75 to 89 inches; silt loam
BCk—89 to 114 inches; loam

Minor Components Composition

Zia and similar soils*:* About 6 percent
Chupe and similar soils*:* About 5 percent
Khapo and similar soils*:* About 4 percent

104—Chupe-Riverwash complex, 1 to 3 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,500 feet (1,646 to 2,286 meters)
Mean annual precipitation: 9 to 13 inches (229 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Chupe and similar soils: 65 percent
Riverwash: 30 percent
Minor components: 5 percent

Component Descriptions

Chupe soils

Landscape: Valleys
Landform: Narrow flood plains on valley floors
Parent material: Alluvium derived from granite, gneiss, schist, granitic sandstone, and mudstone
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.1 inches (low)
Shrink-swell potential: About 1.9 percent (low)
Flooding hazard: Occasional
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6s

Typical Profile

AC—0 to 3 inches; loamy coarse sand
C1—3 to 10 inches; gravelly coarse sand
C2—10 to 26 inches; gravelly coarse sand
C3—26 to 31 inches; very gravelly coarse sand
C4—31 to 37 inches; gravelly coarse sand
C5—37 to 42 inches; very gravelly coarse sand
C6—42 to 50 inches; sandy clay loam
C7—50 to 65 inches; loamy coarse sand
C8—65 to 84 inches; coarse sand
C9—84 to 96 inches; gravelly coarse sand

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Chupe soil.
Landscape: Valleys
Landform: Flood plains on valley floors
Parent material: Alluvium derived from mixed
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 20 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Zia and similar soils*:* About 3 percent
Koshare and similar soils*:* About 1 percent
Khapo and similar soils*:* About 1 percent

105—Dumps, sanitary landfill

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,500 feet (1,737 to 2,286 meters)
Mean annual precipitation: 10 to 15 inches (254 to 381 millimeters)
Mean annual air temperature: 46 to 52 degrees F (8.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Dumps: 80 percent
Minor components: 20 percent

Component Descriptions

Dumps
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Mine spoil or earthy fill
Slope: 1 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded cobbles; about 25 percent subrounded gravel
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Land capability subclass (nonirrigated): 8e

Minor Components Composition

Encantado and similar soils*:* About 6 percent
Tanoan and similar soils*:* About 5 percent
Zozobra and similar soils*:* About 4 percent
Khapo and similar soils*:* About 3 percent
Nazario and similar soils*:* About 1 percent
Panky and similar soils*:* About 1 percent

106—Pits

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,700 feet (1,646 to 2,347 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Pits: 80 percent
Minor components: 20 percent

Component Descriptions

Pits
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 1 to 8 percent
Shape (down/across): Linear/convex
Surface fragments: About 5 percent subrounded cobbles; about 35 percent subrounded gravel
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 4.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Riovista and similar soils*:* About 8 percent
Devargas and similar soils*:* About 4 percent
Paraje and similar soils*:* About 3 percent
Delvalle and similar soils*:* About 3 percent
Agua Fria and similar soils*:* About 2 percent

107—Riverwash, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,500 feet (1,707 to 1,981 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Riverwash: 85 percent
Minor components: 15 percent

Component Descriptions

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Chupe and Cuyamungue soils.
Landscape: Valleys
Landform: Channels on valley floors
Parent material: Alluvium derived from mixed
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 20 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Chupe and similar soils*:* About 8 percent
Cuyamungue and similar soils*:* About 7 percent

108—Zia fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,600 feet (1,676 to 2,012 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Zia and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Zia soils

Landscape: Valleys
Landform: Low stream terraces on valley floors
Position on landform: Tread
Parent material: Alluvium derived from granitic sandstone and mudstone
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 49 to 57 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.4 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Very rare
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 4 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
AC—2 to 7 inches; fine sandy loam
C1—7 to 12 inches; very fine sandy loam
C2—12 to 22 inches; sand
C3—22 to 40 inches; very fine sandy loam
C4—40 to 53 inches; loam
2C5—53 to 69 inches; stratified sand to very gravelly coarse sand
3Btkb—69 to 79 inches; loam
3Bkb—79 to 91 inches; coarse sandy loam
3BCkb—91 to 99 inches; gravelly coarse sand

Minor Components Composition

Khapo and similar soils*:* About 6 percent
Zepol and similar soils*:* About 4 percent

109—Tetilla loam, 1 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,000 to 6,800 feet (1,829 to 2,073 meters)
Mean annual precipitation: 10 to 12 inches (254 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Tetilla and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Tetilla soils

Landscape: Lava fields
Landform: Interfluves on undulating plateaus
Position on landform: Toeslopes, footslopes
Parent material: Alluvium derived from loess, volcanic ash, and basalt
Slope: 1 to 5 percent
Shape (down/across): Concave/linear
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.8 inches (high)
Shrink-swell potential: About 4.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, threeawn, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

AE—0 to 3 inches; loam
Bt1—3 to 8 inches; clay loam
Bt2—8 to 21 inches; clay loam
Btk1—21 to 40 inches; loam
Btk2—40 to 57 inches; sandy clay loam
Bk1—57 to 77 inches; gravelly sandy loam
Bk2—77 to 86 inches; gravelly sandy loam

Minor Components Composition

Calabasas and similar soils*:* About 4 percent
Panky and similar soils*:* About 3 percent
Jaconita and similar soils*:* About 2 percent
Chupe and similar soils*:* About 1 percent

110—Calabasas loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,800 feet (1,768 to 2,073 meters)
Mean annual precipitation: 10 to 12 inches (254 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Calabasas and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Calabasas soils

Landscape: Lava fields
Landform: Interfluves on undulating plateaus
Position on landform: Summits
Parent material: Eolian material derived from volcanic ash and pumice, and alluvium derived from loess and basalt
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Deep
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 39 to 59 inches to petrocalcic; 39 to 79 inches to duripan
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 7.4 inches (moderate)
Shrink-swell potential: About 2.9 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 45 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, threeawn, ring muhly, sand dropseed, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; loam
Bt—4 to 12 inches; clay loam
Btk1—12 to 17 inches; clay loam
Btk2—17 to 25 inches; loam
Bk—25 to 32 inches; very fine sandy loam
Bkq—32 to 49 inches; gravelly sandy loam
Bkqm—49 to 54 inches; cemented material
B'kq—54 to 70 inches; fine sandy loam
B'kqm—70 to 81 inches; cemented material

Minor Components Composition

Tetilla and similar soils*:* About 5 percent
Tsinat and similar soils*:* About 3 percent
Truehill and similar soils*:* About 1 percent
Churipa and similar soils*:* About 1 percent

111—Khapo fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,500 feet (1,676 to 2,286 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Khapo and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Khapo soils

Landscape: Valleys
Landform: High stream terraces
Position on landform: Tread
Parent material: Alluvium derived from granitic sandstone, mudstone, and volcanic ash
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.1 inches (moderate)
Shrink-swell potential: About 1.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
BA—2 to 5 inches; fine sandy loam
Bt—5 to 10 inches; fine sandy loam
Btk1—10 to 20 inches; fine sandy loam
Btk2—20 to 28 inches; fine sandy loam
Btk3—28 to 35 inches; loam
Btk4—35 to 41 inches; sandy loam
BCkb1—41 to 54 inches; fine sandy loam
BCkb2—54 to 73 inches; gravelly coarse sandy loam
Cb—73 to 99 inches; stratified loamy sand to loam

Minor Components Composition

Zia and similar soils*:* About 8 percent
Haozous and similar soils*:* About 5 percent
Urban land*:* About 2 percent

112—Riovista gravelly loamy sand, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,000 to 6,900 feet (1,829 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Riovista and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Riovista soils

Landscape: Valleys
Landform: Low flood plain steps on valley floors
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, and schist over residuum derived from granitic sandstone
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 25 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Rare
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, galleta, oneseed juniper, sideoats grama, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 3 inches; gravelly loamy sand
C1—3 to 8 inches; gravelly sand
C2—8 to 16 inches; very gravelly coarse sand
C3—16 to 35 inches; extremely cobbly coarse sand
C4—35 to 53 inches; extremely gravelly loamy coarse sand
C5—53 to 61 inches; gravelly loamy sand
C6—61 to 95 inches; stratified gravelly coarse sand to loamy sand

Minor Components Composition

Delvalle and similar soils*:* About 6 percent
Urban land*:* About 4 percent
Cuyamungue and similar soils*:* About 3 percent
Khapo and similar soils*:* About 2 percent

113—Delvalle-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,300 feet (1,646 to 2,225 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Delvalle and similar soils: 60 percent
Urban land: 30 percent
Minor components: 10 percent

Component Descriptions

Delvalle soils

Landscape: Valleys
Landform: Stream terraces
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 3 percent subrounded cobbles; about 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.8 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; fine sandy loam
Bk1—3 to 10 inches; fine sandy loam
Bk2—10 to 19 inches; fine sandy loam
Bk3—19 to 34 inches; fine sandy loam
Bk4—34 to 54 inches; sandy loam
BCk1—54 to 63 inches; very gravelly sand
BCk2—63 to 72 inches; extremely gravelly coarse sand
C1—72 to 92 inches; very gravelly loamy coarse sand
C2—92 to 105 inches; sand

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential and industrial districts. It is intermingled with the Delvalle soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 2 percent.
Landscape: Valleys
Landform: Stream terraces
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth to restrictive feature: 0 inches to strongly contrasting textural stratification
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Devargas and similar soils*:* About 5 percent
Slope: 1 to 3 percent
Riovista and similar soils*:* About 3 percent
Dumps*:* About 2 percent
Slope: 0 to 8 percent

114—Devargas-Urban land complex, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,400 feet (1,646 to 2,256 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Devargas and similar soils: 50 percent
Urban land: 45 percent
Minor components: 5 percent

Component Descriptions

Devargas soils

Landscape: Valleys
Landform: High stream terraces
Position on landform: Tread
Parent material: Alluvium derived from sandstone over alluvium derived from granite, gneiss, and schist
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 28 to 31 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 5.2 inches (low)
Shrink-swell potential: About 2.9 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 9 inches; loam
Bt2—9 to 17 inches; clay loam
Btk1—17 to 25 inches; clay loam
Btk2—25 to 30 inches; loam
Bk—30 to 33 inches; very gravelly coarse sandy loam
2BCk—33 to 42 inches; extremely gravelly loamy coarse sand
2C1—42 to 67 inches; extremely cobbly coarse sand

2C2—67 to 85 inches; extremely gravelly loamy coarse sand
2C3—85 to 94 inches; very gravelly coarse sand

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential and industrial districts. It is intermingled with the Devargas soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 2 percent.
Landscape: Valleys
Landform: High stream terraces
Slope: 0 to 3 percent
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Delvalle and similar soils*:* About 3 percent
Panky and similar soils*:* About 1 percent
Dumps*:* About 1 percent

115—Panky-Urban land complex, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 6,900 feet (1,859 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Panky and similar soils: 55 percent
Urban land: 35 percent
Minor components: 10 percent

Component Descriptions

Panky soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Alluvium derived from granite, gneiss, schist, loess, and volcanic ash
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 9.6 inches (high)
Shrink-swell potential: About 2.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 30 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, broom snakeweed, galleta, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt—2 to 9 inches; clay loam
Btk1—9 to 13 inches; clay loam
Btk2—13 to 17 inches; clay loam
Bk1—17 to 34 inches; loam
Bk2—34 to 45 inches; loam
Bkq1—45 to 64 inches; loam
Bkq2—64 to 92 inches; loam
Btyb—92 to 104 inches; loam
BCb—104 to 120 inches; loam

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential and industrial districts. It is intermingled with the Panky soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 2 percent.
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Agua Fria and similar soils*:* About 3 percent
Khapo and similar soils*:* About 3 percent
Devargas and similar soils*:* About 2 percent
Dumps*:* About 2 percent

116—Arents-Urban land-Orthents complex, 1 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,600 feet (1,646 to 2,316 meters)
Mean annual precipitation: 9 to 15 inches (229 to 381 millimeters)
Mean annual air temperature: 46 to 52 degrees F (8.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Arents and similar soils: 50 percent
Urban land: 25 percent
Orthents and similar soils: 20 percent
Minor components: 5 percent

Component Descriptions

Arents soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes, backslopes
Parent material: Roadfill material derived from granite, gneiss, schist, sandstone, or siltstone
Slope: 1 to 45 percent
Shape (down/across): Convex/linear
Surface fragments: About 20 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.1 inches (moderate)
Shrink-swell potential: About 2.2 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 7 (slightly sodic)
Land capability subclass (nonirrigated): 8

Typical Profile

ABkp—0 to 4 inches; gravelly loam
Btkp1—4 to 26 inches; gravelly loam
Btkp2—26 to 46 inches; gravelly loam
Btkp3—46 to 63 inches; loam
BCkp—63 to 90 inches; loam

Urban land

Description: Urban land consists of asphalt highway and frontage road lanes and the steel and concrete of bridges and overpasses. This Urban land is along major highway and road corridors such as Interstate 25 and 40, U.S. highway 285, NM highway 14, and NM highway 599.
Landscape: Fan piedmonts

Landform: Eroded fan remnants
Slope: 1 to 15 percent
Shape (down/across): Linear/linear
Depth to restrictive feature: 0 inches to strongly contrasting textural stratification
Land capability subclass (nonirrigated): 8s

Orthents soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes, toeslopes
Parent material: Roadcut material derived from granite, gneiss, schist, loess, sandstone, or siltstone
Slope: 30 to 60 percent
Shape (down/across): Linear/concave
Surface fragments: About 20 percent subrounded gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Available water capacity: About 1.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Land capability subclass (nonirrigated): 8e

Typical Profile

C1—0 to 7 inches; very gravelly coarse sand
C2—7 to 15 inches; very gravelly coarse sand
C3—15 to 80 inches; stratified gravelly coarse sand to very gravelly coarse sand

Minor Components Composition

Alire and similar soils*:* About 1 percent
Khapo and similar soils*:* About 1 percent
Panky and similar soils*:* About 1 percent
Predawn and similar soils*:* About 1 percent
Tanoan and similar soils*:* About 1 percent

117—Agua Fria-Paraje complex, 1 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,700 feet (1,707 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Agua Fria and similar soils: 60 percent
Paraje and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Agua Fria soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 20 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change; 49 to 59 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 6.0 inches (moderate)
Shrink-swell potential: About 2.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 28 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 10 mmhos/cm (moderately saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, threeawn, oneseed juniper, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

AE—0 to 3 inches; gravelly loam
Bt—3 to 7 inches; clay
Btk1—7 to 13 inches; gravelly clay loam
Btk2—13 to 19 inches; gravelly loam
Bk1—19 to 36 inches; gravelly loam
Bk2—36 to 53 inches; gravelly loam
Bky—53 to 61 inches; very gravelly coarse sandy loam
BCky1—61 to 69 inches; very gravelly loamy coarse sand
BCky2—69 to 88 inches; extremely gravelly coarse sand
C—88 to 100 inches; extremely gravelly loamy coarse sand

Paraje soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Beveled summits
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 2 to 8 percent
Shape (down/across): Convex/convex
Surface fragments: About 5 percent rounded cobbles; about 40 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 6 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 3.4 inches (low)
Shrink-swell potential: About 1.8 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 4 inches; very gravelly loam
Bt—4 to 9 inches; very gravelly clay loam
Btk—9 to 13 inches; very gravelly sandy clay loam
Bk1—13 to 22 inches; very gravelly sandy clay loam
Bk2—22 to 40 inches; extremely gravelly coarse sandy loam
BCk1—40 to 54 inches; extremely gravelly loamy coarse sand
BCk2—54 to 77 inches; extremely gravelly coarse sandy loam
BCk3—77 to 87 inches; extremely gravelly sandy clay loam
BCk4—87 to 99 inches; extremely gravelly coarse sandy loam

Minor Components Composition

Panky and similar soils*:* About 5 percent
Golondrina and similar soils*:* About 3 percent
Urban land*:* About 2 percent

118—Golondrina-Paraje complex, 8 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 7,000 feet (1,768 to 2,134 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Golondrina and similar soils: 50 percent
Paraje and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Golondrina soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium and alluvium derived from granite, gneiss, schist, and loess
Slope: 15 to 45 percent
Shape (down/across): Linear/convex
Surface fragments: About 10 percent rounded cobbles; about 55 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, sideoats grama, New Mexico feathergrass, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 4 inches; extremely gravelly coarse sandy loam
Btk1—4 to 8 inches; very gravelly sandy clay loam
Btk2—8 to 17 inches; very gravelly coarse sandy loam
Btk3—17 to 31 inches; extremely gravelly coarse sandy loam
BCk—31 to 42 inches; very gravelly coarse sandy loam
BCk1—42 to 53 inches; extremely gravelly coarse sandy loam
BCk2—53 to 67 inches; extremely gravelly coarse sandy loam
C—67 to 84 inches; extremely gravelly coarse sandy loam

Paraje soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Shoulders
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 8 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 5 percent rounded cobbles; about 50 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 3.1 inches (low)
Shrink-swell potential: About 1.6 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 3 inches; very gravelly loam
Bt—3 to 6 inches; very gravelly clay loam
Btk—6 to 12 inches; very gravelly sandy clay loam
Bk1—12 to 21 inches; very gravelly sandy clay loam
Bk2—21 to 37 inches; very gravelly coarse sandy loam
BCk1—37 to 47 inches; extremely gravelly loamy coarse sand
BCk2—47 to 62 inches; extremely gravelly loamy coarse sand
BCk3—62 to 79 inches; extremely gravelly coarse sandy loam
C—79 to 94 inches; very gravelly sandy clay loam

Minor Components Composition

Paraje and similar soils*:* About 5 percent
Agua Fria and similar soils*:* About 4 percent
Urban land*:* About 1 percent

119—Vitrina-Haozous complex, 5 to 15 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,600 feet (1,646 to 2,012 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Vitrina and similar soils: 50 percent
Haozous and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Vitrina soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 5 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 20 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, black grama, galleta, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; gravelly coarse sandy loam
Bt1—3 to 11 inches; gravelly sandy loam
Bt2—11 to 16 inches; gravelly coarse sandy loam
Btk—16 to 26 inches; gravelly coarse sandy loam
Bk—26 to 41 inches; gravelly coarse sandy loam
BCk—41 to 53 inches; gravelly sandy loam
Bkb—53 to 61 inches; gravelly coarse sandy loam
BCkb1—61 to 75 inches; very gravelly coarse sandy loam
BCkb2—75 to 98 inches; gravelly coarse sandy loam
Cb—98 to 110 inches; gravelly sandy loam

Haozous soils

Landscape: Fan piedmonts
Landform: Inset fans on eroded fan remnants
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 5 to 15 percent
Shape (down/across): Linear/convex
Surface fragments: About 5 percent rounded cobbles; about 40 percent rounded gravels
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, black grama, galleta, oneseed juniper
Land capability subclass (nonirrigated): 6s

Typical Profile

AC1—0 to 1 inch; very gravelly coarse sandy loam
AC2—1 inch to 8 inches; very gravelly coarse sand
AB—8 to 14 inches; gravelly sandy loam
Bw1—14 to 27 inches; gravelly coarse sandy loam
Bw2—27 to 34 inches; gravelly coarse sandy loam
Bw3—34 to 44 inches; gravelly coarse sandy loam
Bk1—44 to 48 inches; gravelly coarse sandy loam
Bk2—48 to 57 inches; very gravelly coarse sandy loam
BCk1—57 to 89 inches; stratified gravelly loamy coarse sand to very gravelly coarse sand
BCk2—89 to 120 inches; stratified very gravelly loamy coarse sand to gravelly coarse sandy loam

Minor Components Composition

Riverwash*:* About 3 percent
Vitrina and similar soils*:* About 3 percent
Chupe and similar soils*:* About 2 percent
Golondrina and similar soils*:* About 1 percent
Wet spot*:* About 1 percent

120—Quarteles-Rock outcrop complex, 25 to 90 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,900 feet (1,676 to 2,103 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Quarteles and similar soils: 70 percent
Rock outcrop: 20 percent
Minor components: 10 percent

Component Descriptions

Quarteles soils

Landscape: Piedmont slopes
Landform: Ridges, hills
Position on landform: Backslopes
Parent material: Colluvium and residuum derived from micaceous sandstone, siltstone, mudstone, and fanglomerate
Slope: 25 to 90 percent
Shape (down/across): Linear, convex/convex
Surface fragments: About 25 percent rounded medium and coarse gravel
Depth class: Very shallow
Depth to restrictive feature: 4 to 10 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.0 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandstone Hills
Potential native vegetation: sideoats grama, blue grama, Indian ricegrass, mountain mahogany, oneseed juniper
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 2 inches; gravelly loam
2C1—2 to 5 inches; paragravelly loam
2C2—5 to 7 inches; very paragravelly loam
2Cr—7 to 17 inches; cemented bedrock

Rock outcrop

Description: Rock outcrop consists of exposed sandstone or siltstone bedrock. It occurs as ledges or cliffs intermingled with the Quarteles soils.
Landscape: Piedmont slopes

Landform: Hills, ridges
Parent material: Sandstone and siltstone
Slope: 50 to 150 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: At surface, bedrock, lithic
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Minor Components Composition

Jaconita and similar soils*:* About 4 percent
Ojito and similar soils*:* About 3 percent
Xenmack and similar soils*:* About 2 percent
Chupe and similar soils*:* About 1 percent

121—El Rancho silt loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,700 feet (1,676 to 2,042 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

El Rancho and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

El Rancho soils

Landscape: Piedmont slopes
Landform: Fan remnants
Position on landform: Tread
Parent material: Alluvium derived from micaceous siltstone, sandstone, and mudstone
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 3 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.9 inches (high)
Shrink-swell potential: About 4.2 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; silt loam
Bw1—3 to 11 inches; silt loam
Bw2—11 to 24 inches; silt loam
Bw3—24 to 38 inches; silt loam
BC—38 to 53 inches; silt loam
C1—53 to 85 inches; silt loam
C2—85 to 120 inches; silty clay loam

Minor Components Composition

Koshare and similar soils*:* About 5 percent
Walkibout and similar soils*:* About 4 percent
Urban land*:* About 3 percent
Chupe and similar soils*:* About 3 percent

122—Cuyamungue-Riverwash complex, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,500 feet (1,646 to 2,286 meters)
Mean annual precipitation: 9 to 14 inches (229 to 356 millimeters)
Mean annual air temperature: 47 to 52 degrees F (8.3 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Cuyamungue and similar soils: 60 percent
Riverwash: 30 percent
Minor components: 10 percent

Component Descriptions

Cuyamungue soils

Landscape: Valleys
Landform: Flood plains on valley floors
Parent material: Alluvium derived from granite, gneiss, schist, and granitic sandstone
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 35 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.2 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: Bigelow's rubber rabbitbrush, willow, Fremont cottonwood
Land capability subclass (nonirrigated): 4w

Typical Profile

AC—0 to 3 inches; very gravelly coarse sand
C1—3 to 17 inches; stratified gravelly coarse sand to very gravelly coarse sand
C2—17 to 24 inches; stratified gravelly coarse sand to very gravelly coarse sand
C3—24 to 35 inches; very gravelly coarse sand
C4—35 to 58 inches; stratified gravelly coarse sand to extremely gravelly coarse sand
C5—58 to 86 inches; stratified very gravelly coarse sand to extremely gravelly coarse sand
C6—86 to 100 inches; extremely gravelly loamy coarse sand

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Cuyamungue soil.
Landscape: Valleys
Landform: Flood plains on valley floors
Parent material: Alluvium derived from mixed
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 20 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Zia and similar soils*:* About 4 percent
Bosquecito and similar soils*:* About 3 percent
Mirada and similar soils*:* About 2 percent
Wet spot*:* About 1 percent

123—Koshare very fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,800 feet (1,646 to 2,073 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Koshare and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Koshare soils

Landscape: Piedmont slopes
Landform: Fan remnants
Position on landform: Tread
Parent material: Alluvium derived from micaceous sandstone and siltstone
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very fine sandy loam
Bk1—3 to 19 inches; fine sandy loam
Bk2—19 to 30 inches; fine sandy loam
Bk3—30 to 42 inches; fine sandy loam
BCk1—42 to 55 inches; very fine sandy loam
BCk2—55 to 72 inches; fine sandy loam
BCk3—72 to 83 inches; very fine sandy loam
2BCk4—83 to 96 inches; gravelly coarse sand
3BCk5—96 to 121 inches; very fine sandy loam

Minor Components Composition

El Rancho and similar soils*:* About 6 percent
Innacutt and similar soils*:* About 4 percent
Walkibout and similar soils*:* About 3 percent
Urban land*:* About 2 percent

124—Camelrock silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,500 feet (1,676 to 1,981 meters)
Mean annual precipitation: 10 to 12 inches (254 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Camelrock and similar soils: 80 percent
Minor components: 15 percent

Component Descriptions

Camelrock soils

Landscape: Valleys
Landform: High stream terraces
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, schist, micaceous sandstone, siltstone, and mudstone
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 9.7 inches (high)
Shrink-swell potential: About 5.2 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Clayey Bottomland
Potential native vegetation: western wheatgrass, blue grama, fourwing saltbush, galleta
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; silty clay loam
Bw—3 to 7 inches; silty clay loam
Bss—7 to 14 inches; silty clay
Bkssy1—14 to 24 inches; silty clay
Bkssy2—24 to 29 inches; silty clay
BCky1—29 to 41 inches; stratified clay loam to very fine sandy loam
BCky2—41 to 55 inches; stratified loam to silty clay loam
BCky3—55 to 71 inches; clay
C1—71 to 98 inches; stratified loam to silty clay loam
C2—98 to 120 inches; stratified fine sandy loam to silty clay

Minor Components Composition

El Rancho and similar soils*:* About 8 percent
Walkibout and similar soils*:* About 4 percent
Urban land*:* About 3 percent

125—Mirada-Bosquecito complex, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,600 feet (1,676 to 2,012 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Mirada and similar soils: 55 percent
Bosquecito and similar soils: 40 percent
Minor components: 5 percent

Component Descriptions

Mirada soils

Landscape: Valleys
Landform: Abandoned channels on valley floors
Parent material: Alluvium derived from micaceous sandstone, siltstone, granite, gneiss, and schist
Slope: 0 to 1 percent
Shape (down/across): Linear/concave
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Very poorly drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.3 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Ponding hazard: Frequent
Seasonal high water table depth: About 0 to 5 inches
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Marshy
Potential native vegetation: rabbitfootgrass, bluejoint, rush, sedge, western wheatgrass
Land capability subclass (nonirrigated): 5c

Typical Profile

A—0 to 2 inches; silt loam
ACg—2 to 9 inches; silt loam
Cg1—9 to 25 inches; stratified silt loam to fine sandy loam
Cg2—25 to 34 inches; stratified very fine sandy loam to sandy loam
Cg3—34 to 43 inches; stratified fine sandy loam to loamy sand
Cg4—43 to 58 inches; stratified gravelly coarse sand to gravelly coarse sand
Cg5—58 to 80 inches; stratified gravelly coarse sand to very gravelly coarse sand

Bosquecito soils

Landscape: Valleys
Landform: Natural levees flood plains on valley floors
Parent material: Alluvium derived from micaceous sandstone, siltstone, granite, gneiss, and schist
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.5 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 24 to 31 inches
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 7 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: Kentucky bluegrass, cottonwood, western wheatgrass
Land capability subclass (nonirrigated): 2w

Typical Profile

A—0 to 1 inch; very fine sandy loam
AC1—1 inch to 5 inches; loamy very fine sand
AC2—5 to 10 inches; loamy sand
C1—10 to 16 inches; fine sandy loam
C2—16 to 26 inches; fine sandy loam
Cg1—26 to 33 inches; fine sandy loam
Cg2—33 to 42 inches; stratified fine sandy loam to loamy sand
Cg3—42 to 51 inches; stratified very fine sandy loam to loamy sand
Cg4—51 to 64 inches; stratified gravelly coarse sand to loamy very fine sand
C'—64 to 84 inches; stratified gravelly coarse sand to very gravelly coarse sand

Minor Components Composition

Cuyamungue and similar soils*:* About 2 percent
Jaralosa and similar soils*:* About 2 percent
Scogg and similar soils*:* About 1 percent

126—Walkibout-Innacutt complex, 2 to 80 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,100 feet (1,646 to 2,164 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Walkibout and similar soils: 55 percent
Innacutt and similar soils: 25 percent
Minor components: 20 percent

Component Descriptions

Walkibout soils

Landscape: Piedmont slopes
Landform: Gulches
Position on landform: Backslopes
Parent material: Colluvium and alluvium derived from micaceous sandstone, siltstone, mudstone, and fanglomerate
Slope: 25 to 80 percent
Shape (down/across): Linear/convex
Surface fragments: About 5 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 43 to 67 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.1 inches (moderate)
Shrink-swell potential: About 2.4 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Limy
Potential native vegetation: western wheatgrass, galleta, winterfat, Indian ricegrass, fourwing saltbush
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 2 inches; loam
BCk—2 to 7 inches; fine sandy loam
C1—7 to 18 inches; very fine sandy loam
C2—18 to 25 inches; silt loam
C3—25 to 42 inches; silt loam

C4—42 to 49 inches; stratified fine sandy loam to gravelly coarse sand
C5—49 to 55 inches; very fine sandy loam
C6—55 to 72 inches; stratified loamy fine sand to gravelly coarse sand
C7—72 to 87 inches; stratified very fine sandy loam to loamy very fine sand
C8—87 to 120 inches; stratified silt loam to very fine sandy loam

Innacutt soils

Landscape: Piedmont slopes
Landform: Inset fans on gulches
Position on landform: Toeslopes
Parent material: Alluvium derived from micaceous sandstone, siltstone, mudstone, and fanglomerate
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.1 inches (moderate)
Shrink-swell potential: About 1.7 percent (low)
Flooding hazard: Frequent
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Deep Sand
Potential native vegetation: Indian ricegrass, blue grama, sand dropseed, galleta
Land capability subclass (nonirrigated): 7c

Typical Profile

AC1—0 to 2 inches; fine sandy loam
AC2—2 to 6 inches; very fine sandy loam
C1—6 to 18 inches; stratified fine sandy loam to very fine sandy loam
C2—18 to 24 inches; fine sandy loam
C3—24 to 33 inches; fine sandy loam
C4—33 to 47 inches; stratified very fine sandy loam to loamy very fine sand
C5—47 to 53 inches; very gravelly coarse sand
2C6—53 to 98 inches; stratified very fine sandy loam to silt loam
2C7—98 to 120 inches; stratified very fine sandy loam to fine sandy loam

Minor Components Composition

Koshare and similar soils*:* About 5 percent
Chupe and similar soils*:* About 4 percent
Quarteles and similar soils*:* About 4 percent
El Rancho and similar soils*:* About 3 percent
Riverwash*:* About 2 percent
Urban land*:* About 2 percent

127—Ojito-Koshare-Quarteles complex, 5 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,600 feet (1,646 to 2,012 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Ojito and similar soils: 40 percent
Koshare and similar soils: 30 percent
Quarteles and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Ojito soils

Landscape: Piedmont slopes
Landform: Hills
Position on landform: Shoulders, footslopes
Parent material: Eolian material and slope alluvium derived from micaceous sandstone and siltstone over residuum weathered from micaceous sandstone
Slope: 5 to 25 percent
Shape (down/across): Convex/linear
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Sandy Slopes
Potential native vegetation: Indian ricegrass, New Mexico feathergrass, sand dropseed
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; loamy very fine sand
Bk1—3 to 10 inches; loamy very fine sand
Bk2—10 to 18 inches; loamy very fine sand
2BCk1—18 to 25 inches; very fine sandy loam
3BCk2—25 to 35 inches; very paragravelly very fine sand
3Cr—35 to 45 inches; cemented bedrock

Koshare soils

Landscape: Piedmont slopes
Landform: Hills
Position on landform: Toeslopes
Parent material: Eolian material and slope alluvium derived from sandstone and siltstone over residuum weathered from micaceous sandstone, eolian material and slope alluvium derived from micaceous sandstone and siltstone over residuum weathered from micaceous sandstone
Slope: 5 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.4 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 3 inches; very fine sandy loam
Bk1—3 to 15 inches; very fine sandy loam
Bk2—15 to 29 inches; very fine sandy loam
Bk3—29 to 41 inches; very fine sandy loam
BCk—41 to 50 inches; very fine sandy loam
2BCk1—50 to 59 inches; paragravelly loamy very fine sand
2BCk2—59 to 67 inches; very paragravelly loamy very fine sand
2Cr—67 to 77 inches; cemented bedrock

Quarteles soils

Landscape: Piedmont slopes
Landform: Hills
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone, siltstone, and mudstone over residuum weathered from micaceous sandstone and siltstone
Slope: 25 to 50 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent rounded gravel; about 5 percent subangular channers
Depth class: Very shallow
Depth to restrictive feature: 4 to 10 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)

Available water capacity: About 1.3 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandstone Hills
Potential native vegetation: sideoats grama, blue grama, Indian ricegrass, mountain mahogany, oneseed juniper
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; gravelly very fine sandy loam
2C1—3 to 6 inches; very paragravelly very fine sandy loam
2C2—6 to 9 inches; extremely paragravelly very fine sandy loam
2Cr—9 to 19 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 4 percent
Urban land*:* About 2 percent
Walkibout and similar soils*:* About 2 percent
Riverwash*:* About 1 percent
Innacutt and similar soils*:* About 1 percent

128—Koshare-Urban land complex, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,500 feet (1,676 to 1,981 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Koshare and similar soils: 55 percent
Urban land: 35 percent
Minor components: 10 percent

Component Descriptions

Koshare soils

Landscape: Piedmont slopes
Landform: Fan remnants
Position on landform: Tread
Parent material: Alluvium derived from micaceous sandstone and siltstone
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very fine sandy loam
Bk1—3 to 19 inches; fine sandy loam
Bk2—19 to 30 inches; fine sandy loam
Bk3—30 to 42 inches; fine sandy loam
BCk1—42 to 55 inches; very fine sandy loam
BCk2—55 to 72 inches; fine sandy loam
BCk3—72 to 83 inches; very fine sandy loam
2BCk4—83 to 96 inches; gravelly coarse sand
3BCk5—96 to 121 inches; very fine sandy loam

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in and adjacent to communities in northern Santa Fe County such as Cuyamungue, El Rancho, Jacona, Jaconita, Nambe, Pojoaque, Tesuque Pueblo, and their surrounding areas. It is intermingled with Koshare soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.
Landscape: Piedmont slopes
Landform: Fan remnants
Slope: 2 to 6 percent
Shape (down/across): Linear/linear

Minor Components Composition

El Rancho and similar soils*:* About 5 percent
Innacutt and similar soils*:* About 3 percent
Walkibout and similar soils*:* About 2 percent

129—El Rancho-Urban land complex, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,500 feet (1,707 to 1,981 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

El Rancho and similar soils: 55 percent
Urban land: 35 percent
Minor components: 10 percent

Component Descriptions

El Rancho soils

Landscape: Piedmont slopes
Landform: Fan remnants
Position on landform: Tread
Parent material: Alluvium derived from micaceous siltstone, sandstone, and mudstone
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 3 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.9 inches (high)
Shrink-swell potential: About 4.2 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; silt loam
Bw1—3 to 11 inches; silt loam
Bw2—11 to 24 inches; silt loam
Bw3—24 to 38 inches; silt loam
BC—38 to 53 inches; silt loam
C1—53 to 85 inches; silt loam
C2—85 to 120 inches; silty clay loam

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, and sidewalks. Urban land is in and adjacent to communities in northern Santa Fe County such as Cuyamungue, El Rancho, Jacona, Jaconita, Nambe, Pojoaque, Tesuque Pueblo, and their surrounding areas. It is intermingled with El Rancho soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.
Landscape: Piedmont slopes
Landform: Fan remnants
Slope: 1 to 4 percent
Shape (down/across): Linear/linear

Minor Components Composition

Koshare and similar soils*:* About 6 percent
Walkibout and similar soils*:* About 3 percent
Chupe and similar soils*:* About 1 percent

130—Jaralosa very fine sandy loam, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,900 feet (1,646 to 2,103 meters)
Mean annual precipitation: 9 to 14 inches (229 to 356 millimeters)
Mean annual air temperature: 47 to 52 degrees F (8.3 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Jaralosa and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Jaralosa soils

Landscape: Valleys
Landform: Flood plain steps on valley floors
Position on landform: Tread
Parent material: Alluvium derived from micaceous sandstone and siltstone over alluvium derived from granite, gneiss, or schist
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Depth to restrictive feature: 20 to 39 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: willow, cottonwood, sedge
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 1 inch; very fine sandy loam
AC1—1 inch to 6 inches; loamy very fine sand
AC2—6 to 10 inches; very fine sandy loam
ACnz—10 to 16 inches; very fine sandy loam
Cnz1—16 to 22 inches; loamy very fine sand
Cnz2—22 to 35 inches; stratified very fine sandy loam to loamy very fine sand
2C1—35 to 42 inches; gravelly sand, gravelly coarse sand
2C2—42 to 53 inches; stratified very gravelly coarse sand to very gravelly coarse sand
2C3—53 to 84 inches; very gravelly coarse sand

Minor Components Composition

Bosquecito and similar soils*:* About 6 percent
Innacutt and similar soils*:* About 4 percent
Cuyamungue and similar soils*:* About 3 percent
Urban land*:* About 2 percent

131—Jaconita-Xenmack complex, 25 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,600 feet (1,646 to 2,012 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Jaconita and similar soils: 45 percent
Xenmack and similar soils: 45 percent
Minor components: 10 percent

Component Descriptions

Jaconita soils

Landscape: Piedmont slopes
Landform: Upper strath terraces
Position on landform: Riser
Parent material: Colluvium and slope alluvium derived from granite, gneiss, schist, and micaceous sandstone
Slope: 25 to 60 percent
Shape (down/across): Convex/linear
Surface fragments: About 50 percent rounded gravel; about 5 percent rounded cobbles
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.1 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 7 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 7e

Typical Profile

ABk—0 to 2 inches; very gravelly coarse sandy loam
Bk1—2 to 5 inches; very gravelly coarse sandy loam
Bk2—5 to 10 inches; very gravelly loamy coarse sand
BCk1—10 to 22 inches; very gravelly coarse sand
BCk2—22 to 42 inches; extremely gravelly coarse sand
C1—42 to 65 inches; extremely gravelly coarse sand
2C2—65 to 77 inches; very fine sandy loam

2C3—77 to 99 inches; loam
2C4—99 to 108 inches; loamy fine sand
2C5—108 to 120 inches; loam

Xenmack soils

Landscape: Piedmont slopes
Landform: Lower strath terraces
Position on landform: Riser
Parent material: Colluvium derived from granite, gneiss, and schist over residuum derived from sandstone and siltstone
Slope: 25 to 60 percent
Shape (down/across): Concave/linear
Surface fragments: About 50 percent rounded gravel; about 15 percent rounded cobbles
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 7e

Typical Profile

ABk—0 to 2 inches; extremely gravelly sandy loam
Bk1—2 to 7 inches; very gravelly sandy loam
Bk2—7 to 16 inches; gravelly loam
Bk3—16 to 24 inches; gravelly loam
2BCk1—24 to 29 inches; paragravelly clay loam
2BCk2—29 to 37 inches; very paragravelly loam
2Cr—37 to 47 inches; cemented bedrock

Minor Components Composition

Quarteles and similar soils*:* About 5 percent
Zozobra and similar soils*:* About 3 percent
Depolvo and similar soils*:* About 2 percent

132—Depolvo-Sueleros complex, 2 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,500 feet (1,676 to 1,981 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Depolvo and similar soils: 45 percent
Sueleros and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Depolvo soils

Landscape: Piedmont slopes
Landform: Higher portions on strath terraces
Position on landform: Tread
Parent material: Loess derived from micaceous sandstone and siltstone
Slope: 2 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.4 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 18 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 6 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very fine sandy loam
Btk1—3 to 9 inches; loam
Btk2—9 to 21 inches; loam
Btk3—21 to 38 inches; loam
Bk1—38 to 48 inches; loam
Bk2—48 to 58 inches; loam
Btkb—58 to 79 inches; fine sandy loam
Bkb1—79 to 93 inches; sandy loam
Bkb2—93 to 103 inches; fine sandy loam
Bkb3—103 to 109 inches; gravelly sandy loam

Sueleros soils

Landscape: Piedmont slopes
Landform: Beveled, lower portions on strath terraces
Position on landform: Tread
Parent material: Loess derived from micaceous sandstone and siltstone over alluvium derived from granite, gneiss, and schist
Slope: 2 to 15 percent
Shape (down/across): Concave/linear
Surface fragments: About 10 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 6 inches to natric
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 20 mmhos/cm (strongly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 45 (strongly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very fine sandy loam
Btkn1—3 to 6 inches; loam
Btkn2—6 to 14 inches; loam
Btkn3—14 to 26 inches; loam
Bkn—26 to 37 inches; very gravelly sandy loam
2Bk1—37 to 44 inches; very gravelly coarse sand
2Bk2—44 to 54 inches; very gravelly coarse sand
3BCk1—54 to 70 inches; loam
3BCk2—70 to 92 inches; very fine sandy loam
3C—92 to 120 inches; very fine sandy loam

Minor Components Composition

Jaconita and similar soils*:* About 7 percent
Xenmack and similar soils*:* About 5 percent
Ojito and similar soils*:* About 3 percent

133—Chupe fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,300 to 6,600 feet (1,615 to 2,012 meters)
Mean annual precipitation: 9 to 13 inches (229 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Chupe and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Chupe soils

Landscape: Valleys
Landform: Low stream terraces on valley floors
Parent material: Alluvium derived from granite and quartzite
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Rare
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: sand dropseed, black grama, blue grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; fine sandy loam
C1—4 to 8 inches; sand
C2—8 to 23 inches; gravelly coarse sand
C3—23 to 41 inches; gravelly coarse sand
C4—41 to 55 inches; gravelly coarse sand
C5—55 to 76 inches; gravelly coarse sand
C6—76 to 94 inches; very gravelly coarse sand

Minor Components Composition

Metate and similar soils*:* About 5 percent
Scogg and similar soils*:* About 5 percent

134—Bosquecito fine sandy loam, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,200 feet (1,707 to 1,890 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Bosquecito and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Bosquecito soils

Landscape: Valleys
Landform: Flood plain steps on valley floors
Parent material: Alluvium derived from micaceous sandstone and siltstone over alluvium derived from granite, gneiss, or schist
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded gravel
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.0 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: cottonwood, western wheatgrass, willow
Land capability subclass (nonirrigated): 2c

Typical Profile

A—0 to 2 inches; fine sandy loam
AC1—2 to 5 inches; very fine sandy loam
AC2—5 to 8 inches; loamy sand
C1—8 to 12 inches; fine sandy loam
C2—12 to 19 inches; fine sandy loam
Cg1—19 to 29 inches; sandy loam
Cg2—29 to 42 inches; gravelly coarse sand
Cg3—42 to 56 inches; very gravelly coarse sand
C'—56 to 82 inches; very gravelly coarse sand

Minor Components Composition

Mirada and similar soils*:* About 4 percent
Jaralosa and similar soils*:* About 3 percent
Cuyamungue and similar soils*:* About 3 percent

135—Tsinat gravelly loam, 1 to 6 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,800 feet (1,768 to 2,073 meters)
Mean annual precipitation: 10 to 12 inches (254 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Tsinat and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Tsinat soils

Landscape: Lava fields
Landform: Interfluves on undulating plateaus
Position on landform: Beveled summits
Parent material: Eolian material and alluvium derived from basalt and volcanic ash
Slope: 1 to 6 percent
Shape (down/across): Linear/convex
Surface fragments: About 5 percent subangular cobbles; about 25 percent subangular gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to duripan and/or petrocalcic; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Cinder
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, threeawn, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; gravelly loam
Btk1—2 to 9 inches; loam
Btk2—9 to 14 inches; cobbly clay loam
Btk3—14 to 21 inches; cobbly clay loam
Bk—21 to 28 inches; gravelly loam
Bkqm—28 to 45 inches; cemented material
B'k—45 to 54 inches; gravelly sandy loam
2R—54 to 64 inches; cemented bedrock

Minor Components Composition

Calabasas and similar soils*:* About 4 percent
Medrano and similar soils*:* About 3 percent
Churipa and similar soils*:* About 3 percent

136—Churipa very cobbly sandy loam, 5 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 6,700 feet (1,737 to 2,042 meters)
Mean annual precipitation: 10 to 12 inches (254 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Churipa and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Churipa soils

Landscape: Lava fields
Landform: Interfluves on undulating plateaus
Position on landform: Shoulders
Parent material: Alluvium derived from basalt, volcanic ash, and scoria (cinders)
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 2 percent subangular stones; about 25 percent subangular cobbles; about 15 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to petrocalcic and/or duripan; 20 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Shallow
Potential native vegetation: blue grama, sideoats grama, little bluestem, galleta, oneseed juniper, skunkbush sumac
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 1 inch; very cobbly loam
Bt1—1 inch to 6 inches; loam
Bt2—6 to 9 inches; clay loam
Btk—9 to 13 inches; cobbly loam
Bk—13 to 17 inches; cobbly loam
Bkqm—17 to 30 inches; cemented material
B'k—30 to 36 inches; extremely cobbly loamy sand
2R—36 to 46 inches; cemented bedrock

Minor Components Composition

Tsinat and similar soils*:* About 4 percent
Medrano and similar soils*:* About 3 percent
Parida and similar soils*:* About 2 percent
Rock outcrop*:* About 1 percent

137—Medrano extremely gravelly loam, 5 to 65 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 6,900 feet (1,737 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Medrano and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Medrano soils

Landscape: Lava fields
Landform: Cinder cones
Position on landform: Backslopes
Parent material: Slope alluvium derived from volcanic ash over residuum weathered from scoria (cinders)
Slope: 5 to 65 percent
Shape (down/across): Convex/linear
Surface fragments: Less than 1 percent subrounded stones; about 10 percent subrounded cobbles; about 55 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to duripan
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 55 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 6 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, black grama, New Mexico feathergrass, galleta, sideoats grama, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; extremely gravelly loam
Bt1—3 to 7 inches; very gravelly loam
Bt2—7 to 10 inches; very gravelly clay loam
Btk—10 to 14 inches; very gravelly clay loam
Bk—14 to 19 inches; very gravelly loam
Bkqm—19 to 30 inches; cemented material
BCk1—30 to 49 inches; extremely gravelly cinders
BCk2—49 to 80 inches; extremely gravelly cinders

Minor Components Composition

Churipa and similar soils*:* About 4 percent
Tsinat and similar soils*:* About 3 percent
Rock outcrop*:* About 3 percent

138—Andanada very gravelly loam, 5 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,700 feet (1,768 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Andanada and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Andanada soils

Landscape: Lava plateaus
Landform: Undulating mesas, plateaus
Position on landform: Shoulders
Parent material: Slope alluvium derived from basalt
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 35 percent subangular gravel; about 10 percent subangular cobbles; less than 1 percent subangular stones
Depth class: Very shallow
Depth to restrictive feature: 2 to 10 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 0.8 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: New Mexico feathergrass, black grama, sideoats grama, blue grama, oneseed juniper
Land capability subclass (nonirrigated): 7s

Typical Profile

Ak—0 to 3 inches; very gravelly loam
Bk—3 to 9 inches; very gravelly loam
2R—9 to 19 inches; cemented bedrock

Minor Components Composition

Chiminet and similar soils*:* About 5 percent
Rock outcrop*:* About 5 percent

139—Ildefonso-Rock outcrop-Rubble land complex, 30 to 70 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,700 feet (1,676 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Ildefonso and similar soils: 55 percent
Rock outcrop: 20 percent
Rubble land: 15 percent
Minor components: 10 percent

Component Descriptions

Ildefonso soils

Landscape: Lava plateaus
Landform: Escarpments
Position on landform: Backslopes
Parent material: Colluvium derived from basalt over residuum weathered from fanglomerate
Slope: 30 to 70 percent
Shape (down/across): Linear/linear
Surface fragments: About 50 percent subangular gravel; about 20 percent subangular cobbles; about 5 percent subangular stones; about 3 percent subangular boulders
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 7e

Typical Profile

Ak—0 to 5 inches; extremely gravelly sandy loam
Bk1—5 to 15 inches; very gravelly sandy loam
Bk2—15 to 24 inches; very cobbly sandy loam
Bk3—24 to 56 inches; very cobbly sandy loam
2Bk4—56 to 67 inches; gravelly coarse sand
2Bk5—67 to 84 inches; very gravelly coarse sand

Rock outcrop

Description: Rock outcrop consists of exposed basalt bedrock. It occurs as steeply sloping exposures and vertical cliffs and ledges generally located above the Ildefonso soil and above Rubble land.
Landscape: Lava plateaus
Landform: Escarpments, canyons
Parent material: Basalt
Slope: 100 to 300 percent
Depth to restrictive feature: 0 inches to bedrock, lithic
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Rubble land

Description: Rubble land consists of talus of irregularly shaped cobbles, stones, and boulders that are devoid of vegetation. It is on very steeply sloping backslopes below basalt cliffs and is the result of parts of the cliff breaking off and tumbling down slope.
Landscape: Lava plateaus
Landform: Escarpments, canyons
Parent material: Basalt
Slope: 70 to 90 percent
Runoff class: High
Land capability subclass (nonirrigated): 8

Minor Components Composition

Zacaton and similar soils*:* About 6 percent
Abrojo and similar soils*:* About 4 percent

140—Truehill very cobbly loam, 25 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,900 to 7,000 feet (1,798 to 2,134 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Truehill and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Truehill soils

Landscape: Lava fields
Landform: Undulating hills on plateaus
Position on landform: Backslopes, shoulders
Parent material: Slope alluvium and colluvium derived from andesite
Slope: 25 to 45 percent
Shape (down/across): Convex/convex
Surface fragments: About 2 percent subangular stones; about 30 percent subangular cobbles; about 25 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.4 inches (low)
Shrink-swell potential: About 3.1 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 32 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 3 inches; very cobbly loam
Bt1—3 to 7 inches; very cobbly clay loam
Bt2—7 to 12 inches; very cobbly clay loam
Btk—12 to 18 inches; very cobbly loam
Bk1—18 to 31 inches; very cobbly loam
2Bk2—31 to 42 inches; extremely gravelly coarse sandy loam
2BCk1—42 to 56 inches; extremely gravelly coarse sandy loam
2BCk2—56 to 80 inches; extremely gravelly coarse sandy loam

Minor Components Composition

Rock outcrop*:* About 5 percent
Penistaja and similar soils*:* About 3 percent
Ildefonso and similar soils*:* About 2 percent

141—Truehill-Penistaja family-Rock outcrop complex, 4 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,300 feet (1,646 to 1,920 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Truehill and similar soils: 60 percent
Penistaja family and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 10 percent

Component Descriptions

Truehill soils

Landscape: Breaks
Landform: Toreva blocks on escarpments
Position on landform: Backslopes
Parent material: Colluvium derived from basalt
Slope: 15 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: About 7 percent subangular boulders; about 4 percent subangular stones; about 30 percent subangular cobbles; about 25 percent subangular medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 2 inches; extremely cobbly loam
Bt—2 to 9 inches; very cobbly loam
Bk1—9 to 17 inches; very cobbly loam
Bk2—17 to 27 inches; very cobbly loam
Bk3—27 to 45 inches; very cobbly loam
Bk4—45 to 68 inches; extremely cobbly loam
Bk5—68 to 82 inches; very cobbly loam

Penistaja family soils

Landscape: Breaks
Landform: Escarpments
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, and basalt
Slope: 4 to 10 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 8.4 inches (moderate)
Shrink-swell potential: About 3.7 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; sandy loam
Bt—3 to 12 inches; sandy clay loam
Btk1—12 to 28 inches; fine sandy loam
Btk2—28 to 45 inches; loam
Bk—45 to 80 inches; sandy loam
BC—80 to 90 inches; loam

Rock outcrop

Description: Rock outcrop consists of exposed basalt bedrock. It occurs as steeply sloping bedrock and knobs on cliffs and Toreva Blocks and is intermingled with the Truehill soils.
Landscape: Breaks
Landform: Toreva blocks on escarpments
Parent material: Basalt
Slope: 20 to 120 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: 0 inches to bedrock, lithic
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Minor Components Composition

Sandoval and similar soils*:* About 6 percent
Parida and similar soils*:* About 4 percent

142—Parida gravelly loam, 3 to 10 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 6,800 feet (1,859 to 2,073 meters)
Mean annual precipitation: 10 to 12 inches (254 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Parida and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Parida soils

Landscape: Lava fields
Landform: Undulating plateaus
Position on landform: Footslopes
Parent material: Slope alluvium derived from basalt and pyroclastics
Slope: 3 to 10 percent
Shape (down/across): Concave/concave
Surface fragments: About 20 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.2 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 2 inches; gravelly loam
A2—2 to 6 inches; gravelly loam
Bw1—6 to 13 inches; very gravelly coarse sandy loam
Bw2—13 to 18 inches; gravelly coarse sandy loam
Bk—18 to 34 inches; gravelly coarse sandy loam
C—34 to 82 inches; extremely gravelly loamy coarse sand

Minor Components Composition

Churipa and similar soils*:* About 7 percent
Penistaja and similar soils*:* About 3 percent

143—Scogg very fine sandy loam, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,300 to 5,600 feet (1,615 to 1,707 meters)
Mean annual precipitation: 9 to 12 inches (229 to 305 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Scogg and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Scogg soils

Landscape: Valleys
Landform: Flood plains on valley floors
Parent material: Alluvium derived from granite and quartzite
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.9 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 12 to 20 inches
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: willow, sedge, cottonwood, rush
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very fine sandy loam
C—3 to 15 inches; stratified fine sand to fine sandy loam
Cg1—15 to 24 inches; stratified loamy fine sand to very fine sandy loam
Cg2—24 to 31 inches; stratified very fine sandy loam to silt loam
2Cg3—31 to 80 inches; very gravelly coarse sand

Minor Components Composition

Chupe and similar soils*:* About 7 percent
Bosquecito and similar soils*:* About 5 percent
Mirada and similar soils*:* About 3 percent

144—Los Alamos fine sandy loam, 1 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,900 feet (1,768 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Los Alamos and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Los Alamos soils

Landscape: Lava plateaus
Landform: Mesas
Position on landform: Summits
Parent material: Eolian material derived from volcanic ash over residuum weathered from pumice
Slope: 1 to 5 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 4 to 10 inches to abrupt textural change; 20 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 5.9 inches (low)
Shrink-swell potential: About 1.7 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: galleta, black grama, blue grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 3 inches; fine sandy loam
A2—3 to 7 inches; fine sandy loam
Bt—7 to 17 inches; clay loam
Btk—17 to 25 inches; loam
Bk—25 to 32 inches; ashy paragravelly sandy loam
2BCk—32 to 39 inches; paragravel
2C—39 to 80 inches; paragravel

Minor Components Composition

Armenta and similar soils*:* About 5 percent
Navajita and similar soils*:* About 4 percent
Adornado and similar soils*:* About 1 percent

145—Romberg very gravelly sandy loam, 25 to 55 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,800 feet (1,707 to 2,073 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Romberg and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Romberg soils

Landscape: Lava plateaus
Landform: Hills
Position on landform: Backslopes
Parent material: Slope alluvium derived from conglomerate
Slope: 25 to 55 percent
Shape (down/across): Convex/linear
Surface fragments: About 20 percent rounded cobbles; about 45 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.7 inches (low)
Shrink-swell potential: About 3.3 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Gravelly
Potential native vegetation: black grama, oneseed juniper, blue grama, prickly pear, twoneedle pinyon
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; very gravelly sandy loam
Bt1—4 to 11 inches; gravelly sandy clay loam
Bt2—11 to 18 inches; very gravelly sandy clay loam
Btk—18 to 33 inches; gravelly sandy clay loam
C—33 to 79 inches; extremely cobbly loamy coarse sand

Minor Components Composition

Espiritu and similar soils*:* About 7 percent
Chiminet and similar soils*:* About 2 percent
Rock outcrop*:* About 1 percent

200—Predawn loam, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,300 feet (1,859 to 2,225 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Predawn and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Predawn soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Alluvium derived from granite, gneiss, schist, loess, and volcanic ash
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 6 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 7.2 inches (moderate)
Shrink-swell potential: About 2.6 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 5 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, black grama, broom snakeweed
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
BA—2 to 4 inches; loam
Bt—4 to 9 inches; clay loam
Btk1—9 to 14 inches; clay loam
Btk2—14 to 19 inches; clay loam
Bk1—19 to 27 inches; loam
Bk2—27 to 36 inches; loam
BCk1—36 to 52 inches; gravelly sandy loam
BCk2—52 to 77 inches; very gravelly coarse sand
C—77 to 86 inches; gravelly loamy sand

Minor Components Composition

Alire and similar soils*:* About 6 percent
Encantado and similar soils*:* About 3 percent
Urban land*:* About 1 percent

201—Tanoan-Encantado complex, 5 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,500 feet (1,676 to 2,286 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Tanoan and similar soils: 45 percent
Encantado and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Tanoan soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Shoulders
Parent material: Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from basaltic tuff or granitic sandstone
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 15 percent subrounded gravel; about 0 percent subrounded cobbles
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, galleta, black grama, ring muhly
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; gravelly sandy loam
Bk1—3 to 7 inches; loam
Bk2—7 to 24 inches; loam
Bk3—24 to 32 inches; sandy loam
Bkq—32 to 57 inches; loam

BCk1—57 to 70 inches; gravelly loamy coarse sand
BCk2—70 to 84 inches; gravelly coarse sandy loam

Encantado soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium and slope alluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone
Slope: 10 to 25 percent
Shape (down/across): Linear/linear
Surface fragments: About 15 percent subrounded cobbles; about 40 percent subrounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.5 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 27 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta
Land capability subclass (nonirrigated): 4s

Typical Profile

ABk—0 to 3 inches; very gravelly sandy loam
Bk1—3 to 9 inches; very gravelly loam
Bk2—9 to 22 inches; very gravelly coarse sandy loam
BCk1—22 to 33 inches; gravelly loamy coarse sand
BCk2—33 to 45 inches; very gravelly loamy coarse sand
BCk3—45 to 54 inches; very gravelly loamy coarse sand
C1—54 to 63 inches; gravelly loamy sand
C2—63 to 85 inches; very gravelly loamy sand

Minor Components Composition

Nazario and similar soils*:* About 4 percent
Buckhorse and similar soils*:* About 3 percent
Altazano and similar soils*:* About 3 percent
Urban land*:* About 2 percent
Encantado and similar soils*:* About 2 percent
Riverwash*:* About 1 percent

202—Alire loam, 2 to 6 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,400 feet (1,859 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Alire and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Alire soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Beveled summits
Parent material: Alluvium derived granite, gneiss, schist, loess, and volcanic ash
Slope: 2 to 6 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.6 inches (high)
Shrink-swell potential: About 2.8 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 30 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 5 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
Bt—2 to 8 inches; clay loam
Btk1—8 to 15 inches; clay loam
Btk2—15 to 28 inches; clay loam
Bk1—28 to 45 inches; loam
Bk2—45 to 57 inches; gravelly loam
BCk—57 to 71 inches; gravelly sandy loam
BCkq—71 to 105 inches; gravelly sandy loam

Minor Components Composition

Encantado and similar soils*:* About 5 percent
Predawn and similar soils*:* About 2 percent
Tanoan and similar soils*:* About 2 percent
Urban land*:* About 1 percent

203—Buckhorse-Altazano complex, 2 to 8 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,500 feet (1,737 to 2,286 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Buckhorse and similar soils: 55 percent
Altazano and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Buckhorse soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.2 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, sand dropseed, galleta, ring muhly, black grama
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 4 inches; coarse sandy loam
Bt—4 to 11 inches; coarse sandy loam
Btk1—11 to 22 inches; loam
Btk2—22 to 37 inches; loam
Bk—37 to 49 inches; fine sandy loam
BCk—49 to 61 inches; sandy loam
C—61 to 83 inches; gravelly coarse sand

Altazano soils

Landscape: Fan piedmonts
Landform: Inset fans on eroded fan remnants
Parent material: Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone
Slope: 2 to 8 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, sand dropseed, black grama, galleta
Land capability subclass (nonirrigated): 4w

Typical Profile

AC—0 to 2 inches; gravelly sandy loam
C1—2 to 8 inches; gravelly coarse sandy loam
C2—8 to 19 inches; very gravelly loamy coarse sand
C3—19 to 29 inches; gravelly sandy loam
Btkb1—29 to 46 inches; loam
Btkb2—46 to 65 inches; loam
BCkb—65 to 74 inches; gravelly coarse sandy loam
Ckb—74 to 90 inches; gravelly loamy coarse sand

Minor Components Composition

Junebee and similar soils*:* About 4 percent
Tanoan and similar soils*:* About 3 percent
Riverwash*:* About 2 percent
Urban land*:* About 1 percent

204—Altazano loamy sand, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,400 feet (1,859 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Altazano and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Altazano soils

Landscape: Valleys
Landform: Flood plains on valley floors
Parent material: Alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 22 to 30 inches to strongly contrasting textural stratification; 22 to 30 inches to abrupt textural change
Drainage class: Somewhat excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.1 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, Gambel oak, oneseed juniper, black grama, galleta
Land capability subclass (nonirrigated): 4c

Typical Profile

AC—0 to 3 inches; loamy sand
C1—3 to 8 inches; fine sandy loam
C2—8 to 12 inches; loamy sand
C3—12 to 18 inches; stratified sandy loam to loam
C4—18 to 26 inches; gravelly loamy coarse sand
Btkb1—26 to 29 inches; loam
Btkb2—29 to 36 inches; loam

Bkb—36 to 58 inches; loam
BCkb1—58 to 76 inches; gravelly coarse sandy loam
BCkb2—76 to 92 inches; gravelly coarse sand

Minor Components Composition

Buckhorse and similar soils*:* About 5 percent
Levante and similar soils*:* About 3 percent
Tanoan and similar soils*:* About 3 percent
Riverwash*:* About 2 percent
Urban land*:* About 2 percent

205—Nazario gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,200 to 7,400 feet (1,890 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Nazario and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Nazario soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Beveled summits
Parent material: Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from granitic fanglomerate and sandstone
Slope: 2 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent subrounded cobbles; about 20 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 20 to 28 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 28 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 4c

Typical Profile

ABk—0 to 2 inches; gravelly loam
Bk1—2 to 7 inches; gravelly loam
Bk2—7 to 15 inches; gravelly loam
Bk3—15 to 24 inches; gravelly loam
2BCk1—24 to 43 inches; very gravelly loamy coarse sand
2BCk2—43 to 52 inches; gravelly loamy coarse sand
2C1—52 to 67 inches; coarse sand
2C2—67 to 94 inches; gravelly coarse sand

Minor Components Composition

Alire and similar soils*:* About 3 percent
Tanoan and similar soils*:* About 3 percent
Encantado and similar soils*:* About 2 percent
Urban land*:* About 2 percent

206—Encantado very cobbly sandy loam, 25 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,600 feet (1,737 to 2,316 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Encantado and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Encantado soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone
Slope: 25 to 45 percent
Shape (down/across): Linear/linear
Surface fragments: About 20 percent subrounded cobbles; about 25 percent subrounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Calcium carbonate average in horizon of maximum accumulation: About 23 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta
Land capability subclass (nonirrigated): 7e

Typical Profile

ABk—0 to 2 inches; very cobbly sandy loam
Bk1—2 to 8 inches; gravelly sandy loam
Bk2—8 to 12 inches; gravelly coarse sandy loam
Bk3—12 to 24 inches; very gravelly coarse sandy loam
BCk—24 to 31 inches; gravelly loamy sand
BCk1—31 to 56 inches; very gravelly loamy coarse sand
BCk2—56 to 67 inches; gravelly loamy sand
C—67 to 82 inches; gravelly loamy coarse sand

Minor Components Composition

Nazario and similar soils*:* About 4 percent
Encantado and similar soils*:* About 3 percent
Urban land*:* About 2 percent
Rock outcrop*:* About 1 percent

207—Urban land

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,400 feet (1,676 to 2,256 meters)
Mean annual precipitation: 9 to 15 inches (229 to 381 millimeters)
Mean annual air temperature: 47 to 52 degrees F (8.1 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent

Component Descriptions

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, storage yards, roads, streets, sidewalks, and railroad grades. Urban land is in intensely built-up portions of the City of Santa Fe and is mostly within commercial and industrial districts. It is intermingled in places with small remnant areas of natural soil or bodies of man-made soil that have usually been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes are dominantly 1 to 5 percent, but range to 25 percent.
Landscape: Fan piedmonts
Landform: Stream terraces, eroded fan remnants
Slope: 1 to 5 percent
Shape (down/across): Linear/linear
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Minor Components Composition

Alire and similar soils*:* About 4 percent
Panky and similar soils*:* About 3 percent
Buckhorse and similar soils*:* About 2 percent
Predawn and similar soils*:* About 2 percent
Altazano and similar soils*:* About 2 percent
Tanoan and similar soils*:* About 1 percent
Delvalle and similar soils*:* About 1 percent

208—Alire-Urban land complex, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,400 to 7,400 feet (1,951 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Alire and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent

Component Descriptions

Alire soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Beveled summits
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.2 inches (high)
Shrink-swell potential: About 2.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 29 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 5 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 4 inches; loam
Bt—4 to 11 inches; clay loam
Btk1—11 to 20 inches; clay loam
Btk2—20 to 27 inches; loam
Bk1—27 to 42 inches; loam
Bk2—42 to 51 inches; gravelly loam
Bkq1—51 to 69 inches; gravelly loam
Bkq2—69 to 95 inches; gravelly loam
C—95 to 99 inches; gravelly sandy loam

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential districts. It is intermingled with Alire soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 8 percent.
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Slope: 0 to 5 percent
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Predawn and similar soils*:* About 4 percent
Tanoan and similar soils*:* About 3 percent
Altazano and similar soils*:* About 2 percent
Encantado and similar soils*:* About 1 percent

209—Dondiego-Urban land complex, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,300 to 7,800 feet (1,920 to 2,377 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Dondiego and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent

Component Descriptions

Dondiego soils

Landscape: Valleys
Landform: High stream terraces
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 69 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.8 inches (moderate)
Shrink-swell potential: About 4.1 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; sandy loam
Bt1—2 to 7 inches; loam
Bt2—7 to 14 inches; loam
Bt3—14 to 26 inches; loam
Btk—26 to 37 inches; loam
Btk2—37 to 51 inches; loam
Bk—51 to 66 inches; gravelly loam
BCk—66 to 92 inches; gravelly loamy coarse sand
C—92 to 106 inches; very gravelly coarse sand

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential districts. It is intermingled with Dondiego soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.
Landscape: Valleys
Landform: High stream terraces
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Minor Components Composition

Meseeya and similar soils*:* About 3 percent
Altazano and similar soils*:* About 2 percent

210—Urban land-Buckhorse-Altazano complex, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,500 feet (1,737 to 2,286 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Urban land: 60 percent
Buckhorse and similar soils: 20 percent
Altazano and similar soils: 10 percent
Minor components: 10 percent

Component Descriptions

Urban land

Description: Urban land consists of areas covered by buildings, driveways, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and is mostly within residential areas. It is intermingled with the Buckhorse and Altazano soils that are either slightly disturbed or have been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 8 percent.
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8s

Buckhorse soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.2 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy

Potential native vegetation: blue grama, sand dropseed, galleta, ring muhly, black grama
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 4 inches; coarse sandy loam
Bt—4 to 11 inches; coarse sandy loam
Btk1—11 to 22 inches; loam
Btk2—22 to 37 inches; loam
Bk—37 to 49 inches; fine sandy loam
BCk—49 to 61 inches; sandy loam
C—61 to 83 inches; gravelly coarse sand

Altazano soils

Landscape: Fan piedmonts
Landform: Inset fans on eroded fan remnants
Parent material: Slope alluvium derived from granite, gneiss, schist, granitic sandstone, fanglomerate, and mudstone
Slope: 2 to 8 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, sand dropseed, black grama, galleta
Land capability subclass (nonirrigated): 4w

Typical Profile

AC—0 to 2 inches; gravelly sandy loam
C1—2 to 8 inches; gravelly coarse sandy loam
C2—8 to 19 inches; very gravelly loamy coarse sand
C3—19 to 29 inches; gravelly sandy loam
Btkb1—29 to 46 inches; loam
Btkb2—46 to 65 inches; loam
BCkb—65 to 74 inches; gravelly coarse sandy loam
Ckb—74 to 90 inches; gravelly loamy coarse sand

Minor Components Composition

Levante and similar soils*:* About 7 percent
Riverwash*:* About 3 percent

211—Tanoan-Encantado-Urban land complex, 5 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,500 feet (1,676 to 2,286 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Tanoan and similar soils: 35 percent
Encantado and similar soils: 30 percent
Urban land: 25 percent
Minor components: 10 percent

Component Descriptions

Tanoan soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Shoulders
Parent material: Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from basaltic tuff or granitic sandstone
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 15 percent subrounded gravel; about 0 percent subrounded cobbles
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, galleta, black grama, ring muhly
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; gravelly sandy loam
Bk1—3 to 7 inches; loam
Bk2—7 to 24 inches; loam
Bk3—24 to 32 inches; sandy loam
Bkq—32 to 57 inches; loam
BCk1—57 to 70 inches; gravelly loamy coarse sand
BCk2—70 to 84 inches; gravelly coarse sandy loam

Encantado soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium and slope alluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone
Slope: 10 to 25 percent
Shape (down/across): Linear/linear
Surface fragments: About 15 percent subrounded cobbles; about 40 percent subrounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.5 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 27 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta
Land capability subclass (nonirrigated): 4s

Typical Profile

ABk—0 to 3 inches; very gravelly sandy loam
Bk1—3 to 9 inches; very gravelly loam
Bk2—9 to 22 inches; very gravelly coarse sandy loam
BCk1—22 to 33 inches; gravelly loamy coarse sand
BCk2—33 to 45 inches; very gravelly loamy coarse sand
BCk3—45 to 54 inches; very gravelly loamy coarse sand
C1—54 to 63 inches; gravelly loamy sand
C2—63 to 85 inches; very gravelly loamy sand

Urban land

Description: Urban land consists of areas covered by buildings, driveways, parking lots, roads, streets, tennis courts, and sidewalks. Urban land is in portions of the City of Santa Fe and is mostly within residential areas. It is intermingled with Tanoan and Encantado soils that are either undisturbed or have been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 25 percent.
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Slope: 1 to 25 percent
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8

Minor Components Composition

Altazano and similar soils*:* About 4 percent
Junebee and similar soils*:* About 3 percent
Nazario and similar soils*:* About 2 percent
Alire and similar soils*:* About 1 percent

212—Junebee gravelly sandy loam, 5 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,800 feet (1,859 to 2,377 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Junebee and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Junebee soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granitic sandstone, fanglomerate, and mudstone
Slope: 5 to 15 percent
Shape (down/across): Concave/linear
Surface fragments: About 15 percent subrounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.8 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 7 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Deep Sand
Potential native vegetation: Indian ricegrass, blue grama, sand dropseed, galleta
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; gravelly sandy loam
Btk1—3 to 14 inches; sandy loam
Btk2—14 to 29 inches; sandy loam
Btk3—29 to 38 inches; sandy loam
Btk4—38 to 48 inches; gravelly coarse sandy loam
Btk5—48 to 58 inches; gravelly coarse sandy loam
Bk1—58 to 72 inches; gravelly coarse sandy loam
Bk2—72 to 88 inches; gravelly coarse sandy loam
BCk—88 to 112 inches; gravelly loamy coarse sand
C—112 to 122 inches; gravelly loamy coarse sand

Minor Components Composition

Altazano and similar soils*:* About 6 percent
Levante and similar soils*:* About 5 percent
Riverwash*:* About 4 percent

213—Levante-Riverwash complex, 1 to 3 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 7,700 feet (1,707 to 2,347 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Levante and similar soils: 55 percent
Riverwash: 35 percent
Minor components: 10 percent

Component Descriptions

Levante soils

Landscape: Valleys
Landform: Narrow flood plains on valley floors
Parent material: Alluvium derived from granite, gneiss, schist, and granitic sandstone
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 2.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 7 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 4c

Typical Profile

AC—0 to 4 inches; loamy sand
C1—4 to 17 inches; coarse sand
C2—17 to 32 inches; gravelly coarse sand
C3—32 to 45 inches; stratified gravelly loamy coarse sand to gravelly coarse sand
C4—45 to 58 inches; gravelly loamy coarse sand
C5—58 to 86 inches; very gravelly coarse sand
C6—86 to 122 inches; very gravelly coarse sand

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Levante soil.
Landscape: Valleys
Landform: Channels on flood plains
Parent material: Alluvium derived from mixed
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded (shape or size unspecified); about 20 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Altazano and similar soils*:* About 5 percent
Dondiego and similar soils*:* About 3 percent
Urban land*:* About 2 percent

214—Nazario-Urban land complex, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,200 to 7,400 feet (1,890 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Nazario and similar soils: 55 percent
Urban land: 30 percent
Minor components: 15 percent

Component Descriptions

Nazario soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Beveled summits
Parent material: Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from granitic fanglomerate and sandstone
Slope: 2 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent subrounded cobbles; about 20 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 20 to 28 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 28 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 4c

Typical Profile

ABk—0 to 2 inches; gravelly loam
Bk1—2 to 7 inches; gravelly loam
Bk2—7 to 15 inches; gravelly loam
Bk3—15 to 24 inches; gravelly loam
2BCk1—24 to 43 inches; very gravelly loamy coarse sand
2BCk2—43 to 52 inches; gravelly loamy coarse sand

2C1—52 to 67 inches; coarse sand
2C2—67 to 94 inches; gravelly coarse sand

Urban land

Description: Urban land consists of areas covered by buildings, driveways, parking lots, roads, streets, tennis courts, and sidewalks. Urban land is in portions of the City of Santa Fe and is mostly within residential areas. It is intermingled with the Nazario soil that are either undisturbed or have been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 8 percent.
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Slope: 1 to 8 percent
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8

Minor Components Composition

Alire and similar soils*:* About 8 percent
Encantado and similar soils*:* About 4 percent
Tanoan and similar soils*:* About 3 percent

215—Predawn-Urban land complex, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,400 to 7,300 feet (1,951 to 2,225 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Predawn and similar soils: 60 percent
Urban land: 30 percent
Minor components: 10 percent

Component Descriptions

Predawn soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Alluvium derived from granite, gneiss, schist, loess, and volcanic ash
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 4 to 6 inches to strongly contrasting textural stratification; 4 to 6 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 7.6 inches (moderate)
Shrink-swell potential: About 2.7 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 48 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 5 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, black grama, broom snakeweed
Land capability subclass (nonirrigated): 4c

Typical Profile

AE—0 to 5 inches; loam
Bt—5 to 10 inches; clay
Btk1—10 to 16 inches; clay loam
Btk2—16 to 23 inches; clay loam
Bk1—23 to 28 inches; loam
Bk2—28 to 34 inches; loam

Bky1—34 to 48 inches; loam
Bky2—48 to 73 inches; loam
BCk1—73 to 88 inches; loam
BCk2—88 to 100 inches; sandy loam

Urban land

Description: Urban land consists of areas covered by buildings, parking lots, roads, streets, and sidewalks. Urban land is in portions of the City of Santa Fe and surrounding areas and is mostly within residential districts. It is intermingled with Predawn soil that is either undisturbed or has been landscaped and planted. Urban land is hard and impermeable and surface runoff is very rapid. Slopes generally are less than 3 percent.
Landscape: Fan piedmonts
Landform: Eroded fan remnants
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Alire and similar soils*:* About 7 percent
Tanoan and similar soils*:* About 3 percent

216—Dondiego loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,400 feet (1,859 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Dondiego and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Dondiego soils

Landscape: Valleys
Landform: Low stream terraces on valley floors
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, schist, and loess
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.1 inches (moderate)
Shrink-swell potential: About 4.1 percent (moderate)
Flooding hazard: Very rare
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 9 inches; loam
Bt2—9 to 22 inches; loam
Btk—22 to 28 inches; loam
BCk—28 to 36 inches; sandy loam
Btb1—36 to 48 inches; loam
Btb2—48 to 59 inches; loam
BCb—59 to 69 inches; gravelly sandy loam
Cb1—69 to 85 inches; gravelly loamy coarse sand
Cb2—85 to 102 inches; stratified gravelly loamy coarse sand to sandy loam

Minor Components Composition

Ohke and similar soils*:* About 7 percent
Altazano and similar soils*:* About 4 percent
Urban land*:* About 4 percent

217—Ohke sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,700 feet (1,859 to 2,347 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Ohke and similar soils: 80 percent
Minor components: 20 percent

Component Descriptions

Ohke soils

Landscape: Valleys
Landform: Low stream terraces on valley floors
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Very rare
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, Gambel oak, oneseed juniper, black grama, galleta
Land capability subclass (nonirrigated): 4s

Typical Profile

A1—0 to 3 inches; sandy loam
A2—3 to 10 inches; gravelly coarse sandy loam
AC—10 to 14 inches; gravelly loamy coarse sand
C1—14 to 22 inches; gravelly coarse sand
C2—22 to 29 inches; very gravelly coarse sand
C3—29 to 49 inches; gravelly coarse sand
C4—49 to 85 inches; stratified very gravelly coarse sand to gravelly coarse sand
C5—85 to 98 inches; sandy loam
C6—98 to 106 inches; gravelly loamy sand

Minor Components Composition

Dondiego and similar soils*:* About 8 percent
Altazano and similar soils*:* About 7 percent
Urban land*:* About 5 percent

218—Pedregal very gravelly loam, 2 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,900 to 7,600 feet (1,798 to 2,316 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Pedregal and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Pedregal soils

Landscape: Fan piedmonts
Landform: Narrow, eroded fan remnants
Position on landform: Shoulders, beveled summits
Parent material: Alluvium derived from granite, gneiss, and schist over residuum weathered from granitic sandstone, siltstone, and fanglomerate
Slope: 2 to 15 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent rounded cobbles; about 40 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 3.6 inches (low)
Shrink-swell potential: About 1.7 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 39 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, twoneedle pinyon, ring muhly
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 2 inches; very gravelly loam
Bt1—2 to 5 inches; very gravelly clay loam
Bt2—5 to 8 inches; very gravelly clay loam
Btk—8 to 12 inches; very gravelly sandy clay loam
Bk1—12 to 22 inches; very gravelly sandy loam
Bk2—22 to 45 inches; extremely gravelly coarse sandy loam
BCk—45 to 62 inches; extremely gravelly coarse sand
C1—62 to 81 inches; gravelly loamy sand
2C2—81 to 92 inches; silt loam

2C3—92 to 104 inches; silt loam

Minor Components Composition

Predawn and similar soils*:* About 4 percent
Alire and similar soils*:* About 2 percent
Urban land*:* About 2 percent
Encantado and similar soils*:* About 1 percent
Nazario and similar soils*:* About 1 percent

219—Ohke sandy loam, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,300 to 6,700 feet (1,920 to 2,042 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Ohke and similar soils: 80 percent
Minor components: 20 percent

Component Descriptions

Ohke soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from basaltic tuff
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.3 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Hills
Potential native vegetation: blue grama, Gambel oak, oneseed juniper, black grama, galleta
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 3 inches; sandy loam
Bw—3 to 9 inches; gravelly sandy loam
Bkq—9 to 13 inches; gravelly sandy loam
BCkq1—13 to 27 inches; gravelly loamy sand
BCkq2—27 to 48 inches; loamy sand
Cq—48 to 82 inches; loamy sand
C—82 to 98 inches; loamy sand

Minor Components Composition

Nazario and similar soils*:* About 7 percent
Tanoan and similar soils*:* About 6 percent
Rock outcrop*:* About 4 percent
Urban land*:* About 3 percent

220—Horcado-Nazario complex, 2 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 7,100 feet (1,707 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Horcado and similar soils: 60 percent
Nazario and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Horcado soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 15 to 35 percent
Shape (down/across): Linear/convex
Surface fragments: About 50 percent rounded gravel; about 3 percent rounded cobbles
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 14 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: Gambel oak, blue grama, oneseed juniper, bottlebrush squirreltail, sideoats grama, twoneedle pinyon
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 4 inches; very gravelly coarse sandy loam
Bk1—4 to 8 inches; gravelly coarse sandy loam
Bk2—8 to 17 inches; very gravelly loamy coarse sand
BCk1—17 to 33 inches; very gravelly loamy coarse sand
BCk2—33 to 45 inches; very gravelly loamy sand
BCk3—45 to 74 inches; very gravelly loamy coarse sand
BCk4—74 to 88 inches; very gravelly coarse sand
BCkq1—88 to 94 inches; gravelly sandy loam
BCkq2—94 to 105 inches; gravelly sandy loam

Nazario soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Beveled summits, shoulders
Parent material: Alluvium derived from granite, gneiss, schist, and loess over residuum weathered from granitic fanglomerate and sandstone
Slope: 2 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 3 percent rounded cobbles; about 35 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 4.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 17 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: blue grama, black grama, New Mexico feathergrass, oneseed juniper, sideoats grama, twoneedle pinyon, galleta
Land capability subclass (nonirrigated): 4s

Typical Profile

ABk—0 to 2 inches; very gravelly loam
Bk1—2 to 5 inches; gravelly loam
Bk2—5 to 16 inches; gravelly loam
Bk3—16 to 31 inches; gravelly coarse sandy loam
2BCk1—31 to 49 inches; very gravelly coarse sand
2BCk2—49 to 63 inches; gravelly coarse sand
2BCk3—63 to 76 inches; gravelly loamy coarse sand
2C1—76 to 96 inches; gravelly coarse sand
2C2—96 to 120 inches; very gravelly loamy coarse sand

Minor Components Composition

Encantado and similar soils*:* About 4 percent
Latierra and similar soils*:* About 3 percent
Lamesilla and similar soils*:* About 2 percent
Urban land*:* About 1 percent

221—Latierra-Lamesilla-Levante complex, 2 to 15 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,300 feet (1,676 to 2,225 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Latierra and similar soils: 45 percent
Lamesilla and similar soils: 30 percent
Levante and similar soils: 15 percent
Minor components: 10 percent

Component Descriptions

Latierra soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 5 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 20 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 31 to 39 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.1 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, blue grama, New Mexico feathergrass, oneseed juniper, sideoats grama, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; gravelly coarse sandy loam
Bt1—3 to 7 inches; gravelly coarse sandy loam
Bt2—7 to 12 inches; gravelly coarse sandy loam
Btk1—12 to 20 inches; gravelly coarse sandy loam
Btk2—20 to 26 inches; gravelly sandy clay loam
Bk—26 to 37 inches; gravelly coarse sandy loam
BCk—37 to 46 inches; very gravelly loamy coarse sand
C1—46 to 60 inches; loam

C2—60 to 83 inches; very gravelly loamy coarse sand
C3—83 to 110 inches; gravelly coarse sandy loam

Lamesilla soils

Landscape: Fan piedmonts
Landform: Inset fans on eroded fan remnants
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 40 percent rounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.4 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, Gambel oak, oneseed juniper, black grama, galleta
Land capability subclass (nonirrigated): 4w

Typical Profile

AC1—0 to 2 inches; very gravelly coarse sandy loam
AC2—2 to 6 inches; gravelly coarse sandy loam
Bw1—6 to 20 inches; gravelly coarse sandy loam
Bw2—20 to 34 inches; gravelly coarse sandy loam
Bw3—34 to 52 inches; very gravelly coarse sandy loam
Bk—52 to 65 inches; gravelly sandy clay loam
C1—65 to 83 inches; gravelly coarse sandy loam
C2—83 to 104 inches; stratified very gravelly coarse sand to gravelly sandy loam
C3—104 to 121 inches; very gravelly coarse sand

Levante soils

Landscape: Fan piedmonts
Landform: Narrow flood plains on eroded fan remnants
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 2 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 30 percent rounded gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.5 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 2 percent

Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 4w

Typical Profile

AC—0 to 4 inches; gravelly coarse sand
C1—4 to 13 inches; stratified gravelly coarse sand to sandy loam
C2—13 to 29 inches; stratified gravelly coarse sand to coarse sandy loam
C3—29 to 42 inches; stratified gravelly coarse sand to gravelly loamy coarse sand
C4—42 to 55 inches; very gravelly coarse sand
Btb—55 to 65 inches; coarse sandy loam
BCkb1—65 to 81 inches; stratified gravelly loamy coarse sand to gravelly sandy loam
BCkb2—81 to 96 inches; gravelly loamy coarse sand
BCkb3—96 to 105 inches; very gravelly loamy coarse sand

Minor Components Composition

Horcado and similar soils*:* About 4 percent
Altazano and similar soils*:* About 3 percent
Dondiego and similar soils*:* About 3 percent

222—Sipapu-Yuzarra-Kachina complex, 5 to 65 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 7,800 feet (1,707 to 2,377 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Sipapu and similar soils: 45 percent
Yuzarra and similar soils: 30 percent
Kachina and similar soils: 15 percent
Minor components: 10 percent

Component Descriptions

Sipapu soils

Landscape: Piedmont slopes
Landform: Ridges, hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite and gneiss over residuum weathered from granitic sandstone, siltstone, and mudstone
Slope: 20 to 65 percent
Shape (down/across): Convex/convex; linear
Surface fragments: About 5 percent rounded cobbles; about 25 percent rounded gravel
Depth class: Very shallow
Depth to restrictive feature: 6 to 10 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.0 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 12 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: mountain mahogany, oneseed juniper, twoneedle pinyon, black grama, sideoats grama
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 1 inch; gravelly sandy loam
Bk—1 inch to 3 inches; sandy loam
2BCk—3 to 8 inches; very paragravelly fine sandy loam
2Cr—8 to 18 inches; cemented bedrock

Yuzarra soils

Landscape: Piedmont slopes
Landform: Ridges, hills
Position on landform: Beveled summits
Parent material: Alluvium derived from granite, gneiss, and schist over residuum weathered from granitic sandstone and fanglomerate
Slope: 5 to 15 percent
Shape (down/across): Convex/linear, convex
Surface fragments: About 5 percent rounded cobbles; about 45 percent rounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, black grama, little bluestem, sideoats grama
Land capability subclass (nonirrigated): 4s

Typical Profile

ABk—0 to 3 inches; very gravelly sandy loam
Bk1—3 to 10 inches; gravelly sandy loam
2Bk2—10 to 22 inches; very gravelly coarse sand
2Bk3—22 to 26 inches; gravelly sand
2Bk4—26 to 34 inches; very gravelly coarse sand
2Cr—34 to 44 inches; cemented bedrock

Kachina soils

Landscape: Piedmont slopes
Landform: Ridges, hills
Position on landform: Toeslopes
Parent material: Slope alluvium derived from micaceous sandstone, siltstone, mudstone, and fanglomerate
Slope: 5 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Depth to restrictive feature: 79 to 98 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 9.3 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 7 percent

Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, true mountain mahogany, sideoats grama, eriogonum, little bluestem
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; fine sandy loam
Bk1—3 to 13 inches; fine sandy loam
Bk2—13 to 24 inches; sandy clay loam
Bk3—24 to 44 inches; loam
BCk1—44 to 53 inches; sandy loam
BCk2—53 to 73 inches; gravelly sandy loam
BCk3—73 to 81 inches; gravelly sandy clay loam
2BCk4—81 to 93 inches; very paragravelly silty clay loam
2Cr—93 to 103 inches; cemented bedrock

Minor Components Composition

Junebee and similar soils*:* About 3 percent
Badland*:* About 2 percent
Dondiego and similar soils*:* About 2 percent
Levante and similar soils*:* About 1 percent
Rock outcrop*:* About 1 percent
Urban land*:* About 1 percent

223—Kachina fine sandy loam, 5 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 7,300 feet (1,707 to 2,225 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Kachina and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Kachina soils

Landscape: Piedmont slopes
Landform: Hills
Position on landform: Toeslopes
Parent material: Alluvium derived micaceous sandstone, siltstone, mudstone, and fanglomerate
Slope: 5 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 9.7 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 11 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, Ericameria nauseosa ssp. nauseosa var. nauseosa, sideoats grama, blue grama
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; fine sandy loam
Bk1—3 to 7 inches; loam
Bk2—7 to 19 inches; sandy clay loam
Bk3—19 to 26 inches; loam
BCk1—26 to 36 inches; loam
BCk2—36 to 48 inches; loam
BCk3—48 to 59 inches; loam
BCk4—59 to 84 inches; fine sandy loam
BCk5—84 to 102 inches; very fine sandy loam
BCk6—102 to 120 inches; gravelly sandy loam

Minor Components Composition

Sipapu and similar soils*:* About 5 percent
Junebee and similar soils*:* About 4 percent
Levante and similar soils*:* About 3 percent
Urban land*:* About 2 percent
Yuzarra and similar soils*:* About 1 percent

224—Portillo extremely gravelly sandy loam, 25 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,900 to 7,400 feet (1,798 to 2,256 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Portillo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Portillo soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granitic sandstone, siltstone, and fanglomerate
Slope: 25 to 50 percent
Shape (down/across): Linear/convex
Surface fragments: About 20 percent cobbles; about 50 percent rounded gravels; less than 1 percent rounded stones
Depth class: Very deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 4.2 inches (low)
Shrink-swell potential: About 1.7 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: Gambel oak, oneseed juniper, twoneedle pinyon, blue grama
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; extremely gravelly sandy loam
Bt1—3 to 7 inches; very gravelly clay loam
Bt2—7 to 15 inches; very gravelly sandy clay loam
Btk—15 to 17 inches; very gravelly sandy clay loam
Bk1—17 to 26 inches; very gravelly sandy loam
Bk2—26 to 34 inches; very gravelly coarse sandy loam
2BCk1—34 to 53 inches; gravelly loamy sand
2BCk2—53 to 66 inches; coarse sandy loam

2BCk3—66 to 102 inches; gravelly loamy coarse sand
2C—102 to 120 inches; gravelly loamy coarse sand

Minor Components Composition

Encantado and similar soils*:* About 6 percent
Pedregal and similar soils*:* About 3 percent
Sipapu and similar soils*:* About 1 percent

225—Encantado-Resolana complex, 35 to 70 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,000 to 7,900 feet (1,829 to 2,408 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 45 to 49 degrees F (7.2 to 9.4 degrees C)
Frost-free period: 120 to 150 days

Map Unit Composition

Encantado and similar soils: 45 percent
Resolana and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Encantado soils

Landscape: Fan piedmonts
Landform: South-facing eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granitic fanglomerate and sandstone
Slope: 35 to 60 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent rounded cobbles; about 50 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to bedrock, lithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.0 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 21 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta
Land capability subclass (nonirrigated): 7e

Typical Profile

ABk—0 to 1 inch; extremely gravelly coarse sandy loam
Btk—1 inch to 4 inches; very gravelly coarse sandy loam
Bk1—4 to 9 inches; very gravelly coarse sandy loam
Bk2—9 to 16 inches; very gravelly coarse sandy loam
Bk3—16 to 33 inches; extremely gravelly loamy coarse sand
2BCk1—33 to 41 inches; gravelly loamy coarse sand
2BCk2—41 to 51 inches; very gravelly loamy coarse sand

2BCk3—51 to 62 inches; gravelly coarse sand
2R—62 to 72 inches; cemented bedrock

Resolana soils

Landscape: Fan piedmonts
Landform: North-facing eroded fan remnants
Position on landform: Backslopes
Parent material: Colluvium derived granite, gneiss, and schist over residuum weathered from granitic conglomerate
Slope: 40 to 70 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent rounded cobbles; about 40 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.1 inches (low)
Shrink-swell potential: About 2.6 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 19 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, New Mexico feathergrass, black grama, blue grama, sideoats grama, twoneedle pinyon, galleta
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 1 inch; very gravelly coarse sandy loam
Bt—1 inch to 5 inches; gravelly sandy clay loam
Btk1—5 to 11 inches; very gravelly sandy clay loam
Btk2—11 to 17 inches; very gravelly coarse sandy loam
Btk3—17 to 24 inches; very gravelly coarse sandy loam
2Bk1—24 to 34 inches; extremely gravelly coarse sandy loam
2Bk2—34 to 43 inches; extremely gravelly coarse sandy loam
2Bk3—43 to 63 inches; gravelly coarse sandy loam
2R—63 to 73 inches; cemented bedrock

Minor Components Composition

Nazario and similar soils*:* About 5 percent
Crucitas and similar soils*:* About 4 percent
Levante and similar soils*:* About 3 percent
Riverwash*:* About 2 percent
Adellern and similar soils*:* About 1 percent

226—Crucitas gravelly fine sandy loam, 2 to 10 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,500 to 7,300 feet (1,981 to 2,225 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Crucitas and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Crucitas soils

Landscape: Valleys
Landform: Flood plain steps on valley floors
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 2 to 10 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 30 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 30 to 39 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Rare
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, Bigelow's rubber rabbitbrush, Apacheplume, blue grama, prickly pear
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 1 inch; gravelly fine sandy loam
Bw1—1 inch to 6 inches; gravelly sandy loam
Bw2—6 to 15 inches; gravelly sandy loam
Bw3—15 to 25 inches; gravelly sandy loam
Bw4—25 to 36 inches; gravelly sandy loam
2C—36 to 46 inches; extremely gravelly loamy coarse sand
2BCk1—46 to 60 inches; very gravelly coarse sand

2BCk2—60 to 72 inches; extremely gravelly coarse sand
2BCk3—72 to 110 inches; stratified gravelly coarse sand to gravelly fine sandy loam

Minor Components Composition

Levante and similar soils*:* About 7 percent
Ohke and similar soils*:* About 6 percent
Urban land*:* About 2 percent

300—Arnor gravelly sandy loam, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,800 to 8,400 feet (2,073 to 2,560 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Arnor and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Arnor soils

Landscape: Foothills
Landform: Hills
Position on landform: Toeslopes
Parent material: Slope alluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 2 to 8 percent
Shape (down/across): Linear/concave
Surface fragments: About 20 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 7.4 inches (moderate)
Shrink-swell potential: About 4.2 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Bouteloua gracilis
Potential native vegetation: blue grama, oneseed juniper, bottlebrush squirreltail, twoneedle pinyon
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 4 inches; gravelly sandy loam
Bt1—4 to 9 inches; gravelly sandy clay loam
Bt2—9 to 15 inches; gravelly sandy clay loam
Bt3—15 to 24 inches; gravelly sandy clay loam
Btk—24 to 35 inches; gravelly sandy clay loam
Ab—35 to 46 inches; gravelly sandy clay loam
Btkb—46 to 52 inches; gravelly sandy clay loam
2B/Ctkb—52 to 66 inches; very gravelly coarse sandy loam
2Crtk—66 to 80 inches; bedrock

Minor Components Composition

Setonville and similar soils*:* About 4 percent
Antonchico and similar soils*:* About 3 percent
Riverwash*:* About 2 percent
Urban land*:* About 1 percent

301—Enmedio-Atalaya-Rock outcrop complex, 5 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,400 to 8,500 feet (1,951 to 2,591 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Enmedio and similar soils: 60 percent
Atalaya and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 10 percent

Component Descriptions

Enmedio soils

Landscape: Foothills
Landform: Hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 15 to 60 percent
Shape (down/across): Linear/linear
Surface fragments: About 40 percent subrounded gravel; about 25 percent subrounded cobbles; about 1 percent subrounded stones
Depth class: Deep
Depth to restrictive feature: 16 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 2.1 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii
Potential native vegetation: blue grama, twoneedle pinyon, oneseed juniper, skunkbush sumac, Gambel oak
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 2 inches; extremely cobbly sandy loam
Bt1—2 to 5 inches; very gravelly sandy clay loam
Bt2—5 to 13 inches; very gravelly sandy clay loam
Bt3—13 to 19 inches; very gravelly sandy clay loam
2Ct—19 to 35 inches; cobbles
2C—35 to 46 inches; cobbles
2R—46 to 56 inches; bedrock

Atalaya soils

Landscape: Foothills
Landform: Hills
Position on landform: Shoulders, beveled summits
Parent material: Slope alluvium derived from granite, gneiss, and schist over residuum weathered from granite and schist
Slope: 5 to 15 percent
Shape (down/across): Linear/convex
Surface fragments: About 45 percent subrounded gravel; about 10 percent subrounded cobbles; less than 1 percent subrounded stones
Depth class: Deep
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.1 inches (low)
Shrink-swell potential: About 1.0 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii
Potential native vegetation: Gambel oak, blue grama, twoneedle pinyon, oneseed juniper
Land capability subclass (nonirrigated): 4e

Typical Profile

A—0 to 1 inch; very gravelly sandy loam
Bt1—1 inch to 4 inches; gravelly coarse sandy loam
Bt2—4 to 7 inches; gravelly coarse sandy loam
Bt3—7 to 12 inches; gravelly coarse sandy loam
BC1—12 to 24 inches; gravelly coarse sandy loam
BC2—24 to 34 inches; cobbly coarse sandy loam
2CBk—34 to 50 inches; cobbles
2R—50 to 60 inches; bedrock

Rock outcrop

Description: Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Enmedio and Atalaya soils.
Landscape: Foothills
Landform: Hills
Parent material: Granite and gneiss
Slope: 30 to 140 percent
Shape (down/across): Linear/linear
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Minor Components Composition

Setonville and similar soils*:* About 7 percent
Urban land*:* About 3 percent

302—Setonville-Antonchico complex, 3 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,300 to 8,200 feet (1,920 to 2,499 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Setonville and similar soils: 70 percent
Antonchico and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Setonville soils

Landscape: Foothills
Landform: Hills
Position on landform: Footslopes
Parent material: Slope alluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 5 to 15 percent
Shape (down/across): Concave/concave
Surface fragments: About 5 percent subrounded cobbles; about 50 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 20 to 31 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 32 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Bouteloua gracilis
Potential native vegetation: twoneedle pinyon, bottlebrush squirreltail, blue grama, oneseed juniper, Gambel oak
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 2 inches; very gravelly sandy loam
Bt—2 to 8 inches; very gravelly clay loam
Btk—8 to 13 inches; very gravelly sandy clay loam
Bk1—13 to 20 inches; gravelly sandy clay loam
Bk2—20 to 28 inches; very gravelly sandy loam
2BCk1—28 to 36 inches; gravel
2BCk2—36 to 45 inches; cobbles

2R—45 to 55 inches; bedrock

Antonchico soils

Landscape: Foothills
Landform: Hills
Position on landform: Beveled summits
Parent material: Slope alluvium derived from granite, gneiss, and schist over residuum weathered from schist
Slope: 3 to 5 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent subrounded gravel; about 5 percent subrounded cobbles
Depth class: Deep
Depth to restrictive feature: 20 to 42 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.5 inches (low)
Shrink-swell potential: About 1.7 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 26 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, bottlebrush squirreltail, blue grama
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; gravelly sandy loam
Bt1—2 to 7 inches; gravelly sandy clay loam
Bt2—7 to 14 inches; gravelly sandy clay loam
Bt3—14 to 20 inches; gravelly sandy clay loam
2BCk—20 to 42 inches; cobbles
2R—42 to 52 inches; bedrock

Minor Components Composition

Atalaya and similar soils*:* About 5 percent
Enmedio and similar soils*:* About 4 percent
Urban land*:* About 1 percent

303—Morenda, Fiesta, and Espanola soils, 1 to 85 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,800 to 8,500 feet (2,073 to 2,591 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 43 to 45 degrees F (6.1 to 7.2 degrees C)
Frost-free period: 110 to 130 days

Map Unit Composition

Fiesta and similar soils: 35 percent
Morenda, inset fan and similar soils: 25 percent
Morenda, floodplain and similar soils: 20 percent
Espanola and similar soils: 15 percent
Minor components: 5 percent

Component Descriptions

Morenda, inset fan soils

Landscape: Valleys
Landform: Inset fans on valley floors
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 5 to 20 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.0 inches (moderate)
Shrink-swell potential: About 3.6 percent (moderate)
Flooding hazard: Occasional
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel oak, Arizona fescue, muttongrass, elk sedge, ponderosa pine
Land capability subclass (nonirrigated): 3e

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 4 inches; coarse sandy loam
Bw1—4 to 16 inches; gravelly coarse sandy loam
Bw2—16 to 26 inches; gravelly coarse sandy loam
Bw3—26 to 41 inches; gravelly coarse sandy loam
Btb—41 to 53 inches; sandy clay loam
Btkb—53 to 70 inches; loam

2BCkb—70 to 83 inches; gravelly coarse sand

Morenda, flood plain soils

Landscape: Valleys
Landform: Low stream terraces on valley floors
Position on landform: Tread
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Very deep
Drainage class: Moderately well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 2.8 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 39 to 59 inches
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Populus fremontii/Salix/Carex
Potential native vegetation: willow, cottonwood, sedge
Land capability subclass (nonirrigated): 8

Typical Profile

A—0 to 3 inches; sandy loam
AB—3 to 9 inches; sandy loam
Bw1—9 to 20 inches; loam
Bw2—20 to 27 inches; loam
Bw3—27 to 35 inches; sandy loam
BC—35 to 46 inches; gravelly coarse sandy loam
2Cg1—46 to 56 inches; very gravelly coarse sand
2Cg2—56 to 81 inches; extremely gravelly coarse sand

Fiesta soils

Landscape: Valleys
Landform: Valley sides
Position on landform: Footslopes
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 10 to 35 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.2 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel oak, Arizona fescue, muttongrass, elk sedge, ponderosa pine
Land capability subclass (nonirrigated): 4c

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 4 inches; sandy clay loam
Bt1—4 to 9 inches; sandy clay loam
Bt2—9 to 14 inches; sandy clay loam
Bt3—14 to 25 inches; sandy clay loam
Bt4—25 to 42 inches; clay loam
Bt5—42 to 51 inches; gravelly sandy clay loam
Bt6—51 to 64 inches; gravelly sandy clay loam
Btk—64 to 84 inches; gravelly sandy clay loam
Btk/C—84 to 121 inches; gravelly sandy clay loam

Espanola soils

Landscape: Valleys
Landform: High stream terraces
Position on landform: Riser
Parent material: Alluvium derived from granite, gneiss, and schist
Slope: 35 to 85 percent
Shape (down/across): Linear/linear
Surface fragments: About 3 percent subrounded boulders; about 2 percent subrounded stones; about 5 percent subrounded cobbles; about 20 percent subrounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.4 inches (very low)
Shrink-swell potential: About 1.9 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel oak, Arizona fescue, muttongrass, ponderosa pine
Land capability subclass (nonirrigated): 3c

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 8 inches; gravelly sandy clay loam
E/Bt1—8 to 16 inches; extremely gravelly coarse sandy loam
E/Bt2—16 to 31 inches; extremely gravelly coarse sandy loam
Bt—31 to 45 inches; extremely gravelly coarse sandy loam
C1—45 to 54 inches; extremely gravelly loamy coarse sand
C2—54 to 67 inches; extremely gravelly loamy coarse sand
C3—67 to 80 inches; extremely gravelly loamy coarse sand

Minor Components Composition

Enmedio and similar soils*:* About 3 percent
Riverwash*:* About 2 percent

304—Legate-Yohalem-Zarmand complex, 5 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,200 to 8,500 feet (1,890 to 2,591 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Legate and similar soils: 60 percent
Yohalem and similar soils: 20 percent
Zarmand and similar soils: 15 percent
Minor components: 5 percent

Component Descriptions

Legate soils

Landscape: Foothills
Landform: Hills
Position on landform: Shoulders, backslopes
Parent material: Colluvium derived from limestone
Slope: 15 to 45 percent
Shape (down/across): Linear/convex
Surface fragments: About 5 percent subrounded boulders; about 2 percent subrounded stones; about 15 percent subrounded cobbles; about 50 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.6 inches (very low)
Shrink-swell potential: About 2.7 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 72 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii
Potential native vegetation: twoneedle pinyon, blue grama, oneseed juniper, eriogonum, Bigelow's rubber rabbitbrush
Land capability subclass (nonirrigated): 7s

Typical Profile

Ak—0 to 2 inches; extremely gravelly sandy loam
Bk1—2 to 9 inches; very gravelly fine sandy loam
Bk2—9 to 14 inches; very gravelly sandy loam
Bk3—14 to 18 inches; very gravelly sandy loam
2R—18 to 28 inches; bedrock

Yohalem soils

Landscape: Foothills
Landform: Hills
Position on landform: Backslopes
Parent material: Colluvium derived from shale and limestone over residuum weathered from shale
Slope: 30 to 50 percent
Shape (down/across): Linear/convex
Surface fragments: About 45 percent subrounded gravel; about 5 percent subrounded cobbles
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 2.5 inches (very low)
Shrink-swell potential: About 9.4 percent (very high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii
Potential native vegetation: twoneedle pinyon, blue grama, oneseed juniper, eriogonum, Bigelow's rubber rabbitbrush
Land capability subclass (nonirrigated): 6e

Typical Profile

A—0 to 1 inch; very gravelly clay loam
Bw—1 inch to 7 inches; paragravelly clay loam
BCky—7 to 15 inches; extremely paragravelly clay
Cr—15 to 25 inches; bedrock

Zarmand soils

Landscape: Foothills
Landform: Hills
Position on landform: Beveled summits
Parent material: Alluvium derived from limestone and sandstone over residuum weathered from limestone
Slope: 5 to 15 percent
Shape (down/across): Linear/convex
Surface fragments: About 50 percent subrounded gravel; about 20 percent subrounded cobbles; less than 1 percent subrounded stones
Depth class: Moderately deep
Depth to restrictive feature: 20 to 30 inches to bedrock, paralithic; 20 to 39 inches to bedrock, lithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.2 inches (low)
Shrink-swell potential: About 2.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 58 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii
Potential native vegetation: twoneedle pinyon, blue grama, oneseed juniper, Gambel oak, eriogonum, Bigelow's rubber rabbitbrush
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 1 inch; extremely channery fine sandy loam
ABk—1 inch to 9 inches; gravelly fine sandy loam
Bk1—9 to 17 inches; gravelly loam
2Bk2—17 to 24 inches; paragravelly loam
2Crk—24 to 29 inches; bedrock
2R—29 to 39 inches; bedrock

Minor Components Composition

Rock outcrop*:* About 3 percent
Urban land*:* About 2 percent

305—Chimayo-Rock outcrop-Quapaw complex, 50 to 90 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,100 to 8,100 feet (1,859 to 2,469 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Chimayo and similar soils: 45 percent
Rock outcrop: 25 percent
Quapaw and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Chimayo soils

Landscape: Breaks
Landform: Hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 50 to 90 percent
Shape (down/across): Linear/convex
Surface fragments: About 2 percent subrounded boulders; about 3 percent subrounded stones; about 10 percent subrounded cobbles; about 50 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.4 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Mountain Loam
Potential native vegetation: Arizona fescue, blue grama, mountain muhly, sedge, twoneedle pinyon
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; extremely gravelly coarse sandy loam
Bw—3 to 7 inches; very gravelly coarse sandy loam
2C—7 to 17 inches; cobbles
2R—17 to 27 inches; bedrock

Rock outcrop

Description: Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Chimayo soils.
Landscape: Breaks
Landform: Hills
Parent material: Granite and gneiss
Slope: 70 to 190 percent
Shape (down/across): Linear/linear
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Quapaw soils

Landscape: Breaks
Landform: Alluvial cones
Parent material: Colluvium derived from granite, gneiss, and schist
Slope: 60 to 80 percent
Shape (down/across): Linear/linear
Surface fragments: About 55 percent subrounded gravel; about 10 percent subrounded cobbles; about 1 percent subrounded stones
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.2 inches (low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Mountain Loam
Potential native vegetation: Arizona fescue, blue grama, mountain muhly, sedge, twoneedle pinyon
Land capability subclass (nonirrigated): 8e

Typical Profile

A—0 to 3 inches; extremely gravelly loam
Bw—3 to 10 inches; very gravelly loam
Bk1—10 to 18 inches; very gravelly sandy loam
Bk2—18 to 28 inches; extremely gravelly coarse sandy loam
Bk3—28 to 44 inches; extremely gravelly sandy loam
BCk1—44 to 55 inches; extremely gravelly coarse sandy loam
BCk2—55 to 80 inches; extremely cobbly coarse sandy loam

Minor Components Composition

Enmedio and similar soils*:* About 7 percent
Riverwash*:* About 3 percent

306—Adellern gravelly sandy loam, 50 to 90 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,400 to 9,100 feet (2,256 to 2,774 meters)
Mean annual precipitation: 16 to 20 inches (406 to 508 millimeters)
Mean annual air temperature: 43 to 45 degrees F (6.1 to 7.2 degrees C)
Frost-free period: 110 to 130 days

Map Unit Composition

Adellern and similar soils: 95 percent
Minor components: 5 percent

Component Descriptions

Adellern soils

Landscape: Foothills
Landform: North-facing high hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from schist
Slope: 50 to 90 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent angular flagstones; about 5 percent angular channers; about 15 percent subrounded gravel; less than 1 percent subrounded stones
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel oak, mountain muhly, muttongrass
Land capability subclass (nonirrigated): 4e

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 4 inches; gravelly sandy loam
BA—4 to 8 inches; gravelly sandy loam
Bt1—8 to 21 inches; gravelly sandy clay loam
Bt2—21 to 39 inches; very gravelly sandy clay loam
Bt/BC—39 to 55 inches; very gravelly sandy clay loam
BC/Bt—55 to 65 inches; gravelly sandy loam
2Btb—65 to 73 inches; sandy clay loam

2Bkb1—73 to 86 inches; sandy loam
2Bkb2—86 to 101 inches; sandy loam

Minor Components Composition

Zafarano and similar soils*:* About 3 percent
Rock outcrop*:* About 2 percent

307—Urban land-Ustorthents-Ustarents complex, 1 to 65 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,700 to 7,600 feet (2,042 to 2,316 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Urban land: 45 percent
Ustorthents and similar soils: 30 percent
Ustarents and similar soils: 20 percent
Minor components: 5 percent

Component Descriptions

Urban land

Description: Urban land consists of asphalt highway and frontage road lanes and the steel and concrete of bridges and overpasses. This Urban land is along highway corridor Interstate 25 and U.S. highway 285 where they are cut through granite bedrock.
Landscape: Foothills
Landform: Hills
Slope: 1 to 10 percent
Shape (down/across): Linear/linear
Drainage class: Well drained
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Ustorthents soils

Landscape: Foothills
Landform: Hills
Parent material: Residuum weathered from granite, gneiss, and schist
Slope: 1 to 10 percent
Shape (down/across): Concave/linear
Surface fragments: About 80 percent subrounded gravel; about 5 percent subrounded cobbles
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.5 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Land capability subclass (nonirrigated): 7s

Typical Profile

C1—0 to 2 inches; extremely gravelly sandy loam
C2—2 to 30 inches; gravel
R—30 to 40 inches; bedrock

Ustarents soils

Landscape: Foothills
Landform: Hills
Parent material: Roadfill derived from granite, gneiss, and schist
Slope: 35 to 65 percent
Shape (down/across): Linear/linear
Surface fragments: Less than 1 percent subrounded stones; about 40 percent subrounded cobbles; about 40 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 11.6 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Land capability subclass (nonirrigated): 8s

Typical Profile

A—0 to 2 inches; extremely cobbly sandy loam
C—2 to 80 inches; extremely cobbly sandy loam

Minor Components Composition

Enmedio and similar soils*:* About 2 percent
Antonchico and similar soils*:* About 1 percent
Atalaya and similar soils*:* About 1 percent
Setonville and similar soils*:* About 1 percent

308—Enmedio-Zafarano-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6,600 to 9,200 feet (2,012 to 2,804 meters)
Mean annual precipitation: 15 to 17 inches (381 to 432 millimeters)
Mean annual air temperature: 43 to 47 degrees F (6.1 to 8.3 degrees C)
Frost-free period: 110 to 150 days

Map Unit Composition

Enmedio and similar soils: 45 percent
Zafarano and similar soils: 40 percent
Rock outcrop: 10 percent
Minor components: 5 percent

Component Descriptions

Enmedio soils

Landscape: Foothills
Landform: South-facing high hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 35 to 60 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent subrounded stones; about 10 percent subrounded cobbles; about 40 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 3.2 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Hills
Potential native vegetation: oneseed juniper, sideoats grama, black grama, little bluestem
Land capability subclass (nonirrigated): 7e

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 7 inches; very gravelly sandy loam
Bt1—7 to 13 inches; very gravelly sandy clay loam
Bt2—13 to 19 inches; extremely gravelly sandy clay loam
BCt—19 to 34 inches; gravel
2C—34 to 48 inches; gravel
2R—48 to 58 inches; cemented bedrock

Zafarano soils

Landscape: Foothills
Landform: North-facing high hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 35 to 60 percent
Shape (down/across): Linear/linear
Surface fragments: About 40 percent subrounded gravel; about 5 percent subrounded cobbles; less than 1 percent subrounded stones
Depth class: Deep
Depth to restrictive feature: 16 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.3 inches (very low)
Shrink-swell potential: About 3.0 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation: ponderosa pine, Gambel oak, mountain muhly, muttongrass
Land capability subclass (nonirrigated): 7e

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A1—1 inch to 5 inches; very gravelly sandy loam
A2—5 to 12 inches; extremely gravelly sandy loam
Bt—12 to 20 inches; very gravelly sandy clay loam
2C1—20 to 31 inches; gravel
2C2—31 to 43 inches; gravel
2R—43 to 53 inches; bedrock

Rock outcrop

Description: Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Lazaro soils.
Landscape: Foothills
Landform: High hills
Position on landform: Backslopes
Parent material: Granite and gneiss
Slope: 30 to 160 percent
Shape (down/across): Linear/linear
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Lazaro, steep and similar soils*:* About 2 percent
Urban land*:* About 1 percent
Lazaro, rolling and similar soils*:* About 1 percent
Atalaya and similar soils*:* About 1 percent

309—Lazaro complex, 5 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,300 to 9,000 feet (2,225 to 2,743 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 45 to 47 degrees F (7.2 to 8.3 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Lazaro, steep and similar soils: 65 percent
Lazaro, rolling and similar soils: 25 percent
Minor components: 10 percent

Component Descriptions

Lazaro, steep soils

Landscape: Foothills
Landform: High hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 30 to 45 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded cobbles; about 35 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 12 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.4 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation: ponderosa pine, Gambel oak, Arizona fescue, muttongrass, blue grama, sedge
Land capability subclass (nonirrigated): 7e

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A1—1 inch to 4 inches; very gravelly coarse sandy loam
A2—4 to 16 inches; extremely gravelly coarse sandy loam
2C1—16 to 30 inches; gravel
2C2—30 to 50 inches; gravel
2R—50 to 60 inches; cemented bedrock

Lazaro, rolling soils

Landscape: Foothills
Landform: High hills
Position on landform: Beveled summits, shoulders
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 5 to 15 percent
Shape (down/across): Convex/linear
Surface fragments: About 0 percent subrounded cobbles; about 30 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 10 to 30 inches to strongly contrasting textural stratification; 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.7 inches (very low)
Shrink-swell potential: About 1.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation: ponderosa pine, Gambel oak, Arizona fescue, muttongrass, blue grama, sedge
Land capability subclass (nonirrigated): 7s

Typical Profile

A1—0 to 2 inches; gravelly sandy loam
A2—2 to 5 inches; very gravelly coarse sandy loam
C1—5 to 12 inches; extremely gravelly loamy coarse sand
2C2—12 to 25 inches; gravel
2C3—25 to 43 inches; gravel
2Ct—43 to 45 inches; gravel
2R—45 to 55 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Zafarano and similar soils*:* About 3 percent
Enmedio and similar soils*:* About 2 percent

310—Santa Fe-Rock outcrop complex, 25 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,200 to 8,400 feet (2,195 to 2,560 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Santa Fe and similar soils: 60 percent
Rock outcrop: 30 percent
Minor components: 10 percent

Component Descriptions

Santa Fe soils

Landscape: Foothills
Landform: High hills
Position on landform: Backslopes
Parent material: Colluvium derived from granite, gneiss, and schist over residuum weathered from granite
Slope: 25 to 45 percent
Shape (down/across): Linear/convex
Surface fragments: About 30 percent subrounded gravel; about 25 percent subrounded cobbles; less than 1 percent subrounded stones
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.0 inches (very low)
Shrink-swell potential: About 3.7 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii
Potential native vegetation: sideoats grama, twoneedle pinyon, black grama, little bluestem, Gambel oak, blue grama
Land capability subclass (nonirrigated): 7e

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 7 inches; very cobbly fine sandy loam
Bt1—7 to 11 inches; very gravelly sandy clay loam
Bt2—11 to 14 inches; extremely gravelly sandy clay loam
2R—14 to 24 inches; bedrock

Rock outcrop

Description: Rock outcrop consists of exposed granite bedrock. It occurs as steeply sloping bedrock and knobs intermingled with the Santa Fe soils.
Landscape: Foothills
Landform: High hills
Parent material: Granite and gneiss
Slope: 40 to 180 percent
Shape (down/across): Convex/convex
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Enmedio and similar soils*:* About 5 percent
Sancturario and similar soils*:* About 3 percent
Atalaya and similar soils*:* About 2 percent

400—Chiminet-Canuela-Rock outcrop complex, 2 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,900 to 7,100 feet (1,798 to 2,164 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Canuela and similar soils: 30 percent
Chiminet and similar soils: 25 percent
Rock outcrop: 20 percent
Chiminet, thick surface and similar soils: 15 percent
Minor components: 10 percent

Component Descriptions

Chiminet soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus, interfluves on mesas
Position on landform: Shoulders, backslopes
Parent material: Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 8 to 20 percent
Shape (down/across): Convex/convex
Surface fragments: Less than 1 percent subangular boulders; about 10 percent subangular cobbles; less than 1 percent subangular stones; about 15 percent angular gravel
Depth class: Very shallow
Depth to restrictive feature: 4 to 10 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 0.6 inches (very low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; paracobbly ashy coarse sandy loam
2Bw—2 to 6 inches; very paracobbly ashy coarse sandy loam
2Cr—6 to 16 inches; cemented bedrock

Chiminet, thick surface soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus, interfluves on mesas
Position on landform: Backslopes, shoulders
Parent material: Eolian deposits and slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 5 to 15 percent
Shape (down/across): Convex/linear, convex
Surface fragments: About 5 percent angular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.3 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama
Land capability subclass (nonirrigated): 6s

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 5 inches; ashy coarse sandy loam
Bw1—5 to 10 inches; paragravelly ashy coarse sandy loam
2Bw2—10 to 15 inches; very paracobbly ashy coarse sandy loam
2Cr—15 to 25 inches; cemented bedrock

Canuela soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus, interfluves on mesas
Position on landform: Summits
Parent material: Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff
Slope: 2 to 6 percent
Shape (down/across): Linear/linear
Surface fragments: About 15 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.7 inches (very low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, skunkbush sumac, twoneedle pinyon, mountain mahogany, needleandthread
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 2 inches; paragravelly fine sandy loam
Bt1—2 to 7 inches; paragravelly clay loam
2Bt2—7 to 15 inches; very paracobbly sandy clay loam
2Cr—15 to 25 inches; cemented bedrock

Rock outcrop

Description: Rock outcrop consists of exposed tuff bedrock. It occurs as gently sloping bedrock and knobs intermingled with the Chiminet and Chiminet, thick surface, soils.
Landscape: Lava plateaus
Landform: Mesas, plateaus
Parent material: Rhyolitic tuff
Slope: 5 to 25 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: 0 inches to bedrock, lithic
Runoff class: High
Land capability subclass (nonirrigated): 8

Minor Components Composition

Andanada and similar soils*:* About 5 percent
Nyjack and similar soils*:* About 3 percent
Adornado and similar soils*:* About 1 percent
Hackroy and similar soils*:* About 1 percent

401—Rock outcrop-Abrojo-Chiminet complex, 25 to 65 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,200 feet (1,737 to 2,195 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Rock outcrop: 40 percent
Abrojo and similar soils: 30 percent
Chiminet and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Rock outcrop
Description: Rock outcrop consists of exposed tuff and tuff breccia bedrock. It occurs as steeply sloping bedrock and vertical cliffs intermingled with the Chiminet soil and above the Abrojo soil.
Landscape: Lava plateaus
Landform: Undulating mesas, plateaus, canyons
Parent material: Rhyolitic tuff
Slope: 35 to 160 percent
Shape (down/across): Concave/linear
Depth to restrictive feature: At the surface bedrock, lithic
Runoff class: Very high
Land capability subclass (nonirrigated): 8

Abrojo soils

Landscape: Lava plateaus
Landform: Undulating plateaus, mesas, canyons, south-facing plateaus, mesas, canyons
Position on landform: Backslopes
Parent material: Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 25 to 65 percent
Shape (down/across): Concave/linear
Surface fragments: About 10 percent subangular boulders; about 4 percent subangular stones; about 30 percent subangular gravel; about 25 percent subangular cobbles
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Available water capacity: About 4.4 inches (low)
Shrink-swell potential: About 1.1 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 4 mmhos/cm (very slightly saline)

Sodium adsorption ratio average in horizon of maximum accumulation: About 22 (moderately sodic)
Ecological site: Hills
Potential native vegetation: blue grama, oneseed juniper, skunkbush sumac, black grama, galleta
Land capability subclass (nonirrigated): 8

Typical Profile

A—0 to 2 inches; extremely cobbly ashy loamy coarse sand
C1—2 to 9 inches; very gravelly ashy loamy coarse sand
C2—9 to 23 inches; very gravelly ashy loamy coarse sand
C3—23 to 30 inches; very cobbly ashy loamy coarse sand
2C4—30 to 64 inches; ashy loamy sand
3C5—64 to 80 inches; gravelly ashy loamy coarse sand

Chiminet soils

Landscape: Lava plateaus
Landform: Undulating plateaus, mesas, canyons
Position on landform: Backslopes
Parent material: Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 25 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent subrounded stones
Depth class: Very shallow
Depth to restrictive feature: 6 to 10 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Available water capacity: About 0.5 inches (very low)
Shrink-swell potential: About 0.0 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, Indian ricegrass, blue grama, twoneedle pinyon, skunkbush sumac, true mountain mahogany
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; paracobbly ashy loamy coarse sand
2C—2 to 7 inches; paragravelly ashy loamy coarse sand
2Cr—7 to 17 inches; cemented bedrock

Minor Components Composition

Canuela and similar soils*:* About 7 percent
Piojillo and similar soils*:* About 3 percent

402—Navajita complex, 2 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,900 feet (1,768 to 2,103 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Navajita and similar soils: 60 percent
Navajita, thick surface and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Navajita soils

Landscape: Lava plateaus
Landform: North-facing valley sides
Position on landform: Toeslopes, footslopes
Parent material: Eolian deposits and slope alluvium derived from rhyolitic tuff
Slope: 6 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.3 inches (moderate)
Shrink-swell potential: About 3.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, muttongrass, twoneedle pinyon
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
BA—2 to 5 inches; loam
Btk1—5 to 13 inches; loam
Btk2—13 to 22 inches; sandy clay loam
2Btk3—22 to 32 inches; sandy clay loam
2BCt—32 to 42 inches; coarse sandy loam
3Bk—42 to 63 inches; paragravelly coarse sandy loam
3C—63 to 110 inches; paragravelly loamy coarse sand

Navajita, thick surface soils

Landscape: Lava plateaus
Landform: North-facing valley sides
Position on landform: Toeslopes, footslopes
Parent material: Eolian deposits and slope alluvium derived from rhyolitic tuff
Slope: 2 to 10 percent
Shape (down/across): Concave/concave
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 3.1 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, muttongrass, twoneedle pinyon
Land capability subclass (nonirrigated): 4c

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 8 inches; sandy loam
Bt1—8 to 22 inches; sandy loam
Bt2—22 to 29 inches; sandy clay loam
Btk1—29 to 38 inches; sandy clay loam
Btk2—38 to 57 inches; sandy loam
BC—57 to 80 inches; paragravelly sandy loam

Minor Components Composition

Zacaton and similar soils*:* About 4 percent
Piojillo and similar soils*:* About 3 percent
Abrojo and similar soils*:* About 2 percent
Gullied land*:* About 1 percent

403—Piojillo paragravelly ashy loamy coarse sand, 3 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,200 feet (1,737 to 2,195 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Piojillo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Piojillo soils

Landscape: Lava plateaus
Landform: South-facing valley sides
Position on landform: Toeslopes, footslopes
Parent material: Slope alluvium derived from volcanic ash and pumice
Slope: 3 to 15 percent
Shape (down/across): Concave/concave
Surface fragments: About 20 percent subangular gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Available water capacity: About 5.3 inches (low)
Shrink-swell potential: About 1.4 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis/Rhus trilobata/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, blue grama, twoneedle pinyon, black grama
Land capability subclass (nonirrigated): 4s

Typical Profile

A1—0 to 3 inches; paragravelly ashy loamy coarse sand
A2—3 to 6 inches; paragravelly ashy loamy coarse sand
Bw1—6 to 10 inches; paragravelly ashy loamy coarse sand
Bw2—10 to 21 inches; ashy loamy coarse sand
C1—21 to 35 inches; paragravelly ashy loamy coarse sand
C2—35 to 84 inches; paragravelly ashy loamy coarse sand
C3—84 to 110 inches; paragravelly ashy loamy coarse sand

Minor Components Composition

Navajita and similar soils*:* About 4 percent
Abrojo and similar soils*:* About 3 percent
Totavi and similar soils*:* About 2 percent
Zacaton and similar soils*:* About 1 percent

404—Totavi ashy loamy coarse sand, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,000 feet (1,676 to 2,134 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Totavi and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Totavi soils

Landscape: Lava plateaus
Landform: Low stream terraces on valley floors
Position on landform: Tread
Parent material: Alluvium derived from latite, dacite, and rhyolitic tuff
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subangular gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 0.8 percent (low)
Flooding hazard: Very rare
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, Rocky Mountain juniper, blue grama, needleandthread
Land capability subclass (nonirrigated): 4s

Typical Profile

A1—0 to 3 inches; ashy loamy coarse sand
A2—3 to 31 inches; ashy coarse sand
2C1—31 to 52 inches; gravelly ashy loamy sand
3C2—52 to 80 inches; gravelly ashy coarse sand

Minor Components Composition

Navajita and similar soils*:* About 7 percent
Piojillo and similar soils*:* About 5 percent
Riverwash*:* About 3 percent

405—Espiritu-Pedregal complex, 3 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,900 feet (1,768 to 2,103 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Espiritu and similar soils: 50 percent
Pedregal and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Espiritu soils

Landscape: Lava plateaus
Landform: High stream terraces
Position on landform: Riser
Parent material: Alluvium derived from latite, dacite, and rhyolitic tuff
Slope: 25 to 50 percent
Shape (down/across): Concave/linear
Surface fragments: About 2 percent subangular stones; about 65 percent subangular gravel; about 10 percent subangular cobbles
Depth class: Very deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 8.5 inches (moderate)
Shrink-swell potential: About 3.3 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: oneseed juniper, Gambel oak, twoneedle pinyon, blue grama
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; extremely gravelly coarse sandy loam
Bt1—3 to 6 inches; very gravelly sandy clay loam
Bt2—6 to 11 inches; very gravelly sandy clay loam
Bt3—11 to 16 inches; very gravelly coarse sandy loam
2Bt4—16 to 23 inches; loam
2Bt5—23 to 44 inches; loam
2BC—44 to 80 inches; loam

Pedregal soils

Landscape: Lava plateaus
Landform: High stream terraces
Position on landform: Tread
Parent material: Alluvium derived from latite, dacite, and rhyolitic tuff
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular cobbles; about 25 percent subangular gravel
Depth class: Moderately deep
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 10 to 20 inches to strongly contrasting textural stratification; 20 to 39 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 2.7 inches (very low)
Shrink-swell potential: About 2.4 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 48 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: oneseed juniper, Gambel oak, twoneedle pinyon, blue grama, skunkbush sumac
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; gravelly loam
Bt1—3 to 6 inches; clay loam
Bt2—6 to 9 inches; clay loam
Bk1—9 to 13 inches; gravelly loam
Bk2—13 to 17 inches; gravelly sandy loam
2Bk3—17 to 22 inches; very gravelly loamy coarse sand
2Bk4—22 to 26 inches; very gravelly coarse sand
2Bkqm—26 to 34 inches; cemented material
2Bk5—34 to 41 inches; extremely gravelly loamy coarse sand
2C—41 to 70 inches; sandy loam

Minor Components Composition

Navajita and similar soils*:* About 5 percent
Piojillo and similar soils*:* About 3 percent
Totavi and similar soils*:* About 2 percent

406—Rock outcrop-Zacaton-Chiminet complex, 25 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,100 feet (1,676 to 2,164 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Rock outcrop: 40 percent
Zacaton and similar soils: 30 percent
Chiminet and similar soils: 25 percent
Minor components: 5 percent

Component Descriptions

Rock outcrop
Description: Rock outcrop consists of exposed tuff and tuff breccia bedrock. It occurs as steeply sloping bedrock and vertical cliffs intermingled with the Chiminet soil and above the Zacaton soil.
Landscape: Lava plateaus
Landform: Canyons, mesas, plateaus
Parent material: Rhyolitic tuff
Slope: 35 to 180 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: At the surface bedrock, lithic
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Zacaton soils

Landscape: Lava plateaus
Landform: Lower canyons, mesas, plateaus
Position on landform: Backslopes
Parent material: Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 25 to 50 percent
Shape (down/across): Concave/linear
Surface fragments: About 25 percent subangular gravel; about 8 percent subangular stones; about 5 percent subangular boulders; about 25 percent subangular cobbles
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 7.3 inches (moderate)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 16 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 11 (slightly sodic)

Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, muttongrass, Indian ricegrass
Land capability subclass (nonirrigated): 6s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; very cobbly ashy sandy loam
Bw—3 to 9 inches; cobbly ashy sandy loam
Bk1—9 to 18 inches; very gravelly ashy sandy loam
Bk2—18 to 32 inches; very cobbly ashy loam
Bk3—32 to 48 inches; cobbly ashy sandy loam
2Bk4—48 to 63 inches; gravelly ashy sandy loam
2Bk5—63 to 76 inches; gravelly ashy loamy coarse sand
2C—76 to 102 inches; gravelly ashy loamy coarse sand

Chiminet soils

Landscape: Lava plateaus
Landform: Upper canyons, mesas, plateaus
Position on landform: Backslopes
Parent material: Colluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 35 to 60 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent subangular gravel; about 1 percent subangular stones; about 2 percent subangular boulders
Depth class: Very shallow
Depth to restrictive feature: 6 to 10 inches to bedrock, paralithic
Drainage class: Somewhat excessively drained
Slowest permeability: Greater than 20 in/hr (very rapid)
Available water capacity: About 0.6 inches (very low)
Shrink-swell potential: About 1.2 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 2 inches; ashy loamy sand
AB—2 to 5 inches; ashy loamy sand
Bw—5 to 7 inches; paragravelly ashy loamy sand
2Cr—7 to 17 inches; cemented bedrock

Minor Components Composition

Navajita and similar soils*:* About 3 percent
Canuela and similar soils*:* About 2 percent

407—Rock outcrop-Chiminet complex, 20 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,000 to 6,800 feet (1,829 to 2,073 meters)
Mean annual precipitation: 12 to 16 inches (305 to 406 millimeters)
Mean annual air temperature: 47 to 50 degrees F (8.3 to 10.0 degrees C)
Frost-free period: 130 to 160 days

Map Unit Composition

Rock outcrop: 55 percent
Chiminet and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Rock outcrop
Description: Rock outcrop consists of exposed tuff bedrock. It occurs as steeply sloping bedrock, short cliffs, and knobs intermingled with the Chiminet soil.
Landscape: Lava plateaus
Landform: Plateaus
Parent material: Rhyolitic tuff
Slope: 30 to 140 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: 0 inches to bedrock, lithic
Runoff class: Very high
Land capability subclass (nonirrigated): 8s

Chiminet soils

Landscape: Lava plateaus
Landform: Undulating plateaus
Position on landform: Shoulders, backslopes
Parent material: Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 20 to 50 percent
Shape (down/across): Convex/linear
Surface fragments: About 20 percent subangular gravel; about 5 percent subangular stones; about 5 percent subangular boulders; about 5 percent subangular cobbles
Depth class: Very shallow
Depth to restrictive feature: 6 to 10 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.0 inches (very low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)

Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 3 inches; paragravelly ashy coarse sandy loam
2Bw—3 to 8 inches; very paracobbly ashy coarse sandy loam
2Cr—8 to 18 inches; cemented bedrock

Minor Components Composition

Canuela and similar soils*:* About 5 percent
Abrojo and similar soils*:* About 3 percent
Zacaton and similar soils*:* About 2 percent

408—Adornado very paragravelly ashy coarse sandy loam, 8 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,400 to 7,000 feet (1,951 to 2,134 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Adornado and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Adornado soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Backslopes, footslopes
Parent material: Slope alluvium derived from pumice
Slope: 8 to 15 percent
Shape (down/across): Concave/linear
Surface fragments: About 35 percent subangular gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to abrupt textural change; 59 to 79 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.1 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation: ponderosa pine, Gambel oak, little bluestem, blue grama, bottlebrush squirreltail, Rocky Mountain juniper
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 3 inches; very paragravelly ashy coarse sandy loam
Bw1—3 to 9 inches; very paragravelly ashy coarse sandy loam
Bw2—9 to 17 inches; extremely paragravelly ashy coarse sandy loam
Bk—17 to 23 inches; extremely paragravelly ashy coarse sand
2E and Bt1—23 to 42 inches; extremely paragravelly ashy coarse sand
2E and Bt2—42 to 72 inches; extremely paragravelly ashy coarse sand
3Ab—72 to 78 inches; very fine sandy loam
3Btb—78 to 104 inches; sandy clay loam

Minor Components Composition

Nyjack and similar soils*:* About 7 percent
Navajita and similar soils*:* About 2 percent
Canuela and similar soils*:* About 1 percent

409—Hackroy-Nyjack complex, 2 to 12 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,400 to 7,000 feet (1,951 to 2,134 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Hackroy and similar soils: 35 percent
Nyjack and similar soils: 30 percent
Hackroy, thick surface and similar soils: 25 percent
Minor components: 10 percent

Component Descriptions

Hackroy soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Shoulders
Parent material: Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff
Slope: 5 to 12 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 2.5 inches (very low)
Shrink-swell potential: About 8.0 percent (high)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: oneseed juniper, Gambel oak, blue grama, twoneedle pinyon, muhly
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 3 inches; loam
Bt1—3 to 9 inches; clay
2Bt2—9 to 16 inches; very paracobbly clay
2Cr—16 to 26 inches; cemented bedrock

Hackroy, thick surface soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Summits
Parent material: Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff
Slope: 3 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 8 to 18 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 5.1 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, broom snakeweed, plains prickly pear, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 5 inches; fine sandy loam
AB—5 to 9 inches; fine sandy loam
Bt1—9 to 16 inches; clay loam
2Bt2—16 to 19 inches; paracobbly clay
2Cr—19 to 29 inches; cemented bedrock

Nyjack soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Summits
Parent material: Eolian deposits and slope alluvium derived from mixed sources over residuum weathered from rhyolitic tuff
Slope: 2 to 6 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Moderately deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change; 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 6.1 inches (moderate)
Shrink-swell potential: About 3.7 percent (moderate)
Runoff class: Medium

Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, twoneedle pinyon, big sagebrush
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 12 inches; clay loam
Bt2—12 to 20 inches; clay loam
BCt—20 to 28 inches; sandy clay loam
2C—28 to 32 inches; very paragravelly loam
2Cr—32 to 42 inches; cemented bedrock

Minor Components Composition

Canuela and similar soils*:* About 7 percent
Navajita and similar soils*:* About 2 percent
Rock outcrop*:* About 1 percent

410—Chiminet-Canuela-Rock outcrop complex, low precipitation, 3 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 6,800 feet (1,859 to 2,073 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.5 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Chiminet and similar soils: 30 percent
Canuela and similar soils: 25 percent
Rock outcrop: 20 percent
Chiminet, thick surface and similar soils: 15 percent
Minor components: 10 percent

Component Descriptions

Chiminet soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Backslopes
Parent material: Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 8 to 15 percent
Shape (down/across): Convex/linear
Surface fragments: About 20 percent subangular gravel; about 5 percent subangular cobbles; about 2 percent subangular stones
Depth class: Very shallow
Depth to restrictive feature: 6 to 10 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 0.9 inches (very low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 3 inches; paragravelly ashy sandy loam
2Bw—3 to 8 inches; very paracobbly ashy sandy loam
2Cr—8 to 18 inches; cemented bedrock

Chiminet, thick surface soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Backslopes, shoulders
Parent material: Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 3 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 5 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 2.0 inches (very low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, true mountain mahogany, twoneedle pinyon, Indian ricegrass, blue grama
Land capability subclass (nonirrigated): 6s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; ashy sandy loam
Bw1—3 to 7 inches; paragravelly ashy sandy loam
2Bw2—7 to 14 inches; very paracobbly ashy sandy loam
2Cr—14 to 24 inches; cemented bedrock

Canuela soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Summits
Parent material: Eolian deposits and slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 2 to 4 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None

Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, skunkbush sumac, twoneedle pinyon, mountain mahogany, needleandthread
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 2 inches; sandy loam
Bt—2 to 7 inches; loam
2Btk—7 to 16 inches; very paracobbly loam
2Cr—16 to 26 inches; cemented bedrock

Rock outcrop

Description: Rock outcrop consists of exposed tuff bedrock. It occurs as gently sloping bedrock and knobs intermingled with the Chiminet and Chiminet, thick surface, soils.
Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Parent material: Rhyolitic tuff
Slope: 5 to 25 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: At the surface bedrock, lithic
Runoff class: High
Land capability subclass (nonirrigated): 8s

Minor Components Composition

Hackroy and similar soils*:* About 5 percent
Nyjack and similar soils*:* About 3 percent
Chiminet and similar soils*:* About 2 percent

412—Canuela-Hackroy complex, 1 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 6,500 feet (1,859 to 1,981 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.5 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Canuela and similar soils: 50 percent
Hackroy and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Canuela soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Summits
Parent material: Eolian deposits and slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 2 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 11 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, skunkbush sumac, twoneedle pinyon, mountain mahogany, needleandthread
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 3 inches; sandy loam
Bt1—3 to 6 inches; loam
Bt2—6 to 10 inches; clay loam
2Btk—10 to 17 inches; very paracobbly loam
2Cr—17 to 27 inches; cemented bedrock

Hackroy soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus

Position on landform: Summits
Parent material: Slope alluvium derived from rhyolitic tuff over residuum weathered from rhyolitic tuff
Slope: 1 to 5 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 6.6 percent (high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 8 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, broom snakeweed, plains prickly pear, twoneedle pinyon
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 3 inches; fine sandy loam
Bt1—3 to 8 inches; clay
Bt2—8 to 12 inches; clay
2Btk—12 to 19 inches; paracobbly sandy clay loam
2Cr—19 to 29 inches; cemented bedrock

Minor Components Composition

Chiminet and similar soils*:* About 6 percent
Rock outcrop*:* About 4 percent

413—Armenta very paragravelly ashy coarse sand, 3 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,000 feet (1,646 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.5 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Armenta and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Armenta soils

Landscape: Lava plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Backslopes, footslopes
Parent material: Slope alluvium derived from pumice
Slope: 3 to 20 percent
Shape (down/across): Convex/convex
Surface fragments: About 55 percent subrounded gravel
Depth class: Very deep
Drainage class: Somewhat excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 3.3 inches (low)
Shrink-swell potential: About 0.2 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis/Rhus trilobata/Bouteloua gracilis
Potential native vegetation: oneseed juniper, skunkbush sumac, Apache plume, blue grama
Land capability subclass (nonirrigated): 4s

Typical Profile

A—0 to 2 inches; very paragravelly ashy coarse sand
Bw—2 to 10 inches; very paragravelly ashy coarse sandy loam
Bk—10 to 13 inches; very paragravelly ashy coarse sand
E and Bt—13 to 55 inches; extremely paragravelly ashy coarse sand
C—55 to 80 inches; extremely paragravelly ashy coarse sand

Minor Components Composition

Chiminet and similar soils*:* About 7 percent
Canuela and similar soils*:* About 3 percent

414—Metate loam, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,200 to 6,800 feet (1,890 to 2,073 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 47 to 49 degrees F (8.3 to 9.4 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Metate and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Metate soils

Landscape: Lava plateaus
Landform: Flood plain steps on valley floors
Position on landform: Tread
Parent material: Alluvium derived from dacite and rhyolitic tuff
Slope: 0 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.1 inches (moderate)
Shrink-swell potential: About 1.1 percent (low)
Flooding hazard: Rare
Seasonal high water table depth: About 24 to 42 inches
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: cottonwood, blue grama, bottlebrush squirreltail, Gambel oak, Rocky Mountain maple, ponderosa pine
Land capability subclass (nonirrigated): 4s

Typical Profile

A1—0 to 3 inches; ashy loam
A2—3 to 8 inches; ashy loam
A3—8 to 17 inches; ashy loam
AC—17 to 28 inches; ashy loamy sand
C1—28 to 33 inches; stratified ashy coarse sand to ashy sandy loam
C2—33 to 44 inches; stratified ashy coarse sand to sandy loam
2C3—44 to 70 inches; extremely gravelly coarse sand

Minor Components Composition

Espiritu and similar soils*:* About 2 percent
Navajita and similar soils*:* About 2 percent
Pedregal and similar soils*:* About 2 percent
Piojillo and similar soils*:* About 2 percent
Riverwash*:* About 1 percent
Water*:* About 1 percent

500—Sedillo very gravelly loam, 2 to 6 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,400 feet (1,676 to 2,256 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Sedillo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Sedillo soils

Landscape: Fan piedmonts
Landform: Fan remnants
Position on landform: Tread
Parent material: Alluvium derived from monzonite
Slope: 2 to 6 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent subrounded cobbles; about 35 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 2.7 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 27 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, blue grama, twoneedle pinyon, sideoats grama, banana yucca
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 4 inches; very gravelly loam
Bt—4 to 11 inches; very gravelly clay loam
Btk—11 to 19 inches; very cobbly clay loam
Bk1—19 to 31 inches; extremely cobbly loam
Bk2—31 to 43 inches; extremely cobbly sandy loam
BCk—43 to 102 inches; extremely cobbly coarse sand

Minor Components Composition

Cerrillos and similar soils*:* About 4 percent
Ildefonso and similar soils*:* About 3 percent
Truehill and similar soils*:* About 3 percent

501—Truehill extremely gravelly loam, 25 to 55 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 7,400 feet (1,676 to 2,256 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Truehill and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Truehill soils

Landscape: Fan piedmonts
Landform: Fan remnants
Position on landform: Riser
Parent material: Alluvium derived from monzonite
Slope: 25 to 55 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent well rounded stones; about 15 percent well rounded cobbles; about 41 percent well rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 2.8 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 8

Typical Profile

A—0 to 4 inches; extremely gravelly loam
Bt—4 to 7 inches; very gravelly clay loam
Btk—7 to 12 inches; very gravelly clay loam
Bk1—12 to 22 inches; extremely cobbly sandy loam
Bk2—22 to 40 inches; extremely gravelly coarse sandy loam
Bk3—40 to 49 inches; extremely gravelly coarse sand
Bk4—49 to 67 inches; extremely gravelly sandy clay loam
Bk5—67 to 80 inches; extremely gravelly loamy coarse sand

Minor Components Composition

Ildefonso and similar soils*:* About 5 percent
Cerropelon and similar soils*:* About 2 percent
Sedillo and similar soils*:* About 2 percent
Rock outcrop*:* About 1 percent

502—Khapo fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,800 feet (1,676 to 2,073 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Khapo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Khapo soils

Landscape: Semi-bolsons
Landform: Eroded fan remnants
Position on landform: Toeslopes
Parent material: Eolian deposits derived from sandstone and shale over slope alluvium derived from monzonite
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.5 inches (moderate)
Shrink-swell potential: About 2.9 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; fine sandy loam
Bt—3 to 8 inches; fine sandy loam
Btk1—8 to 27 inches; fine sandy loam
Btk2—27 to 37 inches; sandy clay loam
Btk3—37 to 47 inches; sandy clay loam
2BCk—47 to 81 inches; gravelly sandy loam

Minor Components Composition

Cerrillos and similar soils*:* About 6 percent
Zepol and similar soils*:* About 4 percent

503—Espinos very gravelly coarse sandy loam, 5 to 40 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,600 feet (1,707 to 2,012 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.0 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Espinos and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Espinos soils

Landscape: Semi-bolsons
Landform: Low hills
Position on landform: Summits, shoulders, backslopes
Parent material: Slope alluvium derived from tuff breccia and monzonite over residuum weathered from tuff breccia
Slope: 5 to 40 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent subrounded gravel; about 5 percent subrounded cobbles; about 30 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.0 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, sideoats grama, New Mexico feathergrass, black grama, galleta, juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; very gravelly coarse sandy loam
Bk1—1 inch to 6 inches; very gravelly coarse sandy loam
2Bk2—6 to 12 inches; very gravelly sandy loam
2BCk—12 to 16 inches; very gravelly loamy sand
2Crk—16 to 26 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Puertecito and similar soils*:* About 3 percent
Ildefonso and similar soils*:* About 2 percent

504—Sandoval-Badland complex, 15 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,800 feet (1,646 to 2,073 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Sandoval and similar soils: 70 percent
Badland: 20 percent
Minor components: 10 percent

Component Descriptions

Sandoval soils

Landscape: Semi-bolsons
Landform: Low hills
Position on landform: Backslopes
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from shale
Slope: 15 to 45 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent rounded cobbles; about 15 percent rounded medium and coarse gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 12 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shale Hills
Potential native vegetation: alkali sacaton, broom snakeweed, fourwing saltbush, black grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; gravelly clay loam
C1—3 to 10 inches; extremely paragravelly clay loam
C2—10 to 16 inches; extremely paragravelly clay loam
Cr—16 to 26 inches; cemented bedrock

Badland

Description: Badland consists of exposed shale bedrock. It occurs as moderately to steeply sloping shale slopes intermingled with the Sandoval soils.
Landscape: Semi-bolsons
Landform: Low hills
Parent material: Shale
Slope: 40 to 160 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: 0 to 10 inches to bedrock, lithic
Land capability subclass (nonirrigated): 8

Minor Components Composition

Cumacho and similar soils*:* About 5 percent
Rock outcrop*:* About 4 percent
Charalito and similar soils*:* About 1 percent

505—Puertecito-Paraje complex, 15 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 7,100 feet (1,707 to 2,164 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Puertecito and similar soils: 50 percent
Paraje and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Puertecito soils

Landscape: Fault block mountains
Landform: Low hills
Position on landform: Shoulders
Parent material: Slope alluvium derived from monzonite over residuum weathered from monzonite
Slope: 15 to 35 percent
Shape (down/across): Convex/convex
Surface fragments: About 1 percent angular (shape or size unspecified); about 20 percent angular (shape or size unspecified); about 40 percent angular channers
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.0 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Hills
Potential native vegetation: oneseed juniper, blue grama, Gambel oak, black grama, galleta, snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; extremely cobbly sandy loam
Bt—2 to 10 inches; very cobbly sandy clay loam
2R—10 to 20 inches; cemented bedrock

Paraje soils

Landscape: Fault block mountains
Landform: Low hills
Position on landform: Backslopes
Parent material: Colluvium and/or slope alluvium derived from monzonite

Slope: 30 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: Less than 1 percent angular rounded stones; about 35 percent angular rounded cobbles; about 20 percent angular rounded gravel
Depth class: Very deep
Depth to restrictive feature: 2 to 6 inches to abrupt textural change
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 5.8 inches (low)
Shrink-swell potential: About 4.8 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 19 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very cobbly sandy loam
Bt1—3 to 9 inches; very cobbly clay loam
Bt2—9 to 16 inches; very cobbly clay loam
Bt3—16 to 30 inches; very cobbly sandy clay loam
Btk—30 to 59 inches; very cobbly sandy clay loam

Minor Components Composition

Rock outcrop*:* About 5 percent
Wandurn and similar soils*:* About 3 percent
Penistaja and similar soils*:* About 2 percent

506—Ildefonso-Sandoval complex, 5 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,700 feet (1,646 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Ildefonso and similar soils: 50 percent
Sandoval and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Ildefonso soils

Landscape: Fan piedmonts
Landform: Eroded fan remnants
Position on landform: Shoulders, beveled summits
Parent material: Slope alluvium derived from monzonite
Slope: 5 to 25 percent
Shape (down/across): Convex/convex
Surface fragments: About 35 percent subrounded gravel; about 10 percent subrounded cobbles
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.4 inches (low)
Shrink-swell potential: About 2.3 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; very gravelly sandy loam
Bk1—4 to 11 inches; gravelly sandy loam
Bk2—11 to 29 inches; extremely gravelly coarse sandy loam
BCk—29 to 59 inches; gravelly sandy loam

Sandoval soils

Landscape: Basins
Landform: Eroded fan remnants
Position on landform: Backslopes

Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from calcareous shale
Slope: 15 to 35 percent
Shape (down/across): Convex/convex
Surface fragments: About 10 percent subrounded cobbles; about 35 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 2.7 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 11 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shale Hills
Potential native vegetation: alkali sacaton, broom snakeweed, fourwing saltbush, black grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; very gravelly very fine sandy loam
C1—2 to 13 inches; gravelly sandy clay loam
C2—13 to 19 inches; extremely paragravelly sandy clay loam
Cr—19 to 29 inches; cemented

Minor Components Composition

Truehill and similar soils*:* About 4 percent
Rock outcrop*:* About 3 percent
Penistaja and similar soils*:* About 3 percent

507—Ildefonso extremely gravelly sandy loam, 5 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,000 feet (1,646 to 2,134 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Ildefonso and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Ildefonso soils

Landscape: Semi-bolsons
Landform: Eroded fan remnants
Position on landform: Shoulders
Parent material: Slope alluvium derived from monzonite
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 4 percent subrounded gravel; about 10 percent subrounded cobbles
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.3 inches (low)
Shrink-swell potential: About 2.2 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very gravelly sandy loam
Bk1—3 to 8 inches; gravelly sandy loam
Bk2—8 to 28 inches; extremely gravelly coarse sandy loam
Bk3—28 to 80 inches; gravelly sandy loam

Minor Components Composition

Truehill and similar soils*:* About 5 percent
Cerrillos and similar soils*:* About 3 percent
Penistaja and similar soils*:* About 2 percent

508—Charalito-Riverwash complex, 1 to 3 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,500 feet (1,646 to 1,981 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Charalito and similar soils: 65 percent
Riverwash: 20 percent
Minor components: 15 percent

Component Descriptions

Charalito soils

Landscape: Semi-bolsons
Landform: Inset fans on valley floors
Parent material: Alluvium derived from monzonite, limestone, and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/convex
Surface fragments: About 2 percent angular (shape or size unspecified); about 40 percent angular channers; about 25 percent angular channers
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.4 inches (moderate)
Shrink-swell potential: About 2.5 percent (low)
Flooding hazard: Frequent
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 14 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, sideoats grama, little bluestem, galleta, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; gravelly sandy loam
AC—1 inch to 5 inches; gravelly sandy clay loam
C1—5 to 22 inches; gravelly coarse sandy loam
C2—22 to 40 inches; gravelly sandy clay loam
C3—40 to 60 inches; paragravelly sandy loam

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from

prolonged high-intensity storms. In some places it is intermingled with the Charalito soil.
Landscape: Semi-bolsons
Landform: Channels on valley floors
Parent material: Alluvium derived from mixed
Slope: 1 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 45 percent rounded gravel; about 5 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.3 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Seasonal high water table depth: About 0 to 60 inches
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Chupe and similar soils*:* About 7 percent
Cumacho and similar soils*:* About 4 percent
Galisteo and similar soils*:* About 3 percent
Zia and similar soils*:* About 1 percent

509—Puertecito-Wandurn-Rock outcrop complex, 30 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,100 to 7,600 feet (1,859 to 2,316 meters)
Mean annual precipitation: 10 to 15 inches (254 to 381 millimeters)
Mean annual air temperature: 48 to 52 degrees F (8.9 to 11.1 degrees C)
Frost-free period: 130 to 170 days

Map Unit Composition

Puertecito and similar soils: 60 percent
Wandurn and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 10 percent

Component Descriptions

Puertecito soils

Landscape: Fault block mountains
Landform: South-facing high hills
Position on landform: Shoulders, backslopes
Parent material: Colluvium derived from monzonite over residuum weathered from monzonite
Slope: 30 to 60 percent
Shape (down/across): Convex/convex
Surface fragments: About 2 percent angular stones; about 10 percent angular cobbles; about 50 percent angular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.2 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 14 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Hills
Potential native vegetation: blue grama, Gambel oak, oneseed juniper, black grama, broom snakeweed, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; extremely gravelly coarse sandy loam
Bt1—2 to 6 inches; very gravelly sandy clay loam
Bt2—6 to 10 inches; very gravelly clay loam
Btk—10 to 12 inches; very gravelly loam
2R—12 to 22 inches; cemented bedrock

Wandurn soils

Landscape: Fault block mountains
Landform: North-facing high hills
Position on landform: Backslopes
Parent material: Slope alluvium and colluvium derived from monzonite
Slope: 30 to 60 percent
Shape (down/across): Linear/linear
Surface fragments: About 9 percent subangular stones; about 40 percent subangular cobbles; about 25 percent subangular gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, lithic; 39 to 59 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.2 inches (low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: oneseed juniper, twoneedle pinyon, muttongrass, true mountain mahogany, sideoats grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; extremely cobbly sandy clay loam
Bt1—2 to 7 inches; cobbly clay loam
Bt2—7 to 14 inches; very cobbly clay loam
Bt3—14 to 25 inches; extremely cobbly sandy clay loam
Btk—25 to 40 inches; extremely cobbly sandy clay loam
2Bt4—40 to 43 inches; sandy clay loam
2Cr—43 to 50 inches; cemented bedrock
2R—50 to 60 inches; cemented bedrock

Rock outcrop

Description: Rock outcrop consists of exposed monzonite bedrock. It occurs as steeply sloping bedrock, short cliffs, and knobs intermingled with the Puertecito and Wandurn soils.
Landscape: Fault block mountains
Landform: High hills
Parent material: Monzonite
Slope: 40 to 160 percent
Shape (down/across): Linear/linear

Minor Components Composition

Paraje and similar soils*:* About 6 percent
Penistaja and similar soils*:* About 3 percent
Rubble land*:* About 1 percent

510—Cerrillos-Sedillo complex, 1 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 7,200 feet (1,707 to 2,195 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.0 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Cerrillos and similar soils: 60 percent
Sedillo and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Cerrillos soils

Landscape: Fan piedmonts
Landform: Fan remnants
Position on landform: Tread
Parent material: Eolian deposits derived from sandstone and shale over alluvium derived from monzonite
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.7 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 28 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; fine sandy loam
Bt—4 to 12 inches; clay loam
Btk—12 to 20 inches; clay loam
Bk1—20 to 36 inches; gravelly sandy clay loam
Bk2—36 to 46 inches; sandy clay loam
Bk3—46 to 59 inches; gravelly sandy clay loam
Bk4—59 to 86 inches; gravelly sandy clay loam
Bk5—86 to 94 inches; sandy clay loam

Sedillo soils

Landscape: Fan piedmonts
Landform: Fan remnants
Position on landform: Tread
Parent material: Eolian deposits and alluvium derived from sandstone, shale, and monzonite
Slope: 2 to 5 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 5.9 inches (low)
Shrink-swell potential: About 3.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 8 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, black grama, galleta, New Mexico feathergrass, oneseed juniper, sideoats grama, twoneedle pinyon
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; very fine sandy loam
BA—3 to 9 inches; loam
Btk—9 to 15 inches; very cobbly clay loam
Bk1—15 to 25 inches; extremely gravelly loam
Bk2—25 to 39 inches; very cobbly sandy loam
Bk3—39 to 52 inches; cobbly sandy clay loam
Bk4—52 to 69 inches; gravelly sandy clay loam
Bk5—69 to 80 inches; gravelly sandy loam

Minor Components Composition

Penistaja and similar soils*:* About 5 percent
Truehill and similar soils*:* About 3 percent
Ildefonso and similar soils*:* About 2 percent

511—Wandurn-Alchonzo-Rubble land complex, 35 to 90 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,200 to 8,900 feet (1,890 to 2,713 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 45 to 49 degrees F (7.2 to 9.4 degrees C)
Frost-free period: 110 to 150 days

Map Unit Composition

Wandurn and similar soils: 50 percent
Alchonzo and similar soils: 30 percent
Rubble land: 10 percent
Minor components: 10 percent

Component Descriptions

Wandurn soils

Landscape: Fault block mountains
Landform: South-facing mountains
Position on landform: Mountainflank
Parent material: Slope alluvium and colluvium derived from monzonite
Slope: 35 to 75 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subangular stones; about 40 percent subangular cobbles; about 25 percent subangular gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.7 inches (low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: Gambel oak, twoneedle pinyon, muttongrass, oneseed juniper, sideoats grama, wolftail
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 3 inches; extremely cobbly loam
Bt1—3 to 11 inches; very cobbly sandy clay loam
Bt2—11 to 20 inches; very cobbly sandy clay loam
Bt3—20 to 30 inches; very gravelly sandy clay loam
Bt4—30 to 40 inches; extremely gravelly sandy clay loam
Bt5—40 to 47 inches; extremely gravelly sandy clay loam
R—47 to 57 inches; cemented bedrock

Alchonzo soils

Landscape: Fault block mountains
Landform: North-facing mountains
Position on landform: Mountainflank
Parent material: Slope alluvium and colluvium derived from monzonite
Slope: 45 to 90 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular stones; about 10 percent subangular cobbles; about 60 percent subangular gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel's oak, muttongrass, mountain muhly, sedge, eriogonum
Land capability subclass (nonirrigated): 8

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 12 inches; extremely gravelly sandy loam
Bw1—12 to 27 inches; extremely gravelly sandy loam
Bw2—27 to 29 inches; very gravelly sandy loam
R—29 to 39 inches; cemented bedrock

Rubble land

Description: Rubble land consists of talus of irregularly shaped cobbles, stones, and boulders that are devoid of vegetation. It is on very steeply sloping backslopes below basalt cliffs and is the result of parts of the cliff breaking off and tumbling downslope.
Landscape: Fault block mountains
Landform: Mountains
Parent material: Monzonite
Slope: 40 to 80 percent
Shape (down/across): Linear/linear
Depth to restrictive feature: 0 to 10 inches to bedrock, paralithic

Minor Components Composition

Rock outcrop*:* About 6 percent
Cochiti and similar soils*:* About 3 percent
Pastorius and similar soils*:* About 1 percent

512—Cochiti extremely cobbly loam, 15 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,200 to 8,300 feet (1,890 to 2,530 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Cochiti and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Cochiti soils

Landscape: Fault block mountains
Landform: Mountains
Position on landform: Mountainbase
Parent material: Slope alluvium and colluvium derived from monzonite
Slope: 15 to 35 percent
Shape (down/across): Concave/concave
Surface fragments: About 3 percent subangular boulders; about 7 percent subangular stones; about 40 percent subangular cobbles; about 25 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 4.7 inches (low)
Shrink-swell potential: About 6.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: Gambel oak, twoneedle pinyon, mountain mahogany, blue grama, oneseed juniper, sideoats grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 4 inches; extremely cobbly loam
Bt1—4 to 10 inches; extremely cobbly clay loam
Bt2—10 to 31 inches; very cobbly clay loam
Bt3—31 to 57 inches; extremely cobbly sandy clay loam
BC—57 to 80 inches; extremely cobbly sandy loam

Minor Components Composition

Rubble land*:* About 3 percent
Predawn and similar soils*:* About 2 percent
Wandurn and similar soils*:* About 2 percent
Alchonzo and similar soils*:* About 2 percent
Pastorius and similar soils*:* About 1 percent

513—Pedregal very cobbly loam, 8 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,300 to 7,800 feet (1,920 to 2,377 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Pedregal and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Pedregal soils

Landscape: Fan piedmonts
Landform: Fan remnants
Position on landform: Tread
Parent material: Alluvium derived from monzonite
Slope: 8 to 15 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent subrounded stones; about 15 percent subrounded cobbles; about 25 percent subrounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 20 to 36 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 3.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 60 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: oneseed juniper, true mountain mahogany, twoneedle pinyon, pricklypear, skunkbush sumac
Land capability subclass (nonirrigated): 7s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; very cobbly loam
Bt1—3 to 7 inches; very cobbly clay loam
Bt2—7 to 12 inches; very cobbly clay loam
Btk—12 to 18 inches; very cobbly clay loam
Bk1—18 to 25 inches; very gravelly sandy loam
Bkkm—25 to 33 inches; very gravelly sandy loam
2Bk2—33 to 42 inches; very gravelly loamy coarse sand
2Bk3—42 to 79 inches; extremely gravelly coarse sand

Minor Components Composition

Cochiti and similar soils*:* About 6 percent
Predawn and similar soils*:* About 3 percent
Pastorius and similar soils*:* About 1 percent

514—Pegasus extremely cobbly loam, 20 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 7,700 feet (1,737 to 2,347 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Pegasus and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Pegasus soils

Landscape: Fault block mountains
Landform: Low hills
Position on landform: Summits, backslopes, shoulders
Parent material: Slope alluvium and colluvium derived from monzonite
Slope: 20 to 50 percent
Shape (down/across): Convex/convex
Surface fragments: About 2 percent angular stones; about 35 percent angular cobbles; about 35 percent angular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.2 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/Bouteloua gracilis
Potential native vegetation: twoneedle pinyon, oneseed juniper, true mountain mahogany, blue grama, sideoats grama
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 4 inches; extremely cobbly loam
Bt1—4 to 10 inches; cobbly loam
Bt2—10 to 14 inches; very gravelly clay loam
2R—14 to 24 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 4 percent
Wandurn and similar soils*:* About 4 percent
Alchonzo and similar soils*:* About 2 percent

515—Pastorius very cobbly loam, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,000 to 8,100 feet (1,829 to 2,469 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 43 to 45 degrees F (6.1 to 7.2 degrees C)
Frost-free period: 110 to 130 days

Map Unit Composition

Pastorius and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Pastorius soils

Landscape: Fault block mountains
Landform: Low stream terraces on valley floors
Position on landform: Tread
Parent material: Alluvium derived from monzonite
Slope: 3 to 5 percent
Shape (down/across): Linear/concave
Surface fragments: About 25 percent subrounded gravel; about 20 percent subrounded cobbles
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 3.9 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus ponderosa/Festuca arizonica-Danthonia parryi
Potential native vegetation: ponderosa pine, Gambel oak, mountain muhly, muttongrass, blue grama
Land capability subclass (nonirrigated): 4c

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 6 inches; very cobbly loam
Bt1—6 to 17 inches; very cobbly loam
Bt2—17 to 28 inches; extremely cobbly loam
Bt3—28 to 43 inches; extremely cobbly loam
Bt4—43 to 82 inches; extremely cobbly loam

Minor Components Composition

Pedregal and similar soils*:* About 5 percent
Cochiti and similar soils*:* About 3 percent
Riverwash*:* About 2 percent

516—Cerrillos fine sandy loam, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,900 feet (1,646 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Cerrillos and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Cerrillos soils

Landscape: Semi-bolsons
Landform: Alluvial flats
Parent material: Eolian deposits derived from sandstone and shale over alluvium derived from monzonite
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 7.8 inches (moderate)
Shrink-swell potential: About 2.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 26 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 4 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 8 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; fine sandy loam
Bt—4 to 14 inches; sandy clay loam
Btk—14 to 20 inches; sandy clay loam
Bk1—20 to 28 inches; loam
Bk2—28 to 43 inches; gravelly sandy loam
Bk3—43 to 53 inches; gravelly sandy loam
Bk4—53 to 65 inches; fine sandy loam
Bk5—65 to 72 inches; gravelly fine sandy loam
Bk6—72 to 110 inches; very fine sandy loam

Minor Components Composition

Penistaja and similar soils*:* About 5 percent
Sedillo and similar soils*:* About 3 percent
Cumacho and similar soils*:* About 2 percent

517—Puertecito extremely gravelly fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,100 feet (1,646 to 2,164 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Puertecito and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Puertecito soils

Landscape: Semi-bolsons
Landform: Dipslopes on cuestas
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 15 to 25 percent
Shape (down/across): Linear/linear
Surface fragments: About 55 percent subangular gravel; about 15 percent subangular cobbles
Depth class: Shallow
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 0.8 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 9 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Hills
Potential native vegetation: blue grama, oneseed juniper, Gambel oak, black grama, broom snakeweed, galleta, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; extremely gravelly fine sandy loam
Bt—2 to 6 inches; gravelly loam
Btk—6 to 11 inches; very gravelly loam
R—11 to 21 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 6 percent
Sandoval and similar soils*:* About 4 percent

518—Rock outcrop-Skyvillage complex, 5 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,100 feet (1,646 to 2,164 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Rock outcrop: 50 percent
Skyvillage and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Rock outcrop
Description: Rock outcrop consists of exposed sandstone bedrock. It occurs as gently to moderately sloping bedrock, knobs, ledges, and cliffs intermingled with the Skyvillage soil.
Landscape: Semi-bolsons
Landform: Ridges, structural benches
Parent material: Sandstone
Slope: 15 to 150 percent
Shape (down/across): Convex/convex
Depth to restrictive feature: At the surface bedrock, lithic

Skyvillage soils

Landscape: Semi-bolsons
Landform: Ridges, structural benches
Position on landform: Summits, shoulders, backslopes
Parent material: Residuum weathered from sandstone
Slope: 5 to 35 percent
Shape (down/across): Convex/convex
Surface fragments: About 15 percent subrounded gravel
Depth class: Very shallow
Depth to restrictive feature: 2 to 10 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.4 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 10 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Shallow Sandstone
Potential native vegetation: sideoats grama, blue grama, New Mexico feathergrass, black grama, true mountain mahogany, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; gravelly loamy sand
C—3 to 6 inches; gravelly sandy loam
R—6 to 16 inches; cemented bedrock

Minor Components Composition

Sandoval and similar soils*:* About 4 percent
Cerropelon and similar soils*:* About 3 percent
Cumacho and similar soils*:* About 3 percent

519—Cumacho fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,800 feet (1,646 to 2,073 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Cumacho and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Cumacho soils

Landscape: Semi-bolsons
Landform: Pediments
Position on landform: Footslopes, backslopes
Parent material: Eolian deposits and alluvium derived from sandstone and shale over residuum weathered from shale
Slope: 2 to 8 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, densic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 8.2 inches (moderate)
Shrink-swell potential: About 3.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, ring muhly, galleta, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; fine sandy loam
Bt—1 inch to 7 inches; loam
Btk—7 to 11 inches; clay loam
2Bk—11 to 19 inches; clay loam
2BCky—19 to 33 inches; paragravelly clay loam
2C—33 to 46 inches; extremely paragravelly fine sandy loam
2Cd—46 to 64 inches; cemented bedrock

Minor Components Composition

Penistaja and similar soils*:* About 5 percent
Cerrillos and similar soils*:* About 3 percent
Ildefonso and similar soils*:* About 2 percent

520—Cielito-Netoma-Tanbark complex, 1 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,900 feet (1,646 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Cielito and similar soils: 35 percent
Netoma and similar soils: 30 percent
Tanbark and similar soils: 25 percent
Minor components: 10 percent

Component Descriptions

Cielito soils

Landscape: Semi-bolsons
Landform: Low hills
Position on landform: Footslopes, shoulders
Parent material: Eolian material and slope alluvium derived from sandstone and gypsum over residuum weathered from gypsum
Slope: 1 to 10 percent
Shape (down/across): Convex/concave
Surface fragments: About 1 percent subrounded medium and coarse gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 6.4 inches (moderate)
Shrink-swell potential: About 3.2 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 12 percent
Gypsum average in horizon of maximum accumulation: About 90 percent
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 11 (slightly sodic)
Ecological site: Limy
Potential native vegetation: sand dropseed, New Mexico feathergrass, black grama, ephedra, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; very fine sandy loam
Bt—1 inch to 6 inches; gypsiferous clay loam
2By1—6 to 20 inches; gypsiferous loam
2By2—20 to 28 inches; gypsiferous loam
2By/C—28 to 47 inches; stratified gypsiferous coarse sand to gypsiferous coarse sandy loam
2R—47 to 57 inches; cemented bedrock

Netoma soils

Landscape: Semi-bolsons
Landform: Low hills
Position on landform: Toeslopes
Parent material: Slope alluvium derived from gypsum and sandstone
Slope: 4 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded medium and coarse gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.2 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 11 percent
Gypsum average in horizon of maximum accumulation: About 80 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 10 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sand dropseed, black grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 1 inch; fine sandy loam
By1—1 inch to 10 inches; gypsiferous very fine sandy loam
By2—10 to 17 inches; gypsiferous loam
By3—17 to 32 inches; gypsiferous loam
By4—32 to 46 inches; gypsiferous fine sandy loam
By5—46 to 72 inches; gypsiferous fine sandy loam
C—72 to 106 inches; gypsiferous sandy loam

Tanbark soils

Landscape: Semi-bolsons
Landform: Low hills
Position on landform: Backslopes
Parent material: Residuum weathered from gypsum
Slope: 15 to 25 percent
Shape (down/across): Convex/convex
Surface fragments: About 5 percent rounded medium and coarse gravel
Depth class: Very shallow
Depth to restrictive feature: 4 to 10 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 48 percent
Gypsum average in horizon of maximum accumulation: About 90 percent
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)

Sodium adsorption ratio average in horizon of maximum accumulation: About 12 (slightly sodic)
Ecological site: Gyp Hills
Potential native vegetation: ephedra, galleta, gyp dropseed, black grama, sideoats grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 3 inches; gypsiferous coarse sandy loam
By—3 to 7 inches; gypsiferous coarse sandy loam
Cr—7 to 17 inches; cemented bedrock

Minor Components Composition

Badland*:* About 7 percent
Rock outcrop*:* About 3 percent

521—Devargas-Riovista-Riverwash complex, 0 to 5 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,400 feet (1,646 to 2,256 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Devargas and similar soils: 50 percent
Riovista and similar soils: 30 percent
Riverwash: 10 percent
Minor components: 10 percent

Component Descriptions

Devargas soils

Landscape: Fan piedmonts
Landform: Stream terraces
Position on landform: Tread
Parent material: Alluvium derived from monzonite and sandstone
Slope: 1 to 5 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 20 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 2.3 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, black grama, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; sandy loam
Bt—2 to 6 inches; loam
Btk1—6 to 18 inches; loam
Btk2—18 to 30 inches; sandy loam
2BCk—30 to 60 inches; extremely cobbly coarse sand

Riovista soils

Landscape: Fan piedmonts
Landform: Flood plain steps on valley floors
Position on landform: Tread
Parent material: Alluvium derived from monzonite
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent rounded stones; about 10 percent rounded cobbles; about 15 percent rounded gravel
Depth class: Very deep
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.6 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Rare
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, galleta, juniper, sideoats grama, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile

A1—0 to 5 inches; cobbly sandy loam
A2—5 to 14 inches; extremely cobbly sandy loam
C1—14 to 30 inches; extremely cobbly coarse sand
C2—30 to 60 inches; stratified coarse sand to extremely cobbly loamy sand

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Riovista soil.
Landscape: Fan piedmonts
Landform: Channels on valley floors
Parent material: Alluvium derived from mixed
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded cobbles; about 20 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent

Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Penistaja and similar soils*:* About 6 percent
Ildefonso and similar soils*:* About 4 percent

522—Penistaja family fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,500 to 6,900 feet (1,676 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Penistaja family and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Penistaja family soils

Landscape: Semi-bolsons
Landform: Alluvial flats
Parent material: Slope alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/concave
Surface fragments: About 5 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
Btk1—2 to 13 inches; loam
Btk2—13 to 25 inches; clay loam
Btk3—25 to 47 inches; clay loam
Btk4—47 to 91 inches; clay loam
Btk5—91 to 98 inches; sandy clay loam

Minor Components Composition

Cerrillos and similar soils*:* About 5 percent
Ildefonso and similar soils*:* About 4 percent
Truehill and similar soils*:* About 1 percent

523—Kech-Cerropelon-Rock outcrop complex, 5 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,100 feet (1,646 to 2,164 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Kech and similar soils: 45 percent
Cerropelon and similar soils: 35 percent
Rock outcrop: 10 percent
Minor components: 10 percent

Component Descriptions

Kech soils

Landscape: Semi-bolsons
Landform: Bedrock controlled structural benches on hills
Position on landform: Shoulders, summits
Parent material: Slope alluvium derived from sandstone over residuum weathered from sandstone
Slope: 5 to 10 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 2 to 6 inches to abrupt textural change; 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Shallow Sandstone
Potential native vegetation: sideoats grama, Gambel oak, black grama, oneseed juniper, skunkbush sumac
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 2 inches; loamy fine sand
A2—2 to 4 inches; fine sandy loam
Bt1—4 to 8 inches; gravelly sandy clay loam
Bt2—8 to 12 inches; sandy clay loam
Bt3—12 to 18 inches; sandy clay loam
R—18 to 28 inches; cemented bedrock

Cerropelon soils

Landscape: Semi-bolsons
Landform: Bedrock controlled hills
Position on landform: Shoulders, backslopes
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from shale
Slope: 15 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent subrounded stones; about 15 percent subrounded cobbles; about 20 percent subrounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandstone Hills
Potential native vegetation: blue grama, Gambel oak, mountain mahogany, oneseed juniper, sideoats grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; very cobbly sandy loam
Bt1—1 inch to 6 inches; gravelly clay loam
Bt2—6 to 12 inches; clay loam
Btk—12 to 21 inches; clay loam
BCk—21 to 28 inches; clay loam
Cr—28 to 39 inches; cemented bedrock

Rock outcrop

Description: Rock outcrop consists of exposed sandstone bedrock. It occurs as moderately sloping bedrock, ledges, and cliffs intermingled with the Bond and Cerropelon soils.
Landscape: Semi-bolsons
Landform: Bedrock controlled hills
Parent material: Sandstone
Slope: 25 to 70 percent
Shape (down/across): Convex/convex

Minor Components Composition

Skyvillage and similar soils*:* About 5 percent
Cumacho and similar soils*:* About 3 percent
Badland*:* About 2 percent

524—Zia-Gullied land complex, 2 to 10 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,100 feet (1,646 to 2,164 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Zia and similar soils: 65 percent
Gullied land: 25 percent
Minor components: 10 percent

Component Descriptions

Zia soils

Landscape: Semi-bolsons
Landform: Low stream terraces
Position on landform: Backslopes, shoulders
Position on landform: Tread
Parent material: Alluvium derived from sandstone and shale
Slope: 2 to 10 percent
Shape (down/across): Linear/convex
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.6 inches (moderate)
Shrink-swell potential: About 2.5 percent (low)
Flooding hazard: Very rare
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, black grama, galleta, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 3 inches; fine sandy loam
A2—3 to 13 inches; fine sandy loam
C1—13 to 27 inches; fine sandy loam
2C2—27 to 41 inches; loamy fine sand
2C3—41 to 79 inches; fine sandy loam

Gullied land
Landscape: Semi-bolsons
Landform: Low stream terraces

Position on landform: Riser
Parent material: Alluvium derived from sandstone and shale
Slope: 50 to 200 percent
Shape (down/across): Convex/convex

Minor Components Composition

Charalito and similar soils*:* About 4 percent
Sena and similar soils*:* About 3 percent
Galisteo and similar soils*:* About 3 percent

525—Hagerman-Cabreros complex, 2 to 6 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,000 to 7,000 feet (1,829 to 2,134 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Hagerman and similar soils: 50 percent
Cabreros and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Hagerman soils

Landscape: Fault block mountains
Landform: Structural benches on sills
Position on landform: Footslopes
Parent material: Eolian deposits and slope alluvium derived from sandstone, shale, and andesite over residuum weathered from andesite
Slope: 2 to 6 percent
Shape (down/across): Concave/linear
Surface fragments: About 10 percent subangular gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, lithic; 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 5.3 inches (low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; sandy loam
Bt1—3 to 7 inches; clay loam
Bt2—7 to 22 inches; clay loam
Btk—22 to 30 inches; sandy clay loam
Cr—30 to 35 inches; cemented bedrock
R—35 to 45 inches; cemented bedrock

Cabreros soils

Landscape: Fault block mountains
Landform: Structural benches on sills
Position on landform: Toeslopes
Parent material: Eolian material and alluvium derived from sandstone over residuum derived from monzonite, eolian deposits and slope alluvium derived from sandstone, shale, and andesite over residuum weathered from andesite
Slope: 2 to 6 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 59 inches to bedrock, lithic; 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 5.0 inches (low)
Shrink-swell potential: About 3.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 32 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Hills
Potential native vegetation: blue grama, oak, oneseed juniper, black grama, galleta
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
Bt1—2 to 9 inches; loam
Bt2—9 to 18 inches; clay loam
Btk—18 to 25 inches; loam
BCk—25 to 34 inches; gravelly sandy loam
Cr—34 to 47 inches; cemented bedrock
R—47 to 57 inches; cemented bedrock

Minor Components Composition

Penistaja and similar soils*:* About 4 percent
Rock outcrop*:* About 4 percent
Ildefonso and similar soils*:* About 2 percent

526—Penistaja family-Truehill complex, 3 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,800 to 6,900 feet (1,768 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Penistaja family and similar soils: 50 percent
Truehill and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Penistaja family soils

Landscape: Semi-bolsons
Landform: Fan aprons
Position on landform: Footslopes
Parent material: Slope alluvium derived from sandstone, shale, and monzonite
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.0 inches (high)
Shrink-swell potential: About 4.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6s

Typical Profile

A—0 to 3 inches; sandy loam
Bt—3 to 9 inches; loam
Btk1—9 to 27 inches; loam
Btk2—27 to 53 inches; loam
Bk1—53 to 83 inches; gravelly loam
Bk2—83 to 102 inches; sandy loam

Truehill soils

Landscape: Basins
Landform: Inset fans on fan aprons
Position on landform: Summits

Parent material: Slope alluvium derived from sandstone, shale, and monzonite
Slope: 5 to 15 percent
Shape (down/across): Linear/convex
Surface fragments: About 2 percent well rounded stones; about 15 percent well rounded cobbles; about 41 percent well rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.8 inches (very low)
Shrink-swell potential: About 3.6 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 40 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: blue grama, New Mexico feathergrass, black grama, sideoats grama, galleta, oneseed juniper, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 4 inches; extremely gravelly loam
Bt—4 to 7 inches; very gravelly clay loam
Btk—7 to 12 inches; very gravelly clay loam
Bk1—12 to 22 inches; extremely cobbly sandy loam
Bk2—22 to 40 inches; extremely gravelly coarse sandy loam
Bk3—40 to 49 inches; extremely gravelly coarse sand
Bk4—49 to 67 inches; extremely gravelly sandy clay loam
2BCk—67 to 80 inches; extremely gravelly loamy coarse sand

Minor Components Composition

Cerrillos and similar soils*:* About 4 percent
Cumacho and similar soils*:* About 3 percent
Ildefonso and similar soils*:* About 2 percent
Charalito and similar soils*:* About 1 percent

527—Musofare-Asparas complex, 20 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,600 to 6,900 feet (1,707 to 2,103 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Musofare and similar soils: 50 percent
Asparas and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Musofare soils

Landscape: Basins
Landform: South-facing dikes
Position on landform: Backslopes
Parent material: Colluvium derived from diorite, andesite, sandstone, and shale
Slope: 20 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent angular stones; about 30 percent angular cobbles; about 35 percent angular gravel
Depth class: Moderately deep
Depth to restrictive feature: 2 to 4 inches to abrupt textural change; 20 to 59 inches to bedrock, lithic; 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.1 inches (low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 18 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shallow Sandstone
Potential native vegetation: sideoats grama, blue grama, little bluestem, mountain mahogany, black grama, oneseed juniper
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; extremely cobbly sandy loam
Bt—2 to 13 inches; very gravelly clay loam
Btk1—13 to 22 inches; very cobbly loam
Btk2—22 to 34 inches; very cobbly loam
2Cr—34 to 50 inches; cemented bedrock
2R—50 to 60 inches; cemented bedrock

Asparas soils

Landscape: Basins
Landform: North-facing dikes
Position on landform: Backslopes
Parent material: Colluvium derived from diorite, andesite, sandstone, and shale
Slope: 20 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: About 30 percent angular gravel; about 30 percent angular cobbles; about 2 percent angular stones; about 1 percent angular boulders
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 7.9 percent (high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Cinder
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, threeawn, oneseed juniper
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; extremely cobbly loam
Bt1—2 to 7 inches; sandy clay loam
Bt2—7 to 11 inches; clay
Btk—11 to 30 inches; very cobbly clay loam
CBtk—30 to 43 inches; clay
Cr—43 to 53 inches; cemented bedrock

Minor Components Composition

Sandoval and similar soils*:* About 5 percent
Skyvillage and similar soils*:* About 3 percent
Rock outcrop*:* About 2 percent

528—Penistaja family loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 7,000 feet (1,646 to 2,134 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Penistaja family and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Penistaja family soils

Landscape: Basins
Landform: Fan aprons
Position on landform: Toeslopes
Parent material: Slope alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 3 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.6 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, black grama, ring muhly, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 1 inch; loam
A2—1 inch to 5 inches; loam
Btk1—5 to 14 inches; clay loam
Btk2—14 to 24 inches; clay loam
Btk3—24 to 41 inches; clay loam
BCtk—41 to 83 inches; loam

Minor Components Composition

Truehill and similar soils*:* About 4 percent
Cumacho and similar soils*:* About 3 percent
Cerrillos and similar soils*:* About 3 percent

530—Jaralosa-Chupe-Riverwash complex, 0 to 1 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,300 to 7,200 feet (1,615 to 2,195 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Jaralosa and similar soils: 45 percent
Chupe and similar soils: 30 percent
Riverwash: 10 percent
Minor components: 15 percent

Component Descriptions

Jaralosa soils

Landscape: Basins
Landform: Point bars on valley floors
Parent material: Alluvium derived from sandstone and shale over alluvium derived from granite, gneiss, schist, or monzonite
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Depth to restrictive feature: 30 to 39 inches to strongly contrasting textural stratification
Drainage class: Moderately well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.8 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Populus fremontii/Salix exigua-Salix/Carex
Potential native vegetation: cottonwood, willow, sedge
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; very fine sandy loam
AC—1 inch to 17 inches; very fine sandy loam
Cnyz1—17 to 24 inches; loamy very fine sand
Cnyz2—24 to 41 inches; loamy very fine sand
2C1—41 to 60 inches; gravelly coarse sand
2C2—60 to 85 inches; very gravelly coarse sand

Chupe soils

Landscape: Basins
Landform: Flood plains on valley floors
Parent material: Alluvium derived from sandstone, granite, gneiss, and schist
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent rounded medium and coarse gravel
Depth class: Very deep
Depth to restrictive feature: 33 to 43 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.3 inches (low)
Shrink-swell potential: About 0.6 percent (low)
Flooding hazard: Occasional
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: sand dropseed, black grama, blue grama, Bigelow's rubber rabbitbrush, galleta, spike dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

AC—0 to 3 inches; loamy coarse sand
C1—3 to 10 inches; gravelly coarse sand
C2—10 to 26 inches; gravelly coarse sand
C3—26 to 31 inches; gravelly coarse sand
C4—31 to 37 inches; gravelly coarse sand
C5—37 to 42 inches; very gravelly coarse sand
C6—42 to 50 inches; sandy clay loam
C7—50 to 65 inches; gravelly loamy coarse sand
C8—65 to 84 inches; coarse sand
C9—84 to 96 inches; gravelly coarse sand

Riverwash

Description: Riverwash consists of unstable sand and gravel that is reworked by water so frequently that it supports little or no vegetation. Riverwash occurs in arroyos and is subject to frequent, extremely brief periods of flooding from prolonged high-intensity storms. In some places it is intermingled with the Chupe soil.
Landscape: Basins
Landform: Channels on valley floors
Parent material: Alluvium derived from mixed sources
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent rounded (shape or size unspecified); about 20 percent rounded gravel
Drainage class: Excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)

Available water capacity: About 2.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Frequent
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Sena and similar soils*:* About 5 percent
Galisteo and similar soils*:* About 5 percent
Mirada and similar soils*:* About 5 percent

531—Sena very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,400 to 6,600 feet (1,646 to 2,012 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Sena and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Sena soils

Landscape: Basins
Landform: Flood plain steps on valley floors
Position on landform: Tread
Parent material: Alluvium derived from shale
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Depth to restrictive feature: 2 inches to natric
Drainage class: Well drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 6.0 inches (low)
Shrink-swell potential: About 7.9 percent (high)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: About 2 percent
Salinity average in horizon of maximum accumulation: About 18 mmhos/cm (strongly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 20 (moderately sodic)
Ecological site: Salt Flats
Potential native vegetation: alkali sacaton, blue grama, fourwing saltbush, galleta
Land capability subclass (nonirrigated): 6s

Typical Profile

Akz1—0 to 1 inch; very fine sandy loam
Akz2—1 inch to 4 inches; loam
Btknyz1—4 to 11 inches; clay loam
Btknyz2—11 to 20 inches; clay
Btknyz3—20 to 30 inches; clay
Cz1—30 to 58 inches; clay
Cz2—58 to 83 inches; clay

Minor Components Composition

Riverwash*:* About 3 percent
Galisteo and similar soils*:* About 3 percent
Charalito and similar soils*:* About 2 percent
Zia and similar soils*:* About 2 percent

532—Galisteo silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,700 to 6,700 feet (1,737 to 2,042 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Galisteo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Galisteo soils

Landscape: Basins
Landform: Stream terraces
Position on landform: Tread
Parent material: Alluvium derived from shale
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 9.4 inches (high)
Shrink-swell potential: About 7.0 percent (high)
Flooding hazard: Very rare
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Salt Flats
Potential native vegetation: alkali sacaton, blue grama, fourwing saltbush, galleta
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; silty clay loam
AB—4 to 16 inches; clay
Bz1—16 to 45 inches; clay
Bz2—45 to 67 inches; clay loam
C—67 to 80 inches; gravelly sandy clay loam

Minor Components Composition

Gullied land*:* About 5 percent
Sena and similar soils*:* About 2 percent
Riverwash*:* About 2 percent
Penistaja and similar soils*:* About 1 percent

534—Oelop-Charalito complex, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 5,300 to 7,300 feet (1,615 to 2,225 meters)
Mean annual precipitation: 10 to 13 inches (254 to 330 millimeters)
Mean annual air temperature: 50 to 52 degrees F (10.0 to 11.1 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Oelop and similar soils: 70 percent
Charalito and similar soils: 20 percent
Minor components: 10 percent

Component Descriptions

Oelop soils

Landscape: Basins
Landform: Stream terraces
Position on landform: Tread
Parent material: Alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 55 to 63 inches to strongly contrasting textural stratification
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.9 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; sandy clay loam
Btk1—2 to 10 inches; clay loam
Btk2—10 to 27 inches; loam
Btk3—27 to 35 inches; clay loam
Btk4—35 to 60 inches; sandy clay loam
2BCk—60 to 79 inches; gravelly coarse sand

Charalito soils

Landscape: Basins
Landform: Flood plain steps on valley floors

Position on landform: Tread
Parent material: Alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.7 inches (low)
Shrink-swell potential: About 0.5 percent (low)
Flooding hazard: Rare
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: New Mexico feathergrass, blue grama, sideoats grama, little bluestem, galleta, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 6 inches; loamy sand
C1—6 to 21 inches; loamy sand
2C2—21 to 34 inches; sandy loam
3C3—34 to 79 inches; very gravelly coarse sand

Minor Components Composition

Sedillo and similar soils*:* About 4 percent
Hagerman and similar soils*:* About 3 percent
Riverwash*:* About 3 percent

550—Pits, mine

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,500 to 8,000 feet (1,981 to 2,438 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 48 to 50 degrees F (8.9 to 10.0 degrees C)
Frost-free period: 140 to 170 days

Map Unit Composition

Pits, mine: 85 percent
Minor components: 15 percent

Component Descriptions

Pits, mine
Parent material: Mine spoil or earthy fill derived from monzonite
Slope: 8 to 40 percent
Shape (down/across): Convex/convex
Surface fragments: About 5 percent subrounded cobbles; about 35 percent subrounded gravel
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 4.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Land capability subclass (nonirrigated): 8

Minor Components Composition

Pegasus and similar soils*:* About 5 percent
Pedregal and similar soils*:* About 4 percent
Cochiti and similar soils*:* About 2 percent
Wandurn and similar soils*:* About 2 percent
Alchonzo and similar soils*:* About 2 percent

600—Hyer-Witt complex, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,000 feet (1,890 to 2,134 meters)
Mean annual precipitation: 11 to 14 inches (279 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Hyer and similar soils: 50 percent
Witt and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Hyer soils

Landscape: Intermontane basins
Landform: Lower areas on fan piedmonts
Position on landform: Summits
Parent material: Eolian deposits and/or alluvium derived from sandstone and shale
Slope: 1 to 2 percent
Shape (down/across): Concave/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.1 inches (high)
Shrink-swell potential: About 3.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; silt loam
Bt1—2 to 6 inches; silty clay loam
Bt2—6 to 9 inches; silty clay loam
Bt3—9 to 15 inches; silty clay loam
Btk1—15 to 24 inches; silty clay loam
Btk2—24 to 45 inches; loam
Bk1—45 to 61 inches; very fine sandy loam
Bk2—61 to 79 inches; loam
C—79 to 100 inches; loam

Witt soils

Landscape: Intermontane basins
Landform: Higher areas on fan piedmonts
Position on landform: Summits
Parent material: Eolian deposits and/or alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 18 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 10 inches; clay loam
Btk1—10 to 17 inches; clay loam
Btk2—17 to 33 inches; clay loam
Bk1—33 to 48 inches; loam
Bk2—48 to 88 inches; clay loam
Bk3—88 to 122 inches; clay loam

Minor Components Composition

Harvey and similar soils*:* About 4 percent
Ildefonso and similar soils*:* About 3 percent
Palma and similar soils*:* About 3 percent

601—Harvey loam, 3 to 12 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,000 feet (1,890 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Harvey and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Harvey soils

Landscape: Intermontane basins
Landform: South-facing fan piedmonts
Position on landform: Backslopes
Parent material: Alluvium derived from sandstone and shale
Slope: 3 to 12 percent
Shape (down/across): Convex/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.0 inches (high)
Shrink-swell potential: About 3.9 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 47 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Limy
Potential native vegetation: blue grama, galleta, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bk1—2 to 14 inches; fine sandy loam
Bk2—14 to 36 inches; clay loam
Bk3—36 to 53 inches; clay loam
Bk4—53 to 79 inches; clay loam
BC—79 to 121 inches; loam

Minor Components Composition

Palma and similar soils*:* About 5 percent
Witt and similar soils*:* About 2 percent
Lazarus and similar soils*:* About 2 percent
Hyer and similar soils*:* About 1 percent

602—Palma fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,000 feet (1,890 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Palma and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Palma soils

Landscape: Intermontane basins
Landform: North-facing fan piedmonts
Position on landform: Backslopes
Parent material: Alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Convex/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.4 inches (moderate)
Shrink-swell potential: About 2.9 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sideoats grama, galleta
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
AE—2 to 5 inches; fine sandy loam
Bt—5 to 11 inches; loam
Btk1—11 to 17 inches; loam
Btk2—17 to 30 inches; fine sandy loam
Btk3—30 to 43 inches; fine sandy loam
Bk—43 to 74 inches; silt loam
BC—74 to 125 inches; sandy clay loam

Minor Components Composition

Hyer and similar soils*:* About 4 percent
Harvey and similar soils*:* About 3 percent
Lazarus and similar soils*:* About 2 percent
Witt and similar soils*:* About 1 percent

603—Lazarus silt loam, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,000 feet (1,890 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Lazarus and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Lazarus soils

Landscape: Intermontane basins
Landform: Flood plains on valley floors
Parent material: Alluvium derived from sandstone and shale
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.3 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Flooding hazard: Occasional
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4c

Typical Profile

A1—0 to 3 inches; silt loam
A2—3 to 14 inches; silt loam
Bt1—14 to 32 inches; silt loam
Bt2—32 to 53 inches; silty clay loam
Bt3—53 to 102 inches; silty clay loam

Minor Components Composition

Manzano and similar soils*:* About 5 percent
Harvey and similar soils*:* About 3 percent
Palma and similar soils*:* About 2 percent

604—Desario-Espadon complex, 5 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,400 to 8,000 feet (1,951 to 2,438 meters)
Mean annual precipitation: 13 to 15 inches (330 to 381 millimeters)
Mean annual air temperature: 48 to 51 degrees F (8.8 to 10.6 degrees C)
Frost-free period: 120 to 150 days

Map Unit Composition

Desario and similar soils: 50 percent
Espadon and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Desario soils

Landscape: Foothills
Landform: South-facing low hills
Position on landform: Backslopes
Parent material: Slope alluvium and/or residuum weathered from limestone
Slope: 5 to 45 percent
Shape (down/across): Convex/linear
Surface fragments: About 80 percent angular channers
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.2 inches (very low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 12 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Fallugia paradoxa-Chrysothamnus nauseosus/Bouteloua hirsuta-Bouteloua gracilis
Potential native vegetation: twoneedle pinyon, sideoats grama, oneseed juniper, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 1 inch; extremely gravelly loam
Bk1—1 inch to 3 inches; cobbly loam
Bk2—3 to 12 inches; very cobbly loam
R—12 to 22 inches; bedrock

Espadon soils

Landscape: Foothills
Landform: North-facing low hills, cuestas
Position on landform: Backslopes
Parent material: Colluvium and/or residuum weathered from limestone

Slope: 10 to 50 percent
Shape (down/across): Linear/convex
Surface fragments: About 45 percent angular channers
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.0 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 36 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua gracilis
Potential native vegetation: Gambel oak, twoneedle pinyon, needlegrass, oneseed juniper
Land capability subclass (nonirrigated): 4e

Typical Profile

A—0 to 3 inches; very gravelly loam
Bt—3 to 9 inches; very gravelly loam
Bk1—9 to 16 inches; very gravelly loam
2Bk2—16 to 26 inches; extremely gravelly loam
2R—26 to 36 inches; bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Manzano and similar soils*:* About 2 percent
Cochiti and similar soils*:* About 1 percent
Pastorius and similar soils*:* About 1 percent
Lazarus and similar soils*:* About 1 percent

605—Lazarus-Manzano complex, 0 to 8 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,400 to 7,300 feet (1,951 to 2,225 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Lazarus and similar soils: 50 percent
Manzano and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Lazarus soils

Landscape: Foothills
Landform: Flood plains on valley floors
Parent material: Alluvium derived from limestone, sandstone, and shale
Slope: 0 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent (shape or size unspecified)
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.8 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Flooding hazard: Occasional
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; silt loam
Bt1—3 to 8 inches; silty clay loam
Bt2—8 to 17 inches; silty clay loam
Btk1—17 to 27 inches; silty clay loam
Btk2—27 to 53 inches; silty clay loam
Btk3—53 to 82 inches; silt loam

Manzano soils

Landscape: Foothills
Landform: Inset fans on valley sides
Parent material: Slope alluvium derived from limestone, sandstone, and shale

Slope: 4 to 8 percent
Shape (down/across): Concave/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.1 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Flooding hazard: Frequent
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 8 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Bottomland
Potential native vegetation: alkali sacaton, western wheatgrass, blue grama, fourwing saltbush, cholla
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 2 inches; silt loam
A2—2 to 8 inches; gravelly loam
A3—8 to 19 inches; gravelly loam
A4—19 to 43 inches; gravelly loam
Btb—43 to 62 inches; silty clay loam
Btkb—62 to 84 inches; silty clay loam

Minor Components Composition

Desario and similar soils*:* About 5 percent
Espadon and similar soils*:* About 3 percent
Riverwash*:* About 2 percent

606—Pastura-Nala complex, 3 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,200 feet (1,890 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Nala and similar soils: 50 percent
Pastura and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Pastura soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Shoulders
Parent material: Slope alluvium derived from degrading petrocalcic horizons, granite, gneiss, schist, and limestone
Slope: 3 to 5 percent
Shape (down/across): Convex/convex
Surface fragments: About 50 percent rounded gravel
Depth class: Shallow
Depth to restrictive feature: 12 to 16 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.3 inches (very low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 78 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 1 inch; very gravelly very fine sandy loam
Bk1—1 inch to 5 inches; gravelly loam
Bk2—5 to 7 inches; very gravelly loam
Bk3—7 to 15 inches; very gravelly sandy loam
Bkkm1—15 to 22 inches; cemented material
Bkkm2—22 to 32 inches; cemented material

Nala soils

Landscape: Intermontane basins
Landform: Interfluves on Interfluves on undulating plains

Position on landform: Footslopes
Parent material: Slope alluvium derived from degrading petrocalcic horizons, granite, gneiss, and schist
Slope: 8 to 15 percent
Shape (down/across): Concave/linear
Surface fragments: About 1 percent subangular cobbles; about 30 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 4.6 inches (low)
Shrink-swell potential: About 0.8 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 14 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Limy
Potential native vegetation: New Mexico feathergrass, blue grama, winterfat, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; gravelly sandy loam
Bw—2 to 7 inches; gravelly sandy loam
Bk1—7 to 19 inches; gravelly sandy loam
Bk2—19 to 33 inches; gravelly sandy loam
Bk3—33 to 49 inches; gravelly sandy loam
2Ck—49 to 82 inches; extremely gravelly coarse sand

Minor Components Composition

Arojomil and similar soils*:* About 5 percent
Kinsell and similar soils*:* About 3 percent
Raydawn and similar soils*:* About 2 percent

607—Davishat-Palma complex, 1 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,000 feet (1,890 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Davishat and similar soils: 45 percent
Palma and similar soils: 45 percent
Minor components: 10 percent

Component Descriptions

Davishat soils

Landscape: Intermontane basins
Landform: Undulating dunes on plains
Position on landform: Toeslopes
Position on landform: Dip
Parent material: Eolian deposits and slope alluvium derived from sandstone and shale
Slope: 1 to 8 percent
Shape (down/across): Linear/convex
Surface fragments: About 1 percent (shape or size unspecified)
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 1.8 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Deep Sand
Potential native vegetation: blue grama, galleta, Bigelow's sagebrush, black grama, sideoats grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loamy very fine sand
Bw—2 to 12 inches; loamy very fine sand
Bt—12 to 28 inches; fine sandy loam
Btk—28 to 57 inches; fine sandy loam
BCk—57 to 87 inches; fine sandy loam

Palma soils

Landscape: Intermontane basins
Landform: Undulating dunes on plains
Position on landform: Toeslopes, summits

Position on landform: Rise
Parent material: Eolian deposits and slope alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Convex/convex
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.7 inches (moderate)
Shrink-swell potential: About 3.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 60 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, sideoats grama, galleta
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; fine sandy loam
Bt1—4 to 11 inches; fine sandy loam
Bt2—11 to 23 inches; fine sandy loam
Btk—23 to 43 inches; very fine sandy loam
Bk—43 to 79 inches; very paragravelly sandy loam

Minor Components Composition

Tamarindo and similar soils*:* About 5 percent
Raydawn and similar soils*:* About 3 percent
Davishat and similar soils*:* About 2 percent

608—Davishat loamy very fine sand, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,100 feet (1,890 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Davishat and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Davishat soils

Landscape: Intermontane basins
Landform: Undulating interdunes on plains
Position on landform: Toeslopes
Parent material: Eolian deposits and slope alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Linear/concave
Surface fragments: About 2 percent (shape or size unspecified)
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.6 inches (moderate)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Deep Sand
Potential native vegetation: blue grama, galleta, Bigelow's sagebrush, black grama, sideoats grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; loamy very fine sand
Bw—3 to 10 inches; very fine sandy loam
Bt—10 to 41 inches; fine sandy loam
BCk—41 to 79 inches; gravelly sandy loam

Minor Components Composition

Palma and similar soils*:* About 5 percent
Tamarindo and similar soils*:* About 3 percent
Davishat and similar soils*:* About 2 percent

610—Arojomil-Tapia complex, 1 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,200 feet (1,890 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Arojomil and similar soils: 50 percent
Tapia and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Arojomil soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and siltstone over alluvium derived from granite, gneiss, and schist
Slope: 3 to 5 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 35 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 4.5 inches (low)
Shrink-swell potential: About 3.6 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 60 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
B—2 to 10 inches; clay loam
B—10 to 15 inches; loam
B1—15 to 22 inches; very gravelly loam
B2—22 to 33 inches; very gravelly loam
Bkkm1—33 to 41 inches; cemented material
Bkkm2—41 to 46 inches; cemented material

Tapia soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and siltstone over alluvium derived from granite, gneiss, and schist
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.7 inches (moderate)
Shrink-swell potential: About 2.4 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 33 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; silt loam
Bt—2 to 8 inches; silt loam
Btk—8 to 20 inches; gravelly silt loam
Bk1—20 to 30 inches; gravelly sandy loam
Bk2—30 to 52 inches; extremely cobbly loam
Bk3—52 to 67 inches; gravelly loam
Bk4—67 to 100 inches; very gravelly very fine sandy loam

Minor Components Composition

Pastura and similar soils*:* About 5 percent
Nala and similar soils*:* About 4 percent
Raydawn and similar soils*:* About 1 percent

611—Spyglass silt loam, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 6,900 feet (1,890 to 2,103 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Spyglass and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Spyglass soils

Landscape: Intermontane basins
Landform: Flood plain steps on basin floors
Parent material: Alluvium and/or lacustrine deposits derived from sandstone, shale, and gypsum
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 3.8 percent (moderate)
Flooding hazard: Rare
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: About 50 percent
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Gyp Upland
Potential native vegetation: alkali sacaton, blue grama, fourwing saltbush, sideoats grama, ephedra
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; very fine sandy loam
Bt1—2 to 11 inches; clay
Bt2—11 to 20 inches; clay
Btk—20 to 23 inches; clay
2ABk—23 to 26 inches; clay
2By1—26 to 30 inches; loam
2By2—30 to 46 inches; loam
2By3—46 to 67 inches; clay loam
3BCk—67 to 108 inches; very gravelly sand

Minor Components Composition

Trofes and similar soils*:* About 5 percent
Tamarindo and similar soils*:* About 3 percent
Hyer and similar soils*:* About 2 percent

612—Trofes loam, 0 to 2 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 6,900 feet (1,890 to 2,103 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Trofes and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Trofes soils

Landscape: Intermontane basins
Landform: Low stream terraces on basin floors
Parent material: Alluvium and/or lacustrine deposits derived from sandstone, shale, and gypsum
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.5 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 17 percent
Gypsum average in horizon of maximum accumulation: About 14 percent
Salinity average in horizon of maximum accumulation: About 8 mmhos/cm (moderately saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 9 (slightly sodic)
Ecological site: Gyp Upland
Potential native vegetation: alkali sacaton, blue grama, fourwing saltbush, sideoats grama, ephedra
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt—2 to 9 inches; clay loam
Btk1—9 to 15 inches; clay loam
Btk2—15 to 23 inches; clay loam
Btky1—23 to 41 inches; clay loam
Btky2—41 to 55 inches; clay loam
Bky—55 to 72 inches; fine sandy loam
By1—72 to 76 inches; clay loam
By2—76 to 80 inches; clay loam
2BCy—80 to 98 inches; loamy sand

Minor Components Composition

Spyglass and similar soils*:* About 5 percent
Tamarindo and similar soils*:* About 3 percent
Nala and similar soils*:* About 2 percent

613—Kinsell silt loam, 0 to 2 percent slopes, flooded

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,200 feet (1,890 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Kinsell and similar soils: 85 percent
Minor components: 15 percent

Component Descriptions

Kinsell soils

Landscape: Intermontane basins
Landform: Flood plains on valley floors
Parent material: Alluvium derived from sandstone and shale
Slope: 0 to 2 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 5.9 percent (moderate)
Flooding hazard: Occasional
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, sand dropseed, broom snakeweed, ring muhly
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; silt loam
Bt1—2 to 8 inches; silt loam
Bt2—8 to 17 inches; silt loam
Bt3—17 to 32 inches; silt loam
Btk1—32 to 43 inches; silty clay loam
Btk2—43 to 80 inches; silty clay loam

Minor Components Composition

Kinsell and similar soils*:* About 9 percent
Tamarindo and similar soils*:* About 4 percent
Gullied land*:* About 1 percent
Riverwash*:* About 1 percent

614—Tamarindo loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,100 feet (1,890 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Tamarindo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Tamarindo soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Summits
Parent material: Eolian material and alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.5 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; loam
AB—4 to 9 inches; loam
Bt—9 to 16 inches; clay loam
Btk1—16 to 24 inches; clay loam
Btk2—24 to 38 inches; loam
Btk3—38 to 83 inches; loam

Minor Components Composition

Harvey and similar soils*:* About 3 percent
Palma and similar soils*:* About 3 percent
Witt and similar soils*:* About 2 percent
Clovis and similar soils*:* About 2 percent

615—Kwahe-Stanley complex, 0 to 1 percent slopes, ponded

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,000 to 7,200 feet (1,829 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Kwahe and similar soils: 55 percent
Stanley and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Kwahe soils

Landscape: Intermontane basins
Landform: Playa steps on playas
Position on landform: Talf
Parent material: Lacustrine deposits derived from clayey shale
Slope: 0 to 1 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 8.8 inches (moderate)
Shrink-swell potential: About 9.5 percent (very high)
Ponding hazard: Occasional
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 17 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 8 (slightly sodic)
Ecological site: Swale
Potential native vegetation: western wheatgrass, galleta, blue grama, fourwing saltbush
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; clay
Bss—3 to 15 inches; clay
Bssg1—15 to 30 inches; clay
Bssg2—30 to 45 inches; clay
Bssg3—45 to 59 inches; clay

Stanley soils

Landscape: Intermontane basins
Landform: Playa floors on playas
Position on landform: Dip

Parent material: Lacustrine deposits derived from clayey shale
Slope: 0 to 1 percent
Shape (down/across): Concave/concave
Surface fragments: About 2 percent subangular gravel
Depth class: Very deep
Drainage class: Poorly drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 8.3 inches (moderate)
Shrink-swell potential: About 10.0 percent (very high)
Ponding hazard: Occasional
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: About 1 percent
Salinity average in horizon of maximum accumulation: About 6 mmhos/cm (slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Salty Bottomland
Potential native vegetation: western wheatgrass, scarlet globemallow
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; clay
Bsszg1—3 to 17 inches; clay
Bsszg2—17 to 28 inches; clay
Bsszg3—28 to 38 inches; clay
Bsszg4—38 to 56 inches; clay
Bssyzg—56 to 101 inches; clay

Minor Components Composition

Triane and similar soils*:* About 5 percent
Clovis and similar soils*:* About 3 percent
Tamarindo and similar soils*:* About 2 percent

616—Triane silty clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,200 feet (1,890 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 150 to 170 days

Map Unit Composition

Triane and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Triane soils

Landscape: Intermontane basins
Landform: Playa rims on playas
Position on landform: Rise
Parent material: Eolian deposits derived from clayey shale
Slope: 1 to 3 percent
Shape (down/across): Convex/linear
Depth class: Very deep
Drainage class: Somewhat poorly drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 8.7 inches (moderate)
Shrink-swell potential: About 10.0 percent (very high)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 24 percent
Gypsum average in horizon of maximum accumulation: About 3 percent
Salinity average in horizon of maximum accumulation: About 11 mmhos/cm (moderately saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 18 (moderately sodic)
Ecological site: Bottomland
Potential native vegetation: alkali sacaton, western wheatgrass, blue grama, fourwing saltbush, cholla
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 6c

Typical Profile

A1—0 to 2 inches; silty clay loam
A2—2 to 4 inches; silty clay loam
Btyz—4 to 14 inches; clay
Byzg1—14 to 27 inches; clay
Byzg2—27 to 42 inches; clay
2BCzg—42 to 59 inches; clay

Minor Components Composition

Kwahe and similar soils*:* About 4 percent
Stanley and similar soils*:* About 3 percent
Clovis and similar soils*:* About 2 percent
Tamarindo and similar soils*:* About 1 percent

617—Ranchos fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,300 to 7,000 feet (1,920 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Ranchos and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Ranchos soils

Landscape: Intermontane basins
Landform: Undulating inset fans on plains
Parent material: Alluvium and eolian deposits and alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Convex/convex
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.9 inches (moderate)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Very low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, sand dropseed, broom snakeweed, ring muhly
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
BA—2 to 9 inches; fine sandy loam
Bt—9 to 21 inches; fine sandy loam
Btk—21 to 30 inches; fine sandy loam
Bk1—30 to 50 inches; sandy loam
Bk2—50 to 85 inches; fine sandy loam
Bk3—85 to 100 inches; fine sandy loam

Minor Components Composition

Davishat and similar soils*:* About 5 percent
Chupadera and similar soils*:* About 3 percent
Clovis and similar soils*:* About 2 percent

618—Davishat-Chupadera complex, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,400 to 7,000 feet (1,951 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Davishat and similar soils: 55 percent
Chupadera and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Davishat soils

Landscape: Intermontane basins
Landform: Structural benches on plateaus
Position on landform: Footslopes
Parent material: Eolian deposits and alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent subrounded gravel; about 1 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 85 to 91 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 8.3 inches (moderate)
Shrink-swell potential: About 3.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
Bt—2 to 11 inches; fine sandy loam
Btk1—11 to 17 inches; fine sandy loam
Btk2—17 to 31 inches; fine sandy loam
Btk3—31 to 49 inches; fine sandy loam
Btk4—49 to 71 inches; very fine sandy loam
Btk5—71 to 87 inches; very fine sandy loam
R—87 to 97 inches; cemented bedrock

Chupadera soils

Landscape: Intermontane basins
Landform: Structural benches on plateaus
Position on landform: Summits, shoulders
Parent material: Eolian material and alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 1 percent subrounded gravel; about 1 percent subrounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 24 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 3.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 15 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 1 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; fine sandy loam
Bw—1 inch to 12 inches; fine sandy loam
Bk1—12 to 20 inches; sandy loam
Bk2—20 to 35 inches; sandy loam
2R—35 to 40 inches; bedrock

Minor Components Composition

Ranchos and similar soils*:* About 5 percent
Clovis and similar soils*:* About 3 percent
Tamarindo and similar soils*:* About 2 percent

619—Villario-Puertecito complex, 25 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,000 to 7,100 feet (1,829 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Villario and similar soils: 60 percent
Puertecito and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Villario soils

Landscape: Intermontane basins
Landform: Scarp slopes on plateaus, scarp slopes on mesas
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone and shale over residuum weathered from shale
Slope: 30 to 45 percent
Shape (down/across): Linear/linear
Surface fragments: About 8 percent subrounded boulders; about 10 percent subrounded stones; about 10 percent subrounded cobbles; about 15 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.3 inches (very low)
Shrink-swell potential: About 3.0 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shallow
Potential native vegetation: galleta, sideoats grama, black grama, blue grama, wolftail
Land capability subclass (nonirrigated): 6c

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; very stony silt loam
Bt—3 to 8 inches; silty clay loam
2BC—8 to 14 inches; silt loam
2Cr—14 to 24 inches; cemented bedrock

Puertecito soils

Landscape: Intermontane basins
Landform: Dipslopes on plateaus
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 25 to 45 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel; about 15 percent subrounded cobbles; about 6 percent subrounded stones; about 3 percent subrounded boulders
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.3 inches (very low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Hills
Potential native vegetation: black grama, little bluestem, oneseed juniper, sideoats grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; very cobbly sandy loam
Bt1—2 to 6 inches; very cobbly sandy loam
Bt2—6 to 13 inches; very cobbly sandy clay loam
R—13 to 22 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Badland*:* About 3 percent
Raydawn and similar soils*:* About 2 percent

621—Kech-Horchata complex, 1 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 5,900 to 7,200 feet (1,798 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Kech and similar soils: 50 percent
Horchata and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Kech soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plateaus, interfluves on mesas
Position on landform: Shoulders, summits
Parent material: Eolian deposits derived from sandstone, shale, and limestone over residuum weathered from sandstone
Slope: 3 to 8 percent
Shape (down/across): Convex/linear
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 3.4 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 9 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shallow
Potential native vegetation: blue grama, sideoats grama, black grama, wolftail, galleta
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; fine sandy loam
Bt—4 to 9 inches; fine sandy loam
Btk1—9 to 14 inches; loam
Btk2—14 to 18 inches; gravelly loam
2R—18 to 28 inches; cemented bedrock

Horchata soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plateaus
Position on landform: Summits, shoulders
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone

Slope: 1 to 5 percent
Shape (down/across): Linear/linear
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 3.7 inches (low)
Shrink-swell potential: About 2.7 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 32 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 4 inches; very fine sandy loam
Bt—4 to 11 inches; loam
Btk—11 to 17 inches; sandy clay loam
Bk—17 to 28 inches; very cobbly sandy loam
R—28 to 38 inches; cemented bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Arojomil and similar soils*:* About 3 percent
Villario and similar soils*:* About 2 percent

622—Arojomil silt loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,100 to 7,200 feet (1,859 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Arojomil and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Arojomil soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and shale over alluvium derived from mixed sources
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 24 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.001 to 0.06 in/hr (very slow)
Available water capacity: About 2.4 inches (very low)
Shrink-swell potential: About 3.1 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 52 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; silt loam
Bt—2 to 8 inches; silt loam
Btk—8 to 14 inches; very gravelly loam
Bk—14 to 23 inches; extremely gravelly sandy loam
Bkkm—23 to 33 inches; cemented

Minor Components Composition

Tapia and similar soils*:* About 4 percent
Clovis and similar soils*:* About 2 percent
Raydawn and similar soils*:* About 2 percent
Tamarindo and similar soils*:* About 2 percent

623—Clovis loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,000 to 7,200 feet (1,829 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Clovis and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Clovis soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Footslopes, backslopes
Parent material: Slope alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 8.7 inches (moderate)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 26 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 3 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt—2 to 11 inches; loam
Btk1—11 to 22 inches; sandy clay loam
Btk2—22 to 32 inches; sandy clay loam
Bk1—32 to 42 inches; loam
Bk2—42 to 57 inches; gravelly sandy clay loam
Bk3—57 to 80 inches; very gravelly clay loam

Minor Components Composition

Chilerojo and similar soils*:* About 3 percent
Frajillo and similar soils*:* About 3 percent
Kinsell and similar soils*:* About 2 percent
Arojomil and similar soils*:* About 2 percent

624—Clovis very fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,500 to 7,200 feet (1,981 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Clovis and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Clovis soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Summits
Parent material: Slope alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.6 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Negligible
Calcium carbonate average in horizon of maximum accumulation: About 18 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; very fine sandy loam
Bt—2 to 9 inches; sandy clay loam
Btk—9 to 14 inches; clay loam
Bk1—14 to 27 inches; loam
Bk2—27 to 36 inches; loam
2Bk3—36 to 48 inches; sandy clay loam
2BCk—48 to 118 inches; fine sandy loam

Minor Components Composition

Tamarindo and similar soils: About 5 percent
Arojomil and similar soils: About 3 percent
Tapia and similar soils: About 2 percent

625—Raydawn very cobbly sandy loam, 15 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,400 to 7,100 feet (1,951 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Raydawn and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Raydawn soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Shoulders, backslopes
Position on landform: Riser
Parent material: Alluvium derived from granite, gneiss, and schist over residuum weathered from sandstone and shale
Slope: 15 to 35 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent well rounded cobbles; about 30 percent well rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 5.6 inches (low)
Shrink-swell potential: About 4.7 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 46 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Gravelly
Potential native vegetation: black grama, galleta, sideoats grama, ephedra, oneseed juniper
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 6 inches; very cobbly sandy loam
Bk1—6 to 11 inches; very cobbly sandy loam
Bk2—11 to 30 inches; very gravelly loam
2Bk3—30 to 49 inches; very gravelly coarse sandy loam
3C—49 to 59 inches; silty clay loam

Minor Components Composition

Arojomil and similar soils: About 4 percent
Clovis and similar soils: About 3 percent
Tapia and similar soils: About 3 percent

626—Horchata loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,400 to 7,200 feet (1,951 to 2,195 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Horchata and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Horchata soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Backslopes
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent subrounded gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.3 inches (low)
Shrink-swell potential: About 3.1 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, ring muhly, sand dropseed, broom snakeweed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 5 inches; silt loam
Bt2—5 to 12 inches; silt loam
Btk—12 to 18 inches; silt loam
Bk—18 to 35 inches; sandy loam
2R—35 to 45 inches; bedrock

Minor Components Composition

Kech and similar soils*:* About 5 percent
Clovis and similar soils*:* About 3 percent
Tamarindo and similar soils*:* About 2 percent

627—Palabria-Frajillo complex, 1 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,400 to 7,100 feet (1,951 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Palabria and similar soils: 65 percent
Frajillo and similar soils: 25 percent
Minor components: 10 percent

Component Descriptions

Palabria soils

Landscape: Intermontane basins
Landform: Structural benches
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 1 to 8 percent
Shape (down/across): Linear/linear
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.1 inches (high)
Shrink-swell potential: About 3.4 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 13 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 4 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, sand dropseed, broom snakeweed, ring muhly
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; very fine sandy loam
Bt—2 to 11 inches; clay loam
Btk—11 to 18 inches; clay loam
Bk—18 to 30 inches; loam
BCk—30 to 41 inches; very fine sandy loam
2Ck—41 to 52 inches; extremely parachannery very fine sandy loam
2R—52 to 62 inches; bedrock

Frajillo soils

Landscape: Intermontane basins
Landform: Structural benches

Position on landform: Shoulders
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 1 to 5 percent
Shape (down/across): Convex/linear
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 3.6 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shallow Plains
Potential native vegetation: sideoats grama, New Mexico feathergrass, blue grama, big sagebrush, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Btk—2 to 13 inches; loam
Bk—13 to 18 inches; gravelly sandy loam
Cd—18 to 19 inches; bedrock
R—19 to 29 inches; bedrock

Minor Components Composition

Chilerojo and similar soils*:* About 4 percent
Tamarindo and similar soils*:* About 3 percent
Clovis and similar soils*:* About 3 percent

628—Nala gravelly sandy loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,000 feet (1,890 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 140 to 160 days

Map Unit Composition

Nala and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Nala soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Shoulders, backslopes
Parent material: Slope alluvium derived from degrading petrocalcic horizons, granite, gneiss, and schist
Slope: 3 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 20 percent rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 5.5 inches (low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 25 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Limy
Potential native vegetation: New Mexico feathergrass, blue grama, winterfat, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; gravelly fine sandy loam
Bk1—2 to 11 inches; gravelly fine sandy loam
Bk2—11 to 24 inches; gravelly sandy loam
Bk3—24 to 54 inches; gravelly sandy loam
BCk—54 to 81 inches; gravelly sandy loam

Minor Components Composition

Pastura and similar soils*:* About 5 percent
Arojomil and similar soils*:* About 3 percent
Tapia and similar soils*:* About 2 percent

629—Frajillo-Chilerojo complex, 5 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,100 feet (1,890 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Frajillo and similar soils: 55 percent
Chilerojo and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Frajillo soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Backslopes, shoulders
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 5 to 15 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent subangular gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.0 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shallow Plains
Potential native vegetation: sideoats grama, New Mexico feathergrass, blue grama, big sagebrush, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; sandy loam
Btk1—3 to 7 inches; sandy clay loam
2Btk2—7 to 10 inches; extremely paragravelly sandy clay loam
2Btk3—10 to 13 inches; paragravelly sandy clay loam
2R—13 to 23 inches; cemented bedrock

Chilerojo soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Footslopes

Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 5 to 8 percent
Shape (down/across): Concave/linear
Surface fragments: About 3 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to densic material
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 10.1 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 9 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 3 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; fine sandy loam
Bt—2 to 9 inches; loam
Btk1—9 to 16 inches; loam
Btk2—16 to 29 inches; gravelly clay loam
Bk1—29 to 38 inches; gravelly clay loam
2Bk2—38 to 46 inches; clay loam
2Ctk—46 to 60 inches; very paragravelly clay loam
2Cd—60 to 80 inches; cemented

Minor Components Composition

Tamarindo and similar soils*:* About 4 percent
Clovis and similar soils*:* About 3 percent
Palabria and similar soils*:* About 3 percent

630—Tamarindo loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 6,200 to 7,100 feet (1,890 to 2,164 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 150 days

Map Unit Composition

Tamarindo and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Tamarindo soils

Landscape: Intermontane basins
Landform: Interfluves on undulating plains
Position on landform: Footslopes, backslopes
Parent material: Slope alluvium derived from sandstone and shale
Slope: 3 to 8 percent
Shape (down/across): Concave/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.6 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Loamy
Potential native vegetation: blue grama, galleta, broom snakeweed, ring muhly, sand dropseed
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 2 inches; loam
Bt—2 to 13 inches; loam
Btk1—13 to 22 inches; clay loam
Btk2—22 to 35 inches; loam
Btk3—35 to 49 inches; loam
Btk4—49 to 74 inches; loam
Bk—74 to 110 inches; loam
2C—110 to 123 inches; gravelly loam

Minor Components Composition

Arojomil and similar soils*:* About 5 percent
Kinsell and similar soils*:* About 3 percent
Clovis and similar soils*:* About 2 percent

632—Travessilla-Raydawn-Sandoval-Rock outcrop complex, 5 to 45 percent slopes

Map Unit Setting

Major Land Resource Area: 70C
Elevation: 5,800 to 7,000 feet (1,767 to 2,134 meters)
Mean annual precipitation: 12 to 14 inches (305 to 356 millimeters)
Mean annual air temperature: 49 to 51 degrees F (9.4 to 10.6 degrees C)
Frost-free period: 130 to 160 days

Map Unit Composition

Travessilla and similar soils: 35 percent
Raydawn and similar soils: 25 percent
Sandoval and similar soils: 15 percent
Rock outcrop: 10 percent
Minor components: 10 percent

Component Descriptions

Travessilla soils

Landscape: Intermontane basins
Landform: Escarpments
Position on landform: Backslopes
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.6 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shallow Plains
Potential native vegetation: sideoats grama, New Mexico feathergrass, blue grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 1 inch; fine sandy loam
Bk1—1 inch to 7 inches; fine sandy loam
Bk2—7 to 15 inches; paragravelly fine sandy loam
2R—15 to 25 inches; cemented bedrock

Raydawn soils

Landscape: Intermontane basins
Landform: Escarpments
Position on landform: Shoulders

Position on landform: Riser
Parent material: Slope alluvium derived from granite, gneiss, and schist
Slope: 5 to 15 percent
Shape (down/across): Convex/convex
Surface fragments: About 20 percent well rounded cobbles; about 30 percent well rounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 2.4 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 46 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Deep Sand
Potential native vegetation: blue grama, galleta, Bigelow's sagebrush, black grama, sideoats grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 6 inches; very cobbly sandy loam
Bk1—6 to 11 inches; very cobbly sandy loam
Bk2—11 to 30 inches; very gravelly loam
2Bk3—30 to 80 inches; very gravelly coarse sandy loam

Sandoval soils

Landscape: Intermontane basins
Landform: Escarpments
Position on landform: Shoulders, backslopes
Position on landform: Riser
Parent material: Residuum weathered from clayey shale and/or slope alluvium derived from clayey shale
Slope: 15 to 45 percent
Shape (down/across): Convex/convex
Surface fragments: About 5 percent rounded cobbles; about 15 percent rounded medium and coarse gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.5 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 2 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 2 (slightly sodic)
Ecological site: Shale Hills

Potential native vegetation: alkali sacaton, broom snakeweed, fourwing saltbush, black grama
Land capability subclass (nonirrigated): 6c

Typical Profile

A—0 to 3 inches; gravelly sandy loam
C—3 to 11 inches; gravelly loam
Cr—11 to 21 inches; cemented bedrock

Rock outcrop

Description: Rock outcrop consists of exposed sandstone bedrock. It occurs as steeply sloping bedrock, ledges, and cliffs intermingled with the Travessilla and Sandoval soils.
Landscape: Intermontane basins
Landform: Escarpments
Position on landform: Riser
Parent material: Sandstone
Slope: 40 to 160 percent
Shape (down/across): Convex/convex

Minor Components Composition

Villario and similar soils*:* About 6 percent
Scarpine and similar soils*:* About 4 percent

700—Aliante-Altega complex, 1 to 10 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,600 to 7,900 feet (2,012 to 2,408 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Aliante and similar soils: 50 percent
Altega and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Aliante soils

Landscape: Plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Toeslopes, footslopes
Parent material: Slope alluvium derived from sandstone and shale
Slope: 1 to 5 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 9.7 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Loamy Upland
Potential native vegetation: blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 1 inch; silt loam
Bt1—1 inch to 9 inches; silt loam
Bt2—9 to 19 inches; silt loam
Bt3—19 to 31 inches; silt loam
Bt4—31 to 39 inches; silt loam
Bt5—39 to 47 inches; silt loam
ABtb—47 to 65 inches; silty clay loam
BCb1—65 to 91 inches; clay
BCb2—91 to 111 inches; clay loam

Altega soils

Landscape: Plateaus
Landform: Interfluves on undulating plateaus
Position on landform: Summits, shoulders
Parent material: Eolian deposits derived from sandstone and shale over alluvium derived from sandstone and shale
Slope: 3 to 10 percent
Shape (down/across): Convex/linear
Surface fragments: About 2 percent subangular gravel
Depth class: Very deep
Depth to restrictive feature: 98 to 118 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.4 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Loamy Upland
Potential native vegetation: blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 9 inches; loam
Bt2—9 to 19 inches; loam
Btk—19 to 24 inches; loam
BAtkb—24 to 29 inches; clay loam
Btkb1—29 to 43 inches; clay loam
Btkb2—43 to 58 inches; loam
Bkb1—58 to 81 inches; loam
Bkb2—81 to 101 inches; loam
2R—101 to 111 inches; bedrock

Minor Components Composition

Condesa and similar soils*:* About 5 percent
Bernal and similar soils*:* About 3 percent
Altezita and similar soils*:* About 2 percent

701—Sabroso-Verano complex, 35 to 65 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,200 to 8,000 feet (1,890 to 2,438 meters)
Mean annual precipitation: 14 to 17 inches (356 to 432 millimeters)
Mean annual air temperature: 43 to 47 degrees F (6.1 to 8.3 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Sabroso and similar soils: 50 percent
Verano and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Sabroso soils

Landscape: Plateaus
Landform: South-facing plateaus, mesas
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone and shale
Slope: 35 to 60 percent
Shape (down/across): Concave/convex
Surface fragments: About 2 percent subrounded stones; about 30 percent subrounded cobbles; about 35 percent subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 6.3 inches (moderate)
Shrink-swell potential: About 5.9 percent (moderate)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: Gambel oak, twoneedle pinyon, Rocky Mountain juniper, muttongrass, ponderosa pine
Land capability subclass (nonirrigated): 7e

Typical Profile

A—0 to 2 inches; extremely cobbly loam
AB—2 to 6 inches; very gravelly loam
Bt1—6 to 10 inches; very gravelly clay loam
Bt2—10 to 15 inches; very gravelly clay loam
Bt3—15 to 25 inches; very gravelly clay loam
Bt4—25 to 33 inches; very gravelly clay loam
Btk1—33 to 48 inches; gravelly clay loam
Btk2—48 to 66 inches; very cobbly clay loam
2R—66 to 76 inches; bedrock

Verano soils

Landscape: Plateaus
Landform: North-facing plateaus, mesas
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone, shale, and conglomerate
Slope: 35 to 65 percent
Shape (down/across): Concave/linear
Surface fragments: About 30 percent subrounded gravel; about 20 percent subrounded cobbles; less than 1 percent subrounded stones; about 2 percent fine subrounded gravel
Depth class: Very deep
Depth to restrictive feature: 59 to 79 inches to bedrock, paralithic; 79 to 98 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 5.5 inches (low)
Shrink-swell potential: About 6.8 percent (high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, twoneedle pinyon, ponderosa pine, mountain muhly, Rocky Mountain juniper
Land capability subclass (nonirrigated): 7e

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 5 inches; very cobbly loam
BA—5 to 10 inches; very cobbly loam
Bt1—10 to 14 inches; very gravelly clay loam
Bt2—14 to 25 inches; very cobbly clay loam
Bt3—25 to 33 inches; very gravelly clay loam
Bt4—33 to 53 inches; very cobbly clay loam
Bt5—53 to 72 inches; very cobbly clay loam
2Cr—72 to 88 inches; bedrock
2R—88 to 98 inches; bedrock

Minor Components Composition

Altega and similar soils*:* About 4 percent
Bernal and similar soils*:* About 3 percent
Altezita and similar soils*:* About 3 percent

702—Estrada-Chacuaco complex, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,400 to 8,000 feet (1,951 to 2,438 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Estrada and similar soils: 65 percent
Chacuaco and similar soils: 25 percent
Minor components: 10 percent

Component Descriptions

Estrada soils

Landscape: Plateaus
Landform: Valley sides
Position on landform: Toeslopes
Parent material: Alluvium derived from sandstone and shale
Slope: 2 to 8 percent
Shape (down/across): Concave/linear
Surface fragments: About 1 percent angular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.1 inches (high)
Shrink-swell potential: About 5.3 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 1 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Loamy Upland
Potential native vegetation: blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort
Land capability subclass (nonirrigated): 4c

Typical Profile

A1—0 to 2 inches; very fine sandy loam
A2—2 to 7 inches; loam
Bt1—7 to 14 inches; silty clay loam
Bt2—14 to 23 inches; silty clay loam
Bt3—23 to 41 inches; gravelly clay loam
BCtk—41 to 57 inches; clay loam
Ck—57 to 87 inches; very gravelly loam

Chacuaco soils

Landscape: Plateaus
Landform: Valley sides
Position on landform: Footslopes

Parent material: Slope alluvium derived from sandstone and shale
Slope: 2 to 6 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent angular gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 7.1 inches (moderate)
Shrink-swell potential: About 5.0 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 34 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Loamy Upland
Potential native vegetation: blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort
Land capability subclass (nonirrigated): 4c

Typical Profile

A1—0 to 2 inches; very fine sandy loam
A2—2 to 6 inches; loam
Bt1—6 to 16 inches; clay loam
Bt2—16 to 22 inches; clay loam
Bt3—22 to 28 inches; clay loam
Btk—28 to 33 inches; clay loam
Bk—33 to 41 inches; gravelly sandy clay loam
R—41 to 51 inches; bedrock

Minor Components Composition

Aliante and similar soils*:* About 6 percent
Altega and similar soils*:* About 4 percent

703—Estrada loam, 2 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,900 to 8,000 feet (2,103 to 2,438 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Estrada and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Estrada soils

Landscape: Plateaus
Landform: Valley sides
Position on landform: Footslopes, toeslopes
Parent material: Slope alluvium derived from sandstone and shale
Slope: 2 to 15 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent subangular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.1 inches (high)
Shrink-swell potential: About 4.0 percent (moderate)
Flooding hazard: Very rare
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Loamy Upland
Potential native vegetation: blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort
Land capability subclass (nonirrigated): 4e

Typical Profile

A—0 to 2 inches; fine sandy loam
AB—2 to 4 inches; loam
Bt1—4 to 13 inches; loam
Bt2—13 to 19 inches; loam
Btk1—19 to 28 inches; loam
Btk2—28 to 41 inches; loam
B't1—41 to 55 inches; clay loam
B't2—55 to 104 inches; loam
BC—104 to 122 inches; loam

Minor Components Composition

Herrada and similar soils*:* About 4 percent
Riverwash*:* About 2 percent
Bernal and similar soils*:* About 2 percent
Estrada and similar soils*:* About 2 percent

704—Aliante loam, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,500 to 7,900 feet (1,981 to 2,408 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Aliante and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Aliante soils

Landscape: Plateaus
Landform: Flood plains on valley floors
Parent material: Alluvium derived from sandstone and shale
Slope: 0 to 3 percent
Shape (down/across): Linear/linear
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.0 inches (high)
Shrink-swell potential: About 5.5 percent (moderate)
Flooding hazard: Rare
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Loamy Upland
Potential native vegetation: blue grama, western wheatgrass, bottlebrush squirreltail, fringed sagewort
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 6 inches; loam
Bt1—6 to 11 inches; loam
Bt2—11 to 17 inches; silty clay loam
Bt3—17 to 36 inches; silty clay
Bt4—36 to 60 inches; clay loam
CB—60 to 79 inches; gravelly sandy clay loam

Minor Components Composition

Altega and similar soils*:* About 6 percent
Moriartche and similar soils*:* About 4 percent

705—Margosa-Condesa complex, 2 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,400 to 8,100 feet (1,951 to 2,469 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Margosa and similar soils: 50 percent
Condesa and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Margosa soils

Landscape: Plateaus
Landform: Higher areas plateaus
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 2 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 10 percent subangular gravel; about 10 percent subangular cobbles; about 2 percent subrounded stones
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.7 inches (very low)
Shrink-swell potential: About 3.9 percent (moderate)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 72 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: Gambel oak, twoneedle pinyon, needlegrass, oneseed juniper, Rocky Mountain juniper, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 5 inches; cobbly loam
Bt—5 to 8 inches; cobbly clay loam
Btk—8 to 12 inches; gravelly clay loam
Bk—12 to 17 inches; extremely gravelly loam
2R—17 to 27 inches; bedrock

Condesa soils

Landscape: Plateaus
Landform: Lower areas, plateaus
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 2 to 6 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent (shape or size unspecified)
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to bedrock, paralithic; 20 to 39 inches to petrocalcic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.6 inches (low)
Shrink-swell potential: About 4.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 74 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: Gambel oak, twoneedle pinyon, oneseed juniper, Rocky Mountain juniper, blue grama
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
Bt1—2 to 5 inches; loam
Bt2—5 to 10 inches; clay loam
Bt3—10 to 16 inches; loam
Btk—16 to 24 inches; loam
Bkkm—24 to 27 inches; petrocalcic
2Cr—27 to 37 inches; bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Predawn and similar soils*:* About 3 percent
Bernal and similar soils*:* About 2 percent

706—Verano-Altezita complex, 45 to 90 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 6,800 to 8,100 feet (2,073 to 2,469 meters)
Mean annual precipitation: 15 to 18 inches (381 to 457 millimeters)
Mean annual air temperature: 43 to 45 degrees F (6.1 to 7.2 degrees C)
Frost-free period: 100 to 120 days

Map Unit Composition

Verano and similar soils: 65 percent
Altezita and similar soils: 30 percent
Minor components: 5 percent

Component Descriptions

Verano soils

Landscape: Plateaus
Landform: Lower north-facing escarpments
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone and shale
Slope: 45 to 65 percent
Shape (down/across): Linear/linear
Surface fragments: About 10 percent subrounded gravel; about 20 percent subrounded cobbles; about 2 percent subrounded stones; about 1 percent subrounded stones
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 6.2 inches (moderate)
Shrink-swell potential: About 5.7 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, twoneedle pinyon, ponderosa pine, mountain muhly, Rocky Mountain juniper
Land capability subclass (nonirrigated): 7e

Typical Profile

Oi—0 to 1 inch; very stony slightly decomposed plant material
A1—1 inch to 4 inches; cobbly loam
A2—4 to 9 inches; cobbly sandy loam
E—9 to 13 inches; very cobbly fine sandy loam
Bt1—13 to 23 inches; very cobbly clay loam

Bt2—23 to 32 inches; very gravelly clay
Bt3—32 to 40 inches; very gravelly clay loam
BC—40 to 51 inches; clay loam
Cr—51 to 61 inches; cemented

Altezita soils

Landscape: Plateaus
Landform: Upper north-facing escarpments
Position on landform: Backslopes
Parent material: Colluvium derived from sandstone over residuum weathered from sandstone
Slope: 60 to 90 percent
Shape (down/across): Convex/linear
Surface fragments: About 2 percent subrounded stones; about 1 percent subrounded stones; about 20 percent subrounded cobbles; about 25 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.1 inches (very low)
Shrink-swell potential: About 4.1 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 9 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, mountain muhly, needlegrass
Land capability subclass (nonirrigated): 5s

Typical Profile

Oi—0 to 1 inch; very gravelly slightly decomposed plant material
A1—1 inch to 6 inches; very cobbly sandy loam
A2—6 to 14 inches; very cobbly sandy clay loam
BCk—14 to 18 inches; extremely cobbly sandy clay loam
R—18 to 28 inches; bedrock

Minor Components Composition

Rock outcrop*:* About 3 percent
Sabroso and similar soils*:* About 2 percent

707—Altezita-Esquila-Rock outcrop complex, 2 to 10 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,700 to 8,100 feet (2,042 to 2,469 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 45 to 47 degrees F (7.2 to 8.3 degrees C)
Frost-free period: 110 to 130 days

Map Unit Composition

Altezita and similar soils: 50 percent
Esquila and similar soils: 30 percent
Rock outcrop: 10 percent
Minor components: 4 percent

Component Descriptions

Altezita soils

Landscape: Plateaus
Landform: Higher areas plateaus
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone over residuum weathered from sandstone
Slope: 5 to 10 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent subrounded cobbles; about 2 percent subrounded gravel; about 1 percent subrounded stones
Depth class: Very shallow
Depth to restrictive feature: 1 to 10 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, mountain muhly, needlegrass
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; cobbly loam
Bw—2 to 7 inches; sandy loam
2R—7 to 17 inches; bedrock

Esquila soils

Landscape: Plateaus
Landform: Lower areas plateaus
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 2 to 5 percent
Shape (down/across): Concave/linear
Surface fragments: About 2 percent subrounded gravel; about 5 percent subrounded cobbles
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 5.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, mountain muhly
Land capability subclass (nonirrigated): 4s

Typical Profile

Oi—0 to 2 inches; slightly decomposed plant material
A1—2 to 3 inches; sandy loam
A2—3 to 7 inches; sandy loam
E—7 to 9 inches; loamy sand
Bt1—9 to 17 inches; clay
2Bt2—17 to 20 inches; very paragravelly clay
2R—20 to 30 inches; bedrock

Rock outcrop

Description: Rock outcrop consists of exposed sandstone bedrock. It occurs as gently sloping bedrock intermingled with the Altezita and Esquila soils.
Landscape: Plateaus
Landform: Lower areas plateaus
Parent material: Sandstone
Slope: 5 to 15 percent
Shape (down/across): Linear/linear

Minor Components Composition

Bernal and similar soils*:* About 3 percent
Margosa and similar soils*:* About 1 percent

708—Uva-Herrada complex, 3 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,200 to 8,000 feet (1,890 to 2,438 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Uva and similar soils: 50 percent
Herrada and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Uva soils

Landscape: Plateaus
Landform: Undulating plateaus
Position on landform: Shoulders, summits
Parent material: Eolian deposits derived from sandstone and shale over residuum weathered from sandstone
Slope: 3 to 15 percent
Shape (down/across): Convex/linear
Surface fragments: Less than 1 percent angular stones; about 10 percent angular gravel; about 10 percent cobbles
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 1.6 inches (very low)
Shrink-swell potential: About 2.0 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, blue grama, muttongrass
Land capability subclass (nonirrigated): 4e

Typical Profile

Oi—0 to 0 inch; cobbly slightly decomposed plant material
A—0 to 3 inches; cobbly loamy fine sand
Bt1—3 to 6 inches; sandy loam
Bt2—6 to 9 inches; paragravelly sandy loam
Btk/Crk—9 to 17 inches; sandy loam
R—17 to 27 inches; bedrock

Herrada soils

Landscape: Plateaus
Landform: Undulating plateaus
Position on landform: Footslopes
Parent material: Alluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 3 to 10 percent
Shape (down/across): Concave/linear
Surface fragments: About 5 percent angular gravel
Depth class: Very deep
Depth to restrictive feature: 79 to 98 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.5 inches (high)
Shrink-swell potential: About 4.3 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 3 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, ponderosa pine, Rocky Mountain juniper, twoneedle pinyon, Junegrass, blue grama
Land capability subclass (nonirrigated): 3c

Typical Profile

A—0 to 2 inches; loam
AB—2 to 4 inches; loam
BA—4 to 9 inches; loam
Bt1—9 to 22 inches; loam
Bt2—22 to 31 inches; clay loam
Bt3—31 to 43 inches; silty clay loam
Btk1—43 to 51 inches; loam
Btk2—51 to 69 inches; loam
2C—69 to 91 inches; silt loam
3R—91 to 101 inches; bedrock

Minor Components Composition

Estrada and similar soils*:* About 5 percent
Bernal and similar soils*:* About 3 percent
Rock outcrop*:* About 2 percent

709—Moriartche clay loam, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,600 to 7,300 feet (2,012 to 2,225 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Moriartche and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Moriartche soils

Landscape: Plateaus
Landform: Alluvial flats on valley floors
Parent material: Alluvium derived from shale
Slope: 0 to 3 percent
Shape (down/across): Concave/linear
Surface fragments: About 1 percent angular gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 9.5 inches (high)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: Medium
Calcium carbonate average in horizon of maximum accumulation: About 9 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Swale
Potential native vegetation: blue grama, western wheatgrass, fringed sagewort
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 1 inch; clay loam
BA—1 inch to 4 inches; clay loam
Bw—4 to 14 inches; clay
Bss1—14 to 27 inches; silty clay loam
Bss2—27 to 88 inches; silty clay

Minor Components Composition

Aliante and similar soils*:* About 5 percent
Altega and similar soils*:* About 4 percent
Water*:* About 1 percent

710—Predawn fine sandy loam, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 36
Elevation: 6,600 to 8,000 feet (2,012 to 2,438 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Predawn and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Predawn soils

Landscape: Plateaus
Landform: Eroded fan remnants
Position on landform: Summits
Parent material: Eolian deposits derived from sandstone and shale over alluvium derived from granite, gneiss, and schist
Slope: 1 to 4 percent
Shape (down/across): Linear/linear
Surface fragments: About 1 percent subrounded gravel
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.06 to 0.2 in/hr (slow)
Available water capacity: About 10.6 inches (high)
Shrink-swell potential: About 5.2 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 20 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: oneseed juniper, twoneedle pinyon, Rocky Mountain juniper, blue grama, muttongrass
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 1 inch; fine sandy loam
BA—1 inch to 3 inches; clay loam
Bt—3 to 16 inches; clay loam
Btk1—16 to 25 inches; clay loam
Btk2—25 to 33 inches; clay loam
2Bk—33 to 49 inches; clay loam
2Btk3—49 to 66 inches; clay loam
2Btk4—66 to 119 inches; loam

Minor Components Composition

Fangio and similar soils*:* About 5 percent
Herrada and similar soils*:* About 3 percent
Urraca and similar soils*:* About 2 percent

711—Fangio-Ortiz complex, 15 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,600 to 8,000 feet (2,012 to 2,438 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Fangio and similar soils: 50 percent
Ortiz and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Fangio soils

Landscape: Plateaus
Landform: Upper eroded fan remnants
Position on landform: Backslopes
Parent material: Alluvium and colluvium derived from granite, gneiss, and schist over residuum weathered from shale
Slope: 15 to 50 percent
Shape (down/across): Convex/convex
Surface fragments: Less than 1 percent rounded stones; about 30 percent rounded cobbles; about 35 percent rounded gravel
Depth class: Very deep
Depth to restrictive feature: 69 to 94 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 8.3 inches (moderate)
Shrink-swell potential: About 6.0 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 35 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Bouteloua gracilis-Bouteloua curtipendula
Potential native vegetation: oneseed juniper, twoneedle pinyon, black grama, sideoats grama, blue grama
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 4 inches; extremely cobbly loam
AB—4 to 8 inches; extremely cobbly loam
Btk1—8 to 12 inches; very cobbly loam
Btk2—12 to 20 inches; very cobbly clay loam
Btk3—20 to 28 inches; cobbly clay loam
BCk—28 to 36 inches; cobbly clay loam
2Ck—36 to 79 inches; clay loam
2Cr—79 to 89 inches; extremely paragravelly cemented

Ortiz soils

Landscape: Plateaus
Landform: Lower eroded fan remnants
Position on landform: Backslopes
Parent material: Alluvium derived from granite, gneiss, and schist over residuum weathered from shale
Slope: 15 to 40 percent
Shape (down/across): Concave/linear
Surface fragments: About 30 percent rounded cobbles; about 40 percent rounded gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 8.4 inches (moderate)
Shrink-swell potential: About 6.0 percent (high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 14 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Bouteloua gracilis-Bouteloua curtipendula
Potential native vegetation: oneseed juniper, twoneedle pinyon, blue grama, black grama, pricklypear
Land capability subclass (nonirrigated): 7s

Typical Profile

A—0 to 2 inches; extremely cobbly loam
Bt1—2 to 5 inches; clay
Bt2—5 to 10 inches; clay
Bt3—10 to 18 inches; gravelly clay
Btk—18 to 31 inches; gravelly clay loam
Bk—31 to 45 inches; gravelly clay loam
2Ck—45 to 57 inches; extremely paragravelly clay loam
2Cr1—57 to 67 inches; extremely paragravelly cemented silty clay loam
2Cr2—67 to 77 inches; cemented

Minor Components Composition

Cueva and similar soils*:* About 4 percent
Altega and similar soils*:* About 3 percent
Predawn and similar soils*:* About 2 percent
Rock outcrop*:* About 1 percent

712—Altega very fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,500 to 7,400 feet (1,981 to 2,256 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Altega and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Altega soils

Landscape: Plateaus
Landform: Fan aprons
Parent material: Slope alluvium derived from mixed sources
Slope: 3 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 2 percent rounded (shape or size unspecified)
Depth class: Very deep
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.6 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 4 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: twoneedle pinyon, blue grama, oneseed juniper, broom snakeweed, western wheatgrass
Land capability subclass (nonirrigated): 4c

Typical Profile

A—0 to 2 inches; loam
AB—2 to 11 inches; loam
Bt—11 to 27 inches; clay loam
Btk1—27 to 50 inches; silt loam
Btk2—50 to 98 inches; loam

Minor Components Composition

Moriartche and similar soils*:* About 5 percent
Ortiz and similar soils*:* About 2 percent
Cueva and similar soils*:* About 2 percent
Rock outcrop*:* About 1 percent

713—Lomapedro-Skyute complex, 2 to 10 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,200 to 8,500 feet (2,195 to 2,591 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 43 to 45 degrees F (6.1 to 7.2 degrees C)
Frost-free period: 100 to 120 days

Map Unit Composition

Lomapedro and similar soils: 60 percent
Skyute and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Lomapedro soils

Landscape: Foothills
Landform: Hills
Position on landform: Shoulders
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from shale
Slope: 2 to 8 percent
Shape (down/across): Linear/linear
Surface fragments: About 17 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 7.6 inches (moderate)
Shrink-swell potential: About 6.2 percent (high)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: oneseed juniper, ponderosa pine, Douglas fir, twoneedle pinyon, sedge
Land capability subclass (nonirrigated): 3c

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 4 inches; gravelly sandy loam
Bt1—4 to 7 inches; gravelly clay loam
Bt2—7 to 24 inches; clay
Btk—24 to 39 inches; silty clay loam
BCk—39 to 49 inches; extremely paragravelly clay loam
Cr—49 to 59 inches; cemented

Skyute soils

Landscape: Foothills
Landform: Hills
Position on landform: Summits
Parent material: Residuum weathered from sandstone and shale
Slope: 2 to 10 percent
Shape (down/across): Convex/linear
Surface fragments: About 5 percent subrounded cobbles; about 15 percent subrounded gravel
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 1.2 inches (very low)
Shrink-swell potential: About 2.7 percent (low)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, twoneedle pinyon, ponderosa pine, little bluestem, sedge
Land capability subclass (nonirrigated): 4s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; gravelly sandy loam
Bt1—3 to 6 inches; sandy loam
Bt2—6 to 9 inches; sandy clay loam
C—9 to 12 inches; gravelly sandy loam
R—12 to 22 inches; bedrock

Minor Components Composition

Rock outcrop*:* About 5 percent
Glorieta and similar soils*:* About 3 percent
Cueva and similar soils*:* About 2 percent

715—Lomapedro gravelly sandy clay loam, 25 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 7,000 to 8,400 feet (2,134 to 2,560 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 43 to 45 degrees F (6.1 to 7.2 degrees C)
Frost-free period: 100 to 120 days

Map Unit Composition

Lomapedro and similar soils: 90 percent
Minor components: 10 percent

Component Descriptions

Lomapedro soils

Landscape: Foothills
Landform: Hills
Position on landform: Backslopes
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from shale
Slope: 25 to 50 percent
Shape (down/across): Linear/linear
Surface fragments: About 25 percent subrounded gravel
Depth class: Deep
Depth to restrictive feature: 39 to 59 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 7.5 inches (moderate)
Shrink-swell potential: About 7.2 percent (high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 5 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: oneseed juniper, ponderosa pine, Douglas fir, twoneedle pinyon, sedge
Land capability subclass (nonirrigated): 6e

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 4 inches; gravelly sandy clay loam
Bt1—4 to 7 inches; sandy clay loam
Bt2—7 to 18 inches; very gravelly clay
Bt3—18 to 25 inches; clay
Bk—25 to 50 inches; paragravelly clay loam
Cr—50 to 60 inches; cemented

Minor Components Composition

Rock outcrop*:* About 5 percent
Skyute and similar soils*:* About 2 percent
Cueva and similar soils*:* About 2 percent
Glorieta and similar soils*:* About 1 percent

717—Glorieta-Ribera complex, 1 to 15 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,500 to 7,800 feet (1,981 to 2,377 meters)
Mean annual precipitation: 16 to 18 inches (406 to 457 millimeters)
Mean annual air temperature: 45 to 47 degrees F (7.2 to 8.3 degrees C)
Frost-free period: 110 to 130 days

Map Unit Composition

Glorieta and similar soils: 55 percent
Ribera and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Glorieta soils

Landscape: Foothills
Landform: Hills, scarps
Position on landform: Footslopes, toeslopes
Parent material: Slope alluvium derived from sandstone and shale
Slope: 5 to 15 percent
Shape (down/across): Concave/linear
Depth class: Very deep
Depth to restrictive feature: 79 to 98 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 8.0 inches (moderate)
Shrink-swell potential: About 6.8 percent (high)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 11 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 2 mmhos/cm (very slightly saline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (nonsodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: Gambel oak, twoneedle pinyon, Rocky Mountain juniper, blue grama, muttongrass, sideoats grama
Land capability subclass (nonirrigated): 3e

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A1—1 inch to 3 inches; sandy loam
A2—3 to 6 inches; sandy loam
Bt—6 to 14 inches; clay
Btk1—14 to 30 inches; clay
Btk2—30 to 50 inches; sandy clay
Btk3—50 to 85 inches; coarse sandy loam
Cr—85 to 94 inches; cemented

Ribera soils

Landscape: Foothills

Landform: Structural benches
Position on landform: Summits
Parent material: Slope alluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 1 to 8 percent
Shape (down/across): Convex/linear
Surface fragments: About 1 percent angular gravel
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to densic material; 20 to 39 inches to bedrock, paralithic
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 3.8 inches (low)
Shrink-swell potential: About 5.5 percent (moderate)
Runoff class: Low
Calcium carbonate average in horizon of maximum accumulation: None
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Juniperus monosperma-Pinus edulis/Bouteloua gracilis-Bouteloua curtipendula
Potential native vegetation: Gambel oak, twoneedle pinyon, oneseed juniper, sedge, true mountain mahogany, ponderosa pine
Land capability subclass (nonirrigated): 5s

Typical Profile

A1—0 to 1 inch; loamy fine sand
A2—1 inch to 8 inches; fine sandy loam
Bt1—8 to 13 inches; sandy clay loam
Bt2—13 to 23 inches; clay loam
Cd—23 to 26 inches; noncemented material
Cr—26 to 36 inches; cemented material

Minor Components Composition

Cueva and similar soils*:* About 4 percent
Rock outcrop*:* About 2 percent
Bernal and similar soils*:* About 2 percent
Estrada and similar soils*:* About 2 percent

718—Bernal-Cueva complex, 10 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 70A
Elevation: 6,100 to 7,900 feet (1,859 to 2,408 meters)
Mean annual precipitation: 14 to 16 inches (356 to 406 millimeters)
Mean annual air temperature: 46 to 48 degrees F (7.8 to 8.9 degrees C)
Frost-free period: 120 to 140 days

Map Unit Composition

Bernal and similar soils: 50 percent
Cueva and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Bernal soils

Landscape: Foothills
Landform: Hills
Position on landform: Shoulders
Parent material: Fine-loamy colluvium derived from sandstone and shale, slope alluvium derived from sandstone and shale over residuum weathered from sandstone
Slope: 10 to 25 percent
Shape (down/across): Convex/linear
Depth class: Shallow
Depth to restrictive feature: 10 to 20 inches to bedrock, lithic
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.7 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate average in horizon of maximum accumulation: About 14 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus edulis-Juniperus monosperma/Quercus gambelii/Bouteloua curtipendula-Poa fernaldiana
Potential native vegetation: Gambel oak, twoneedle pinyon, Rocky Mountain juniper, sedge
Land capability subclass (nonirrigated): 4s

Typical Profile

Oi—0 to 1 inch; slightly decomposed plant material
A—1 inch to 3 inches; loam
Bt1—3 to 12 inches; clay loam
Bt2—12 to 17 inches; clay loam
2R—17 to 27 inches; bedrock

Cueva soils

Landscape: Foothills
Landform: Hills

Position on landform: Backslopes
Parent material: Residuum weathered from shale
Slope: 20 to 50 percent
Shape (down/across): Linear/convex
Surface fragments: About 5 percent very angular flagstones; about 15 percent very angular channers
Depth class: Moderately deep
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Slowest permeability: 0.0 to 0.001 in/hr (impermeable)
Available water capacity: About 5.9 inches (low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: Very high
Calcium carbonate average in horizon of maximum accumulation: About 6 percent
Gypsum average in horizon of maximum accumulation: None
Salinity average in horizon of maximum accumulation: About 1 mmhos/cm (nonsaline)
Sodium adsorption ratio average in horizon of maximum accumulation: About 0 (slightly sodic)
Ecological site: Pinus ponderosa-Juniperus scopulorum/Quercus gambelii-Cercocarpus montanus/Poa fendleriana-Muhlenbergia montana
Potential native vegetation: Gambel oak, twoneedle pinyon, Douglas fir, Rocky Mountain juniper, sideoats grama
Land capability subclass (nonirrigated): 5s

Typical Profile

A—0 to 2 inches; channery loam
Bt1—2 to 6 inches; clay
Bt2—6 to 19 inches; clay loam
Btk—19 to 33 inches; clay loam
Cd—33 to 43 inches; noncemented material

Minor Components Composition

Badland*:* About 4 percent
Rock outcrop*:* About 3 percent
Glorieta and similar soils*:* About 2 percent
Ribera and similar soils*:* About 1 percent

W—Water

Map Unit Setting

Major Land Resource Area: 36

Map Unit Composition

Water: 100 percent
Minor components: None

Component Descriptions

Water

Landform: Lakes, rivers
Ponding hazard: Frequent
Seasonal high water table depth: About 0 to 5 inches

Use and Management of the Soils

For general and detailed information regarding the use and management of the map units in this survey, see the soil reports and report descriptions on the Web Soil Survey at http://websoilsurvey.nrcs.usda.gov. A soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information developed during a soil survey 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 recreational 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 a survey to locate sources of sand, 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 a soil survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. Only normal practices for the rated use are considered. Unusual modifications to the site or soil material are not considered in the ratings. Where soils have limitations, engineers and others may be able to modify soil features or adjust the plans for a structure to compensate for most of the limitations. Most of these modifications, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes. Capability classes are listed for each map unit in the section “Detailed Soil Map Units”.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. *(21)*

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry. Table 11 lists the capability subclasses and acreage of the survey area.

In class 1, there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

Table 11.—Acreage by Capability Class and Subclass

Capability class	Capability subclass	Acreage
Unclassified	---	11,280
2	w	314
2	c	311
3	e	1,890
3	c	8,723
4	e	18,930
4	w	8,549
4	s	38,444
4	c	111,370
5	s	7,012
5	c	432
6	e	22,142
6	s	33,086
6	c	433,219
7	e	87,590
7	s	59,244
7	c	686
8	---	45,739
8	e	1,780
8	s	11,325

Rangeland

Livestock grazing in northern New Mexico has a long tradition, with the Spanish introducing cattle to the area in the 1500's. Historically, grazing was done for subsistence. Today many small operations are run by Hispanic families to whom ranching is a way of life and a much needed form of supplemental income. Many of these families have been residents since before New Mexico became a territory in 1848. Their livelihood and traditional way of life is being threatened by the rapidly increasing value of real estate in Santa Fe County.

Approximately 59 percent of the land in Santa Fe County is currently rangeland, about 3.5 percent has been subdivided or converted into urban land. As the county has become more developed, there has been an increasing trend toward small acreage horse grazing. This is especially true for the southern part of the county.

Grazing was traditionally sheep and goats with some cattle. Currently, the area is grazed predominantly by cattle. There is still some sheep and goat grazing, horse grazing, and a few people graze alpacas and llamas.

The mountains, foothills, and the shortgrass steppe are the three major areas used for grazing. The mountains and parts of the foothills are primarily grazed in spring and summer while the shortgrass steppe tends to be grazed year round.

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, vegetation, and water.

Table 12 shows, for each soil that supports vegetation suitable for grazing, the ecological site; total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the headings in the table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the

soil developmental process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available on the internet at http://www.nrcs.usda.gov/technical/efotg or in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well-managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under rangeland composition, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook" which is available on the internet at http://www.glti.usda.gov or in local offices of the Natural Resources Conservation Service or

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, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Table 12.—Rangeland Productivity

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
100:				
Panky	Loamy	950	550	375
101:				
Zozobra	Gravelly	900	500	350
Jaconita	Gravelly	900	550	250
102:				
Khapo	Loamy	950	600	375
103:				
Zepol	Loamy	950	650	375
104:				
Chupe	Sandy	850	550	325
Riverwash	---	---	---	---
105:				
Dumps	---	---	---	---
106:				
Pits	---	---	---	---
107:				
Riverwash	---	---	---	---
108:				
Zia	Loamy	950	650	375
109:				
Tetilla	Loamy	875	620	350
110:				
Calabasas	Loamy	875	800	350
111:				
Khapo	Loamy	950	650	375
112:				
Riovista	Gravelly	900	625	350
113:				
Delvalle	Loamy	950	650	375
Urban land	---	---	---	---
114:				
Devargas	Loamy	950	550	375
Urban land	---	---	---	---
115:				
Panky	Loamy	950	550	375
Urban land	---	---	---	---

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
116:				
Arents	---	---	---	---
Urban land	---	---	---	---
Orthents	---	---	---	---
117:				
Agua Fria	Loamy	875	619	350
Paraje	Gravelly	1,000	800	400
118:				
Golondrina	Gravelly	900	350	250
Paraje	Gravelly	1,000	450	400
119:				
Vitrina	Gravelly	900	625	375
Haozous	Gravelly	900	600	375
120:				
Quarteles	Sandstone Hills	625	413	200
Rock outcrop	---	---	---	---
121:				
El Rancho	Loamy	950	650	375
122:				
Cuyamungue	---	1,200	600	100
Riverwash	---	---	---	---
123:				
Koshare	Sandy	850	550	325
124:				
Camelrock	Clayey Bottomland	3,200	2,250	1,250
125:				
Mirada	Marshy	1,800	1,400	1,000
Bosquecito	---	1,400	1,200	800
126:				
Walkibout	Limy	950	650	375
Innacutt	Deep Sand	900	600	275
127:				
Ojito	Sandy Slopes	1,305	630	315
Koshare	Sandy	850	550	325
Quarteles	Sandstone Hills	625	413	200
128:				
Koshare	Sandy	850	550	325
Urban land	---	---	---	---
129:				
El Rancho	Loamy	950	650	375
Urban land	---	---	---	---
130:				
Jaralosa	---	800	600	400

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
131:				
Jaconita	Gravelly	900	550	250
Xenmack	Gravelly	900	550	250
132:				
Depolvo	Sandy	850	550	325
Sueleros	Sandy	850	550	325
133:				
Chupe	Sandy	850	550	325
134:				
Bosquecito	---	1,400	1,200	800
135:				
Tsinat	Cinder	875	619	350
136:				
Churipa	Shallow	850	575	300
137:				
Medrano	Gravelly	1,000	625	350
138:				
Andanada	Gravelly	800	600	400
139:				
Ildefonso	Gravelly	950	675	400
Rock outcrop	---	---	---	---
Rubble land	---	---	---	---
140:				
Truehill	Gravelly	900	700	350
141:				
Truehill	Gravelly	900	700	350
Penistaja family	Loamy	950	650	375
Rock outcrop	---	---	---	---
142:				
Parida	Gravelly	900	625	350
143:				
Scogg	---	1,800	1,600	1,000
144:				
Los Alamos	Loamy	950	660	375
145:				
Romberg	Gravelly	1,000	800	600
200:				
Predawn	Loamy	950	600	375
201:				
Tanoan	---	800	600	400
Encantado	---	800	600	400

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
202:				
Alire	Loamy	950	500	375
203:				
Buckhorse	Loamy	850	588	325
Altazano	Gravelly	900	600	375
204:				
Altazano	Gravelly	900	600	375
205:				
Nazario	---	800	600	400
206:				
Encantado	---	800	600	400
207:				
Urban land	---	---	---	---
208:				
Alire	Loamy	950	500	375
Urban land	---	---	---	---
209:				
Dondiego	Loamy	950	650	375
Urban land	---	---	---	---
210:				
Urban land	---	---	---	---
Buckhorse	Loamy	850	588	325
Altazano	Gravelly	900	600	375
211:				
Tanoan	---	800	600	400
Encantado	---	800	600	400
Urban land	---	---	---	---
212:				
Junebee	Deep Sand	900	600	275
213:				
Levante	Sandy	850	550	325
Riverwash	---	---	---	---
214:				
Nazario	---	800	600	400
Urban land	---	---	---	---
215:				
Predawn	Loamy	950	600	375
Urban land	---	---	---	---
216:				
Dondiego	Loamy	950	650	375
217:				
Ohke	Gravelly	900	625	350

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
218:				
Pedregal	---	1,100	900	500
219:				
Ohke	Hills	900	600	375
220:				
Horcado	---	900	600	400
Nazario	---	800	600	400
221:				
Latierra	Gravelly	900	625	350
Lamesilla	Gravelly	900	638	375
Levante	Sandy	850	550	325
222:				
Sipapu	---	1,100	1,000	600
Yuzarra	---	1,100	1,000	600
Kachina	---	1,100	800	600
223:				
Kachina	---	1,100	700	500
224:				
Portillo	---	800	600	400
225:				
Encantado	---	1,000	800	600
Resolana	---	900	750	600
226:				
Crucitas	---	1,100	850	500
300:				
Arnor	---	1,200	1,000	700
301:				
Enmedio	---	1,100	900	700
Atalaya	---	1,100	800	700
Rock outcrop	---	---	---	---
302:				
Setonville	---	1,200	900	700
Antonchico	---	1,200	900	700
303:				
Fiesta	---	800	600	400
Morenda, inset fan	---	800	600	400
Morenda, flood plain	---	800	600	400
Espanola	---	800	600	400
304:				
Legate	---	800	600	400
Yohalem	---	800	600	400
Zarmand	---	800	600	400

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
305:				
Chimayo	Mountain Loam	1,400	1,000	700
Rock outcrop	---	---	---	---
Quapaw	Mountain Loam	1,400	1,000	700
306:				
Adellern	---	600	400	200
307:				
Urban land	---	---	---	---
Ustorthents	---	---	---	---
Ustarents	---	---	---	---
308:				
Enmedio	Hills	1,400	600	400
Zafarano	---	600	450	200
Rock outcrop	---	---	---	---
309:				
Lazaro, steep	---	800	700	400
Lazaro, rolling	---	800	500	400
310:				
Santa Fe	---	1,400	600	400
Rock outcrop	---	---	---	---
400:				
Canuela	---	900	700	500
Chiminet	---	1,000	600	400
Rock outcrop	---	---	---	---
Chiminet, thick surface	---	1,000	600	400
401:				
Rock outcrop	---	---	---	---
Abrojo	Hills	900	520	375
Chiminet	---	1,000	600	400
402:				
Navajita	---	1,200	900	500
Navajita, thick surface	---	1,200	900	500
403:				
Piojillo	---	1,400	1,200	800
404:				
Totavi	---	2,000	1,500	1,000
405:				
Espiritu	---	900	700	500
Pedregal	---	1,100	800	600
406:				
Rock outcrop	---	---	---	---
Zacaton	---	1,200	900	700
Chiminet	---	1,000	800	400
407:				
Rock outcrop	---	---	---	---
Chiminet	---	1,200	1,000	800

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
408:				
Adornado	---	1,000	750	500
409:				
Hackroy	---	1,200	900	600
Nyjack	---	1,200	950	600
Hackroy, thick surface	---	1,200	800	600
410:				
Chiminet	---	1,200	1,000	600
Canuela	---	900	700	500
Rock outcrop	---	---	---	---
Chiminet, thick surface	---	1,200	1,000	600
412:				
Canuela	---	900	700	500
Hackroy	---	1,400	1,000	800
413:				
Armenta	---	900	650	400
414:				
Metate	---	1,200	900	700
500:				
Sedillo	---	1,100	1,000	500
501:				
Truehill	---	900	700	350
502:				
Khapo	Loamy	950	450	375
503:				
Espinos	Gravelly	900	400	350
504:				
Sandoval	Shale Hills	660	455	250
Badland	---	---	---	---
505:				
Puertecito	Hills	900	700	375
Paraje	---	900	800	350
506:				
Ildefonso	Loamy	950	675	400
Sandoval	Shale Hills	660	455	250
507:				
Ildefonso	Loamy	950	650	375
508:				
Charalito	Gravelly	900	625	350
Riverwash	---	---	---	---
509:				
Puertecito	Hills	900	600	375
Wandurn	---	1,000	850	600
Rock outcrop	---	---	---	---

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
510:				
Cerrillos	Loamy	950	800	375
Sedillo	Gravelly	900	500	350
511:				
Wandurn	---	1,000	800	700
Alchonzo	---	600	400	200
Rubble land	---	---	---	---
512:				
Cochiti	---	900	700	500
513:				
Pedregal	---	1,100	700	600
514:				
Pegasus	---	1,000	700	500
515:				
Pastorius	---	800	600	400
516:				
Cerrillos	Loamy	950	500	375
517:				
Puertecito	Hills	900	638	375
518:				
Rock outcrop	---	---	---	---
Skyvillage	Shallow Sandstone	625	300	300
519:				
Cumacho	Loamy	950	375	375
520:				
Cielito	Limy	950	525	375
Netoma	Sandy	700	200	200
Tanbark	Gyp Hills	475	400	200
521:				
Devargas	Loamy	950	525	375
Riovista	Gravelly	900	625	350
Riverwash	---	---	---	---
522:				
Penistaja family	Loamy	950	400	375
523:				
Kech	Shallow Sandstone	700	580	275
Cerropelon	Sandstone Hills	625	500	200
Rock outcrop	---	---	---	---
524:				
Zia	Loamy	950	650	375
Gullied land	---	---	---	---
525:				
Hagerman	Loamy	950	500	300
Cabreros	Hills	900	625	375

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
526:				
Penistaja family	Loamy	950	800	375
Truehill	Gravelly	900	800	350
527:				
Musofare	Shallow Sandstone	700	500	275
Asparas	Cinder	875	600	350
528:				
Penistaja family	Loamy	950	400	375
530:				
Jaralosa	---	800	600	400
Chupe	Sandy	850	550	325
Riverwash	---	---	---	---
531:				
Sena	Salt Flats	1,500	1,025	550
532:				
Galisteo	Salt Flats	1,500	1,025	550
534:				
Oelop	Loamy	1,500	950	375
Charalito	Gravelly	900	625	350
550:				
Pits, mine	---	---	---	---
600:				
Hyer	Loamy	1,500	520	400
Witt	Loamy	1,500	550	400
601:				
Harvey	Limy	950	510	375
602:				
Palma	Sandy	900	600	275
603:				
Lazarus	Loamy	1,500	950	400
604:				
Desario	---	700	500	400
Espadon	---	800	600	400
605:				
Lazarus	Loamy	1,500	950	400
Manzano	Bottomland	4,000	2,900	1,800
606:				
Nala	Limy	1,500	950	400
Pastura	Loamy	1,500	1,100	400
607:				
Davishat	Deep Sand	2,100	1,175	250
Palma	Sandy	900	600	275

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
608:				
Davishat	Deep Sand	2,100	1,175	250
610:				
Arojomil	Loamy	1,500	950	400
Tapia	Loamy	1,500	550	400
611:				
Spyglass	Gyp Upland	750	525	300
612:				
Trofes	Gyp Upland	750	525	300
613:				
Kinsell	Loamy	1,500	700	400
614:				
Tamarindo	Loamy	1,500	950	400
615:				
Kwahe	Swale	1,500	900	700
Stanley	Salty Bottomland	1,550	820	600
616:				
Triane	Bottomland	3,000	2,500	1,800
617:				
Ranchos	Loamy	1,500	600	400
618:				
Davishat	Loamy	1,500	650	400
Chupadera	Loamy	1,500	800	400
619:				
Villario	Shallow	1,000	650	300
Puertecito	Hills	1,400	900	400
621:				
Kech	Shallow	1,000	900	300
Horchata	Loamy	1,500	1,100	400
622:				
Arojomil	Loamy	1,500	950	400
623:				
Clovis	Loamy	1,500	550	400
624:				
Clovis	Loamy	1,500	750	400
625:				
Raydawn	Gravelly	750	525	300
626:				
Horchata	Loamy	1,500	950	400
627:				
Palabria	Loamy	1,500	1,350	400
Frajillo	Shallow Plains	1,500	1,000	700

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
628:				
Nala	Limy	1,500	950	400
629:				
Frajillo	Shallow Plains	1,500	1,000	700
Chilerojo	Loamy	1,500	950	400
630:				
Tamarindo	Loamy	1,500	950	400
632:				
Travessilla	Shallow Plains	1,500	1,000	700
Raydawn	Deep Sand	2,100	1,175	250
Sandoval	Shale Hills	660	455	250
Rock outcrop	---	---	---	---
700:				
Aliante	Loamy Upland	1,700	1,650	400
Altega	Loamy Upland	1,500	1,000	400
701:				
Sabroso	---	1,300	900	600
Verano	---	1,100	800	500
702:				
Estrada	Loamy Upland	1,700	1,650	400
Chacuaco	Loamy Upland	1,500	950	400
703:				
Estrada	Loamy Upland	1,500	950	400
704:				
Aliante	Loamy Upland	1,700	1,650	400
705:				
Margosa	---	1,200	1,000	600
Condesa	---	1,200	900	600
706:				
Verano	---	1,000	800	500
Altezita	---	1,300	900	600
707:				
Altezita	---	1,300	1,000	600
Esquila	---	1,300	1,000	800
Rock outcrop	---	---	---	---
708:				
Uva	---	2,000	1,500	1,000
Herrada	---	2,000	1,500	1,000
709:				
Moriartche	Swale	2,500	1,800	1,100
710:				
Predawn	---	2,000	1,500	1,000

Table 12.—Rangeland Productivity—Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
711:				
Fangio	---	700	400	300
Ortiz	---	1,600	1,200	800
712:				
Altega	---	1,200	800	500
713:				
Lomapedro	---	1,300	1,100	800
Skyute	---	1,600	1,400	1,000
715:				
Lomapedro	---	1,300	1,100	800
717:				
Glorieta	---	1,600	1,200	800
Ribera	---	1,800	1,500	1,000
718:				
Bernal	---	1,800	1,500	1,000
Cueva	---	1,600	1,200	800
W:				
Water	---	---	---	---

Classification of the Soils

This section describes the system of soil classification. The classification of each soil in the survey area is shown in the table “Classification of the Soils.” The Official Soil Series Descriptions, including the range of important characteristics of the soils, for the series in this survey area are available online at http://soils.usda.gov/technical/classification/osd. Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, which is typical of the series is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual.” *(17)* Many of the technical terms used in the descriptions are defined in “Soil Taxonomy.” *(20)*

The system of soil classification used by the National Cooperative Soil Survey has six categories. (19, 20) 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. The categories are described in the following paragraphs.

ORDER. Twelve soil orders are recognized. Five of the orders occur in this survey area. 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 “sols”. An example is Alfisol. Alfisols, Aridisols, Entisols, Inceptisols, and Mollisols occur in this survey area.

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 Ustoll (“Ust” meaning an ustic moisture regime and “oll” from Mollisol indicating a mollic epipedon high in base saturation.)

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argiustolls (“Argi” meaning presence of an argillic horizon and “ustoll”, the suborder of mollisols in an ustic moisture regime.)

SUBGROUP. Each great group has a “typic” subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The subgroup “Pachic” identifies the extragrade that indicates an over thickened mollic epipedon.) An example is Pachic Argiustolls

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is Fine-loamy, mixed, superactive, mesic Pachic Argiustolls.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example of a soil series with the taxonomic classification is the Dondiego series.

Soil Series

Abrojo Series
Adellern Series
Adornado Series
Agua Fria Series
Alchonzo Series
Aliante Series
Alire Series
Altazano Series
Altega Series
Altezita Series
Andanada Series
Antonchico Series
Armenta Series
Arnor Series
Arojomil Series
Asparas Taxadjunct *
Atalaya Series
Bernal Series
Bosquecito Series
Buckhorse Series
Cabreros Series
Camelrock Series
Canuela Series
Cerrillos Series
Cerropelon Series
Chacuaco Series
Charalito Series
Chilerojo Series
Chimayo Series
Chiminet Series
Chupadera Series
Chupe Series
Churipa Series
Cielito Series
Clovis Series
Cochiti Series
Condesa Series
Crucitas Series
Cueva Series
Cumacho Series
Cuyamungue Series
Davishat Series
Delvalle Series
Depolvo Series
Desario Series
Devargas Series
Dondiego Series
El Rancho Series
Encantado Series
Enmedio Series
Espanola Series
Espinos Series
Esquila Series
Estrada Series
Fangio Series
Fiesta Series
Frajillo Series
Glorieta Series
Golondrina Series
Hagerman Series

Haozous Series
Harvey Series
Herrada Series
Horcado Series
Horchata Series
Hyer Series
Ildefonso Series
Innacutt Series
Jaconita Series
Junebee Series
Kachina Series
Kech Series
Khapo Series
Kinsell Series
Koshare Series
Kwahe Series
Lamesilla Series
Latierra Series
Lazaro Series
Lazarus Series
Legate Series
Levante Series
Lomapedro Series
Los Alamos Series
Manzano Series
Margosa Series
Medrano Series
Metate Series
Mirada Series
Morenda Series
Moriartche Series
Musofare Series
Nala Series
Navajita Series
Nazario Series
Netoma Series
Nyjack Series
Oelop Series
Ohke Series
Ojito Series
Ortiz Series
Palma Series
Paraje Series
Parida Series
Pastorius Series
Pastura Taxadjunct *
Pedregal Series
Pegasus Series
Penistaja Series
Piojillo Series
Portillo Series
Predawn Series
Puertecito Series
Quapaw Series
Quarteles Series
Ranchos Series
Raydawn Series
Resolana Series
Ribera Series
Riovista Series
Romberg Series
Sabroso Series
Sandoval Series
Santa Fe Series
Scogg Series
Sedillo Series
Sena Series
Sipapu Series
Skyute Series
Skyvillage Series
Spyglass Series
Stanley Series

Sueleros Series
Tamarindo Series
Tanbark Series
Tanoan Series
Tapia Series
Tetilla Series
Totavi Series
Travessilla Series
Triane Series
Truehill Series
Tsinat Series
Uva Series
Verano Series
Villario Series
Walkibout Series
Wandurn Series
Witt Series
Xenmack Series
Yohalem Series
Yuzarra Series
Zacaton Series
Zafarano Series
Zarmand Series
Zepol Series
Zia Series
Zozobra Series

Taxadjuncts

A taxadjunct is a soil (map unit component) that is correlated (named) as a recognized, existing soil series for the purpose of expediency. Taxadjuncts use a soil series name as a reference name but the soils have one or more differentiating characteristics that are outside the taxonomic class limits of the family or higher category for the named soil series. These properties in the aggregate, give responses to use and management similar to those of the named soil series

Asparas: This soil is a taxadjunct to the series because it has a fine particle-size class. The taxonomic class is Fine, mixed, superactive, mesic Calcidic Argiustolls.

Pastura: This soil is a taxadjunct to the series because it has a loamy-skeletal particle-size class. The taxonomic class is Loamy-skeletal, carbonatic, mesic, shallow Calcic Petrocalcids.

Formation of the Soils

This section defines soil, describes the factors of soil formation, and relates them to the formation of the soils in the survey area.

Factors of Soil Formation

Soil is a dynamic medium forming a living shell of varying thickness over the rocky crust of the Earth. Soil, as used in this publication, is a natural body or a collection of natural bodies on the earth's surface, containing living matter and supporting or capable of supporting plant life. Its upper limit is air or shallow water. At its margins it grades to deep water or to barren areas of rock. Soil grades at its lower limit to bedrock or to earthy materials virtually devoid of roots, animals, or marks of other biologic activity. *(18,20)*

Soil is the result of the interaction of five soil forming factors. *(3,13)* These factors determine the unique properties and characteristics of a soil at any given location. The five soil forming factors are: (1) the type and mineralogical composition of the *parent material*; (2) the *living organisms* on and in the soil; (3) the *topography* or relief features of a landscape; (4) the different *climates* that the soil has been exposed to; and (5) the length of *time* these development forces have acted upon the soil. The interrelationship of these factors is very complex and it is difficult to isolate the effects of any one factor. The effect of the factors also varies from place to place, but the interaction of the factors ultimately determines the kind of soil that forms. The term "pedogenesis" (soil genesis) is often used to connote the process of soil formation.

Parent Material

Parent material is the unconsolidated organic and mineral matter in which soil forms. Parent materials influence or wholly determine the color, texture, mineralogy, structure, consistency, reaction, erodibility, and natural fertility of soil.

Most mineral matter is ultimately derived from some type of rock. The survey area has landscapes that in some areas are dominated by exposed bedrock. The vast majority of the bedrock types present in this survey area are igneous rocks and sedimentary rocks. There are some areas in the east central part of the survey area that have appreciable amounts of metamorphic rocks. These rock layers are grouped together into mapable units called formations. Physical and chemical weathering of rocks in these exposed geologic formations, accompanied by natural erosion, provides an abundant source of loose rock debris for the parent materials of soils.

Since the parent materials derived from particular geologic formations have specific characteristics, the soils that form in them tend to also have specific characteristics that are related to or derived from these materials. Certain properties such as mineralogy and soil color are strongly influenced by the initial nature of the parent materials. Such properties are especially evident in dry regions where the rate of chemical alteration of most minerals is slow because of the lack of abundant soil moisture.

The soils in the survey area are formed in several types of parent material. Some soils have formed in only one type of material, while many others have formed in a combination of several types. The parent materials present are alluvium, residuum, colluvium, lacustrine, and eolian material. Each of these materials are discussed in the following paragraphs.

Alluvium is sediment that has been moved by running water. It may have been moved many miles or only a few feet. If it has only moved a few feet, we will usually modify the term to *slope alluvium.* In this survey area, it commonly is derived from bedrock such as tuff, sandstone, shale, limestone, or basalt, but it may also be derived from existing soils which are undergoing accelerated erosion.

Common landforms in this survey area where alluvium is a dominant parent material are flood plains, alluvial fans, and stream terraces. The high stream terraces in the northwest part of the survey area are a distinctive feature denoting much older age. The same is true for many of the eroded fan remnants in the central part of the survey area. Some soils, especially in the northern part of the survey area are forming in young, relatively unaltered Holocene alluvium and therefore have minimally developed diagnostic subsurface horizons.

Alluvial deposits are typically stratified because of the fluctuating nature of the processes involving erosion, transportation, and deposition of sediments. This inherent stratification is clearly evident in very young alluvial deposits, but is less evident where pedogenesis has altered or obscured the deposits. Differences in particle or grain sizes because of stratification play an important role in the diagnostic horizons that may form in a soil. For example, calcic horizons in soils commonly form over or within layers having distinct differences in grain size. This effect is because of the change in the size of the pores from one strata or layer to the next, which affects water flow. These different layers slow the movement of soil water and allow compounds such as calcium carbonate held in suspension to be withdrawn into large soil pores where they accumulate over time.

Residuum is material formed in place by the physical and chemical weathering of bedrock. Common landform positions in this survey where residuum contributes to the soil material are summits of mesas, plateaus, and structural benches.

Colluvium is material that has been moved down steep slopes by mass wasting processes. It is composed of material that has rolled, slid, or fallen down slope because of the influence of gravity. The size fractions of particles in most colluvial deposits are large and the material is unsorted. The rock fragments in colluvium are usually angular, except where the fragments are derived from rock formations or unconsolidated deposits that have preexisting, rounded fragments. Most often, colluvium is an important soil parent material on backslopes.

Lacustrine is material that has formed in lake or playa water and exposed when the water level is lowered or the elevation of the land is raised. This occurs mostly in playas in the southeast part of the survey area.

Eolian material is sediment that has been transported by wind. Thick eolian deposits are commonly composed of sand and silt sized particles, but may also be composed of aggregated clay-size particles. Eolian materials are sorted through transport where finer materials such as silt and very fine sand may move many miles from the source but coarser materials such as fine or medium sand will be deposited much closer to the source. Calcium carbonate and other chemical compounds such as sodium sulfate are also moved and redeposited by wind in the form of dust. *(9,22)* Such atmospheric additions of dry clay and fine silt-size particles have a significant cumulative effect over a long period of time, especially on stable landform positions. Labile calcium released by calcareous dust into the soil water may combine with the sulfate anion present in saline soils to form accumulations of secondary gypsum.

Living Organisms

Plant, animal, and microbial life affect many soil processes such as the physical and chemical weathering of bedrock and parent material, the rates of organic matter decomposition and biochemical transformation, and plant nutrient cycling. Plant roots grow into bedrock and parent material, breaking it loose into individual particles and exert strong pressures to force open joints in rock and unconsolidated materials,

making them more porous. Organic matter is incorporated into the soil solum through root growth and death and also provides an organic mulch at the soil surface by plant litter. In ecosystems with poor soil nutrition or low available moisture, plants can cycle nutrients from great depths or pull water from relatively dry materials in the soil, making them available to other plants and animals.

Animals have an impact on soil formation. Creatures such as ants, earthworms, cicada larvae, mice, moles, prairie dogs, and badgers live and burrow in the soil. Their activities mix layers and concentrate soil particles, while also increasing porosity, permeability, and recycling plant matter and nutrients. Certain soil bacteria participate symbiotically with plants in the basic enzymatic transformations of nitrification, and nitrogen fixation and are responsible for reduction and oxidation processes that induce sulfur oxidation, iron mobilization, and many other biochemical and geochemical transformations in the soil. *(5)* Actinomycetes are bacteria-like fungi that are of great importance in the decomposition of soil organic matter and are also partly responsible for the aroma of fresh soil. Certain species of fungi may aid or speed the accumulation of calcium carbonate within desert soils. *(13)*

Field research by ecologists is revealing the importance that algae and spore producing plants play in the health and stability of fragile soils in dry regions. Cryptogamic soil crusts form on and directly under the soil surface when symbiotic communities of algae, fungi, mosses, and lichens flourish. These crusts are characteristically dark and lumpy and can become well developed on sandy, saline, or gypsiferous soils which lack gravel lags or desert pavements. Cryptogamic crusts are important because they provide surface aggregation that stabilizes and protects otherwise sparsely vegetated soils from the hazards of water erosion and soil blowing. (2,6) Other benefits which cryptogam crusts provide is adding organic matter, fixing atmospheric nitrogen, increasing water infiltration, and protecting moisture within the upper inch of soil. *(7)*

Humans alter the soil by building structures, manipulating rangeland plants for livestock, harvesting or chaining trees, and by leveling, tilling, planting, and irrigating for crop production. All of these activities can cause serious soil erosion and ecosystem degradation if land users are not careful and do not practice good soil conservation techniques.

Topography

Topography has an important influence on soil formation, due both to slope gradient and aspect. Slope gradient determines the rate of surface runoff and the hazard of soil erosion by water as well as the internal drainage of soils. The Quarteles soil has a high rate of surface runoff and a severe hazard of water erosion because of steep slopes, resulting in only minimal soil development. By contrast, the well-developed Panky soil has a slow rate of surface runoff and only a slight hazard of water erosion because these soils are on more gentle slopes.

The aspect, or geographic direction a slope faces, can also affect soil formation. In the northern hemisphere, steep north-facing slopes have cooler, more moderate temperatures and more effective soil moisture than steep south-facing slopes.

Topography affects the micro-climatic factors of soils in areas of deeply entrenched canyons. The phenomenon of nighttime cold air drainage into canyons effectively lengthens the frost-free period of soils on adjacent uplands, while shortening the period for the soils on the canyon floors.

Climate

Climate plays an important role in the formation of soils. Climate is a dynamic factor that fluctuates diurnally, monthly and yearly in the mid-latitudes in response to the seasons. It has also undergone significant global changes over the long span of

geologic time. A change in climate alters the balance of other soil forming factors, and soils often display morphologic features that formed under the influence of past climates. Many soils in dry regions which have argillic horizons overlying well developed calcic horizons probably display the effects of former climates. The early Holocene epoch was a time of continent-wide climatic change where increasingly arid conditions, especially in the western parts of the United States, caused additions of calcium carbonate to engulf the argillic horizons of many soils. *(9)*

A wide range of soil temperature and moisture regimes exist within this survey area. Soil temperature regimes in the survey area range from mesic at low and middle elevations to frigid on the highest elevations. Temperature affects the rate of biological activity, the rate of decomposition of organic matter, and the rate of certain chemical reactions. Within these temperature regimes, rates of many processes can effectively double for every 10 degree C. rise in temperature. *(5)*

Regional and local weather patterns determine when, what types, and in what amounts precipitation will fall. The survey area has a distinct bi-seasonal pattern of precipitation with significant amounts of moisture coming in winter and summer. Soils at the higher elevations receive much more winter precipitation than those at lower elevations. Moisture coming in the winter in the form of snow and gentle rain avoid high rates of evaporation and can penetrate deeply into soil profiles; consequently, higher elevation soils undergo greater degrees of leaching. Spring months are normally dry and windy with little rainfall. The strong spring winds intensify the dry climate and deplete soil moisture through high evaporation rates. Moisture coming in summer when evapotranspiration rates are high, penetrates to only very shallow depths. Summer moisture typically comes as heavy rainfall from high-intensity thunderstorms of short duration. These summer monsoon storms, occurring between July and September, are isolated in extent and undependable in occurrence. Much of the moisture that falls from such high intensity storms runs off the soil surfaces and is unavailable for plant growth.

Soil moisture affects the types of native vegetation present, the rate of biologic activity, the rate of leaching of chemical compounds, and the degree of illuviation of soil colloids. Within certain limits, increasing amounts of soil moisture will result in greater soil development by increasing the amounts and rates of processes acting upon the soil.

Time

The length of time that parent materials have been exposed to the effects of climate and living organisms is an important factor in soil development. Soil age is the measure of this length of time and is important in identifying soil properties and characteristics. In general, the longer duration of time that a soil has been forming, the stronger degree of expression its diagnostic horizons will have.

The development of carbonate (Bk) horizons of pedogenic origin is a common occurrence in the survey area and is closely related to soil age. *(9,22)* The formation of Bk horizons can be divided into several identifiable and differentiable stages of maturity of which qualitative and sometimes quantitative age distinctions can be made between soils. This is often a useful and important tool in identifying landform types and positions.

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" which is available on the internet at http://soils.usda.gov/technical or in local offices of the Natural Resources Conservation Service.

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.

Alluvial fan. A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect. The direction toward which a slope faces. Also called slope aspect.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hill slope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A flood plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology). A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle-size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. An informal term loosely applied to various portions of a flood plain.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

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 general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be

supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canyon. A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Cement rock. Clayey limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

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.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are compounds making up concretions. See Redoximorphic features.

Conglomerate. A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

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.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cutbanks cave (in tables)**.** The walls of excavations tend to cave in or slough.

Dactite. A fine-grained extrusive rock with the same general composition as andesite but having less calcic plagioclase and more quartz. *(1)*

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables)**.** A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

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 wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained*, and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw. A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Earthy fill. See Mine spoil.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (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 pavement. A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface. A land surface shaped by the action of erosion, especially by running water.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fanglomerate. A sedimentary rock consisting of waterworn, fragments of various sizes, deposited in an alluvial fan, and later cemented into a firm rock. *(1)*

Fan remnant. A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. An obsolete, informal term loosely applied to the lowest flood plain steps that are subject to regular flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Foothills. A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope. The concave surface at the base of a hill slope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microlows (microbasins) and microhighs (microknolls) in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Gneiss. A foliated rock formed by regional metamorphism, in which bands or lenticles of granular minerals alternate with bands or lenticles in which minerals having flaky or elongate prismatic habits predominate. *(1)*

Granite. A plutonic rock in which quartz constitutes 10 to 50 percent of the felsic components and in which the alkali feldspars/total feldspars ratio is generally restricted to the range of 65 to 90 percent. *(1)*

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables)**.** Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hill slope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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 capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. See Redoximorphic features.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K-sat. Saturated hydraulic conductivity. (See Permeability.)

Lapilli. Pyroclastic materials that may be either essential, accessory, or accidental in origin, of a size range that has been variously defined within the limits of 2 and 64 mm. The fragments may be either solidified or still viscous when they land; thus, there is no characteristic shape. *(1)*

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables)**.** Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Latite. A porphyritic extrusive rock having pheoncrysts of plagioclase and potassium feldspar in nearly equal amounts. *(1)*

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. See Redoximorphic features.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

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. A kind of map unit that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Monzonite. A group of plutonic rocks intermediate in composition between syenite and diorite, containing approximately equal amounts of alkali feldspar and plagioclase, little or no quartz and commonly augite as the main mafic mineral. *(1)*

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common*, and *many; size—fine, medium*, and *coarse*; and *contrast—faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch)*; medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch)*;* and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

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.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three-dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 000.0015 inch
Very slow	000.0015 to 000.06 inch
Slow	000.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables)**.** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables)**.** Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology). A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Pumice. Highly vesicular pyroclasts with very low bulk density and thin vesicle walls. *(1)*

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   a. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; and
   b. Masses, which are noncemented concentrations of substances within the soil matrix; and
   c. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.

2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   a. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; and
   b. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rhyolite. A group of igneous rocks, typically porphyritic and commonly exhibiting flow texture, with phenocrysts of quartz and alkali feldspar in a glassy to cryptocrystalline groundmass. *(1)*

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser. The vertical or steep side slope (e.g., escarpment) of terraces, flood plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called 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-sized particles.

Saturated hydraulic conductivity (K-sat). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Schist. A strongly foliated crystalline rock, formed by dynamic metamorphism, that can be readily split into thin flakes or slabs because of the well-developed parallelism of more than 50 percent of the minerals present, particularly those of lamellar or elongate prismatic habit. *(1)*

Scoria. A bomb-size pyroclast that is irregular in formation and generally very vesicular. *(1)*

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hill slope. A shoulder is a transition from summit to backslope.

Shrink-swell (in tables)**.** The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level.....0 to 1 percent
Very gently sloping.....1 to 3 percent
Gently sloping .....3 to 5 percent
Moderately sloping.....5 to 8 percent
Strongly sloping.....8 to 12 percent
Moderately steep .....12 to 20 percent
Steep .....20 to 45 percent
Very steep ..... 45 percent and higher

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished

peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill (in tables)**.** The slow filling of ponds, resulting from restricted permeability in the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na+ to Ca ++ + Mg++. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Strath terrace. An extensive remnant of a strath (a flat valley bottom) that belonged to a former erosion cycle before rejuvenation of the stream following uplift, change in base level, or climate change. *(1)*

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

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).

Substratum. See Underlying material.
Subsurface layer. Any surface soil horizon (A, E, A2, A3, A4) below the surface layer.
Summit. The topographically highest position of a hill slope. It has a nearly level (planar or only slightly convex) surface.
Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."
Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.
Talus. Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.
Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.
Terrace (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.
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 that is 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.
Toeslope. The gently inclined surface at the base of a hill slope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hill slope continuum that grades to valley or closed-depression floors.
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.
Toreva block. A slump block consisting essentially of a single large mass of unjostled material which, during decent, has undergone a backward rotation toward the parent cliff about a horizontal axis that roughly parallels it. *(1)*
Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.
Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hill slope continuum.
Underlying material. The part of the soil below the solum.
Valley fill. The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

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LOCATION OJITO NM

Established Series
Rev. CDH/JVC/WWJ
01/2008

OJITO SERIES

The Ojito series consists of somewhat excessively drained soils that are moderately deep to interbedded sandstone and siltstone bedrock. Ojito soils formed in eolian material, slope alluvium, and residuum derived from micaceous sandstone and siltstone. Ojito soils are on beveled summits, shoulders, and footslopes of ridges and hills. Slopes are 5 to 25 percent. Mean annual precipitation is about 11 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Ustic Haplocambids

TYPICAL PEDON: Ojito loamy very fine sand--on a shoulder of a ridge sloping 16 percent to the west at 6,020 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was slightly moist from 4 to 10 inches and otherwise dry throughout.)

A--0 to 3 inches; brown (7.5YR 5/3) loamy very fine sand, brown (7.5YR 4/3) moist; moderate very thick platy structure parting to moderate coarse granular; soft, very friable, slightly sticky and nonplastic; few coarse, few fine, and many very fine roots; few very fine irregularly shaped pores; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary. (2 to 4 inches thick)

Bk1--3 to 10 inches; light brown (7.5YR 6/3) loamy very fine sand, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few coarse, few medium, few fine, and common very fine roots; few fine and few very fine tubular pores; 2 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 12 inches thick)

Bk2--10 to 18 inches; light brown (7.5YR 6/4) loamy very fine sand, brown (7.5YR 4/4) moist; moderate coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few coarse, few medium, few fine, and common very fine roots; few fine and few very fine tubular pores; 2 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments; moderately alkaline (pH 8.0); clear wavy boundary. (6 to 13 inches thick)

2BCk1--18 to 25 inches; light brown (7.5YR 6/4) very fine sandy loam, brown (7.5YR 4/4) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few coarse, few medium, few fine, and common very fine roots; few fine and few very fine irregularly shaped pores; 10 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments; moderately alkaline (pH 8.2); abrupt wavy boundary. (5 to 12 inches thick)

3BCk2--25 to 35 inches; light brown (7.5YR 6/3) and pinkish gray (7.5YR 7/2) very paragravelly very fine sand, brown (7.5YR 5/4) and light brown (7.5YR 6/4) moist; massive, platy rock structure; slightly hard, friable, nonsticky and nonplastic; few medium, few fine, and few very fine roots; few very fine irregularly shaped pores; 50 percent sandstone paragravel; slightly and strongly effervescent, secondary calcium carbonate segregated as few fine and medium irregularly shaped coats on pararock fragments; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 10 inches thick)

3Cr--35 to 45 inches; interbedded weakly cemented micaceous sandstone and siltstone bedrock.

TYPE LOCATION: Santa Fe County, New Mexico; on the Pojoaque Indian Reservation about 2 miles northeast of Pojoaque; 500 feet north and 4,600 feet east of the southwest corner of section 32, T.20N., R.9E.; USGS Espanola 7.5 minute topographic quadrangle; Latitude 35 degrees 54 minutes 54 seconds North and Longitude 106 degrees 0 minutes 8 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is intermittently moist in some part from July to October and December to March. The soils are driest in May and June. The soil moisture regime is aridic bordering on ustic.

Mean annual soil temperature - 52 to 54 degrees F.
Depth to paralithic contact - 20 to 40 inches
Depth to base of cambic horizon - 15 to 29 inches
Volcanic glass content: 5 to 15 percent in the coarse silt plus sand fraction
Lithology of rock fragments: sandstone

Reaction - slightly alkaline in the surface; moderately alkaline in the subsoil and substratum

Salinity, mmhos/cm - 0 to 4

Sodicity, SAR - 0 to 13

Particle-size control section (weighted averages)
Silicate clay content: 2 to 12 percent
Sand content: 60 to 90 percent
Fine sand or coarser content: 20 to 35 percent

Rock fragment content: 5 to 10 percent gravel
Mica content: 1 to 5 percent (by grain count)

A horizon
Value: 5 or 6 dry
Chroma: 3 or 4, dry or moist
Rock fragments: 0 to 10 percent gravel

Bk horizons
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: loamy very fine sand or fine sandy loam
Rock fragments: 5 to 10 percent gravel
Calcium carbonate equivalent: 1 to 5 percent

2BCk horizon
Value: 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: very fine sandy loam, loamy very fine sand, or very fine sand
Rock fragments: 5 to 10 percent gravel
Calcium carbonate equivalent: 1 to 5 percent
Other features: some pedons contain 5 to 10 percent paragravel

3BCk horizons
Value: 5 through 7 dry, 4 through 6 moist
Chroma: 2 through 4, dry or moist
Texture: very fine sand, loamy very fine sand, or very fine sandy loam; some pedons have strata or thin subhorizons of gravelly coarse sand or gravelly loamy sand
Rock fragments: 0 to 10 percent gravel
Pararock fragments: 10 to 50 percent weakly cemented sandstone or siltstone paragravel, some of which will slake in water
Calcium carbonate equivalent: 1 to 5 percent

COMPETING SERIES: These are the Begay, Delvalle, Ignacio, Kitsili, Koshare, Parida, Remmit, Sandspring, and Turnback series.
Begay, Delvalle, Kitsili, Koshare, Parida, Remmit, and Sandspring soils are all deeper than 40 inches to bedrock.
Ignacio soils are moderately deep to a lithic contact.
Turnback soils have hues of 10YR and 2.5Y and do not have significant amounts of mica in the silt and sand fractions.
In addition, Remmit and Turnback soils are in the Western Great Plains (LRR-G MLRAs 67, 58B) and are more moist in May and June.

GEOGRAPHIC SETTING: Ojito soils are on beveled summits, shoulders, and footslopes of ridges and hills. They formed in eolian material, alluvium, and residuum derived from Tertiary micaceous sandstone and siltstone. Slopes are 5 to 25 percent. Elevation ranges from 5,400 to 6,600 feet. The mean annual precipitation is 9 to 12 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Koshare soil and the Innacutt, Quarteles, El Rancho, and Walkibout soils. Innacutt soils are very deep, do not have diagnostic horizons, and occur on inset fans and narrow flood plains of gulches. Koshare soils are very deep and occur on adjacent toeslopes. Quarteles soils are loamy, very shallow to soft bedrock, do not have diagnostic subsurface horizons, and occur on adjacent backslopes. El Rancho soils are fine-silty, very deep, and occur on toeslopes of ridges and hills. Walkibout soils are coarse-silty, very deep, and occur on side slopes of gulches.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained; low surface runoff; moderately rapid permeability.

USE AND VEGETATION: Ojito soils are used for urban development, livestock grazing, and recreation. The historic climax vegetation is Indian ricegrass, other shrubs, New Mexico feathergrass, and sand dropseed. The ecological site is Sandy Slopes(R036XB111NM).

DISTRIBUTION AND EXTENT: Ojito soils are of moderate extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Ojito is a local Spanish place name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from the soil surface to a depth of about 3 inches. (A horizon)
Cambic horizon - The zone from 3 to about 25 inches. (Bk1, Bk2, and 2BCk1 horizons)
Paralithic contact - The boundary at about 35 inches to weakly cemented bedrock. (3Cr layer)
Particle-size control section - The zone from 10 to 35 inches (Bk2, 2BCk1, 3BCk2 horizon)
Series control section - The zone from 0 to 45 inches.

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ABROJO NM

Established Series
Rev. CDH/TWH/WWJ
01/2008

ABROJO SERIES

The Abrojo series consists of very deep, somewhat excessively drained soils that formed in colluvium over residuum derived from rhyolitic tuff. Abrojo soils are on south-facing backslopes of mesas, undulating plateaus, and canyons. Slopes are 25 to 65 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 49 degrees F.

TAXONOMIC CLASS: Ashy-skeletal, glassy, nonacid, mesic Vitritorrandic Ustorthents

TYPICAL PEDON: Abrojo extremely cobbly ashy loamy coarse sand, extremely bouldery--on a backslope of a mesa sloping 50 percent to the south at 6,490 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described on November 10, 1999, the soil was dry throughout.) Surface is covered with 35 percent gravel, 30 percent cobbles, 10 percent stones, and 15 percent boulders.

A--0 to 2 inches; light brown (7.5YR 6/3) extremely cobbly ashy loamy coarse sand, brown (7.5YR 4/3) moist; weak medium platy structure parting to weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and many very fine roots; common very fine irregularly shaped pores; 30 percent gravel, 25 percent cobbles, 10 percent stones and 15 percent boulders; neutral (pH 7.2); abrupt smooth boundary. (2 to 4 inches thick)

C1--2 to 9 inches; pink (7.5YR 7/3) very gravelly ashy loamy coarse sand, brown (7.5YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few medium, common fine, and many very fine roots; common very fine irregularly shaped pores; 30 percent gravel and 10 percent cobbles; slightly alkaline (pH 7.4); clear smooth boundary. (12 to 32 inches thick)

C2--9 to 23 inches; pink (7.5YR 7/3) very gravelly ashy loamy coarse sand, brown (7.5YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few coarse, common medium, common fine, and common very fine roots; 25 percent gravel, 10 percent cobbles, and 5 percent stones; moderately alkaline (pH 8.2); clear smooth boundary. (12 to 32 inches thick)

C3--23 to 30 inches; pink (7.5YR 7/3) very cobbly ashy loamy coarse sand, brown (7.5YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very coarse, few coarse, few medium, common fine,

and common very fine roots; 20 percent gravel, 15 percent cobbles, and 5 percent stones; moderately alkaline (pH 8.0); abrupt wavy boundary. (12 to 32 inches thick)

2C4--30 to 64 inches; white (7.5YR 8/1) ashy loamy sand, light gray (7.5YR 7/1) moist; massive; soft, very friable, slightly sticky and nonplastic; few medium and few fine roots; few fine and few very fine tubular pores; strongly alkaline (pH 8.8); abrupt wavy boundary. (26 to 40 inches thick)

3C5--64 to 80 inches; reddish yellow (7.5YR 7/6) gravelly ashy loamy coarse sand, strong brown (7.5YR 5/6) moist; single grain; loose, nonsticky and nonplastic; 25 percent gravel; very strongly alkaline (pH 9.1).

TYPE LOCATION: Bandelier National Monument, Tsankawi section, Santa Fe County, New Mexico; about 2.75 miles north of White Rock; USGS White Rock 7.5 minute topographic quadrangle; Latitude 35 degrees 51 minutes 35 seconds North and Longitude 106 degrees 12 minutes 55 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture: The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Average annual soil temperature: 50 to 52 degrees F.
Lithology of fragments: rhyolitic tuff
Volcanic glass content: 70 to 90 percent in the coarse silt plus sand fraction

Particle-size control section:
Sand content: 75 to 90 percent
Rock fragment content: 35 to 60 percent
Volcanic glass content: 70 to 90 percent in the coarse silt plus sand fraction

A horizon
Hue: 5YR to 10 YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 or 3, dry or moist
Clay content: 4 to 8 percent
Rock fragments: total range is 60 to 85 percent
25 to 35 percent gravel
15 to 25 percent cobbles
5 to 10 percent stones
5 to 15 percent boulders

C horizons
Hue: 5YR to 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 6 dry, 3 to 6 moist
Texture: very cobbly or very gravelly-ashy coarse sand, ashy loamy coarse sand, or ashy loamy sand
Clay content: 4 to 8 percent
Sand content: 75 to 90 percent
Fine sand or coarser content: 70 to 85 percent
Salinity, mmhos/cm: 0 to 2 in the upper part, 2 to 4 in the lower part
Sodicity, SAR: 0 to 4 in the upper part, 5 to 13 in the lower part
Rock fragments: total range is 35 to 60 percent
25 to 35 percent gravel
5 to 15 percent cobbles
0 to 5 percent stones
Reaction: slightly alkaline or moderately alkaline

2C4 horizon
Hue: 2.5YR to 10YR
Value: 7 or 8 dry, 5 to 7 moist
Chroma: 1 to 6 dry, 1 to 8 moist
Texture: ashy coarse sand, ashy sand, ashy loamy coarse sand, ashy loamy sand, or ashy loamy fine sand
Clay content: 4 to 8 percent
Sand content: 75 to 90 percent
Fine sand or coarser content: 70 to 85 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 5 to 13
Rock fragments - 0 to 10 percent gravel

3C5 horizon
Value: 6 or 7 dry, 5 or 6 moist
Chroma: 5 or 6, dry or moist
Clay content: 4 to 8 percent
Salinity, mmhos/cm: 2 to 4
Sodicity, SAR: 13 to 30
Rock fragments: 20 to 30 percent gravel
Reaction: strongly alkaline or very strongly alkaline

COMPETING SERIES: There are no competing series.

GEOGRAPHIC SETTING: Abrojo soils are on south-facing backslopes of mesas, undulating plateaus, and canyons. They formed in colluvium over residuum derived from rhyolitic tuff of the Quaternary age Bandelier Tuff formation. Slopes are 25 to 65 percent. Elevation ranges from 5,700 to

7,200 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 48 to 50 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Chiminet and Piojillo soils. Chiminet soils are ashy, very shallow, and occur on south-facing upper backslopes of mesas. Piojillo soils are ashy, are very deep, and occur on footslopes of valley sides.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained; low surface runoff; rapid permeability.

USE AND VEGETATION: Abrojo soils are used for recreation, wildlife habitat, and watershed. The historic climax vegetation is blue grama, black grama, galleta, skunkbush sumac, and oneseed juniper. The ecological site is Hills (R036XB124NM).

DISTRIBUTION AND EXTENT: Abrojo soils are of small extent on the southwestern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update, 2008. Abrojo is the Spanish word for thistle.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from 0 to about 2 inches. (A horizon)
Vitritorrandic feature - based on volcanic glass content throughout the upper 30 inches (A, C1, C2, and C3 horizons).

Classified according Keys to Soil Taxonomy Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ADELLERN NM

Established Series
Rev. CDH/WWJ/TWH
01/2008

ADELLERN SERIES

The Adellern series consists of very deep, well drained soils that formed in colluvium derived from granite, gneiss, and schist over residuum weathered from schist. Adellern soils are on north-facing backslopes of high hills. Slopes are 50 to 90 percent. Mean annual precipitation is about 18 inches and mean annual temperature is about 43 degrees F.

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, frigid Pachic Argiustolls

TYPICAL PEDON: Adellern gravelly sandy loam--on the backslope of a mountain sloping 82 percent to the north (352 degrees) at 7,690 feet elevation-mixed coniferous forestland. (Colors are for dry soil unless otherwise noted. When described, the soil was slightly moist from 3 to 34 inches and otherwise dry throughout.)

Oi--0 to 2 inches, slightly decomposed needles and twigs; abrupt smooth boundary. (1 to 3 inches thick)

A--2 to 4 inches; very dark gray (10YR 3/1) gravelly sandy loam, black (10YR 2/1) moist; moderate medium granular structure; soft, friable, slightly sticky and nonplastic; common fine and many very fine roots; common very fine irregularly shaped pores; 15 percent gravel, 5 percent channers, and 5 percent flagstones; neutral (pH 6.8); abrupt smooth boundary. (2 to 4 inches thick)

BAt--4 to 8 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, few medium, common fine, and common very fine roots; few fine and few very fine tubular pores; common faint clay bridges between sand grains; 10 percent gravel and 5 percent channers; neutral (pH 6.8); clear wavy boundary. (0 to 5 inches thick)

Bt1--8 to 21 inches; brown (10YR 4/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common coarse, few medium, common fine, and few very fine roots; few fine and common very fine tubular pores; few distinct clay films on rock fragments and common faint clay bridges between sand grains; 15 percent gravel, 5 percent channers, and 5 percent flagstones; neutral (pH 7.0); gradual wavy boundary. (6 to 13 inches thick)

Bt2--21 to 39 inches; brown (10YR 4/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and few very fine roots; few distinct clay films on faces of peds and on rock fragments and common faint clay bridges between sand grains; 50 percent gravel, 5 percent cobbles, 5 percent paragravel, and 5 percent paracobbles; neutral (pH 7.0); gradual wavy boundary. (8 to 18 inches thick)

Bt/BC--39 to 55 inches; dark brown (10YR 3/3) very gravelly sandy clay loam and brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) and brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and few very fine roots; few distinct clay films on faces of peds and on rock fragments and common faint clay bridges between sand grains; 45 percent gravel, 5 percent cobbles, and 5 percent paragravel; neutral (pH 7.0); clear wavy boundary. (13 to 22 inches thick)

BC/Bt--55 to 65 inches; brown (10YR 5/3) gravelly sandy loam and dark brown (10YR 3/3) very gravelly sandy clay loam, brown (10YR 4/3) and dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few medium, few fine, and few very fine roots; few faint clay bridges between sand grains; 25 percent gravel, 5 percent cobbles, and 5 percent paragravel; neutral (pH 7.2); clear wavy boundary. (7 to 16 inches thick)

2Btb--65 to 73 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few fine and few very fine roots; few faint clay films on faces of peds; 5 percent gravel and 5 percent paragravel; slightly alkaline (pH 7.4); clear smooth boundary. (0 to 10 inches thick)

2Bkb1--73 to 86 inches; gray (10YR 6/1) sandy loam, gray (10YR 5/1) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; 5 percent gravel and 5 percent paragravel; strongly effervescent, secondary calcium carbonate segregated as many fine irregularly shaped and rounded coats on faces of peds; slightly alkaline (pH 7.4); clear smooth boundary. (0 to 16 inches thick)

2Bkb2--86 to 101 inches; gray (10YR 6/1) sandy loam, gray (10YR 5/1) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; 10 percent gravel and 2 percent paragravel; strongly effervescent, secondary calcium carbonate segregated as many medium irregularly shaped and rounded coats on faces of peds and on rock fragments; strongly alkaline (pH 8.6).

TYPE LOCATION: Santa Fe County, New Mexico; about 4.5 miles west of Santa Fe; 175 feet north and 1,425 feet west of the southeast corner of section 4, T.17N., R.10E.; USGS Santa Fe 7.5 minute topographic quadrangle; Latitude 35 degrees 43 minutes 34 seconds North and Longitude 105 degrees 52 minutes 49 seconds West, NAD 27.

RANGE IN CHARACTERISTICS: (Depths given are measured from the mineral soil surface)
Soil moisture - The soil moisture control section (SMCS) is moist in all parts from January to May and intermittently moist in some part from June to December. The SMCS is dry in some part less than 60 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soil moisture regime is typic ustic.

Mean annual soil temperature - 44 to 47 degrees F.
Thickness of the mollic epipedon - 27 to 49 inches
Depth to calcareous material (as visible secondary calcium carbonate) - 53 to 80 inches
Lithology of rock fragments: granite, gneiss, and schist
Organic matter content - 2 to 4 percent in the mollic epipedon
Salinity, mmhos/cm - 0 to 1 in the surface and subsoil; 0 to 2 in the buried subsoil
Sodicity, SAR - 0 to 1 in the surface and subsoil; 0 to 4 in the buried subsoil

Particle-size control section (weighted averages)
Silicate clay content: 20 to 35 percent
Sand content: 40 to 60 percent
Fine sand or coarser content: 30 to 50 percent
Rock fragment content: 35 to 60 percent
Mica content: 25 to 45 percent (by grain count)

A horizon
Hue: 7.5YR or 10YR
Value: 2 or 3 moist
Chroma: 1 or 2, dry or moist
Clay content: 10 to 16 percent
Rock fragments: total range is 15 to 30 percent
15 to 25 percent gravel
0 to 5 percent channers
0 to 5 percent flagstones
0 to 10 percent cobbles

BA horizon
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: very gravelly sandy clay loam or very gravelly coarse sandy loam
Clay content: 12 to 22 percent
Rock fragments: total range is 20 to 35 percent
15 to 25 percent gravel
0 to 5 percent channers
0 to 10 percent cobbles

Bt1 horizon
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: gravelly sandy clay loam, gravelly clay loam, or very gravelly sandy clay loam
Clay content: 24 to 35 percent
Rock fragments: total range is 25 to 40 percent
15 to 25 percent gravel
0 to 5 percent channers
5 to 10 percent cobbles

Bt2 horizon
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: very gravelly sandy clay loam or very gravelly clay loam
Clay content: 20 to 30 percent
Rock fragments: total range is 45 to 60 percent
40 to 50 percent gravel
5 to 10 percent cobbles
0 to 5 percent paragravel
0 to 5 percent paracobbles

Bt/BC horizon
Hue: 7.5YR or 10YR
Value: 3 through 5 dry, 2 through 4 moist
Chroma: 2 or 3, dry or moist
Texture: very gravelly sandy clay loam or very gravelly sandy loam
Clay content: 18 to 27 percent
Rock fragments: total range is 40 to 60 percent
35 to 50 percent gravel
5 to 10 percent cobbles
0 to 5 percent paragravel

BC/Bt horizon
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 3 or 4 moist
Texture: gravelly sandy loam, gravelly coarse sandy loam, or very gravelly sandy loam
Clay content: 10 to 20 percent
Rock fragments: total range is 20 to 40 percent
20 to 30 percent gravel
0 to 5 percent cobbles

0 to 5 percent paragravel

2Btb horizon
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 1 through 3, dry or moist
Texture: sandy clay loam, sandy loam, or gravelly sandy loam
Clay content: 16 to 27 percent
Rock fragments: total range is 5 to 25 percent
5 to 15 percent gravel
0 to 5 percent cobbles
0 to 5 percent paragravel

2Bkb horizons
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 1 through 3, dry or moist
Texture: sandy loam, coarse sandy loam, or gravelly sandy loam
Clay content: 10 to 18 percent
Calcium carbonate equivalent: 2 to 8 percent
Rock fragments: total range is 5 to 25 percent
5 to 15 percent gravel
0 to 5 percent cobbles
0 to 5 percent paragravel

COMPETING SERIES: These are the Braziel, Fessler, Mapache, Pastorius, Pastorpeak and Zillion series. Braziel soils are presumed to be dry in the moisture control section during July and August. Fessler soils have rock fragments of argillite and have less mica. Mapache soils have rock fragments of dacite and latite. Pastorious soils have less mica and greater than 10 percent cobbles in the argillic horizon. Pastorpeak soils have carbonate accumulations within 40 inches. Zillion soils have a calcic horizon.

GEOGRAPHIC SETTING: Adellern soils are on backslopes of hills and mountains. They formed in Precambrian Age colluvium derived from granite, gneiss, and schist over residuum weathered from schist. Slopes are 50 to 90 percent. Elevation ranges from 7,400 to 9,100 feet. The mean annual precipitation is 16 to 20 inches with about 40 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 42 to 45 degrees F. The frost-free period is 110 to 140 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Atalaya, Enmedio, Fiesta, and Morenda soils. Atalaya soils are coarse-loamy over fragmental, do not have mollic epipedons, and occur on beveled summits. Enmedio soils are loamy-skeletal over fragmental and occur on south-facing

backslopes of hills. Fiesta soils are fine-loamy and occur on footslopes of valley sides. Morenda soils are coarse-loamy, have water tables within 5 feet, and occur on low stream terraces of valley floors.

DRAINAGE AND PERMEABILITY: Well drained; very high runoff; moderate permeability.

USE AND VEGETATION: Adellern soils are used for timber production, urban development, and recreation. The historic climax vegetation is ponderosa pine, Gambel's oak, mountain muhly, and muttongrass. The ecological site is Pinus ponderosa/Quercus gambleii (F048AY010NM).

DISTRIBUTION AND EXTENT: Adellern soils are of small extent on the southwestern Sangre de Cristo part of the Southern Rocky Mountains province in northcentral New Mexico. The MLRA is 48A.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Adellern is a coined name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Mollic epipedon - The zone from 2 to 39 inches. (A, BAt, Bt1, and Bt2 horizons)
Argillic horizon - The zone from 8 to 73 inches. (Bt1, Bt2, Bt/BC, BC/Bt, and 2Btb horizons)
Particle-size control section - The zone from 8 to 28 inches (Bt1 and part of Bt2 horizon)
Series control section - The zone from 0 to 73 inches.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a clacimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION AGUA FRIA NM

Established Series
RD: EMB/CDH/TWH
01/2008

AGUA FRIA SERIES

The Agua Fria series consists of very deep, well drained soils that formed in alluvium derived from granite, gneiss, schist, and loess. Agua Fria soils are on eroded fan remnants. Slopes are 1 to 4 percent. Mean annual precipitation is about 11 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Calcic Paleargids

TYPICAL PEDON: Agua Fria gravelly loam--on an erosional fan remnant sloping 1 percent to the south at 6,305 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was dry throughout.)

AE--0 to 3 inches; light brown (7.5YR 6/3) gravelly loam, brown (7.5YR 4/3) moist; moderate very thick platy structure parting to weak medium granular; soft, very friable, slightly sticky and slightly plastic; few medium, common fine, and common very fine roots; common very fine vesicular pores; common uncoated sand and silt grains (skeletans) as spots on undersides of plates; few 1 to 2 millimeter wide cracks; 20 percent gravel; slightly alkaline (pH 7.4); abrupt smooth boundary. (2 or 3 inches thick)

Bt--3 to 7 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; strong medium prismatic structure parting to weak fine angular blocky; slightly hard, friable, very sticky and moderately plastic; common fine and common very fine roots; few fine and few very fine irregularly shaped pores; few, 1 to 2 millimeter wide cracks; many distinct clay films on faces of peds; 10 percent gravel; slightly alkaline (pH 7.6); clear smooth boundary. (4 or 5 inches thick)

Btk1--7 to 13 inches; brown (7.5YR 5/4) gravelly clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to weak coarse subangular blocky; moderately hard, firm, moderately sticky and moderately plastic; common fine and common very fine roots; few medium and common fine tubular pores; common distinct and few faint clay films on faces of peds; 15 percent gravel; strongly effervescent, secondary calcium carbonate segregated as common medium and large irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 9.0); clear wavy boundary. (4 to 9 inches thick)

Btk2--13 to 19 inches; brown (7.5YR 5/4) gravelly loam, brown (7.5YR 4/4) moist; weak coarse

prismatic structure parting to moderate coarse subangular blocky; moderately hard, firm, moderately sticky and slightly plastic; few fine and common very fine roots; few fine and common very fine tubular pores; few distinct clay films on faces of peds and common faint clay films on faces of peds and lining pores; 20 percent gravel; strongly effervescent, secondary calcium carbonate segregated as common fine and medium irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 9.0); abrupt wavy boundary. (0 to 7 inches thick)

Bk1--19 to 36 inches; pink (7.5YR 7/3) gravelly loam, light brown (7.5YR 6/4) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and common very fine roots; few very fine tubular pores; 20 percent gravel; violently effervescent, matrix is impregnated with secondary calcium carbonate; strongly alkaline (pH 9.0); gradual smooth boundary. (6 to 17 inches thick)

Bk2--36 to 53 inches; pink (7.5YR 7/3) gravelly loam, light brown (7.5YR 6/4) moist; moderate coarse subangular blocky structure; moderately hard, friable, slightly sticky and slightly plastic; few fine and common very fine roots; few fine and common very fine tubular pores; 25 percent gravel; violently effervescent, matrix is impregnated with secondary calcium carbonate; strongly alkaline (pH 9.0); clear wavy boundary. (6 to 17 inches thick)

Bky--53 to 61 inches; pink (7.5YR 7/4) very gravelly coarse sandy loam, brown (7.5YR 5/4) moist; moderate coarse subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; few fine and common very fine irregularly shaped pores; 30 percent gravel and 10 percent cobbles; secondary gypsum segregated as few fine crystals on faces of peds; violently effervescent, secondary calcium carbonate segregated as common fine and medium irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 8.5); clear wavy boundary. (8 to 20 inches thick)

BCyk1--61 to 69 inches; light brown (7.5YR 6/3) very gravelly loamy coarse sand, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; few fine tubular pores; 45 percent gravel and 10 percent cobbles; secondary gypsum segregated as common fine and medium irregularly shaped clusters of crystals on very coarse sand grains and rock fragments; violently effervescent, secondary calcium carbonate segregated as few fine and medium irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 18 inches thick)

BCyk2--69 to 88 inches; light brown (7.5YR 6/4) extremely gravelly coarse sand, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 65 percent gravel and 5 percent cobbles; secondary gypsum segregated as few fine and medium irregularly shaped clusters of crystals on very coarse sand grains and rock fragments; slightly effervescent in spots, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments; slightly alkaline (pH 7.8); gradual smooth boundary. (12 to 29 inches thick)

C--88 to 100 inches; reddish yellow (7.5YR 6/6) extremely gravelly loamy coarse sand, strong brown (7.5YR 4/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 65 percent gravel and 5 percent cobbles; slightly alkaline (pH 7.6).

TYPE LOCATION: Santa Fe County, New Mexico; about 4 miles northeast of La Cienega; 1,200 feet south and 650 feet west of the northeast corner of section 22, T.16N., R.8E.; USGS Turquoise Hill 7.5 minute topographic quadrangle; Latitude 35 degrees 36 minutes 23 seconds North and Longitude 106 degrees 4 minutes 24.5 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture: The soil moisture control section is intermittently moist in some part from July to October and December to March. The soils are driest in May and June. The soil moisture regime is aridic bordering on ustic.

Mean annual soil temperature: 52 to 54 degrees F.
Depth to base of argillic horizon: 13 to 19 inches
Depth to calcareous material (as visible secondary calcium carbonate): 6 to 10 inches
Depth to calcic horizon: 13 to 19 inches
Lithology of rock fragments: granite, gneiss, and schist

Particle-size control section (weighted averages)
Silicate clay content: 27 to 34 percent
Sand content: 30 to 45 percent
Fine sand and coarser content: 40 to 60 percent
Rock fragment content: 15 to 20 percent gravel
Mica content: 1 to 3 percent (by grain count)

AE or A horizons
(an albic horizon in some pedons)
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 2 through 4, dry or moist
Rock fragments: 15 to 20 percent gravel
Clay content: 15 to 20 percent
Reaction: neutral or slightly alkaline

Bt horizon
Value: 4 or 5 dry, 3 or 4 moist
Texture: clay loam or clay
Clay content: 35 to 42 percent
Rock fragments: 5 to 10 percent gravel
Reaction: neutral or slightly alkaline

Btk horizons
Value: 5 or 6 dry, 4 or 5 moist
Texture: gravelly clay loam or gravelly loam
Clay content: 25 to 30 percent
Rock fragments: 15 to 20 percent gravel, some pedons have subhorizons with less than 15 percent gravel
Calcium carbonate equivalent: 3 to 10 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 13
Gypsum content: 0 to 1 percent
Reaction: moderately alkaline or strongly alkaline

Bk horizons
Value: 7 or 8 dry, 5 through 7 moist
Chroma: 1 through 4 dry, 2 through 4 moist
Texture: gravelly loam or gravelly sandy loam
Rock fragments: total range is 15 to 35 percent
15 to 30 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 15 to 40 percent
Salinity, mmhos/cm: 2 to 16
Sodicity, SAR: 4 to 13
Gypsum content: 0 to 1 percent
Reaction: moderately alkaline or strongly alkaline

Bky horizon
Value: 6 through 8 dry, 4 through 7 moist
Chroma: 2 through 4 dry, 3 or 4 moist
Texture: very gravelly sandy loam, very gravelly coarse sandy loam, or very gravelly loam
Rock fragments: total range is 35 to 60 percent
30 to 50 percent gravel
5 to 10 percent cobbles
Calcium carbonate equivalent: 10 to 30 percent
Salinity, mmhos/cm: 4 to 16
Sodicity, SAR: 4 to 13
Gypsum content: 1 to 3 percent
Reaction: moderately alkaline or strongly alkaline

BCyk and C horizons
Value: 5 through 7 dry, 4 through 6 moist
Chroma: 3 through 6, dry or moist
Texture: very gravelly sandy loam to extremely gravelly coarse sand
Rock fragments: total range is 35 to 75 percent, averaging 50 to 70 percent with:
45 to 60 percent gravel

5 to 10 percent cobbles
Calcium carbonate equivalent: 0 to 10 percent
Salinity, mmhos/cm: 4 to 16
Sodicity, SAR: 0 to 13
Gypsum content: 0 to 5 percent
Reaction: slightly alkaline or moderately alkaline

COMPETING SERIES: This is the Panky series. Panky soils do not have horizons with gravelly textures above 40 inches and do not have horizons with very gravelly textures between 40 and 60 inches.

GEOGRAPHIC SETTING: Agua Fria soils are on summits of erosional fan remnants. They formed in alluvium derived from Precambrian granite, gneiss, and schist; and Quaternary loess. Slopes are 1 to 4 percent. Elevation ranges from 5,600 to 6,700 feet. The mean annual precipitation is 10 to 13 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Golondrina and Paraje soils and the competing Panky soil. Golondrina soils are loamy-skeletal, have mollic epipedons, and occur on backslopes and footslopes of erosional fan remnants. Paraje soils are loamy-skeletal and occur on adjacent beveled summits and shoulders of erosional fan remnants.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; permeability is slow in the upper part and moderately rapid to very rapid in the lower part.

USE AND VEGETATION: Agua Fria soils are used for urban development, livestock grazing, and recreation. The historic climax vegetation is blue grama, galleta, ring muhly, oneseed juniper, sand dropseed, and threeawn. The ecological site is Cinder(R036XB117NM).

DISTRIBUTION AND EXTENT: Agua Fria soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County (Santa Fe Area), New Mexico, 1970.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon: The zone from the soil surface to 3 inches. (AE horizon)
Argillic horizon: The zone from 3 to 19 inches. (Bt, Btk1, and Btk2 horizons)
Calcic horizon: The zone from 19 to 53 inches. (Bk1 and Bk2 horizons)
Particle-size control section: The zone from 3 to 19 inches (the entire argillic horizon)
Paleargid great group: There is a clay increase of 15 percent or more (absolute) within one inch at the

upper boundary of the argillic horizon. (AE and Bt horizons)

The 11/2006 revision moves the typical pedon to the pedon used in the update survey of the Santa Fe Area. The classification was also revised from fine, montmorillonitic, mesic Ustollic Haplargids to fine-loamy, mixed, superactive, mesic Calcic Paleargids. The series range in characteristics was re-written to comprise only the Agu Fria soils in the Santa Fe update survey.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION DONDIEGO NM

Established Series
Rev. CDH/JVC/WWJ
01/2008

DONDIEGO SERIES

The Dondiego series consists of very deep, well drained soils that formed in alluvium derived from granite, gneiss, and schist. Dondiego soils are on treads of high stream terraces, low stream terraces of valley floors, and toeslopes of valley sides. Slopes are 1 to 3 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Pachic Argiustolls

TYPICAL PEDON: Dondiego sandy loam--on the tread of a high steam terrace sloping 2 percent to the southwest at 7,078 feet elevation--urban open-space land. (Colors are for dry soil unless otherwise noted. When described, the soil was moist from 1 to 50 inches and otherwise dry throughout.)

A--0 to 2 inches; brown (7.5YR 5/3) sandy loam, dark brown (7.5YR 3/2) moist; weak coarse platy structure parting to moderate medium granular; soft, very friable, slightly sticky and nonplastic; common fine and common very fine roots; few fine and few very fine irregularly shaped pores; 10 percent gravel; neutral (pH 6.6); clear smooth boundary. (2 to 4 inches thick)

Bt1--2 to 7 inches; brown (7.5YR 5/3) loam, dark brown (7.5YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and common very fine roots; few fine and few very fine tubular pores; few faint clay films on faces of peds and lining pores; 5 percent gravel; neutral (pH 6.8); abrupt smooth boundary. (5 to 9 inches thick)

Bt2--7 to 14 inches; brown (7.5YR 4/2) loam, very dark gray (7.5YR 3/1) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and common very fine roots; common fine and few very fine tubular pores; few faint clay films on faces of peds and lining pores; 5 percent gravel; slightly alkaline (pH 7.4); clear smooth boundary. (6 to 15 inches thick)

Bt3--14 to 26 inches; brown (7.5YR 4/2) loam, very dark gray (7.5YR 3/1) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and common very fine roots; few fine and few very fine tubular pores; few distinct clay films on faces of peds and lining pores and few faint clay films on faces of peds; 5 percent gravel; very slightly

effervescent, secondary calcium carbonate segregated as very few fine irregularly shaped coats on rock fragments; slightly alkaline (pH 7.6); clear smooth boundary. (0 to 10 inches thick)

Btk1--26 to 37 inches; brown (7.5YR 4/2) loam, very dark gray (7.5YR 3/1) moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few coarse, few medium, few fine, and few very fine roots; few fine and few very fine tubular pores; few distinct clay films on faces of peds and lining pores and few faint clay films on faces of peds; 5 percent gravel; very slightly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments; slightly alkaline (pH 7.8); clear wavy boundary. (9 to 16 inches thick)

Btk2--37 to 51 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and common very fine roots; common fine and common very fine tubular pores; few faint clay films on faces of peds and lining pores; 10 percent gravel; noneffervescent in spots to very slightly effervescent elsewhere, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (9 to 16 inches thick)

Bk--51 to 66 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse, few medium, few fine, and few very fine roots; common fine and common very fine tubular pores; 15 percent gravel and 5 percent cobbles; strongly effervescent, secondary calcium carbonate segregated as common fine irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.2); abrupt wavy boundary. (8 to 20 inches thick)

BCk--66 to 92 inches; brown (7.5YR 5/4) gravelly loamy coarse sand, brown (7.5YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few medium, few fine, and few very fine roots; few strata of loam; 20 percent gravel and 5 percent cobbles; slightly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments and coarse sand grains; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 26 inches thick)

C--92 to 106 inches; brown (7.5YR 5/4) very gravelly coarse sand, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few fine and few very fine roots; 35 percent gravel and 5 percent cobbles; very slightly effervescent; moderately alkaline (pH 8.4).

TYPE LOCATION: Santa Fe County, New Mexico; about 2 miles southeast of downtown Santa Fe within the nonsectionized Santa Fe Grant; 1,975 feet east and 975 feet north of the intersection of Saint Michaels Drive and Old Pecos Trail; USGS Santa Fe 7.5 minute topographic quadrangle; Latitude 35 degrees 39 minutes 26 seconds North and Longitude 105 degrees 55 minutes 52 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. December and August are the wettest months of the year. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 49 to 52 degrees F.
Depth to base of mollic epipedon - 40 to 69 inches
Depth to base of argillic horizon - 36 to 54 inches
Depth to calcareous material (as visible secondary calcium carbonate) - 17 to 32 inches

Particle-size control section weighted averages - Silicate clay content: 18 to 27 percent; Sand content: 30 to 50 percent; Fine sand or coarser content: 15 to 30 percent; Rock fragment content: 5 to 10 percent gravel, lithology of fragments is granite, gneiss, and schist; mica content: 3 to 10 percent (by grain count).

Organic matter content - 2 to 4 percent in the upper part of the mollic epipedon and 1 to 3 percent in the lower part

Salinity, mmhos/cm - 0 to 1 in the surface, upper part of the subsoil, and lower part of the substratum; 0 to 2 in the lower part of the subsoil and upper part of the substratum

Reaction - neutral in the surface and upper subsoil; slightly alkaline to moderately alkaline in the lower subsoil; neutral to moderately alkaline in the substratum.

A horizon
Value: 3 through 5 dry, 2.5 or 3 moist
Chroma: 2 or 3, dry or moist
Rock fragments: 5 to 10 percent gravel

Bt horizons
Value: 3 through 5 dry, 2.5 or 3 moist
Chroma: 2 or 3 dry, 1 through 3 moist
Rock fragments: 0 to 10 percent gravel

Btk horizons
Value: 4 or 5 dry, 2.5 or 3 moist
Chroma: 2 or 3 dry, 1 through 3 moist
Texture: loam or sandy loam
Rock fragments: 5 to 10 percent gravel
Calcium carbonate equivalent: 1 to 3 percent

Bk horizon (a BCk or BC in some pedons)
Value: 4 or 5 dry
Chroma: 2 or 3, dry or moist
Texture: gravelly loam, gravelly sandy loam, or sandy loam
Rock fragments: total range is 10 to 25 percent
10 to 20 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 1 to 3 percent
Other features: some pedons have strata of gravelly coarse sand; some pedons have buried Bt horizons.

BCk and C horizons
Hue: 5YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: stratified gravelly loamy coarse sand to very gravelly coarse sand or stratified gravelly loamy coarse sand to coarse sand
Rock fragments: total range is 20 to 40 percent
20 to 35 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 0 to 2 percent
Other features: some pedons have strata of sandy loam or loam; some pedons do not have sandy substrata

COMPETING SERIES: These are the Albinas, Bluewater (T), Estrada, Farnum, Funmar, Garrett, Haxtun, Jarita, Keya, Prosper, Renner, Sampson, Tracylee (T), Vosburg, Wetterdon and Woodly series.

Albinas, Farnum, Funmar, Haxtun, Keya, Prosper, Renner, Sampson, Tracylee, Woodly, and Woonsocket soils are moist in some part of the moisture control section from May 15th to July 15th and are in a climatic setting that receives three-fourths of the precipitation between April and September. In addition, Haxtun soils have argillic horizons that are buried by younger eolian parent materials; Tracylee soils have hue of 10YR or yellower; Keya and Woodly soils are noncalcareous throughout. Bluewater soils have calcic horizons between 10 and 35 inches, seasonal high water tables between 30 and 51 inches, and redoximorphic features within 40 inches of the soil surface. Estrada soils have rock fragments of sandstone and shale. Garrett soils have Bt horizons with hue of 5YR or redder. Jarita soils have hard bedrock between 20 and 40 inches. Vosburg soils are more moist in late spring, do not have fragments of igneous and metamorphic rocks, and have frost-free periods of less than 140 days

GEOGRAPHIC SETTING: Dondiego soils are on treads of high stream terraces and on low stream terraces of valley floors. They formed in alluvium derived from granite, gneiss and schist. Slopes are 1 to 3 percent. Elevation ranges from 6,100 to 7,800 feet. The mean annual precipitation is 13 to 15 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 50 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Altazano, Buckhorse, Levante, and Ohke soils. Buckhorse soils are coarse-loamy, have thin mollic epipedons, and occur on toeslopes. Levante soils are sandy, do not have diagnostic horizons, and occur on narrow flood plains of arroyos. Altazano soils are coarse-loamy, do not have diagnostic horizons, and occur on flood plains of valley floors. Ohke soils are sandy, have thin mollic epipedons, and occur on adjacent portions of low stream terraces.

DRAINAGE AND PERMEABILITY: Well drained; low surface runoff; moderate permeability in the subsoil, moderate or moderately rapid permeability in the upper substratum, and very rapid permeability in the lower substratum. The phase occurring on low stream terraces is subject to rare flooding.

USE AND VEGETATION: Dondiego soils are used for urban development, livestock grazing, and recreation. The historic climax vegetation is blue grama, black grama, broom snakeweed, galleta, and ring muhly. The ecological site is Loamy(R036XB112NM).

DISTRIBUTION AND EXTENT: Dondiego soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. The name Dondiego is taken from the Governor Don Diego de Vargas, the first governor following the reconquest of New Mexico.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Mollic epipedon (Pachic feature) - The zone from the soil surface to a depth of about 66 inches. (A, Bt1, Bt2, Bt3, Btk1, Btk2, and Bk horizons)
Argillic horizon - The zone from 2 to about 51 inches. (Bt1, Bt2, Bt3, Btk1, and Btk2 horizons)

This series was originally proposed as the Ownyate series in 1996 and renamed Dondiego in 2006.

Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ESTRADA NM

Tentative Series
Rev. CAB-CDH-WJG
12/2007

ESTRADA SERIES

The Estrada series consists of very deep, well drained soils that formed in slope alluvium derived from sandstone and shale. Estrada soils are on footslopes and toeslopes of valley sides. Slopes are 2 to 15 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Pachic Argiustolls

TYPICAL PEDON: Estrada fine sandy loam--on a toeslope of an undulating plateau sloping 7 percent to the northwest (306 degrees) at 7,725 feet elevation-forestland. (Colors are for dry soil unless otherwise noted. When described on September 22, 1999, the soil was dry throughout.)

A--0 to 2 inches; brown (7.5YR 4/3) fine sandy loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many fine roots; few very fine irregular pores; 5 percent gravel; neutral (pH 6.8); abrupt smooth boundary. (2 to 4 inches thick)

AB--2 to 4 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and common very fine roots; few very fine tubular pores; less than 2 percent gravel; slightly effervescent (2 percent CaCO3 equivalent); neutral (pH 6.8); clear smooth boundary. (2 to 8 inches thick)

Bt1--4 to 13 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few medium, common fine, and few very fine roots; few medium and fine tubular pores; few distinct and few faint clay films on ped faces and along surfaces of pores; 10 percent gravel; strongly effervescent (4 percent CaCO3 equivalent); neutral (pH 7.2); clear smooth boundary.

Bt2--13 to 19 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; few medium and fine tubular pores; many faint clay films on ped faces and along surfaces of pores; less than 2 percent gravel; strongly effervescent (4 percent CaCO3 equivalent); slightly alkaline (pH 7.4); clear smooth boundary. (thickness of Bt horizons is 10 to 23

inches)

Btk1--19 to 28 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and moderately plastic; few coarse, few medium, common fine, and few very fine roots; common fine and few very fine tubular pores; few faint clay films on ped faces and along surfaces of pores; 2 percent gravel; strongly effervescent, secondary calcium carbonates segregated as few fine irregularly shaped masses on faces of peds (2 percent CaCO3 equivalent); neutral (pH 7.0); clear smooth boundary.

Btk2--28 to 41 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate thick platy structure parting to moderate fine subangular blocky; very hard, friable, slightly sticky and moderately plastic; few coarse, medium, fine, and very fine roots; few fine tubular pores; few faint clay films on ped faces and along surfaces of pores; 10 percent gravel; strongly effervescent, secondary calcium carbonates segregated as common medium irregularly shaped masses and few very fine concentrations around rock fragments and between peds (1 percent CaCO3 equivalent); neutral (pH 7.2); clear wavy boundary. (Thickness of Btk horizons is 10 to 35 inches)

Bt1--41 to 55 inches; brown (7.5YR 4/3) clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; very hard, friable, moderately sticky and moderately plastic; few coarse, fine, and very fine roots; few medium and many fine tubular pores; few faint clay films on ped faces and along surfaces of pores; less than 2 percent gravel; neutral (pH 7.0); clear smooth boundary.

Bt2--55 to 104 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and moderately plastic; few fine roots; common fine tubular pores; common distinct clay films on ped faces and along pores; 5 percent gravel; neutral (pH 7.0); clear smooth boundary. (Thickness of Bt horizons is 0 to 39 inches)

BC--104 to 122 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; less than 2 percent gravel; neutral (pH 7.2).

TYPE LOCATION: Santa Fe County, New Mexico, about 2 1/4 miles south of the Glorieta Battlefield National Historic Monument; Glorieta USGS 7.5 minute topographic quadrangle; Latitude 35 degrees 32 minutes 26 seconds North and Longitude 105 degrees 45 minutes 6 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section (SMCS) is intermittently moist in some part from July to October and December to March. Additional run-on occurs from July through September. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Soil temperature - 48 to 50 degrees F

Depth to base of mollic epipedon - 20 to 79 inches
Depth to base of argillic horizon - 24 to 109 inches

Particle-size control section weighted averages:
Silicate clay content: 20 to 30 percent
Sand content: 35 to 50 percent
Fine sand or coarser content: 25 to 40 percent
Rock fragment content: 5 to 10 percent

Salinity: dS/m - 0 to 2
Sodicity: SAR - 0 to 4

A horizon
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Clay content: 8 to 18
Rock fragment content: 2 to 5 percent gravel

AB horizon
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 1 to 3 dry, 2 or 3 moist
Texture: loam, sandy loam, or fine sandy loam
Clay content: 12 to 16 percent
Rock fragment content: 2 to 10 percent gravel

Bt horizons
Hue: 7.5YR
Value: 4 dry, 3 moist
Chroma: 2 or 3 dry or moist
Texture: loam, clay loam
Clay content: 18 to 30 percent
Rock fragment content: 2 to 10 percent gravel

Btk horizons
Hue: 5YR, 7.5YR, and 10YR
Value: 3 to 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: loam, clay loam, and gravelly loam
Clay content: 18 to 30 percent
Rock fragments: 2 to 15 percent gravel
Calcium carbonate equivalent: 1 to 2 percent

Bt horizons
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist
Texture: loam or clay loam
Clay content: 22 to 30 percent
Rock fragment content: 2 to 5 percent gravel

BC horizon
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist
Texture: loam, fine sandy loam, or sandy clay loam
Clay content: 18 to 25 percent
Rock fragment content: 2 to 5 percent gravels

COMPETING SERIES: These are the Albinas, Bluewater, Farnum, Funmar, Garrett, Haxtun, Jarita, Keya, Dondiego, Prosper, Renner, Sampson, Tracylee, Vosburg, and Wetterdon series. Bluewater has a high water table. Jarita has a lithic contact within 40 inches. Bluewater, Farnum, Funmar, Garrett, Haxtun, Keya, Dondiego, Prosper, Renner, Sampson, Tracylee, Vosburg, and Wetterdon are more acidic than Estrada. Albinas, Farnum, Funmar, Haxtun, Renner, and Tracylee have hues more yellow than Estrada. Farnum, Funmar, Keya, and Wetterdon do not have visible carbonates within 60 inches.

GEOGRAPHIC SETTING: Estrada soils are on toeslopes of valley sides. They formed in alluvium derived from sandstone and shale. Slopes are 2 to 15 percent. Elevation ranges from 6,400 to 7,800 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. Mean annual air temperature is 46 to 48 degrees F. The frost-free period is 120 to 140 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Altezita, Esquila, Herrada, Sabroso and Verona soils. Altezita soils are very shallow, do not have an argillic horizon, and occur on beveled summits. Esquila soils are clayey, do not have a mollic epipedon, have smecitic mineralogy, and occur on toeslopes of plateaus. Herrada soils are fine-loamy, do not have a mollic epipedon, and occur on summits and footslopes of undulating plateaus. Sabroso soils are clayey-skeletal, do not have a mollic epipedon, and occur on south-facing backslopes of mesas. Verono soils are clayey-skeletal and are on north-facing backslopes of mesas.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; permeability is moderately slow.

USE AND VEGETATION: Estrada soils are used for livestock grazing, woodland production, and recreation. Present vegetation is mountain muhly, penstemon, twoneedle pion, ponderosa pine, Rocky Mountain juniper, and oneseed juniper.

DISTRIBUTION AND EXTENT: Estrada soils are of small extent on the northern Glorieta Slope part of the Pecos Valley section of the Great Plains province in northcentral New Mexico. The MLRA is 70A.

MLRA OFFICE RESPONSIBLE: Temple, Texas.

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 1996. Estrada is a Spanish surname.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - 0 to 55 inches. (A, AB, Bt1, Bt2, Btk1, Btk2, and Bt1 horizons)

Argillic horizon - 4 to 104 inches. (Bt1, Bt2, Btk1, Btk2, Bt1, and Bt2 horizons)

Pachic feature - 0 to 55 inches. (A, AB, Bt1, Bt2, Btk1, Btk2, and Bt1 horizons).

ADDITIONAL DATA: The series type location has been sampled for partial characterization by the Soil Survey Laboratory (SSL), Lincoln, NE, as soil survey sample number S99NM-049-006; Calcium carbonate equivalence was determined using a field calcimeter and confirmed by lab sample in some horizons.

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION FRAJILLO NM

Tentative Series
Rev. CDH/WMR/WJG
12/2007

FRAJILLO SERIES

The Frajillo series consists of well drained soils that are shallow to sandstone bedrock. Frajillo soils formed in alluvium and residuum derived from sandstone and shale. They are on shoulders and backslopes on interfluves of undulating plains and on summits of structural benches. Slopes are 1 to 15 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Loamy, mixed, superactive, mesic Aridic Lithic Argiustolls

TYPICAL PEDON: Frajillo sandy loam--on a shoulder of an undulating plateau sloping 5 percent to the south at 6,935 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described on September 9th, 2002, the soil was moist from 0 to 6 inches and otherwise dry throughout.)

A--0 to 3 inches; reddish brown (5YR 4/3) sandy loam, dark reddish brown (5YR 3/2) moist; weak medium platy structure parting to weak fine granular; soft, very friable, slightly sticky and nonplastic; few medium, few fine, and few very fine roots; common very fine interstitial pores; 10 percent gravel; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (1 to 4 inches thick)

Btk1--3 to 7 inches; reddish brown (5YR 4/3) sandy clay loam, dark reddish brown (5YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and common very fine roots; common very fine tubular pores; common faint clay films on faces of peds and lining pores; 10 percent gravel; strongly effervescent, secondary calcium carbonate segregated as common fine irregularly shaped accumulations on faces of peds (3 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); abrupt wavy boundary. (3 to 7 inches thick)

2Btk2--7 to 10 inches; pale red (2.5YR 6/2) extremely paragravelly sandy clay loam, dusky red (2.5YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and common very fine roots; common very fine tubular pores; few faint clay films on faces of peds; 75 percent paragravel; violently effervescent, secondary calcium carbonate segregated as few fine irregularly shaped accumulations on faces of peds and many fine irregularly shaped accumulation on rock fragments (5 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); abrupt wavy boundary. (2 to 8 inches thick)

2Btk3--10 to 13 inches; reddish brown (2.5YR 4/3) paragravelly sandy clay loam, dark reddish brown (2.5YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; common faint clay films on faces of peds; 20 percent paragravel; violently effervescent, secondary calcium carbonate segregated as common fine irregularly shaped accumulations on faces of peds (3 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); abrupt smooth boundary. (3 to 6 inches thick)

2R--13 to 23 inches; strongly cemented sandstone bedrock.

TYPE LOCATION: Santa Fe County, New Mexico; 300 feet west and 50 feet south of the northeast corner of section 11, T.10N., R.11E.; USGS El Cuervo Butte 7.5 minute topographic quadrangle; Latitude 35 degrees 06 minutes 49 seconds North and Longitude 105 degrees 44 minutes 45 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section is intermittently moist in some part from July to October and December to March. It is assumed to be dry in all parts 50 to 75 percent of the time (cumulative), when the soil temperature at 20 inches is 41 degrees F. or higher. The soils are driest in May and June. The soil moisture regime is ustic aridic.

Mean annual soil temperature - 51 to 53 degrees F.

Depth to base of argillic horizon - 10 to 19 inches

Depth to calcareous material (as visible secondary calcium carbonate) - 2 to 9 inches

Depth to lithic contact 10 to 20 inches

Particle-size control section weighted averages
Silicate clay content: 20 to 30 percent
Sand content: 45 to 55 percent
Fine sand or coarser content: 35 to 45 percent
Rock fragment content: 5 to 10 percent gravel in upper part
Pararock fragment content: 20 to 75 percent paragravel in lower part

Salinity, mmhos/cm - 0 to 2
Sodicity, SAR - 0 to 4

A horizon
Hue: 2.5YR or 5YR

Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Rock fragment content: 5 to 10 percent gravel

Upper Btk horizons
Hue: 2.5YR or 5YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: sandy clay loam or loam
Rock fragment content: 5 to 10 percent gravel
Calcium carbonate equivalent: 1 to 5 percent

Lower Btk horizons
Hue: 2.5YR or 5YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 2 to 4 dry, 3 or 4 moist
Texture: extremely paragravelly sandy clay loam, very paragravelly loam, paragravelly sandy clay loam, or paragravelly loam
Pararock fragment content: 20 to 80 percent paragravel
Calcium carbonate equivalent: 2 to 8 percent

R layer is strongly or very strongly cemented sandstone bedrock

COMPETING SERIES: These are the Bernal, Joachem and Margosa series. Bernal, Joachem, and Margosa soils are in the aridic ustic moisture regime. The Frajillo series is in the ustic aridic moisture regime.

GEOGRAPHIC SETTING: Frajillo soils are on shoulders and backslopes on interfluves of undulating plains and on summits of structural benches. They formed in eolian material and residuum derived from sandstone and shale of the. Slopes are 1 to 15 percent. Elevation ranges from 6,200 to 7,100 feet. The mean annual precipitation is 12 to 14 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 49 to 51 degrees F. The frost-free period is 130 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Arojomil, Clovis, Ildefonso, Kinsell, and Palabria soils. Arojomil soils are moderately deep to a petrocalcic horizon and are on summits and shoulders of undulating plateaus. Clovis soils have a calcic horizon and occur on backslopes and footslopes. Ildefonso soils are loamy-skeletal, have a calcic horizon, and occur on shoulders and backslopes. Kinsell soils are fine-silty, have a mollic epipedon, and occur on floodplains and channels of valley floors. Palabria soils are deep, have a calcic horizon, and occur on structural benches.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; moderate permeability.

USE AND VEGETATION: Frajillo soils are used for livestock grazing and recreation. Present vegetation is New Mexico feathergrass, black grama, blue grama, bud sagebrush, Bigelow sagebrush, Bigelow rubber rabbitbrush, and buckwheat.

DISTRIBUTION AND EXTENT: Frajillo soils are of small extent in the northeastern part of the Estancia Basin in the Mexican Highland section of the Basin and Range physiographic province in northcentral New Mexico, MLRA 70C.

MLRA OFFICE RESPONSIBLE: Temple, Texas.

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2002. Frajillo is a coined name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - surface to a depth of about 3 inches. (A horizon)
Argillic horizon - 3 to about 13 inches. (Btk1, 2Btk2, and 2Btk3 horizons)
Lithic contact - 13 inches. (top of 2R layer)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: The series type location has been sampled in one horizon for partial characterization by the Soil Survey Laboratory (SSL), Lincoln, NE, as soil survey sample number S-NM-02-049-014; Calcium carbonate equivalence was determined using a field calcimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION ALIRE NM

Established Series
Rev. CDH/JVC/WWJ
01/2008

ALIRE SERIES

The Alire series consists of very deep, well drained soils that formed in alluvium derived from granite, gneiss, schist, loess, and volcanic ash. Alire soils are on beveled summits of eroded fan remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 49 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Calcidic Haplustalfs

TYPICAL PEDON: Alire loam--on a summit of an eroded fan remnant sloping 3 percent to the west at 6,635 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was dry throughout.)

A--0 to 2 inches; brown (7.5YR 5/3) loam, brown (7.5YR 4/3) moist; weak coarse platy structure parting to moderate fine granular; soft, very friable, slightly sticky and nonplastic; common fine and common very fine roots; few very fine vesicular pores; 10 percent gravel; neutral (pH 6.8); abrupt smooth boundary. (2 to 4 inches thick)

Bt--2 to 8 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, firm, moderately sticky and moderately plastic; few coarse, few medium, few fine, and common very fine roots; few medium and common very fine tubular pores; few distinct clay films on faces of peds and lining pores and common faint clay films on faces of peds; 5 percent gravel; neutral (pH 7.0); clear smooth boundary. (6 to 14 inches thick)

Btk1--8 to 15 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common medium, few fine, and few very fine roots; few fine and common very fine tubular pores; few distinct clay films on faces of peds and lining pores and few faint clay films on faces of peds; 5 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments and coarse sand grains; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 9 inches thick)

Btk2--15 to 28 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate coarse

subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine and common very fine roots; few fine and few very fine tubular pores; few distinct clay films on faces of peds and lining pores and few faint clay films on faces of peds; 10 percent gravel; strongly effervescent, secondary calcium carbonate segregated as common medium and large irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 8.8); abrupt wavy boundary. (0 to 15 inches thick)

Bk1--28 to 45 inches; pinkish white (7.5YR 8/2) loam, pink (7.5YR 7/3) moist; moderate coarse platy structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 10 percent gravel; violently effervescent, matrix is impregnated with secondary calcium carbonate; strongly alkaline (pH 9.0); clear wavy boundary. (10 to 23 inches thick)

Bk2--45 to 57 inches; pink (7.5YR 8/3) gravelly loam, light brown (7.5YR 6/4) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; few very fine tubular pores; 15 percent gravel; violently effervescent, secondary calcium carbonate segregated as many large and medium irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 9.0); clear wavy boundary. (8 to 18 inches thick)

BCk--57 to 71 inches; pink (7.5YR 7/3) gravelly sandy loam, light brown (7.5YR 6/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few fine and common very fine roots; 20 percent gravel; violently effervescent, secondary calcium carbonate segregated as many medium and fine irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 8.8); clear wavy boundary. (0 to 22 inches thick)

BCqk--71 to 105 inches; light brown (7.5YR 6/4) gravelly sandy loam, strong brown (7.5YR 5/6) moist; weak very coarse subangular blocky structure; hard, friable, nonsticky and nonplastic; few very fine roots; common fine and many very fine irregularly shaped pores; matrix is partially cemented in spots by secondary silica; 30 percent gravel; noneffervescent in spots to strongly effervescent elsewhere, secondary calcium carbonate segregated as few large and medium irregularly shaped coats on faces of peds; strongly alkaline (pH 8.6).

TYPE LOCATION: Santa Fe County, New Mexico; about 2.5 miles northwest of Agua Fria; 1,250 feet west and 1,825 feet north of the southeast corner of section 24, T.17N., R.8E.; USGS Agua Fria 7.5 minute topographic quadrangle; Latitude 35 degrees 41 minutes 14 seconds North and Longitude 106 degrees 2 minutes 23 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 49 to 52 degrees F.
Depth to base of argillic horizon - 16 to 40 inches
Depth to calcareous material (as visible secondary calcium carbonate) - 8 to 16 inches
Depth to calcic horizon - 16 to 40 inches
Volcanic glass content - 1 to 5 percent in the coarse silt and very fine sand fractions
Ammonium-oxalate extractable Al plus 1/2Fe: less than 0.20 percent
Lithology of rock fragments: granite, gneiss, and schist

Particle-size control section (weighted averages)
Silicate clay content: 25 to 35 percent
Sand content: 30 to 45 percent
Fine sand or coarser content: 20 to 35 percent
Rock fragment content: 5 to 10 percent gravel
Mica content: 1 to 3 percent (by grain count)

Reaction - neutral in the surface; neutral to slightly alkaline in the upper part of the subsoil; moderately alkaline to strongly alkaline in the lower part of the subsoil; strongly alkaline in the upper part of the substratum; moderately alkaline to strongly alkaline in the lower part of the substratum

A horizon
Value: 3 or 4 moist
Chroma: 2 or 3, dry or moist
Rock fragments: 5 to 10 percent gravel

Bt horizon
Chroma: 3 or 4, dry or moist
Texture: clay loam or loam
Rock fragment content: 5 to 10 percent gravel

Btk horizons
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6, dry or moist
Texture: clay loam or loam
Rock fragment content: 5 to 10 percent gravel
Calcium carbonate equivalent: 2 to 10 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 4 to 13

Bk1 horizon
Value: 7 or 8 dry, 6 through 8 moist
Chroma: 1 through 3 dry, 2 through 4 moist
Rock fragments: 5 to 10 percent gravel

Calcium carbonate equivalent: 20 to 40 percent
Salinity, mmhos/cm: 0 to 4
Sodicity, SAR: 4 to 13

Bk2 or Bkq horizons
Hue: 5YR or 7.5YR
Value: 7 or 8 dry, 6 through 8 moist
Chroma: 1 through 3 dry, 2 through 4 moist
Texture: gravelly loam or gravelly sandy loam
Rock fragments: total range is 15 to 30 percent
15 to 25 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 15 to 30 percent
Salinity, mmhos/cm: 2 to 8
Sodicity, SAR: 4 to 13
Other features: minor amounts of secondary gypsum (up to 1 percent) are present in some pedons; weak, discontinuous cementation by secondary silica or up to 10 percent durinodes are present in some pedons below 40 inches

BC or C horizons
Hue: 5YR or 7.5YR
Value: 6 or 7 dry, 5 or 6 moist
Chroma: 2 through 4, dry or moist
Texture: gravelly sandy loam, very gravelly sandy loam, and gravelly loam
Rock fragments: total range is 15 to 50 percent, averaging 25 to 45 percent with:
15 to 45 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 5 to 20 percent
Salinity, mmhos/cm: 0 to 4
Sodicity, SAR: 0 to 4
Other features: minor amounts of secondary gypsum (up to 1 percent) are present in some pedons; weak, discontinuous cementation by secondary silica or up to 10 percent durinodes are present in some pedons below 40 inches.

COMPETING SERIES: These are the Banquito, Brumley, Goesling, Maia, Nomrah, and Todest series. The Banquito series are moderately deep. The Brumley series have rock fragments of sandstone. The Goesling series has less than 10 percent rock fragments of sandstone lithology in the lower Bk horizon. The Maia series have 15 to 30 percent gravel contents in the particle-size control section. The Nomrah series has rock fragments of sandstone. The Todest series are moderately deep to limestone.

GEOGRAPHIC SETTING: Alire soils are on beveled summits of eroded fan remnants. They formed in alluvium derived from Precambrian granite, gneiss, and schist and Quaternary loess and volcanic ash.

Slopes are 2 to 8 percent. Elevation ranges from 6,100 to 7,400 feet. The mean annual precipitation is 13 to 15 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 50 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Encantado, Predawn, and Tanoan soils. Encantado soils are sandy-skeletal, have calcic horizons, and occur on shoulders and backslopes of eroded fan remnants. Piedawn soils have upper argillic horizons with more than 35 percent clay and occur on higher, nearly level summits of eroded fan remnants. Tanoan soils are coarse-loamy, have calcic horizons, and occur on shoulders and footslopes of eroded fan remnants.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; moderately slow permeability.

USE AND VEGETATION: Alire soils are used for urban development, livestock grazing, and recreation. The historic climax vegetation is blue grama, galleta, ring muhly, black grama, and broom snakeweed. The ecological site is Loamy(R036XB112NM).

DISTRIBUTION AND EXTENT: Alire soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Alire is a street name in Santa Fe.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from the soil surface to a depth of about 2 inches. (A horizon)

Argillic horizon - The zone from 2 to about 28 inches. (Bt, Btk1, and Btk2 horizons)

Calcic horizon - The zone from 28 to about 57 inches. (Bk1 and Bk2 horizons)

Particle-size control section - The zone from 2 to 22 inches (Bt, Btk1, and part of Btk2 horizon)

Series control section - The zone from 0 to 60 inches.

Note: This soil has minor amounts of volcanic glass in either the coarse silt or very fine sand fractions. It is assumed that most of the volcanic glass derived from nearby Pleistocene ash eruptions has altered to more stable minerals like chalcedony. In addition, Lincoln lab data from adjacent soils indicates that

ammonium oxalate extractable aluminum and iron percentages are very low. It is estimated that Alire soils have similar values and thus lack the properties of the andic intergrades.

ADDITIONAL DATA: The series type location has been sampled for full characterization by the Soil Survey Laboratory (SSL), Lincoln, NE, as soil survey sample number S95NM-049-001.

National Cooperative Soil Survey
U.S.A.

LOCATION ARMENTA NM

Established Series
Rev. CAF/CDH/TWH
01/2008

ARMENTA SERIES

The Armenta series consists of very deep, somewhat excessively drained soils that formed in slope alluvium derived from pumice. Armenta soils are on interfluves on undulating plateaus. Slopes are 3 to 20 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Ashy-pumiceous, glassy, mesic Vitritorrandic Haplustolls

TYPICAL PEDON: Armenta very paragravelly ashy coarse sand--on a footslope of an interfluve sloping 8 percent to the southeast at 6,275 feet elevation--pinyon-juniper forestland. (Colors are for dry soil unless otherwise noted. When described on September 20, 2000, the soil was dry throughout.) Surface is covered with 55 percent pumice paragravel.

A--0 to 2 inches; grayish brown (10YR 5/2) very paragravelly ashy coarse sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; few fine and common very fine roots; 45 percent paragravel; neutral (pH 6.9); clear smooth boundary. (2 to 5 inches thick)

Bw--2 to 10 inches; brown (10YR 5/3) very paragravelly ashy coarse sandy loam, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common coarse, few medium, common fine, and common very fine roots; 45 percent paragravel; slightly acid (pH 6.4); clear smooth boundary. (5 to 11 inches thick)

Bk--10 to 13 inches; pale brown (10YR 6/3) very paragravelly ashy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; common medium, few coarse, few fine, and few very fine roots; 55 percent paragravel; noneffervescent matrix, strongly effervescent in few fine irregularly shaped concretions of secondary calcium carbonate (1 percent calcium carbonate equivalent); neutral (pH 7.2); abrupt wavy boundary. (5 to 15 inches thick)

E and **Bt**--13 to 55 inches; white (N 8/0) extremely paragravelly ashy coarse sand (E), white (N 8/0) moist; single grain; loose, nonsticky and nonplastic; common medium, few fine and few very fine roots; few, thin (0.5 to 1 cm thick), continuous very pale brown (10YR 7/3) lamellae (Bt), light yellowish brown (10YR 6/4) moist, total thickness is 8 cm; 70 percent pumice paragravel; neutral (pH 7.3);

gradual wavy boundary. (20 to 45 inches thick)

C--55 to 80 inches; white (N 8/0) extremely paragravelly ashy coarse sand, white (N 8/0) moist; single grain; loose, nonsticky and nonplastic; few fine and few very fine roots; 80 percent pumice paragravel; neutral (pH 7.3).

TYPE LOCATION: Bandelier National Monument, Sandoval County, New Mexico; 9.42 miles south of Los Alamos city pond; USGS Frijoles 7.5 minute topographic quadrangle; Latitude 35 degrees 44 minutes 46.42 seconds North and Longitude 106 degrees 16 minutes 27.28 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Average annual soil temperature - 51 to 53 degrees F.
Thickness of mollic epipedon - 10 to 14 inches
Depth to calcareous material (as visible secondary calcium carbonate) - 7 to 13 inches
Oxalate extractable Al + 1/2Fe: .01 to .10 percent (estimated)

Particle-size control section:
Paragravel content (pumice fragments): 45 to 85 percent
Volcanic glass content: 70 to 95 percent in the coarse silt plus sand fraction

A horizon
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Clay content: 2 to 8 percent
Pararock fragments: 40 to 60 percent paragravel

Bw horizon (a Bt horizon in some pedons)
Hue: 10 YR or 7.5 YR
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 2 to 4 dry, 2 or 3 moist
Texture: very paragravelly or extremely paragravelly--ashy loamy coarse sand, ashy loamy sand, or ashy coarse sandy loam
Clay content: 6 to 14 percent
Sand content: 60 to 80 percent
Pararock fragments: 45 to 70 percent paragravel
Reaction: slightly acid or neutral

Bk horizons
Value: 6 or 7 dry, 4 to 6 moist
Chroma: 2 or 3 dry, 2 to 4 moist
Texture: very paragravelly ashy coarse sand or extremely paragravelly ashy coarse sand
Clay content: 1 to 6 percent
Sand content: 80 to 95 percent
Pararock fragments: 50 to 70 percent paragravel
Calcium carbonate equivalent: 1 to 2 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Volcanic glass content: 70 to 90 percent in the coarse silt plus sand fraction

E and Bt horizons
Value: 7 or 8, dry or moist
Chroma: 0 to 2, dry or moist
Clay content: 1 to 6 percent
Sand content: 80 to 95 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Pararock fragments: 60 to 80 percent paragravel
Volcanic glass content: 80 to 95 percent in the coarse silt plus sand fraction

C horizons
Value: 7 or 8, dry or moist
Chroma: 0 to 2, dry or moist
Clay content: 0 to 4 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Pararock fragments: 65 to 85 percent paragravel

COMPETING SERIES: There are no competing series.

GEOGRAPHIC SETTING: Armenta soils are on backslopes, footslopes, and toeslopes of interfluves on undulating plateaus. They formed in slope alluvium derived from air-fall pumice of the Quaternary Age Cajete Member. Slopes are 3 to 20 percent. Elevation ranges from 5,400 to 7,000 feet. The mean annual precipitation is 12 to 14 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 49 to 51 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Canuela, Hackroy, and Chiminet soils. Canuela soils are loamy, shallow to bedrock, have an argillic horizon, and occur on beveled summits of interfluves. Hackroy soils are clayey, shallow to bedrock, have an argillic horizon, and are on summits

of interfluves. Chiminet soils are loamy, very shallow to bedrock, and are on shoulders and backslopes of interfluves.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained; low surface runoff; moderately rapid permeability in the upper part and very rapid in the lower part.

USE AND VEGETATION: Armenta soils are used for and recreation and wildlife habitat. The historic climax vegetation is ponderosa pine, Gambel's oak, mountain muhly, and muttongrass. The ecological site is Pinus edulis/Rhus trilobata/Bouteloua gracilis (F036XB133NM).

DISTRIBUTION AND EXTENT: Armenta soils are of small extent on the southwestern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico, Santa Fe Area Soil Survey Update, 2008. Series proposed in Sandoval County, New Mexico; Bandelier National Monument Soil Survey; 2000. Armenta is a street name in Santa Fe.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - The zone from the soil surface to a depth of about 10 inches. (A and Bw horizons)

Vitritorrandic feature - Based on both the content of pumice and on the estimated content of volcanic glass throughout the upper 30 inches (A, Bw, Bk, and part of E and Bt horizons).

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a calcimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION ADORNADO NM

Established Series
Rev. JMP/CDH/TWH
01/2008

ADORNADO SERIES

The Adornado series consists of very deep, somewhat excessively drained soils that formed in slope alluvium derived from pumice. Adornado soils are on backslopes and footslopes of interfluves on undulating plateaus. Slopes are 8 to 20 percent. Mean annual precipitation is about 17 inches and mean annual temperature is about 47 degrees F.

TAXONOMIC CLASS: Ashy-pumiceous, glassy, mesic Vitrandic Haplustolls

TYPICAL PEDON: Adornado very paragravelly ashy sandy loam--on a footslope of an undulating plateau sloping 13 percent to the east at 7,316 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described on September 8, 2000, the soil was dry throughout.) Surface is covered with 50 percent pumice paragravel.

A1--0 to 2 inches; very dark grayish brown (10YR 3/2) very paragravelly ashy sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine and many very fine roots; 40 percent paragravel; neutral (pH 6.8); abrupt smooth boundary. (2 to 5 inches thick)

A2--2 to 11 inches; dark grayish brown (10YR 4/2) extremely paragravelly ashy coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse granular structure; soft, very friable, slightly sticky and nonplastic; few medium, common fine, and many very fine roots; one 7-cm krotovina; 65 percent paragravel; neutral (pH 6.8); clear smooth boundary. (6 to 9 inches thick)

Bt--11 to 30 inches; grayish brown (10YR 5/2) extremely paragravelly ashy sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and nonplastic; few medium, common fine, and many very fine roots; few faint clay films on pararock fragments; 70 percent paragravel; neutral (pH 6.8); abrupt wavy boundary. (6 to 19 inches thick)

2E and **Bt1**--30 to 47 inches; white (10YR 8/1) extremely paragravelly ashy coarse sand (E), light gray (10YR 7/1) moist; single grain; loose, nonsticky and nonplastic; few medium, common fine, and few very fine roots; one 20-cm krotovina; 75 percent paragravel; slightly alkaline (pH 7.6); common lamellae of brownish yellow (10YR 6/6) very paragravelly ashy coarse sand (Bt), yellowish brown

(10YR 5/6) moist, soft, very friable, nonsticky and nonplastic; few fine roots; 50 percent paragravel; lamellae are continuous, nearly horizontal, 0.5 to 1 cm thick, total thickness is 3 cm; gradual smooth boundary. (9 to 46 inches thick)

2E and **Bt2**--47 to 64 inches; white (10YR 8/1) extremely paragravelly ashy coarse sand (E), light gray (10YR 7/1) moist; single grain; loose, nonsticky and nonplastic; few medium, few fine, and common very fine roots; one 20-cm krotovina; 80 percent paragravel; slightly alkaline (pH 7.8); common lamellae of brownish yellow (10YR 6/6) very paragravelly ashy coarse sand (Bt), yellowish brown (10YR 5/6) moist, soft, very friable, nonsticky and nonplastic; few fine roots; 55 percent paragravel; lamellae are continuous, nearly horizontal, 0.5 to 1 cm thick, total thickness is 7 cm; gradual smooth boundary. (13 to 17 inches thick)

2C--64 to 82 inches; white (10YR 8/1) extremely paragravelly ashy coarse sand, light gray (10YR 7/1) moist; single grain; loose, nonsticky and nonplastic; 85 percent paragravel; slightly alkaline (pH 7.8).

TYPE LOCATION: Bandelier National Monument; Los Alamos County, New Mexico; USGS Frijoles 7.5 minute topographic quadrangle; about 4 miles south of Los Alamos; Latitude 35 degrees 49 minutes 30.69 seconds North and Longitude 106 degrees 19 minutes 43.40 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section (SMCS) is moist in all parts from January to May and intermittently moist in some part from June to December. The SMCS is dry in some part less than 60 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soil moisture regime is typic ustic.

Average annual soil temperature - 47 to 49 degrees F.
Thickness of mollic epipedon: 14 to 35 inches
Lithology of pararock fragments: Pumice
Depth to buried horizons: 60 to 80 inches or more
Volcanic glass content: 70 to 90 percent in the coarse silt plus sand fraction
Oxalate extractable Al + 1/2Fe: .01 to .10 percent

Particle-size control section:
Paragravel content (pumice fragments): 45 to 90 percent
Volcanic glass content: 70 to 95 percent in the coarse silt plus sand fraction

A1 horizon
Hue - 7.5YR or 10YR
Value - 2 to 5 dry, 2 or 3 moist
Chroma - 1 to 3, dry or moist
Texture - very paragravelly ashy sandy loam or very paragravelly ashy coarse sandy loam
Clay content - 8 to 18 percent

Sand content: 55 to 65 percent
Pararock fragments - 35 to 60 percent paragravel

A2 horizon
Value - 4 or 5 dry
Chroma - 2 or 3 dry
Clay content - 8 to 18 percent
Sand content: 55 to 65 percent
Pararock fragments - 45 to 65 percent paragravel

Bt horizon
Hue - 7.5YR or 10YR
Value - 5 to 7 dry, 3 to 5 moist
Chroma - 2 to 6 dry or moist
Texture - extremely paragravelly ashy sandy loam, very paragravelly ashy coarse sandy loam, or extremely paragravelly ashy coarse sandy loam
Clay content - 8 to 18 percent
Sand content: 55 to 65 percent
Pararock fragments - 45 to 75 percent paragravel

2E and Bt horizons
Hue: 7.5YR or 10YR
Value - 6 to 8 dry, 7 or 8 moist
Chroma - 1 to 3 dry, 1 to 4 moist
Clay content - 2 to 8 percent
Sand content: 80 to 95 percent
Pararock fragments - 70 to 90 percent paragravel
Reaction: slightly alkaline or moderately alkaline

2C horizon
Hue - 7.5YR or 10YR
Chroma - 1 or 2 moist
Clay content - 0 to 4 percent
Sand content: 80 to 95 percent
Pararock fragments - 75 to 90 percent paragravel

Buried horizons (when present)
Hue: 7.5YR or 10YR
Value: 5 or 6 dry
Chroma: 3 to 6, dry or moist
Texture: very fine sandy loam, sandy clay loam, or paragravelly clay loam
Clay content - 18 to 35 percent

Pararock fragments: 5 to 25 percent paragravel
Lithology of pararock fragments: rhyolitic tuff
Reaction: neutral

COMPETING SERIES: There are no competing series. Similar soils in different families are the Armenta and Cajete series. Armenta soils are in an aridic ustic moisture regime. Cajete soils are in a frigid temperature regime.

GEOGRAPHIC SETTING: Adornado soils are on backslopes and footslopes of interfluves on undulating plateaus. They formed in slope alluvium derived from air-fall pumice of the Quaternary Age Cajete Member. Slopes are 8 to 20 percent. Elevation ranges from 6,400 to 7,600 feet. The mean annual precipitation is 14 to 20 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 45 to 49 degrees F. The frost-free period is 120 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Canuela, Letrado, Nyjack, and Tocal soils. Canuela soils are loamy, shallow, and occur on narrow summits of undulating plateaus at lower elevations. Letrado soils are fine-loamy, do not have mollic epipedons, and occur on toeslopes of interfluves on undulating plateaus. Nyjack soils are fine-loamy, moderately deep, and occur on summits of interfluves on undulating plateaus at lower elevations. Tocal soils are clayey, shallow, and occur on shoulders of interfluves on undulating plateaus.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained, low runoff; permeability is moderately rapid in the upper part and very rapid in the lower part.

USE AND VEGETATION: Adornado soils are used for recreation and wildlife habitat. The historic climax vegetation is ponderosa pine, Gambel's oak, Rocky Mountian juniper, blue grama, bottlebrush squirreltail, and little bluestem. The ecological site is Pinus ponderosa/Quercus gambleii (F048AY010NM).

DISTRIBUTION AND EXTENT: Adornado soils are of small extent on the southwestern Jemez Volcanic Field part of the Southern Rocky Mountain province in northcentral New Mexico. The MLRA is 48A.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico, Santa Fe Area Soil Survey Update, 2008. Series proposed in Los Alamos County, New Mexico; Bandelier National Monument Soil Survey, 2000. Adornado is a coined name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - The zone from 0 to 30 inches. (A1, A2, and Bt horizons)

This pedon has a Bt horizon that does not qualify as an argillic horizon.

Particle-size control section - The zone from 10 to 40 inches. (A2, Bt, and 2E and Bt1 horizons)

Vitrandic feature - Based on both the content of pumice and on the estimated content of volcanic glass throughout the upper 30 inches (A1, A2, and Bt horizons).

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ALCHONZO NM

Established Series
Rev. CAF/CDH/WWJ
01/2008

ALCHONZO SERIES

The Alchonzo series consists of moderately deep, well drained soils that formed in slope alluvium and colluvium derived from monzonite. Alchonzo soils are on north-facing mountainflanks of mountains. Slopes are 45 to 90 percent. Mean annual precipitation is about 17 inches and mean annual temperature is about 46 degrees F.

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, frigid Pachic Haplustolls

TYPICAL PEDON: Alchonzo extremely gravelly loam, extremely stony--on a mountain sloping 47 percent to the north at 7,850 feet elevation--forestland. (Colors are for dry soil unless otherwise noted. When described on August 28, 2001, the soil was dry throughout.)

Oi--0 to 2 inches; slightly decomposed needles, twigs, and cones; abrupt smooth boundary. (1 to 2 inches thick)

A--2 to 12 inches; very dark brown (10YR 2/2) extremely gravelly sandy loam, black (10YR 2/1) moist; moderate medium granular structure; soft, loose, slightly sticky and nonplastic; many coarse, many medium, common fine, and few very fine roots; common medium and common fine irregularly shaped pores; 60 percent gravel, 10 percent cobbles, and 5 percent stones; neutral (pH 6.8); gradual smooth boundary. (1 to 10 inches thick)

Bw1--12 to 27 inches; dark brown (10YR 3/3) extremely gravelly sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, loose, slightly sticky and nonplastic; common medium, common fine, and few very fine roots; common fine and common medium irregularly shaped pores; 45 percent gravel, 5 percent cobbles, and 20 percent stones; neutral (pH 6.6); clear smooth boundary. (5 to 17 inches thick)

Bw2--27 to 29 inches; very dark brown (7.5YR 2.5/2) very gravelly sandy loam, black (7.5YR 2.5/1) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common medium and few very fine roots; common medium and few fine irregularly shaped pores; 30 percent gravel, 5 percent cobbles, and 5 percent stones; neutral (pH 6.6). (2 to 11 inches thick)

R--29 inches; hard monzonite bedrock.

TYPE LOCATION: Santa Fe County, New Mexico; about 5.5 miles south of Madrid, New Mexico; USGS Golden, 7.5 minute topographic quadrangle; Latitude 35 degrees 19 minutes 46.9 seconds North and Longitude 106 degrees 09 minutes 33.4 seconds West, NAD 27.

RANGE IN CHARACTERISTICS: (Depths given are measured from the mineral soil surface)

Soil moisture: The soil moisture control section (SMCS) is moist in all parts from January to May and intermittently moist in some part from June to December. The SMCS is dry in all parts less than 40 percent of the time and dry in some or all parts more than 105 cumulative days when the soil temperature at 20 inches (50 cm) is above 41 degrees F. The soil moisture regime is typic ustic.

Average annual soil temperature - 45 to 47 degrees F
Depth to base of mollic epipedon - 20 to 35 inches
Depth to lithic contact - 20 to 40 inches
Organic matter content - 2 to 5 percent in the mollic epipedon
Lithology of rock fragments: monzonite

Particle-size control section weighted averages -
Silicate clay content: 14 to 18 percent
Sand content: 45 to 70
Fine sand or coarser content: 40 to 65
Rock fragment content: 35 to 75 percent

A horizon
Value: 2 through 5 dry, 2 or 3 moist
Chroma: 1 through 3, dry or moist
Clay content: 9 to 14 percent
Rock fragments: Total range is 60 to 90 percent
45 to 60 percent gravel
10 to 20 percent cobbles
0 to 5 percent stones
0 to 5 percent boulders

Bw1 horizon
Value: 2 through 4 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: extremely gravelly sandy loam, extremely cobbly sandy loam, very cobbly loam, very gravelly fine sandy loam
Clay content: 14 to 19 percent:
Rock fragments: Total range is 45 to 75 percent

35 to 55 percent gravel
5 to 15 percent cobbles
0 to 20 percent stones
0 to 5 percent boulders

Bw2 horizon
Hue: 7.5 YR or 10YR
Value: 2.5 through 5, dry or moist
Chroma: 2 through 4, dry or moist
Texture: very gravelly sandy loam, very cobbly sandy loam, very cobbly loam
Clay content: 13 to 15 percent
Rock fragments: Total range is 35 to 60 percent
10 to 30 percent gravel
5 to 20 percent cobbles
0 to 5 percent stones
0 to 5 percent boulders

COMPETING SERIES: These are the Blanca, Caballo, Garber, Hidatsa, Lolo, Mescalero, Osha, and Utso series.
Blanca, Caballo, Garber, Hidatsa, Lolo, Osha, and Utso soils do not have a lithic contact above 40 inches.
Mescalero soils have rock fragments of limestone and are calcareous in the lower part of the mollic epipedon.

GEOGRAPHIC SETTING: Alchonzo soils are on north-facing mountainflanks of mountains. They formed in slope alluvium and colluvium derived from Tertiary age monzonite. Slopes are 45 to 90 percent. Elevation ranges from 6,900 to 8,900 feet. The mean annual precipitation is 16 to 18 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 45 to 47 degrees F. The frost-free period is 110 to 130 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Cochiti and Wandurn soils. Cochiti soils are very deep, have an argillic horizon, are in an aridic ustic soil moisture regime, and occur on alluvial fans. Wandurn soils have an argillic horizon, are in an aridic ustic soil moisture regime, and occur on adjacent south-facing backslopes of mountains.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; permeability is moderately rapid.

USE AND VEGETATION: Alchonzo soils are used for wildlife habitat and recreation. The historic climax vegetation is ponderosa pine, Gambel's oak, mountain muhly, and muttongrass. The ecological site is Pinus ponderosa/Quercus gambleii (F048AY010NM).

DISTRIBUTION AND EXTENT: Alchonzo soils are of small extent on the Mexican Highlands section of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Alchonzo is a coined name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Mollic epipedon (Pachic feature) - The zone from the soil surface to a depth of about 29 inches. (A1, Bw1, and Bw2 horizons)
Lithic contact- monzonite bedrock at 29 inches. (R layer)

Particle-size-control section- The zone from 12 to 29 inches. (Bw1 and Bw2 horizons)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ALIANTE NM

Tentative Series
Rev. JMP/CDH/WJG
12/2007

ALIANTE SERIES

The Aliante series consists of very deep, well drained, soils that are moderately permeable in the upper part and slowly permeable in the lower part. These soils formed in slope alluvium and alluvium derived from sandstone and shale. Aliante soils are on footslopes and toeslopes of interfluves on undulating plateaus and flood plains of valley floors. Slopes are 0 to 5 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Aridic Argiustolls

TYPICAL PEDON: Aliante loam--on the toeslope of an undulating plateau sloping 5 percent to the southeast at 7,500 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 1 inch; brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure parting to weak fine granular; soft, friable, slightly sticky and slightly plastic; few fine and many very fine roots; few fine interstitial pores; 5 percent gravel; neutral (pH 6.8); abrupt smooth boundary. (1 to 3 inches thick)

Bt1--1 to 9 inches; brown (10YR 4/3) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, many fine, and common very fine roots; few medium and few fine tubular pores; few faint clay films on faces of peds; slightly alkaline (pH 7.6); clear smooth boundary.

Bt2--9 to 19 inches; dark brown (7.5YR 3/3) silt loam, very dark brown (7.5YR 2.5/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and moderately plastic; few medium, many fine, and many very fine roots; few medium and few fine tubular pores; few distinct and many faint clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt3--19 to 31 inches; brown (7.5YR 4/4) silt loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few common and many very fine roots; few medium and common fine tubular pores; few faint clay films on faces of peds; 3 percent gravel; slightly alkaline (pH 7.6); clear smooth boundary.

Bt4--31 to 38 inches; brown (7.5YR 4/4) silt loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; few very coarse, common fine, and few very fine roots; few fine and common very fine tubular pores; few distinct clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt5--38 to 47 inches; brown (7.5YR 4/4) silt loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine and few very fine roots; few fine tubular pores; few faint clay films on faces of peds; slightly alkaline (pH 7.4); clear wavy boundary. (combined thickness of the Bt horizons is 35 to 70 inches thick)

ABtb--47 to 65 inches; dark brown (10YR 3/3) silty clay loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few medium and few very fine roots; common fine tubular pores; 5 percent gravel; moderately alkaline (pH 8.2); clear smooth boundary. (8 to 18 inches thick)

BC1b--65 to 91 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; weak coarse subangular blocky structure; very hard, very firm, very sticky and very plastic; neutral (pH 7.2); clear smooth boundary. (5 to 20 inches thick)

BC2b--91 to 111 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; weak coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; 5 percent gravel; neutral (pH 7.2).

TYPE LOCATION: Santa Fe County, New Mexico; about 2.75 miles southwest of Glorieta; 1800 feet east and 850 feet north of the southwest corner of Section 9, T15N, R11E; USGS Glorieta 7.5 minute topographic quadrangle; Latitude 35 degrees 32 minutes 18 seconds North and Longitude 105 degrees 46 minutes 53 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. December and August are the wettest months of the year. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 49 to 51 degrees F.
Depth to base of mollic epipedon - 10 to 20 inches
Depth to base of argillic horizon - 44 to 60
Organic matter content - 1 to 2 percent in the mollic epipedon and .5 to 1 percent below
Salinity, dS/m - 0 to 1

Particle size control section weighted averages:
Silicate clay content: 18 to 27 percent
Sand content: 20 to 30 percent
Fine sand or coarser content: 5 to 15 percent;
Rock fragment content: 2 to 5 percent gravel, lithology of fragments is sandstone.

A horizon
Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2.5 or 3 moist
Chroma: 2 to 4 dry, 2 or 3 moist
Rock fragments: 2 to 10 percent gravel

Upper Bt horizons
Hue: 7.5YR or 10YR
Value: 3 or 4 dry, 2.5 or 3 moist
Chroma: 2 or 3, dry or moist
Texture - loam or silt loam
Rock fragments: 0 to 5 percent gravel

Lower Bt horizons
Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 3 or 4 moist
Chroma: 3 or 4 dry or moist
Texture - loam or silt loam
Rock fragments: 0 to 5 percent gravel

ABtb horizon
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 1 to 3, dry or moist
Texture: loam, clay loam or silt clay loam
Rock fragments: 0 to 2 percent gravel

BC horizons (where present)
Chroma: 3 or 4, dry or moist
Texture: clay or clay loam
Rock fragments: 2 to 5 percent

COMPETING SERIES: These are the Alliance , Cale , Calemore, Hugoton, Kadoka, Keith(NE), Mace, Norka, Thirtynine, and Vale) series Alliance, Calemore, Hugoton, Kadoka, Keith, Norka, and Thirtynine soils are more moist in their moisture control section in late spring and early summer. Cale, Calemore, Hugoton, Mace, Norka, Thirtynine and Vale soils have accumulations of secondary carbonates. In addition, Mace soils are moderately deep to bedrock.

GEOGRAPHIC SETTING: Aliante soils are on footslopes and toeslopes of interfluves of undulating plateaus. They formed in slope alluvium and alluvium derived from Triassic and Permian age sandstone and shale. Slopes are 0 to 5 percent. Elevation ranges from 6,500 to 7,900 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 46 to 48 degrees F. The frost-free period is 120 to 140 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Altega, Altezita, Esquila, Estrada, Sabroso and Verano soils. Altega soils do not have a mollic epipedon and occur on adjacent summits of undulating plateaus. Altezita soils are loamy, very shallow, and occur on beveled summits. Estrada soils are fine-loamy, have thick mollic epipedons, and occur on footslopes and toeslopes. Sabroso soils are loamy-skeletal, do not have a mollic epipedon, and occur on steep south-facing backslopes. Verano soils are loamy-skeletal and occur on steep north-facing backslopes..

DRAINAGE AND PERMEABILITY: Well drained; low surface runoff; moderately slow permeability in the subsoil, slow permeability in the upper buried soil, and moderately slow permeability in the substratum.

USE AND VEGETATION: Aliante soils are used for urban development, livestock grazing, and recreation. Present vegetation is western wheatgrass, blue grama, sand dropseed, cheatgrass, junegrass, broom snakeweed, mullein, and scattered twoneedle pinyon and Rocky Mountain juniper.

DISTRIBUTION AND EXTENT: Aliante soils are of small extent on the northern Glorieta Slope part of the Pecos Valley section of the Great Plains province in northcentral New Mexico. The MLRA is 70A.

MLRA OFFICE RESPONSIBLE: Temple, Texas

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2000. Aliante is a place name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - 0 to 19 inches. (A, Bt1, and Bt2 horizons)

Argillic horizon - 9 to 47 inches. (Bt horizons)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: The series type location has been sampled for the National Soil Survey Laboratory (NSSL), Lincoln, NE, as soil survey sample number S99NM-049-7. Reference analyses such as particle-size distribution, organic carbon content, and cation exchange capacity are being performed.

National Cooperative Soil Survey
U.S.A.

LOCATION ALTAZANO NM

Established Series
Rev. CDH/JVC/TWH
01/2008

ALTAZANO SERIES

The Altazano series consists of very deep, well to somewhat excessively drained soils that formed in alluvium and slope alluvium derived from granite, gneiss, and schist, and from granitic sandstone, fanglomerate, and mudstone. Altazano soils are on inset fans of eroded fan remnants and narrow flood plains of valley floors. Slopes are 0 to 8 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents

TYPICAL PEDON: Altazano gravelly sandy loam--on a small inset fan sloping 5 percent to the northwest at 6,730 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was dry throughout.)

AC--0 to 2 inches; brown (7.5YR 5/3) gravelly sandy loam, brown (7.5YR 4/3) moist; weak medium platy structure parting to moderate medium granular; soft, very friable, slightly sticky and nonplastic; few fine and common very fine roots; surface has discontinuous lag deposits of very gravelly coarse sand, very fine sandy loam, and plant debris from recent flooding; 20 percent gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 5 inches thick)

C1--2 to 8 inches; brown (7.5YR 5/3) gravelly coarse sandy loam, brown (7.5YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and nonplastic; few medium, few fine, and common very fine roots; common very fine irregularly shaped pores; 25 percent gravel; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 14 inches thick)

C2--8 to 19 inches; brown (7.5YR 5/3) very gravelly loamy coarse sand, brown (7.5YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few medium, common fine, and common very fine roots; few very fine irregularly shaped pores; common thin lenses of sandy loam; 35 percent gravel and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary. (4 to 13 inches thick)

C3--19 to 29 inches; brown (7.5YR 5/3) gravelly sandy loam, brown (7.5YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and nonplastic; common medium, few fine, and few

very fine roots; few fine and few very fine irregularly shaped pores; few thin lenses of very gravelly loamy coarse sand; 25 percent gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (0 to 11 inches thick)

Btkb1--29 to 46 inches; brown (7.5YR 5/3) loam, dark brown (7.5YR 3/3) moist; weak medium prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few coarse, common medium, few fine, and common very fine roots; few fine and few very fine tubular pores; few faint clay films on faces of peds and lining pores; 5 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments; moderately alkaline (pH 8.4); clear smooth boundary. (8 to 17 inches thick)

Btkb2--46 to 65 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 4/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and few very fine roots; few fine and common very fine tubular pores; few faint clay films on faces of peds and lining pores; 5 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine and medium irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (9 to 22 inches thick)

BCkb--65 to 74 inches; light brown (7.5YR 6/3) gravelly coarse sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and few very fine roots; few very fine irregularly shaped pores; thin stratum of very gravelly sandy loam at top of horizon; 15 percent gravel and 5 percent cobbles; strongly effervescent, secondary calcium carbonate segregated as common fine and medium irregularly shaped coats on rock fragments; strongly alkaline (pH 8.6); clear smooth boundary. (0 to 20 inches thick)

Ckb--74 to 90 inches; light brown (7.5YR 6/3), gravelly loamy coarse sand, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 15 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on rock fragments; moderately alkaline (pH 8.4).

TYPE LOCATION: Santa Fe County, New Mexico; about 3 miles north of Agua Fria; 100 feet north and 850 feet west of the southeast corner of section 18, T.17N., R.9E.; USGS Agua Fria 7.5 minute topographic quadrangle; Latitude 35 degrees 41 minutes 49.5 seconds North and Longitude 106 degrees 1 minute 16 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is intermittently moist in some part from December to March and July to October. Rainfall and floodwaters moisten the profile in the summer. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 49 to 52 degrees F.
Thickness of surface mantle over buried soils - 20 to 40 inches

Lithology of fragments: granite, gneiss and schist.

There are no subsurface diagnostic horizons except buried diagnostic horizons and features
Depth to buried argillic horizon 25 to 35 inches
Depth to buried identifiable secondary carbonates - 14 to 43 inches
Depth to paralithic contact - 85 to 100 inches
Depth to buried calcic horizon 58 to 68 inches
Reaction - slightly alkaline to moderately alkaline in the surface and subsurface horizons; moderately alkaline to strongly alkaline in the buried horizons

Particle-size control section (weighted averages)
Silicate clay content: 4 to 14 percent
Sand content: 60 to 80 percent
Fine sand or coarser content: 70 to 90 percent
Rock fragment content: 15 to 35 percent

AC horizon
Value: 5 or 6 dry
Chroma: 3 or 4 dry
Texture: gravelly sandy loam or loamy sand
Rock fragments: 5 to 25 percent gravel
Other features: this horizon is a recent stratified deposit and does not qualify as an Ochric epipedon; some pedons contain as much as 30 percent rock fragments

C horizons
Value: 5 or 6 dry
Chroma: 3 or 4, dry or moist
Texture: stratified very gravelly loamy coarse sand to gravelly sandy loam or stratified gravelly loamy coarse sand to fine sandy loam
Rock fragments: total range is 15 to 35 percent
15 to 30 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 2 to 10 percent
Salinity, mmhos/cm: 0 to 2
Other features: thin subhorizons have as few as 10 percent or as much as 40 percent gravel

Btkb or Bkb horizons
Value: 4 through 6 dry, 3 or 4 moist
Chroma: 2 through 4, dry or moist
Texture: loam, sandy loam, or sandy clay loam
Rock fragments: 5 to 15 percent gravel
Calcium carbonate equivalent: 2 to 20 percent

Salinity, mmhos/cm: 0 to 2

BCkb horizon
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 through 4, dry or moist
Texture: gravelly coarse sandy loam, gravelly sandy loam, or gravelly loam
Rock fragments: total range is 15 to 35 percent
15 to 30 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 2 to 20 percent
Salinity, mmhos/cm: 0 to 2

Ckb horizon
Value: 5 or 6 dry
Chroma: 3 or 4, dry or moist
Texture: gravelly loamy coarse sand or gravelly coarse sand
Rock fragments: 15 to 30 percent gravel
Calcium carbonate equivalent: 2 to 10 percent
Salinity, mmhos/cm: 0 to 2

COMPETING SERIES: These are the Pietown and Sodawells series. The Pietown series are very deep. The Sodawells series receive most of their moisture during April through June.

GEOGRAPHIC SETTING: Altazano soils are on small inset fans of erosional fan remnants and narrow flood plains of valley floors. They formed in alluvium derived from Precambrian granite, gneiss, and schist; and from Tertiary granitic sandstone, fanglomerate, and mudstone. Slopes are 0 to 8 percent. Elevation ranges from 5,700 to 7,900 feet. The mean annual precipitation is 13 to 15 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 50 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Buckhorse, Levante, and Dondiego soils. Buckhorse soils have mollic epipedons and argillic horizons, and occur on adjacent toeslopes. Levante soils are sandy, do not have buried soils within 40 inches, and occur on adjacent narrowflood plains of arroyos. Dondiego soils are fine-loamy, have thick mollic epipedons, and occur on adjacent low stream terraces.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained, low and very low surface runoff; permeability is moderately rapid to moderate in the upper loamy horizons and rapid to very rapid in the lower sandy horizons. These soils are subject to occasional or frequent, extremely brief periods of flooding between July and September. Floodwaters may have high velocity but are generally less than 2 feet deep.

USE AND VEGETATION: Altazano soils are used for urban development, livestock grazing, and recreation. The historic climax vegetation is blue grama, black grama, Gambel oak, and oneseed juniper. The ecological site is Hills (R036XB124NM).

DISTRIBUTION AND EXTENT: Altazano soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Altazano is a street name in Santa Fe.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Surface mantle of new material - new alluvial material from the soil surface to 29 inches. (AC, C1, C2, and C3 horizons)
Buried soil from 29 to 90 inches (Btkb, BCk, and Ck horizons)
Particle-size control section from 10 to 29 inches (part of the C2 and the C3 horizon)
Buried Argillic horizon - The zone from 29 to about 65 inches. (Btkb horizons)
Buried Identifiable secondary carbonates - 29 to 90 inches
Buried Calcic horizon 65 to 90 inches
Fluventic feature - an irregular organic-carbon distribution is inferred from the stratified textures.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ALTEGA NM

Tentative Series
Rev. LAG/CDH/ACT/WJG
12/2007

ALTEGA SERIES

The Altega series consists of very deep, well drained, moderately permeable soils that formed in eolian material and slope alluvium derived from sandstone and shale. Altega soils are on summits and shoulders of interfluves on undulating plateaus and on fan aprons. Slopes are 3 to 10 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine-silty, mixed, superactive, mesic Aridic Haplustalfs

TYPICAL PEDON: Altega loam--on a summit of an undulating plateau sloping 3 percent to the east southeast at 7,490 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the profile was dry throughout.)

A--0 to 2 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine and few very fine roots; few very fine irregularly shaped pores; slightly alkaline (pH 7.6); abrupt smooth boundary. (1 to 3 inches thick)

Bt1--2 to 9 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, common fine, and few very fine roots; few fine tubular pores; few faint clay films on faces of peds; slightly alkaline (pH 7.6); abrupt smooth boundary.

Bt2--9 to 19 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and slightly plastic; few coarse, few medium, few fine, and few very fine roots; common fine tubular pores; few faint clay films on faces of peds; neutral (pH 7.2); abrupt smooth boundary. (combined thickness of the Bt horizons is 12 to 30 inches)

Btk--19 to 24 inches; brown (7.5YR 5/3) loam, brown (7.5YR 4/3) moist; moderate medium angular blocky structure; hard, firm, moderately sticky and slightly plastic; few fine and few very fine roots; common fine tubular pores; few faint clay films on faces of peds; strongly effervescent, secondary calcium carbonate segregated as few medium irregularly shaped coats on faces of peds; slightly alkaline (pH 7.4); clear smooth boundary. (5 to 16 inches thick)

BAtkb--24 to 29 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/2) moist; moderate fine angular blocky structure; hard, friable, moderately sticky and slightly plastic; few fine and few very fine roots; common fine tubular pores; few distinct and few faint clay films on faces of peds; violently effervescent, secondary calcium carbonate segregated as many coarse irregularly shaped coats on faces of peds; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 10 inches thick)

Btkb1--29 to 43 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 4/4) moist; moderate fine angular blocky structure; hard, friable, moderately sticky and moderately plastic; few fine and few very fine roots; few fine and few very fine tubular pores; few faint clay films on faces of peds; violently effervescent, secondary calcium carbonate segregated as many coarse irregularly shaped coats on faces of peds; strongly alkaline (pH 8.6); clear wavy boundary.

Btkb2--43 to 58 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few common, few fine and few very fine roots; few very fine tubular pores; few faint clay films on faces of peds; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds; moderately alkaline (pH 8.4); clear wavy boundary. (combined thickness of the Btkb horizon is 6 to 30 inches.)

Bkb1--58 to 81 inches; reddish yellow (7.5YR 6/6) loam, strong brown (7.5YR 4/6) moist; moderate medium angular blocky structure; hard, firm, slightly sticky and nonplastic; few fine roots; few very fine tubular pores; 5 percent gravel; violently effervescent, secondary calcium carbonate segregated as few coarse and common medium irregularly shaped coats on faces of peds; moderately alkaline (pH 8.4); clear wavy boundary. (10 to 23 inches thick).

Bkb2--81 to 101 inches; reddish yellow (7.5YR 7/6) loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and many very fine tubular pores; 5 percent gravel; slightly effervescent, secondary calcium carbonate segregated as few medium irregularly shaped coats on faces of peds; strongly alkaline (pH 8.8); abrupt wavy boundary. (0 to 20 inches thick).

2R--101 to 111 inches; very strongly cemented sandstone bedrock.

TYPE LOCATION: Santa Fe County, New Mexico; 2,225 feet east and 650 feet north of the southwest corner of section 9, T.15N., R.11E.; USGS Glorieta 7.5 minute topographic quadrangle; Latitude 35 degrees 32 minutes 16 seconds North and Longitude 105 degrees 46 minutes 49 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of

the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is aridic ustic.

Soil temperature - 49 to 51 degrees F.
Depth to base of argillic horizon - 40 to 66 inches
Depth to calcareous material (as visible secondary calcium carbonate) - 15 to 30 inches
Reaction - slightly alkaline in the surface; neutral to moderately alkaline and upper part of the subsoil; moderately alkaline to strongly alkaline in the lower part of the subsoil and in the substratum
Salinity: 0 to 1
Sodicity, SAR: 0 to 2
Buried horizons do not occur in all pedons.

Particle size control section weighted averages: -
Silicate clay content: 25 to 35 percent
Sand content: 25 to 40 percent
Fine sand or coarser content: 8 to 15 percent
Rock fragment content: 2 to 5 percent gravel, lithology of fragments is sandstone

A horizon
Hue: 7.5YR or 10YR
Value: 3 to dry, 3 or 4 moist
Chroma: 2 to 4 dry, 1 to 4 moist
Rock fragments: 2 to 5 percent, mostly gravel

Bt horizons
Hue: 7.5YR or 10YR
Value: 3 through 5 dry, 2 to 4 moist
Chroma: 2 to 5 dry, 2 to 4 moist
Texture: loam or clay loam
Rock fragments: 2 to 12 percent, mostly gravel
Other features: when color value moist is 3 or less, color chroma moist is 4 (non-mollic)

Btk horizon
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 4, 2 to 4 moist
Texture: loam or clay loam
Rock fragments: 2 to 5 percent, mostly gravel
Calcium carbonate equivalent: 1 to 3 percent

BAtkb horizon (where present)
Hue: 7.5YR or 10YR

Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 4, 2 to 4 moist
Texture: loam or clay loam
Rock fragments: 2 to 5 percent, mostly gravel
Calcium carbonate equivalent: 1 to 3 percent

Btkb horizons
Value: 6 dry, 4 moist
Chroma: 3 or 4, dry or moist
Texture: loam or clay loam
Rock fragments: 0 to 5 percent, mostly gravel
Calcium carbonate equivalent: 1 to 3 percent

Bkb horizons
Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 3 or 4 moist
Chroma: 2 to 8 dry, 2 to 6 moist
Texture: gravelly loam or loam
Rock fragments: 3 to 20 percent, mostly gravel
Calcium carbonate equivalent: 1 to 3 percent

COMPETING SERIES: These are the Amal(NM), Buick(CO), Chevelon(AZ), Chita(NM), Elpedro (NM), Keiser(MT), Klinedraw(WY), Moncha(NM), Oshoto(WY), Pulpit(CO), Roubideau(CO), Sharps (CO), Verde(CO), Wetherill(NM), and Wiley(CO) series. Amal and Elpedro soils receive higher amounts of winter precipitation. In addition, Amal soils have calcic horizons below 40 inches and Elpedro soils are weathered from limestone and are dominated by silt loam and silty clay loam textures. Chita soils have igneous parent materials and do not have buried horizons. Buick, Keiser, Klinedraw, Oshoto, and Wiley soils are more moist in the late spring and early summer (May and June) and dry in late summer in the soil moisture control section. Chevelon soils are moderately deep to bedrock and do not have secondary carbonates within the profile. Moncha soils have silt loam and silty clay loam textures and do not have accumulations of secondary carbonates. Pulpit, Roubideau, and Verde soils are moderately deep to a lithic contact. Sharps soils are moderately deep to a paralithic contact. Wetherill soils receive higher amounts of winter precipitation and have calcic horizons below 40 inches.

One of the above series currently listed as a competitor is the Chita(NM) series. Chita soils have calcic horizons within 40 inches and should be reclassified in the Calcidic subgroup.

GEOGRAPHIC SETTING: Altega soils are on summits and shoulders of interfluves on undulating plateaus and on fan aprons. They formed in Triassic and Permian age eolian material and alluvium derived from sandstone and shale. Slopes are 3 to 10 percent. Elevation ranges from 6,500 to 7,900 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 46

to 48 degrees F. The frost-free period is 120 to 140 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Aliante, Altezita, Esquila, Estrada, Sabroso and Verano soils. Aliante soils have a mollic epipedon and occur on toeslopes and footslopes of undulating plateaus. Altezita soils are loamy, are very shallow, and occur on beveled summits. Estrada soils have a thick mollic epipedon and occur on footslopes and toeslopes. Esquila soils are clayey, shallow to sandstone bedrock, and occur on toeslopes of plateaus. Sabroso soils are loamy-skeletal and occur on steep south-facing backslopes. Verano soils are loamy-skeletal, have a mollic epipedon, and occur on steep north-facing backslopes.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; moderately slow permeability in the subsoil and moderately rapid permeability in the substratum.

USE AND VEGETATION: Altega soils are used for urban development, livestock grazing, and recreation. Present vegetation is blue grama, sand dropseed, bottlebrush squirreltail, june grass, western wheatgrass, cheatgrass, broom snakeweed, scattered walking stick cholla, and scattered Rocky Mountain juniper, and two-needle pinyon.

DISTRIBUTION AND EXTENT: Altega soils are of small extent on the northern Glorieta Slope part of the Pecos Valley section of the Great Plains physiographic province in northcentral New Mexico. The MLRA is 70A.

MLRA OFFICE RESPONSIBLE: Temple, Texas.

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2000. Altega is a local place name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - 0 to 2 inches (A horizon)

Argillic horizon - 2 to 58 inches (Bt horizons)

Lithic contact - 101 inches (top of 2R layer)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: The series type location was sampled for the National Soil Survey Laboratory (NSSL), Lincoln, NE, as soil survey sample number S99NM-049-8. Reference analyses such as particle-size distribution, organic carbon content, and cation exchange capacity were performed.

National Cooperative Soil Survey
U.S.A.

LOCATION ALTEZITA NM

Tentative Series
Rev. LAG/CDH/WJG
12/2007

ALTEZITA SERIES

The Altezita series consists of very shallow to sandstone bedrock, well drained, moderately rapidly permeable soils that formed in eolian deposits derived from sandstone over residuum weathered from sandstone. Altezita soils are on summits of plateaus. Slopes are 5 to 10 percent. Mean annual precipitation is about 17 inches and mean annual temperature is about 46 degrees F.

TAXONOMIC CLASS: Loamy, mixed, superactive, mesic Lithic Haplustolls

TYPICAL PEDON: Altezita cobbly loam--on a summit of a plateau sloping 5 percent to the west-southwest at 7,835 feet elevation--ponderosa pine forestland. (Colors are for dry soil unless otherwise noted.)

A--0 to 2 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and few very fine roots; few very fine interstitial pores; 10 percent pebbles, 10 percent cobbles, and 1 percent stones; slightly acid (pH 6.4); abrupt smooth boundary. (2 to 6 inches thick)

Bw--2 to 7 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic, few coarse, few medium, common fine, and few very fine roots; few fine tubular pores; very faint clay bridging between some sand grains; 5 percent pebbles and 5 percent cobbles; neutral (pH 6.6); abrupt smooth boundary. (5 to 6 inches thick)

2R--7 to 17 inches; very strongly cemented sandstone bedrock

TYPE LOCATION: Santa Fe County, New Mexico; about 4.5 miles south southwest of Glorieta; 1000 feet east and 1100 feet north of the southwest corner of section 11, T.15N., R.11E.; USGS Pecos 7.5 minute topographic quadrangle; Latitude 35 degrees 32 minutes 19 seconds North and Longitude 105 degrees 44 minutes 45 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section(SMCS) is moist in all parts from January to May and intermittently moist in some part from June to December. The SMCS is dry in some part less than 60 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soil moisture regime is typic ustic

Soil temperature - 47 to 49 degrees F.
Organic matter content - 1 to 3 percent
Reaction - slightly acid in the surface and neutral in the subsoil.
Salinity, dS/m - 0 to 1
Sodicity, SAR - 0 to 2

Particle size control section weighted averages:
Silicate clay content: 8 to 18 percent
Sand content: 50 to 70 percent
Fine sand or coarser content: more than 40 percent
Rock fragment content: 10 to 25 percent, lithology of fragments is sandstone.

A horizon
Value: 2 to 4 dry, 2 or 3 moist
Chroma: 1 or 2 dry, 1 or 2 moist
Rock fragments: total range is 15 to 35 percent; 5 to 15 percent pebbles; 10 to 20 percent cobbles; 0 to 1 percent stones

Bw horizon
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 dry, 2 or 3 moist
Texture: sandy loam, fine sandy loam
Rock fragments: total range is 5 to 14 percent; 0 to 10 percent pebbles; 0 to 5 percent cobbles.

COMPETING SERIES: COMPETING SERIES: These include the Apache (NM), Bluemound (MN), Dalerose (CO), Hedville (KS) and Sogn (KS) series. Apache and Dalerose are in the aridic ustic moisture regime and should be reclassified as Aridic Lithic Haplustolls. Bluemound, Hedville, and Sogn soils are moist in the late spring and early summer in the soil moisture control section. In addition, Hedville soils have a mean annual soil temperature of 52 to 57 degrees F and Sogn soils have more than 20 percent clay in the particle-size control section.

GEOGRAPHIC SETTING: Altezita soils are on summits of plateaus. They formed in Permian age eolian deposits derived from sandstone over residuum weathered from sandstone. Slopes are 5 to 10 percent. Elevation ranges from 6,700 to 8,100 feet. The mean annual precipitation is 16 to 18 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 45 to 47 degrees F. The frost-free period is 110 to 130 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Esquila, Sabroso, and Verano soils. Esquila soils are clayey, do not have a mollic epipedon, have an argillic horizon, and occur on adjacent toeslopes of plateaus. Sabroso soils are loamy-skeletal, have an argillic horizon, and occur on steep south-facing backslopes. Verano soils are loamy-skeletal, have an argillic horizon, and occur on steep north-facing backslopes.

DRAINAGE AND PERMEABILITY: Well drained; low surface runoff; moderately rapid permeability.

USE AND VEGETATION: Altezita soils are used for timber products and livestock grazing. Present vegetation is ponderosa pine, twoneedle pinyon, Rocky Mountain juniper, Gambel oak, and oneseed juniper, with an understory of mesa dropseed, nutsedge, mountain muhly, blue grama, and junegrass.

DISTRIBUTION AND EXTENT: Altezita soils are of small extent on the northern Glorieta Slope part of the Pecos Valley section of the Great Plains physiographic province in northcentral New Mexico. The MLRA is 70A.

MLRA OFFICE RESPONSIBLE: Temple, Texas

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2000. Altezita is a place name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - 0 to 7 inches. (A and Bw horizons)

Lithic contact - 7 inches. (top of 2R layer)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: None

National Cooperative Soil Survey
U.S.A.

LOCATION ANDANADA NM

Established Series
Rev. CDH/TWH
01/2008

ANDANADA SERIES

The Andanada series consists of very shallow, well drained soils that formed in slope alluvium derived from basalt. Andanada soils are on shoulders of mesas and undulating plateaus. Slopes are 5 to 15 percent. Mean annual precipitation is about 11 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents

TYPICAL PEDON: Andanada very gravelly loam, on the shoulder of a mesa sloping 11 percent to the southeast at 6,218 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described on October 16, 2000, the profile was dry throughout.) Surface is covered with 35 percent gravel, 10 percent cobbles, and 1 percent stones.

Ak--0 to 3 inches; very dark grayish brown (10YR 3/2) very gravelly loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and many very fine roots; 30 percent gravel, 5 percent cobbles, and 1 percent stones; violently effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments (26 percent calcium carbonate equivalent); strongly alkaline (pH 8.6); clear smooth boundary. (2 to 4 inches thick)

Bk--3 to 9 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and common very fine roots; 30 percent gravel and 5 percent cobbles; violently effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments (29 percent calcium carbonate equivalent); strongly alkaline (pH 8.6); abrupt wavy boundary. (2 to 7 inches thick)

2R--9 inches; indurated basalt bedrock

TYPE LOCATION: Santa Fe County, about 4 miles east-northeast of White Rock; Latitude 35 degrees 50 minutes 49 seconds North and Longitude 106 degrees 08 minutes 17 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture: - The soil moisture control section is intermittently moist in some part from July to October and December to March. The soils are driest in May and June. The soil moisture regime is torric (aridic) bordering on ustic.

Average annual soil temperature: 52 to 54 degrees F.
Depth to lithic contact: 4 to 10 inches
Lithology of rock fragments: Basalt

Particle-size control section weighted averages:
Silicate clay content: 18 to 27 percent
Sand content: 40 to 65 percent
Fine sand or coarser content: 35 to 55 percent
Rock fragment content: 35 to 60 percent

Ak horizons
Value: 3 to 6 dry; 2 to 4 moist
Chroma: 2 or 3 dry, 2 to 4 moist
Clay content: 14 to 24 percent
Calcium carbonate equivalent: 15 to 30 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Rock fragments: total range is 35 to 50 percent, 30 to 40 percent gravel, 5 to 10 percent cobbles, 0 to 2 percent stones

Bk horizon
Hue: 7.5YR or 10YR
Value: 4 to 6 dry; 3 to 5 moist
Chroma: 2 or 3 dry, 2 to 4 moist
Texture: very gravelly loam, very gravelly sandy clay loam
Clay content: 20 to 27 percent
Calcium carbonate equivalent: 20 to 40 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Rock fragments: total range is 35 to 60 percent, 30 to 50 percent gravel, 5 to 10 percent cobbles
Other features: These horizons represent degrading calcic horizons but do not meet definition criteria 3b. for a calcic horizon and/or are too thin.

COMPETING SERIES: These are the Daklos, Ednagrey, Hillburn, Meriwhitica, Nonip, Redsun, Reef, Skos, Sunup, Teesto and Windcomb series. These series all have less than 15 percent calcium carbonate equivalent. In addition, Daklos, Hillburn, Nonip, Reef, Skos, and Windcomb soils do not have visible

secondary calcium carbonates. Meriwhitica, Reef, and Windcomb soils have less than 18 percent clay. The Ednagrey series has rock fragments of limestone.

GEOGRAPHIC SETTING: Andanada soils are on shoulders of mesas and undulating plateaus. They formed in slope alluvium and residuum derived locally from early Quaternary age Cuerbio Basalt formation. Slopes are 5 to 15 percent. Elevation ranges from 5,800 to 6,700 feet. The mean annual precipitation is 10 to 13 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Churipa, Ildefonso, and Parida soils. Churipa soils are loamy, have argillic horizons, and occur on beveled summits. Ildefonso soils have calcic horizons, are very deep, and occur on backslopes. Parida soils are coarse-loamy, are very deep, and occur on footslopes.

DRAINAGE AND PERMEABILITY: Well drained; low to medium surface runoff; moderate permeability.

USE AND VEGETATION: Andanada soils are used for livestock grazing, recreation, and wildlife habitat. The historic climax vegetation is New Mexico feathergrass, blue grama, black grama, sideoats grama, and oneseed juniper. The ecological site is Hills (R036XB124NM).

DISTRIBUTION AND EXTENT: Andanada soils are of moderate extent on the southwestern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Soil Survey Update, 2008. Andanada is a coined name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon - The zone from the soil surface to a depth of about 3 inches. (Ak horizon)
Lithic contact - The presence of indurated basalt bedrock at 9 inches. (2R layer)

Despite the dark colors, a mollic epipedon is not recognized in this soil because it is not moist in some part for greater than 90 days. A calcic horizon is not recognized because this soil typically has less than 5 percent identifiable secondary carbonates and/or the horizon is less than 15cm thick.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION ANTONCHICO NM

Established Series
Rev. CDH/TWH
01/2008

ANTONCHICO SERIES

The Antonchico series consists of deep, well drained soils that formed in alluvium derived from granite, gneiss, and schist over residuum derived from schist. Antonchico soils are on beveled summits of hills and knolls. Slopes are 3 to 5 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine-loamy over fragmental, paramicaceous, mesic Calcidic Argiustolls

TYPICAL PEDON: Antonchico gravelly sandy loam--on a beveled summit of a hill sloping 4 percent to the southwest at 7,315 feet elevation-pinyon-juniper forestland. (Colors are for dry soil unless otherwise noted. When described, the soil was moist from 3 to 20 inches and otherwise dry throughout.)

A--0 to 2 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure parting to moderate coarse granular; soft, very friable, slightly sticky and slightly plastic; few fine and common very fine roots; few very fine irregularly shaped pores; 20 percent gravel and 5 percent cobbles; neutral (pH 6.8); abrupt smooth boundary. (2 or 3 inches thick)

Bt1--2 to 7 inches; brown (7.5YR 4/2) gravelly sandy clay loam, dark brown (7.5YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; common fine and common very fine roots; few fine and few very fine tubular pores; few distinct and common faint clay films on faces of peds and lining pores; 15 percent gravel; neutral (pH 6.8); clear smooth boundary. (3 to 8 inches thick)

Bt2--7 to 14 inches; brown (7.5YR 4/3) gravelly sandy clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; few medium, common fine, and few very fine roots; few medium and few fine tubular pores; common distinct and common faint clay films on faces of peds and lining pores; 25 percent gravel; 2 percent paragravel and 2 percent paragravel; neutral (pH 6.8); gradual wavy boundary. (5 to 11 inches thick)

Bt3--14 to 20 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic;

few medium, few fine and few very fine roots; few fine tubular pores; common faint clay films on faces of peds and lining pores; 25 percent gravel; 5 percent paragravel and 5 percent paragravel; neutral (pH 6.8); abrupt wavy boundary. (0 to 10 inches thick)

2BCk--20 to 42 inches; cobbles; fine earth is very pale brown (10YR 8/2) loamy coarse sand, light gray (10YR 7/2) moist; massive; loose, nonsticky and nonplastic; few medium, few fine, and few very fine roots; 60 percent gravel and 35 percent cobbles; rock fragments are angular and separated by fractures devoid of fine earth in some part; violently effervescent, secondary calcium carbonate segregated as many medium irregularly shaped coats on rock fragments and as soft masses (26 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); clear wavy boundary. (16 to 28 inches thick).

2R--42 inches; indurated schist bedrock

TYPE LOCATION: Santa Fe County, New Mexico; about 2 1/4 miles southeast of Seton Village within the nonsectionized Sebastian de Vargas Grant, projected location is 1,300 feet west and 800 feet north of the southeast corner of Sec. 29, T16N, R10E; USGS Seton Village 7.5 minute topographic quadrangle; Latitude 35 degrees 34 minutes 57 seconds North and Longitude 105 degrees 53 minutes 52 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 48 to 50 degrees F.
Thickness of mollic epipedon - 10 to 18 inches
Depth to base of argillic horizon - 10 to 20 inches
Mica content - 25 to 40 percent in coarse silt to fine sand fractions
Depth to calcareous material (as visible secondary calcium carbonate) - 16 to 20 inches
Depth to calcic horizon - 16 to 20 inches
Depth to lithic contact - 40 to 60 inches
Rock fragment lithology: granite, gneiss, and schist

Particle-size control section (weighted averages)
Upper part
Silicate clay content: 20 to 35 percent
Sand content: 40 to 60 percent
Fine sand or coarser content: 30 to 45 percent
Rock fragment content: total range is 15 to 30 percent with 15 to 25 percent gravel and 0 to 5 percent cobbles

Mica content: 45 to 55 percent (by grain count)
Lower part
Silicate clay content: 10 to 18 percent
Sand content: 55 to 70 percent
Fine sand or coarser content: 45 to 65 percent
Rock fragment content: total range is 90 to 95 percent with 55 to 65 percent gravel and 30 to 35 percent cobbles
Mica content: 45 to 55 percent (by grain count)

A horizon
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist

Upper Bt horizons
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 4, dry or moist
Texture: gravelly sandy clay loam or gravelly clay loam
Rock fragment content: total range is 15 to 30 percent
15 to 25 percent gravel
0 to 5 percent cobbles
Paragravel and paracobble content: 0 to 5 percent

Lower Bt horizon
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: gravelly sandy clay loam or gravelly clay loam
Rock fragment content: total range is 15 to 30 percent
15 to 25 percent gravel
0 to 5 percent cobbles
Paragravel content: 0 to 5 percent

2BCk horizon
Hue: 7.5YR or 10YR
Value: 7 or 8 dry, 5 to 7 moist
Chroma: 2 or 3, dry or moist
Texture: cobbles or gravel
Clay content of fine earth: 10 to 18 percent
Rock fragment content: total range is 90 to 95 percent
55 to 65 percent gravel
30 to 35 percent cobbles
Calcium carbonate equivalent: 20 to 40 percent

Paragravel content: 0 to 10 percent

COMPETING SERIES: There are no competing series in this family. The Setonville series in a closely related family does not have a mollic epipedon and has mixed mineralogy.

GEOGRAPHIC SETTING: Antonchico soils are on beveled summits of hills and knolls. They formed in alluvium derived locally from Precambrian granite, gneiss, and schist over residuum of Precambrian schist bedrock. Slopes are 3 to 5 percent. Elevation ranges from 6,300 to 8,200 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 49 degrees F. The frost-free period is 130 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Arnor, Atalaya, Enmedio and Setonville soils. Arnor soils are fine-loamy, do not have calcic horizons and fragmental materials, and occur on toeslopes of hills. Atalaya soils are coarse-loamy over fragmental, do not have calcic horizons, and occur on beveled summits. Enmedio soils are loamy-skeletal over fragmental, do not have mollic epipedons or calcic horizons, and occur on backslopes of hills. Setonville soils are loamy-skeletal over fragmental, do not have mollic epipedons, and occur on adjacent footslopes of hill and knolls.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; permeability is moderate.

USE AND VEGETATION: Antonchico soils are used for urban development, cord wood products, livestock grazing, and recreation. The historic climax vegetation is ponderosa pine, Gambel's oak, mountain muhly, and muttongrass. The ecological site is Pinus ponderosa/Quercus gambleii (F048AY010NM).

DISTRIBUTION AND EXTENT: Antonchico soils are of small extent on the southwestern Sangre de Cristo part of the Southern Rocky Mountains province in northcentral New Mexico. The MLRA is 48A.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Antonchico is a street name in Santa Fe.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Mollic epipedon - The zone from the soil surface to a depth of about 14 inches. (A, Bt1, and Bt2 horizons)
Argillic horizon - The zone from 2 to about 20 inches. (Bt1, Bt2, and Bt3 horizons)
Calcic horizon - The zone from 20 to about 42 inches. (2BCk horizon)
Fragmental feature -from 20 to about 42 inches. (2BCk horizon)
Lithic contact - The presence of indurated schist bedrock at 42 inches. (2R layer)
Particle-size control section - The zone from 2 to 40 inches. (Bt1, Bt2, Bt3, and 2BCk horizons

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a calcimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION ARNOR NM

Established Series
Rev. CDH/WWJ/TWH
01/2008

ARNOR SERIES

The Arnor series consists of very deep, well drained soils that formed in slope alluvium and alluvium derived from granite, gneiss, and schist over residuum derived from granite. Arnor soils are on toeslopes of hills. Slopes are 2 to 8 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

TYPICAL PEDON: Arnor gravelly sandy loam--on a toeslope of a hill sloping 7 percent to the east at 7,280 feet elevation-pinyon-juniper forestland. (Colors are for dry soil unless otherwise noted. When described, the soil was slightly moist from 0 to 8 inches and otherwise dry.)

A--0 to 4 inches; brown (7.5YR 4/3) gravelly sandy clay loam, dark brown (7.5YR 3/3) moist; weak thick platy structure parting to moderate coarse granular; soft, very friable, slightly sticky and slightly plastic; common fine and common very fine roots; few very fine irregularly shaped pores; 20 percent gravel; neutral (pH 6.8); abrupt smooth boundary. (4 to 7 inches thick)

Bt1--4 to 9 inches; brown (7.5YR 5/4) gravelly sandy clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few medium, common fine, and common very fine roots; few very fine tubular pores; common faint and few distinct clay films on faces of peds; 15 percent gravel; neutral (pH 7.0); clear wavy boundary. (5 to 10 inches thick)

Bt2--9 to 15 inches; brown (7.5YR 5/4) gravelly sandy clay loam, brown (7.5YR 5/4) gravelly sandy clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few medium, common fine, and common very fine roots; few very fine tubular pores; common faint clay films on faces of peds and few distinct clay films on faces of peds and on rock fragments; 20 percent gravel; neutral (pH 7.2); clear wavy boundary. (6 to 13 inches thick)

Bt3--15 to 24 inches; brown (7.5YR 5/3) gravelly sandy clay loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; few medium, common fine, and common very fine roots; few fine and common very fine tubular pores; few

faint clay films on faces of peds and on rock fragments and common distinct clay films on faces of peds; 25 percent gravel; slightly alkaline (pH 7.4); clear wavy boundary. (6 to 13 inches)

Btk--24 to 35 inches; brown (7.5YR 5/3) gravelly sandy clay loam, brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; few medium, few fine, and common very fine roots; few very fine tubular pores; common faint and few distinct clay films on faces of peds; 20 percent gravel; strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.2); clear wavy boundary. (11 to 19 inches thick)

ABtkb--35 to 46 inches; brown (7.5YR 4/3) gravelly sandy clay loam, dark brown (7.5YR 3/3) moist; moderate coarse subangular blocky structure; soft, firm, slightly sticky and slightly plastic; few medium, few fine, and common very fine roots; few fine and few very fine tubular pores; few faint clay films on faces of peds; 20 percent gravel; strongly effervescent, secondary calcium carbonate segregated as common fine irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 25 inches thick)

Btkb--46 to 52 inches; yellowish red (5YR 5/6) gravelly sandy clay loam, yellowish red (5YR 4/6) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and common very fine tubular pores; 25 percent gravel; violently effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 26 inches thick)

2Btk/Cb--52 to 66 inches; yellowish red (5YR 5/8) very gravelly coarse sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure and massive; hard to slightly hard, friable to very friable, slightly sticky and nonplastic; few fine and few very fine roots; few very fine tubular pores; 35 percent gravel and 30 percent paragravel; slightly to strongly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (6 to 14 inches thick).

2Crtk--66 inches; weathered granite bedrock; very few distinct clay films on rock fragments; secondary calcium carbonate segregated as few very fine irregularly shaped accumulations on paragravel.

TYPE LOCATION: Santa Fe County, New Mexico; about 2 miles southeast of Seton Village within the nonsectionized Sebastian de Vargas Grant; USGS Seton Village 7.5 minute topographic quadrangle; Latitude 35 degrees 34 minutes 33 seconds North and Longitude 105 degrees 54 minutes 15.5 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and

June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 49 to 51 degrees F.
Depth to calcareous material (as visible secondary calcium carbonate) - 23 to 43 inches
Depth to paralithic material - 60 to 80 inches
Salinity, mmhos/cm: 0 to 1
Sodicity, SAR: 0 to 4
Lithology of fragments: granite, gneiss, and schist

Particle-size control section (weighted averages)
Silicate clay content: 25 to 35 percent
Sand content: 35 to 50 percent
Fine sand or coarser content: 25 to 40 percent
Rock fragment content: 15 to 30 percent gravel
Mica content: 15 to 20 percent (by grain count)

A horizon
Value: 4 or 5 dry
Chroma: 2 or 3, dry or moist
Rock fragment content: 15 to 25 percent, mostly gravel

Bt horizons
Chroma: 3 through 6, dry or moist
Texture: gravelly sandy clay loam or gravelly clay loam
Rock fragment content: 15 to 25 percent, mostly gravel
Reaction: neutral or slightly alkaline

Btk horizons
Value: 3 or 4 moist
Chroma: 3 through 6, dry or moist
Texture: gravelly sandy clay loam or gravelly clay loam
Rock fragment content: 15 to 25 percent, mostly gravel
Calcium carbonate equivalent: 1 to 2 percent

ABtkb horizon (not in all pedons)
Texture: gravelly sandy clay loam or gravelly coarse sandy loam
Calcium carbonate equivalent: 1 to 2 percent

Btkb horizon (not in all pedons)
Hue: 5YR or 7.5YR
Chroma: 3 through 6 moist
Texture: gravelly coarse sandy loam or gravelly sandy clay loam

Rock fragments: total range is 20 to 35 percent, mostly gravel
Calcium carbonate equivalent: 1 to 2 percent

2Btk/Cb horizon (a 2Btk/C in some pedons)
Hue: 5YR or 7.5YR
Chroma: 4 through 8 dry, 4 or 6 moist
Texture: very gravelly coarse sandy loam or very gravelly sandy clay loam
Rock fragments: total range is 35 to 45 percent, mostly gravel
Calcium carbonate equivalent: 1 to 2 percent

COMPETING SERIES: These are the Arwite, Augustine, Bigbow, Bosonoak, Carri, Celacy, Celavar, Dalhart, Deekay, Dermala, Elwop, Evpark, Flugle, Fort Collins, Gateson, Iwela, Likorly, Navajita, Nyjack, Oldwolf, Olnest, Orlie, Parkelei, Pinitos, Rauzi, Ribera, Rockybutte, Stoneham, Toluca, and Wagonhound series.

Arwite soils have hue yellower than 7.5YR.
Carri, Celacy, Celvar, Elwop, Evpark, Gateson, Nyjack, Oldwolf, and Ribera soils are moderately deep to a lithic or paralithic contact.
Bigbow soils have a 2Bt horizon with less sand and less than 15 percent rock fragments.
Bosonoak, Deekay, Flugle, Fort Collins, Navajita, Olnes, Orlie, Parkelei, Pinitos, Rauzi, Stoneham, Toluca, and Wagonhound soils have less than 15 percent rock fragments.
Dalhart and Likorly soils have annual soil temperatures greater than 52 degrees.
Dermala soils have less mica.
Iwela soils have a discontinuity with skeletal material within 40 inches.
Rockybutte soils are 20 to 40 inches to fragmental material.

GEOGRAPHIC SETTING: Arnor soils are on toeslopes of hills. They formed in slope alluvium and alluvium derived locally from Precambrian granite, gneiss, and schist over residuum of Precambrian granite bedrock. Slopes are 2 to 8 percent. Elevation ranges from 6,800 to 8,400 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 49 degrees F. The frost-free period is 130 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Atalaya, Enmedio, and Setonville soils. Atalaya soils are coarse-loamy over fragmental, are deep to granite or gneiss bedrock, and occur on beveled summits. Enmedio soils are loamy-skeletal over fragmental, have mollic epipedons, and occur on backslopes of hills. Setonville soils are loamy-skeletal over fragmental, have calcic horizons, and occur on footslopes of hills.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; moderately slow permeability.

USE AND VEGETATION: Arnor soils are used for urban development, cord wood products, livestock grazing, and recreation. The historic climax vegetation is blue grama, bottlebrush squirreltail, oneseed juniper, two-needle pinyon, . The ecological site is Juniperus monosperma-Pinus edulis/Fallugia parodoxa, Chrysothamnus nauseosis/Bouteloua hirsuta-Bouteloua gracilis(F36XB0136NM).

DISTRIBUTION AND EXTENT: Arnor soils are of small extent on the southwestern Sangre de Cristo part of the Southern Rocky Mountains province in northcentral New Mexico. The MLRA is 48A.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Arnor is a street name in Santa Fe.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon - The zone from the soil surface to 4 inches. (A horizon)
Argillic horizon - The zone from 4 to 66 inches. (Bt1, Bt2, Bt3, Btk, ABtb, Btkb, and 2Btk/Cbhorizons)
Paralithic contact - weathered granite bedrock at 66 inches (2Crtk layer)

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a calcimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION AROJOMIL NM

Tentative Series
Rev. AJM/CDH/WMR
12/2007

AROJOMIL SERIES

The Arojomil series consists of moderately deep to a petrocalcic horizon, well drained soils that formed in eolian material over relict alluvium derived from granite, gneiss, and schist. Arojomil soils are located on interfluves of undulating plains and alluvial fan remnants from the southern Sangre de Cristo Mountains. Slopes are 1 to 5 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Ustalfic Petrocalcids

TYPICAL PEDON: Arojomil silt loam-sloping 2 percent to the south-southwest (200 degrees) at 6,650 feet elevation-rangeland. (Colors are for dry soil unless otherwise noted. When described on May 24, 2002, the soil was dry throughout.)

A--0 to 2 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; moderate medium platy structure parting to moderate very fine granular; soft, very friable, slightly sticky and slightly plastic; common fine and common very fine roots; common very fine irregularly shaped pores; non to slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (1 to 5 inches thick)

Bt--2 to 10 inches; dark yellowish brown (10YR 4/4) clay loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; few fine and common very fine roots; common fine and few very fine tubular pores; clay films as common faint and few distinct coats in pores and on ped faces; non to slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (3 to 10 inches thick)

Btk--10 to 15 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine and few very fine roots; few fine and few very fine tubular pores; 12 percent gravel as petronodes; clay films as common distinct and few faint coats in pores and on ped faces; strongly to violently effervescent, secondary calcium carbonate segregated as common fine rounded and discontinuous concretions (7 percent calcium carbonate equivalent); moderately alkaline (pH 8.3); clear smooth boundary. (5 to 20 inches thick)

Bk1--15 to 22 inches; very pale brown (10YR 7/3) very gravelly loam, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; 40 percent gravel as petronodes; violently effervescent, secondary calcium carbonate segregated as common medium rounded concretions and many coarse irregular shaped coats on ped faces (17 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); gradual wavy boundary. (7 to 16 inches thick)

Bk2--22 to 33 inches; very pale brown (10YR 8/2) very gravelly loam, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; few very fine tubular pores; 45 percent gravel as petronodes; violently effervescent, secondary calcium carbonate segregated as many coarse rounded concretions and many irregular shaped coats on ped faces (33 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); abrupt wavy boundary. (7 to 12 inches thick)

Bkkm1--33 to 41 inches; white (10YR 8/1) petrocalcic material, very strongly cemented but penetrable; common very fine roots (49 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); clear wavy boundary. (4 to 10 inches thick)

Bkkm2--41 to 46 inches; white (10YR 8/1) petrocalcic material, very rigid and indurated; moderately alkaline (pH 8.4). (5 to 20+ inches thick)

TYPE LOCATION: Santa Fe County, New Mexico; about 5.5 miles northeast of Stanley; 1,622 feet north and 100 feet east of the southwest corner of section 6, T.11N., R.10E.; USGS Stanley 7.5 minute topographic quadrangle; Latitude 35 degrees 12 minutes 0 seconds North and Longitude 105 degrees 55 minutes 13 seconds West NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is intermittently moist in some part from July to October and December to March. It is assumed to be dry in all parts for less than 75 percent of the time (cumulative), when the soil temperature at 20 inches is 41 degrees F. or higher. The soils are driest in May and June. The soil moisture regime is ustic aridic.

Soil temperature - 51 to 54 degrees F.
Thickness of ochric epipedon - 2 to 5 inches
Depth to base of argillic horizon - 12 to 18 inches
Depth to calcic horizon - 10 to 34 inches

Depth to petrocalcic horizon - 20 to 40 inches
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4

Particle-size control section weighted averages -

Silicate clay content: 18 to 27 percent;
Sand content: 25 to 40 percent;
Fine sand or coarser content: 15 to 25 percent;
Rock fragment content: total range is: 0 to 35 percent gravel, lithology of fragments is mostly petronodes with a few of granite, gneiss, and schist.

A horizon
Hue: 7.5 YR or 10YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 3 to 4, dry or moist
Clay content: 10 to 20 percent
Calcium carbonate equivalent: 0 to 1 percent
Rock fragment content: total range is 0 to 10 percent, mostly gravel

Bt horizon
Hue: 7.5 YR or 10YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist
Texture: loam, silt loam, silty clay loam, or clay loam
Clay content: 18 to 27 percent
Calcium carbonate equivalent: 5 to 10 percent
Rock fragment content: total range is 0 to 10 percent, mostly gravel
Salinity, mmhos/cm: 0 to 1
Sodicity, SAR: 0 to 4

Btk horizon
Hue: 7.5 YR or 10YR
Value: 4 to 6 dry, 4 or 5 moist
Chroma: 3 or 4 moist
Texture: loam, silt loam, very gravelly loam, gravelly silt loam
Clay content: 18 to 27 percent
Calcium carbonate equivalent: 10 to 15 percent
Rock fragment content: total range is 10 to 35 percent, mostly gravel
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4

Bk horizons
Hue: 7.5 YR or 10YR
Value: 6 or 7 dry, 5 or 6 moist
Chroma: 3 or 4, dry or moist
Texture: very gravelly loam, very gravelly sandy loam, extremely cobbly loam, extremely cobbly sandy loam, extremely gravelly sandy loam
Clay content: 8 to 18 percent

Calcium carbonate equivalent: 15 to 45 percent
Rock fragment content: total range is 35 to 70 percent
5 to 40 percent gravel
5 to 30 percent cobbles
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4

Bkkm horizons
Hue: 10YR
Value 8, dry or moist
Chroma 1, dry or moist
Calcium carbonate equivalent: 40 to 70 percent

COMPETING SERIES: This is the Lapoint series. Soils from this series are cooler, and receive less annual moisture at a steady year round rate with a slight increase at the end of the growing season.

GEOGRAPHIC SETTING: Arojomil soils are on interfluves of undulating plains formed in eolian material derived from sandstone and siltstone over alluvium derived from Precambrian age granite, gneiss, and schist. Slopes are 1 to 5 percent. Elevation ranges from 6,100 to 7,200 feet. The mean annual precipitation is 12 to 14 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 49 to 51 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Pastura and Tapia soils. Pastura soils are loamy, are shallow to a petrocalcic horizon, and occur on shoulders. Tapia soils are very deep, do not have a petrocalcic horizon, and occur on summit positions adjacent to the Arojomil soils.

DRAINAGE AND PERMEABILITY: Well drained; low surface runoff; permeability is moderately slow.

USE AND VEGETATION: Arojomil soils are used for livestock grazing, urban development, and some wildlife habitat. Present vegetation is blue grama, threeawn, whipple cholla, tree cholla, broom snakeweed, and fringed sagewort.

DISTRIBUTION AND EXTENT: Arojomil soils are of moderate extent in the Estancia Basin of North-Central New Mexico. The MLRA is 70C.

MLRA OFFICE RESPONSIBLE: Temple, Texas.

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2003. Arojomil is a coined name.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - soil surface to a depth of about 2 inches. (A horizons)
Argillic Horizon - 2 to 15 inches. (Bt and Btk horizons)
Calcic horizon - 15 to 33 inches. (Bk1 and Bk2 horizons).
Petrocalcic Horizon 33 to 46 inches. (Bkkm horizons)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: The series type location has been sampled for full characterization by the Soil Survey Laboratory (SSL), Lincoln, NE, as soil survey sample number S-NM-02-049-009; Calcium carbonate equivalence was determined using a field calcimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION ATALAYA NM

Established Series
Rev. CDH/TWH
01/2008

ATALAYA SERIES

The Atalaya series consists of deep, well drained soils that formed in alluvium and slope alluvium derived from granite, gneiss, and schist over residuum derived from granite. Atalaya soils are on beveled summits and shoulders of hills. Slopes are 5 to 15 percent. Mean annual precipitation is about 15 inches and mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Coarse-loamy over fragmental, mixed, superactive, mesic Aridic Haplustalfs

TYPICAL PEDON: Atalaya very gravelly sandy loam, stony--on a beveled summit of a hill sloping 10 percent to the southeast at 7,375 feet elevation, pinyon-juniper forestland. (Colors are for dry soil unless otherwise noted. When described, the soil was dry throughout.)

A--0 to 1 inch; brown (7.5YR 4/3) very gravelly sandy loam, dark brown (7.5YR 3/3) moist; weak coarse platy structure parting to moderate medium granular; soft, very friable, slightly sticky and nonplastic; few fine and common very fine roots; few fine and few very fine irregularly shaped pores; 45 percent gravel, 10 percent cobbles, and 1 percent stones; neutral (pH 6.8); abrupt smooth boundary. (1 to 3 inches thick)

Bt1--1 to 4 inches; reddish brown (5YR 4/4) gravelly coarse sandy loam, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium, few fine, and common very fine roots; few very fine tubular pores; common faint clay films on faces of peds; 20 percent gravel and 5 percent cobbles; 30 percent paragravel; neutral (pH 6.8); clear wavy boundary. (3 to 6 inches thick)

Bt2--4 to 7 inches; yellowish red (5YR 5/6) gravelly coarse sandy loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, few fine, and few very fine roots; few very fine tubular pores; common faint clay films on faces of peds and few faint clay films on rock fragments; 25 percent gravel and 5 percent cobbles; 35 percent paragravel; neutral (pH 7.0); clear irregular boundary. (3 to 6 inches thick)

Bt3--7 to 12 inches; reddish brown (5YR 5/4) gravelly coarse sandy loam, reddish brown (5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic;

common medium, few fine, and few very fine roots; few very fine tubular pores; few faint clay films on faces of peds and common faint clay films on rock fragments; 25 percent gravel and 5 percent cobbles; 25 percent paragravel and 5 percent paracobbles; neutral (pH 7.0); gradual wavy boundary. (4 to 9 inches thick)

BC1--12 to 24 inches; grayish brown (10YR 5/2) with yellowish brown (10YR 5/6) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) with dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few coarse, few medium, few fine, and few very fine roots; few very fine tubular pores; clay commonly forming in situ on rock fragments; 15 percent gravel and 5 percent cobbles; 50 percent paragravel and 10 percent paracobbles; neutral (pH 6.8); clear wavy boundary. (10 to 16 inches thick)

BC2--24 to 35 inches; grayish brown (10YR 5/2) with yellowish brown (10YR 5/4) cobbly coarse sandy loam, dark grayish brown (10YR 4/2) with dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few medium and few very fine roots; clay forming in situ on some rock fragments; 10 percent gravel and 10 percent cobbles; 50 percent paragravel and 10 percent paracobbles; neutral (pH 6.8); clear wavy boundary. (9 to 15 inches thick)

2CBk--35 to 50 inches; gravel; fine earth is yellowish brown (10YR 5/4) coarse sand, dark yellowish brown (10YR 4/4) moist; massive; loose, nonsticky and nonplastic; few coarse, few medium, and few fine roots; 70 percent gravel and 25 percent cobbles; rock fragments are angular and separated by fractures devoid of fine earth in some part; strongly to violently effervescent, secondary calcium carbonate segregated as many medium irregularly shaped coats on rock fragments (3 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); clear wavy boundary. (6 to 18 inches thick)

2R--50 inches; hard gneiss bedrock

TYPE LOCATION: Santa Fe County, New Mexico; about 2 miles southeast of Seton Village within the nonsectionized Sebastian de Vargas Grant, projected location is 1,350 feet east and 2,000 feet south of the northwest corner of section 32, T.16N., R.10E.; USGS Seton Village 7.5 minute topographic quadrangle; Latitude 35 degrees 34 minutes 30 seconds North and Longitude 105 degrees 54 minutes 23 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 48 to 50 degrees F.
Depth to base of argillic horizon - 10 to 17 inches
Depth to calcareous material (as visible secondary calcium carbonate) - 31 to 40 inches

Depth to lithic contact - 40 to 60 inches
Lithology of rock fragments: granite, gneiss, or schist

Particle-size control section (weighted averages)
Silicate clay content: 10 to 18 percent
Sand content: 35 to 55 percent
Fine sand or coarser content: 25 to 40 percent
Rock fragment content: total range is 20 to 35 percent
15 to 25 percent gravel
5 to 10 percent cobbles
Mica content: 25 to 45 percent (by grain count)

A horizon
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Rock fragment content: total range is 35 to 60 percent
30 to 50 percent gravel
5 to 10 percent cobbles
0 to 1 percent stones

Bt horizons
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 4 or 6, dry or moist
Texture: gravelly coarse sandy loam or gravelly sandy loam
Clay content: 10 to 18 percent
Rock fragment content: total range is 20 to 35 percent
15 to 25 percent gravel
5 to 10 percent cobbles
Paragravel content: 25 to 45 percent
Paracobble content: 0 to 10 percent

BC1 horizon
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 6, dry or moist
Texture: gravelly coarse sandy loam or gravelly sandy loam
Clay content: 8 to 12 percent
Rock fragment content: total range is 20 to 35 percent
15 to 25 percent gravel
5 to 10 percent cobbles
Paragravel content: 45 to 55 percent
Paracobble content: 5 to 15 percent

BC2 horizon
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 4, dry or moist
Texture: cobbly coarse sandy loam or cobbly sandy loam
Clay content: 6 to 10 percent
Rock fragment content: total range is 20 to 35 percent
10 to 20 percent gravel
10 to 15 percent cobbles
Paragravel content: 50 to 60 percent
Paracobble content: 10 to 25 percent

2CBk horizon
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Clay content: 0 to 4percent
Calcium carbonate equivalent: 1 to 5 percent
Rock fragment content: total range is 90 to 95 percent
20 to 75 percent gravel
20 to 70 percent cobbles

COMPETING SERIES: There are no competing series in this family. The Antonchico series in a closely related family has a mollic epipedon.

GEOGRAPHIC SETTING: Atalaya soils are on beveled summits and shoulders of hills. They formed in alluvium and slope alluvium derived locally from Precambrian granite, gneiss, and schist over residuum of Precambrian granite or gneiss bedrock. Slopes are 5 to 15 percent. Elevation ranges from 6,400 to 8,500 feet. The mean annual precipitation is 14 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 49 degrees F. The frost-free period is 130 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Arnor, Enmedio, and Setonville soils. Arnor soils are fine-loamy, do not have fragmental materials, and occur on toeslopes of hills. Enmedio soils are loamy skeletal over fragmental, have mollic epipedons, and occur on backslopes of hills. Setonville soils are loamy-skeletal over fragmental, have calcic horizons, and occur on footslopes of hills and knolls.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; permeability is moderately rapid in the surface and subsoil and very rapid in the lower substratum.

USE AND VEGETATION: Atalaya soils are used for urban development, cord wood products, livestock grazing, and recreation. The historic climax vegetation is blue grama, Gamble's oak, twoneedle

pinyon, and oneseed juniper. The ecological site is Pinus edulis-Juniperus monosperma/Quercus gambeli/Bouteloua gracilis(F036XB134NM).

DISTRIBUTION AND EXTENT: Atalaya soils are of small extent on the southwestern Sangre de Cristo part of the Southern Rocky Mountains province in northcentral New Mexico. The MLRA is 48A.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Atalaya is a name of a mountain east of Santa Fe.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon - The zone from the soil surface to a depth of about 1 inch. (A horizon)
Argillic horizon - The zone from 1 to about 12 inches. (Bt1, Bt2, and Bt3 horizons)
Fragmental feature - from 35 to about 50 inches. (2CBk horizon)
Lithic contact - hard gneiss bedrock at 50 inches. (2R layer)
Particle-size control section - The zone from 1 to 12 inches. (Bt1, Bt2, and Bt3 horizons)

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a calcimeter. EC was determined with an instant EC salinity kit.

National Cooperative Soil Survey
U.S.A.

LOCATION BERNAL NM

Established Series
Rev. VGL/BDS/JBC/WJG
12/2007

BERNAL SERIES

The Bernal series consists of shallow to sandstone bedrock, well drained soils that formed in material weathered from sandstone. Bernal soils are on mesa tops and upland ridge crests, and have slopes of 0 to 25 percent. The mean annual precipitation is about 15 inches and the mean annual air temperature is about 50 degrees F.

TAXONOMIC CLASS: Loamy, mixed, superactive, mesic Aridic Lithic Argiustolls

TYPICAL PEDON: Bernal loam, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist, moderate very fine granular structure; soft, very friable; many very fine and fine roots; many fine pores; neutral; clear smooth boundary. (2 to 6 inches thick)

B1--3 to 7 inches; brown (7.5YR 4/3) sandy clay loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, neutral; clear smooth boundary. (2 to 6 inches thick)

B2t--7 to 12 inches; reddish brown (5YR 5/3) heavy sandy clay loam, reddish brown (5YR 4/3) moist; moderate medium prismatic structure parting to moderate fine angular and subangular blocky; hard, friable, slightly sticky; common thin clay coatings on sand grains as bridges between grains and as pore filling; neutral; abrupt smooth boundary. (4 to 8 inches thick)

R--12 to 22 inches; light colored, strongly cemented sandstone bedrock with few fractures and only slightly weathered on upper surface.

TYPE LOCATION: Torrance County, New Mexico; SW1/4 NE1/4 SW1/4 of section 15, T.9N., R.13E.

RANGE IN CHARACTERISTICS: Thickness of the solum and depth to bedrock range from 8 to 20 inches. Mean annual soil temperature ranges from 47 degrees to 59 degrees F. Rock fragments range from few to about 15 percent of which 60 percent is gravel. The solum is neutral or mildly alkaline. The control section ranges from heavy sandy loam to sandy clay loam and averages 18 to 35 percent clay.

Carbonates are usually absent throughout the profile but range to a trace in the immediate area of the lithic contact.

The A horizon has hue of 10YR through 5YR, value of 3 through 5 dry, 2 or 3 moist, and chroma of 2 or 3. It is clay loam, loam, fine sandy loam or loamy sand.

The B2t horizon has hue usually of 7.5YR or 5YR and ranging to 10YR, value of 4 through 6 dry, 3 through 5 moist, and chroma of 2 through 4. It is clay loam, loam, sandy loam, or fine sandy loam.

COMPETING SERIES: These are the Apache, Cabezon, Encierro, Hagerman, Montvale, Progresso, and Salas series. Apache soils lack argillic horizons and have Cca horizons above the lithic contact. Cabezon soils have fine-textured cobbly control sections with the clay fraction dominated by montmorillonite. Encierro soils have fine-textured control sections and have an accumulation of calcium carbonate above the lithic contact. Hagerman, Progresso, and Salas soils have bedrock at depths of 20 to 40 inches; also, Hagerman and Progresso soils lack a mollic epipedon. Montvale soils have numerous flagstones throughout the soil and have an accumulation of calcium carbonate above the lithic contact.

GEOGRAPHIC SETTING: The Bernal soils are on mesa tops and upland ridge crests on bedrock controlled landscape. Slopes range from 0 to 30 percent. Elevations are 5,300 to 7,900 feet. The soils formed in moderately fine textured noncalcareous sandy material weathered from the sandstone, with possible minor addition of eolian material. The climate is semiarid continental. At the type location, the mean annual temperature is about 46 degrees to 52 degrees F. The average annual precipitation is about 12 to 16 inches. The precipitation pattern is characterized by a marked summer maximum resulting from thunderstorms. The frost-free season is 120 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Carnero, Pastura and Travessilla soils and the competing Encierro and Hagerman soils. Carnero soils have sandstone at depths of 20 to 40 inches. Pastura soils lack a mollic epipedon and have a petrocalcic horizon at depths of less than 20 inches. Travessilla soils lack a mollic epipedon and an argillic horizon.

DRAINAGE AND PERMEABILITY: Well drained; medium runoff; moderate permeability.

USE AND VEGETATION: Rangeland. Principal native plants are blue grama, sand dropseed, and galleta, and commonly with an overstory of pinyon and juniper.

DISTRIBUTION AND EXTENT: Central and northern New Mexico and central Colorado. The series is extensive.

MLRA OFFICE RESPONSIBLE: Temple, Texas

SERIES ESTABLISHED: Santa Fe County, New Mexico, 1970.

National Cooperative Soil Survey
U.S.A.

LOCATION BOSQUECITO NM

Established Series
CDH/JVC/WWJ
01/2008

BOSQUECITO SERIES

The Bosquecito series consists of very deep, somewhat poorly drained soils that formed in alluvium derived from granite, gneiss, schist, and micaceous sandstone and siltstone. Bosquecito soils are on flood plains of valley floors with intermittent streams. Slopes are 0 to 2 percent. Mean annual precipitation is about 11 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, calcareous, mesic Oxyaquic Ustifluvents

TYPICAL PEDON: Bosquecito very fine sandy loam--on a slightly convex natural levee of a flood plain sloping 1 percent to the northwest at 6,220 feet elevation--riparian woodland. (Colors are for moist soil unless otherwise noted. When described, the soil was dry from the soil surface to 3 inches, slightly moist from 3 to 9 inches, moist from 9 to 22 inches, and wet from 22 to 29 inches with a water table present at 29 inches.)

A--0 to 1 inch; brown (7.5YR 4/2) very fine sandy loam, brown (7.5YR 5/3) dry; weak coarse granular structure; soft, very friable, slightly sticky and nonplastic; few fine and many very fine roots; few fine and common very fine irregularly shaped pores; strongly effervescent; negative reaction to alpha, alpha-dipyridyl; moderately alkaline (pH 8.0); abrupt wavy boundary. (1 to 3 inches thick)

AC1--1 to 5 inches; brown (7.5YR 4/3) loamy very fine sand, light brown (7.5YR 6/3) dry; weak coarse granular structure; soft, very friable, nonsticky and nonplastic; few medium, common fine, and common very fine roots; few fine and common very fine tubular pores; strongly effervescent; negative reaction to alpha, alpha-dipyridyl; strongly alkaline (pH 8.6); clear wavy boundary. (4 to 6 inches thick)

AC2--5 to 10 inches; brown (7.5YR 4/4) loamy sand, light brown (7.5YR 6/3) dry; weak coarse granular structure; soft, very friable, nonsticky and nonplastic; few coarse, few medium, common fine, and few very fine roots; few very fine irregularly shaped pores; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation; 5 percent gravel; strongly effervescent; negative reaction to alpha, alpha-dipyridyl; strongly alkaline (pH 8.8); abrupt smooth boundary. (4 to 7 inches thick)

C1--10 to 16 inches; brown (7.5YR 4/3) fine sandy loam, light brown (7.5YR 6/3) dry; massive; soft, very friable, slightly sticky and nonplastic; few coarse, common medium, few fine, and few very fine

roots; few fine tubular pores; common fine distinct strong brown (7.5YR 4/6) masses of iron accumulation; strongly effervescent; negative reaction to alpha, alpha-dipyridyl; strongly alkaline (pH 8.6); clear wavy boundary. (6 to 14 inches thick)

C2--16 to 26 inches; brown (7.5YR 4/3) fine sandy loam, light brown (7.5YR 6/3) dry; massive; soft, very friable, slightly sticky and nonplastic; common coarse, common medium, common fine, and few very fine roots; common fine tubular pores; one laminae of very fine sandy loam; few fine distinct strong brown (7.5YR 4/6) and few fine prominent yellowish red (5YR 5/8) masses of iron accumulation; 5 percent gravel; strongly effervescent; negative reaction to alpha, alpha-dipyridyl; strongly alkaline (pH 8.5); abrupt wavy boundary. (5 to 12 inches thick)

Cg1--26 to 33 inches; dark grayish brown (10YR 4/2) fine sandy loam, pale brown (10YR 6/3) dry; massive; soft, very friable, slightly sticky and nonplastic; few coarse, few medium, few fine, and few very fine roots; common fine tubular pores; few lenses of loamy sand; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation; 5 percent gravel; strongly effervescent; positive reaction to alpha, alpha-dipyridyl; moderately alkaline (pH 8.4); clear wavy boundary. (7 to 12 inches thick)

Cg2--33 to 42 inches; very dark grayish brown (10YR 3/2) with dark grayish brown (10YR 4/2) stratified fine sandy loam to loamy sand, grayish brown (10YR 5/2) with pale brown (10YR 6/3) dry; massive; soft, very friable, slightly sticky and nonplastic; few fine and few very fine roots; few fine and few very fine tubular pores; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation; 5 to 10 percent gravel; strongly effervescent; positive reaction to alpha, alpha-dipyridyl; moderately alkaline (pH 8.4); clear wavy boundary. (9 to 17 inches thick)

Cg3--42 to 51 inches; dark grayish brown (10YR 4/2) stratified very fine sandy loam to loamy sand, pale brown (10YR 6/3) dry; massive and single grain; soft and loose, very friable and loose, slightly sticky and nonsticky, and nonplastic; few fine and few very fine roots; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation; 5 percent gravel; strongly effervescent; positive reaction to alpha, alpha-dipyridyl; moderately alkaline (pH 8.4); gradual smooth boundary. (0 to 16 inches thick)

Cg4--51 to 64 inches; brown (7.5YR 4/2) stratified gravelly coarse sand to loamy very fine sand, brown (7.5YR 5/2) dry; single grain and massive; loose and soft, loose and very friable, nonsticky and slightly sticky, and nonplastic; 5 to 20 percent gravel; strongly effervescent; positive reaction to alpha, alpha-dipyridyl; moderately alkaline (pH 8.2); clear wavy boundary. (0 to 19 inches thick)

C'--64 to 84 inches; brown (7.5YR 4/3) stratified gravelly coarse sand and very gravelly coarse sand, brown (7.5YR 5/3) dry; single grain; loose, nonsticky and nonplastic; few strata of fine sandy loam; 20 to 40 percent gravel; slightly and strongly effervescent; negative reaction to alpha, alpha-dipyridyl; moderately alkaline (pH 8.2); gradual smooth boundary.

TYPE LOCATION: Santa Fe County, New Mexico; on the Tesuque Indian Reservation about 0.25 mile west-southwest of Camel Rock; 750 feet west and 1,250 feet south of the northeast corner of section 4, T.18N., R.9E.; USGS Tesuque 7.5 minute topographic quadrangle; Latitude 35 degrees 49 minutes 24 seconds North and Longitude 105 degrees 59 minutes 3 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. The soil moisture regime is ustic bordering on aquic. The Cg horizons are saturated with ground water for six to twelve months in most years. Water within the capillary fringe moistens horizons above the upper boundary of saturation.

Mean annual soil temperature - 52 to 54 degrees F.
Depth to redox concentrations - 3 to 10 inches
Depth to horizons with aquic conditions - 24 to 38 inches
Mica content - 10 to 25 percent in coarse silt to fine sand fractions
Lithology of rock fragments: granite, gneiss, and schist

Particle-size control section (weighted averages)
Silicate clay content: 6 to 12 percent
Sand content: 45 to 80 percent
Fine sand or coarser content: 15 to 45 percent
Rock fragment content: 0 to 5 percent
Mica content: 1 to 5 percent (by grain count)

Reaction - slightly alkaline to moderately alkaline in the surface; strongly alkaline in the upper part of the underlying materials; moderately alkaline in the lower part of the underlying materials

Calcium carbonate equivalent - 2 to 5 percent

Sodicity, SAR - 4 to 13 in the surface; 0 to 4 in the underlying materials

A horizon
Value: 3 or 4 moist, 4 or 5 dry
Salinity, mmhos/cm: 16 to 40

AC horizons
Value: 4 or 5 moist, 4 to 6 dry
Chroma: 2 through 4, moist or dry
Texture: loamy very fine sand, loamy sand, very fine sandy loam, or fine sandy loam; some pedons have lenses or strata of silt loam
Salinity, mmhos/cm: 1 to 4
Redox concentrations: none or few, faint or distinct concentrations of iron as masses

C horizons
Value: 4 or 5 moist, 5 or 6 dry
Chroma: 2 through 4, moist or dry
Texture: fine sandy loam, very fine sandy loam, or loamy very fine sand; some pedons have lenses or strata of silt loam
Salinity, mmhos/cm: 0 to 2
Redox concentrations: common or many, distinct or prominent concentrations of iron as masses

Cg1 horizon
Hue: 7.5YR or 10YR
Value: 3 or 4 moist
Chroma: 1 or 2, moist or dry
Texture: fine sandy loam or sandy loam; few strata of silt loam and coarse sandy loam; few laminae of very fine sandy loam
Salinity, mmhos/cm: 0 to 2
Rock fragments: 0 to 5 percent gravel
Redox concentrations: few or common, distinct or prominent concentrations of iron as masses or pore linings

Cg2 and Cg3 horizons
Hue: 7.5YR or 10YR
Value: 3 through 5 moist, 5 or 6 dry
Chroma: 2 or 3 dry
Texture: stratified loamy sand to very fine sandy loam
Salinity, mmhos/cm: 0 to 2
Rock fragments: 5 to 10 percent gravel
Redox concentrations: few or common, distinct or prominent concentrations of iron as masses or pore linings.

Cg4 and C' horizons
Hue: 7.5YR or 10YR
Value: 4 or 5 moist
Chroma: 1 through 3, moist or dry
Texture: stratified very gravelly coarse sand to loamy very fine sand; few strata of sandy loam or fine sandy loam; few laminae of very fine sandy loam
Salinity, mmhos/cm: 0 to 2
Rock fragments: total range is 5 to 40 percent, averaging 15 to 35 percent gravel

COMPETING SERIES: These are the Haigler and Kitcarson series. Both of these soils receive peak periods of precipitation in the spring and early summer months and do not have significant amounts of mica in the silt and sand fractions. In addition, Haigler soils have SAR above 15 within the particle-size control section.

GEOGRAPHIC SETTING: Bosquecito soils are on natural levees and crevasse splays on flood plains of valley floors with intermittent streams. They formed in alluvium derived from Precambrian granite, gneiss, and schist, and Tertiary micaceous sandstone and siltstone. Slopes are 0 to 2 percent. Elevation ranges from 5,500 to 6,600 feet. The mean annual precipitation is 9 to 12 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Cuyamungue, Jaralosa, and Mirada soils. Cuyamungue soils are sandy-skeletal, have seasonal high water tables between 5 and 8 feet, and occur on low flood plains below Bosquecito. Jaralosa soils are coarse-loamy over sandy or sandy-skeletal, have seasonal high water tables between 3.5 and 5 feet from the soil surface, and occur on low flood plains. Mirada soils are hydric, have seasonal high water tables near the soil surface, and occur on low flood plains.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained; very low surface runoff; moderately rapid permeability in the loamy horizons and strata and rapid to very rapid permeability in the sandy horizons and strata. These soils are subject to occasional, extremely brief periods of flooding between July and September. Floodwaters have low velocity and are generally less than two feet deep. A seasonal high water table is present between 2.0 and 3.5 feet.

USE AND VEGETATION: Bosquecito soils are used for livestock grazing, wildlife habitat, and recreation. The historic climax vegetation is cottonwood, western wheatgrass, willow, and bluegrass. The ecological site is Populus fremontii/Salix exugia-Salix/Carex(F036XB137NM).

DISTRIBUTION AND EXTENT: Bosquecito soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Bosquecito is a Spanish word for small woods.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from the soil surface to a depth of about 1 inch. (A horizon)

Fluventic feature - Alluvial stratification and an irregular organic-carbon distribution.

Oxyaquic feature - Aquic conditions (endosaturation and reduction) in all horizons between 26 and 64 inches. Reduced iron ions are indicated by the horizons producing a strong red color after spot application of alpha, alpha-dipyridyl in a neutral, 1-normal ammonium acetate solution. An anaerobic

state is inferred by the stale, musty odor of the Cg horizons, which indicates the decomposition of organic matter in the absence of oxygen.

Depleted matrix - The presence of a low chroma matrix which contains reduced iron, but does not change color on exposure to air. (Cg1, Cg2 Cg3, and Cg4 horizons)

Note: This soil does not meet the Criteria for Hydric Soils as defined by the National Technical Committee for Hydric Soils (1994).

National Cooperative Soil Survey
U.S.A.

LOCATION BUCKHORSE NM

Established Series
Rev. JVC/TWH
01/2008

BUCKHORSE SERIES

The Buckhorse series consists of very deep, well drained soils that formed in slope alluvium derived from granite, gneiss, schist, and granitic sandstone, fanglomerate, and mudstone. Buckhorse soils are on toeslopes of eroded fan remnants. Slopes are 2 to 8 percent. Mean annual precipitation is about 14 inches and mean annual temperature is about 49 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Calcidic Argiustolls

TYPICAL PEDON: Buckhorse coarse sandy loam--on a toeslope of an erosional fan remnant sloping 7 percent to the southeast at 6,730 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was moist from 1 to 3 inches and otherwise dry throughout.)

A--0 to 4 inches; brown (7.5YR 4/3) coarse sandy loam, dark brown (7.5YR 3/2) moist; weak medium platy structure parting to moderate fine granular; soft, very friable, slightly sticky and nonplastic; many very fine roots; few very fine irregularly shaped pores; 10 percent gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary. (2 to 4 inches thick)

Bt--4 to 11 inches; brown (7.5YR 4/3) coarse sandy loam, dark brown (7.5YR 3/2) moist; moderate medium prismatic structure parting to weak coarse subangular blocky; soft, very friable, slightly sticky and nonplastic; few medium, few fine, and common very fine roots; few fine and few very fine tubular pores; few distinct clay films on faces of peds and few faint clay films on faces of peds and lining pores; 10 percent gravel; strongly effervescent, secondary calcium carbonate segregated as very few irregularly shaped coats on rock fragments; moderately alkaline (pH 8.3); clear smooth boundary. (5 to 8 inches thick)

Btk1--11 to 22 inches; brown (7.5YR 5/3) loam, brown (7.5YR 4/2) moist; moderate medium prismatic structure parting to weak coarse subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; few coarse, few medium, few fine, and common very fine roots; common very fine tubular pores; few faint clay films on faces of peds and lining pores; 10 percent gravel; violently effervescent, secondary calcium carbonate segregated as common fine and medium irregularly shaped coats on faces of peds and on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 16 inches thick)

Btk2--22 to 37 inches; light brown (7.5YR 6/3) loam, brown (7.5YR 4/3) moist; weak medium prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; few coarse, few medium, common fine and common very fine roots; few fine and common very fine tubular pores; few faint clay films on faces of peds and lining pores; 5 percent gravel; violently effervescent, secondary calcium carbonate segregated as common fine irregularly shaped coats on faces of peds and on rock fragments; strongly alkaline (pH 8.6); clear wavy boundary. (0 to 16 inches thick)

Bk--37 to 49 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 4/4) moist; moderate coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few medium, few fine, and few very fine roots; few fine and common very fine tubular pores; 5 percent gravel; violently effervescent, secondary calcium carbonate segregated as few fine and medium irregularly shaped coats on rock fragments and on faces of peds; strongly alkaline (pH 8.6); clear smooth boundary. (6 to 18 inches thick)

BCk--49 to 61 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 4/4) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few fine and few very fine roots; few fine and few very fine tubular pores; 10 percent gravel; strongly effervescent, secondary calcium carbonate segregated as very few fine irregularly shaped coats on rock fragments; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 26 inches thick)

C--61 to 83 inches; light brown (7.5YR 6/4) gravelly coarse sand, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; few strata of loam and sandy loam; 20 percent gravel; slightly effervescent; moderately alkaline (pH 8.2).

TYPE LOCATION: Santa Fe County, New Mexico; about 2.5 miles north of Agua Fria; 900 feet east and 700 feet south of the northwest corner of section 20, T.17N., R.9E.; USGS Agua Fria 7.5 minute topographic quadrangle; Latitude 35 degrees 41 minutes 42 seconds North and Longitude 106 degrees 0 minutes 55 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - Typically, the soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Mean annual soil temperature - 49 to 52 degrees F.
Depth to base of mollic epipedon - 7 to 19 inches
Depth to calcareous material - 0 to 8 inches
Depth to base of argillic horizon - 15 to 38 inches
Depth to calcic horizon - 7 to 11 inches
Lithology of rock fragments: granite, gneiss, and schist.

Volcanic glass content: 70 to 90 percent in the coarse silt plus sand fraction

Particle-size control section (weighted averages)
Silicate clay content: 8 to 18 percent
Sand content: 35 to 65 percent
Fine sand and coarser content: more than 35 percent
Rock fragment content: 0 to 15 percent gravel
Mica content: 1 to 3 percent (by grain count)

Organic matter content - 1 to 3 percent in the mollic epipedon

Reaction - neutral to moderately alkaline in the surface and in the upper part of the subsoil; moderately alkaline to strongly alkaline in the lower part of the subsoil and in the upper part of the substratum; slightly alkaline to strongly alkaline in the lower part of the substratum.

Salinity, mmhos/cm - 0 to 1 in the surface and subsoil; 0 to 2 in the substratum

Sodicity, SAR - 0 to 1 in the surface and subsoil; 0 to 4 in the substratum

A horizon
Value: 4 or 5 dry
Chroma: 2 or 3, dry or moist
Rock fragments: 5 to 15 percent gravel

Bt horizon
Value: 4 or 5 dry
Chroma: 2 or 3, dry or moist
Texture: coarse sandy loam, sandy loam, or loam

Btk horizons
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 3 or 4 dry, 2 through 4 moist
Texture: loam or sandy loam
Calcium carbonate equivalent: 5 to 15 percent

Bk horizons
Value: 5 through 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: fine sandy loam, sandy loam, or loam
Rock fragments: 0 to 15 percent gravel
Calcium carbonate equivalent: 5 to 15 percent
Other features: some pedons have thin subhorizons with texture of gravelly loam or gravelly sandy loam.

BCk horizon
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: sandy loam, coarse sandy loam, or gravelly sandy loam
Rock fragments: 5 to 20 percent gravel
Calcium carbonate equivalent: 5 to 10 percent
Other features: some pedons have thin subhorizons with texture of very gravelly coarse sandy loam or very gravelly loamy coarse sand.

C horizons
Value: 5 through 7 dry, 4 or 5 moist
Chroma: 3 or 4 dry, 3, 4, or 6 moist
Texture: stratified gravelly coarse sand to loam
Rock fragments: 5 to 20 percent gravel
Calcium carbonate equivalent: 0 to 10 percent
Other features: some pedons have buried horizons with weak, discontinuous cementation by secondary silica or up to 15 percent calcium carbonate equivalent.

COMPETING SERIES: There are currently no competing series.

GEOGRAPHIC SETTING: Buckhorse soils are on toeslopes of erosional fan remnants. They formed in alluvium derived from Precambrian granite, gneiss, and schist, and from Tertiary granitic sandstone, fanglomerate, and mudstone. Slopes are 2 to 8 percent. Elevation ranges from 5,700 to 7,900 feet. The mean annual precipitation is 13 to 15 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 50 degrees F. The frost-free period is 140 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Altazano, Encantado, and Tanoan soils. Altazano soils are coarse-loamy, have stratified alluvial mantles, and occur on adjacent, frequently flooded inset fans. Encantado soils are sandy-skeletal, have calcic horizons, and occur on shoulders and backslopes of erosional fan remnants. Tanoan soils are coarse-loamy, have ochric epipedons and calcic horizons, and occur on shoulders and footslopes of erosional fan remnants.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; moderately rapid permeability in the subsoil and in the upper part of the substratum, and moderately rapid or rapid permeability in the lower part of the substratum.

USE AND VEGETATION: Buckhorse soils are used for urban development, livestock grazing, and recreation. The historic climax vegetation is blue grama, galleta, ring muhly, black grama, and broom snakeweed. The ecological site is Loamy(R036XB112NM).

DISTRIBUTION AND EXTENT: Buckhorse soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Buckhorse is a coined name derived from the name Buckman, its region of origin. This series was originally proposed as Buckmen in 1996, and changed to Buckhorse in 2006.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - The zone from the soil surface to a depth of about 11 inches. (A and Bt horizons)

Argillic horizon - The zone from 4 to about 37 inches. (Bt, Btk1, and Btk2 horizons)

Calcic horizon - The zone from 11 to about 49 inches. (Btk1, Btk2, and Bk horizons)

ADDITIONAL DATA: The series type location has been sampled for the Soil Survey Laboratory (SSL), Lincoln, NE, as soil survey sample number S94NM-049-001. Reference analyses such as particle-size distribution, organic carbon content, and cation exchange capacity were performed.

National Cooperative Soil Survey
U.S.A.

LOCATION CABREROS NM

Established Series
Rev. AJM/CDH/TWH
01/2008

CABREROS SERIES

The Cabreros series consists of well drained soils that are moderately deep to monzonite bedrock. Cabreros soils formed in slope alluvium and eolian material derived from monzonite on toeslopes of structural benches on sills. Slope ranges from 2 to 6 percent. Mean annual precipitation is about 11 inches and the mean annual air temperature is about 51 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Ustic Calciargids

TYPICAL PEDON: Cabreros fine sandy loam, on a 2 percent slope, east southeast aspect, at 6,215 feet elevation - rangeland. (Colors are for dry soil unless otherwise noted. When described on June 16, 2004, the profile was dry throughout.)

A--0 to 2 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 5 percent gravel; neutral (pH 7.1); clear wavy boundary. (1 to 3 inches thick)

Bt1--2 to 9 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common medium vesicular pores; common distinct clay coatings on ped faces; 5 percent gravel; slightly alkaline (pH 7.4); gradual wavy boundary.

Bt2--9 to 18 inches; strong brown (7.5YR 5/6) clay loam, strong brown (7.5YR 4/6) moist; strong medium prismatic structure parting to strong medium subangular blocky; very hard, friable, moderately sticky and moderately plastic; common prominent and many distinct clay films on ped faces; 3 percent gravel; moderately alkaline (pH 8.3); clear wavy boundary. (combined thickness of the Bt horizons is 7 to 17 inches)

Btk--18 to 25 inches; brown (7.5YR 5/4) loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and slightly plastic; few prominent and common distinct clay films on ped faces; common medium irregularly shaped calcium carbonate seams; 6 percent calcium carbonate equivalent; strongly alkaline (pH 8.6); clear wavy boundary. (7 to 20 inches

thick)

BCk--25 to 34 inches; pale red (2.5YR 7/2) gravelly sandy loam, light reddish brown (2.5YR 6/4) moist; weak medium and weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; 5 percent paragravel; 15 percent gravel and 5 percent cobbles; carbonates disseminated throughout matrix; 36 percent calcium carbonate equivalent; moderately alkaline (pH 8.4); abrupt wavy boundary. (4 to 12 inches thick)

Cr--34 to 47 inches; moderately cemented monzonite bedrock. (6 to 16 inches thick)

R--47 to 57 inches; indurated monzonite bedrock.

TYPE LOCATION: Santa Fe County, New Mexico; about 8.5 miles southeast of Cerrillos; northwest quarter of northeast quarter, Sec. 19, T.13N., R.9E; USGS Captain Davis Mountain 7.5 minute topographic quad; Longitude 106 degrees, 01 minute, 36.22 seconds west; Latitude 35 degrees, 20 minutes, 47.14 seconds north, NAD 83; UTM 13S 0406702 3911747.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is intermittently moist in some part from July to October and December to March. It is assumed to be dry in all parts 50 to 75 percent of the time (cumulative), when the soil temperature at 20 inches is 41 degrees F. or higher. The soils are driest in May and June. The soil moisture regime is aridic bordering on ustic.

Mean annual soil temperature: 52 to 54 degrees F (11.1 to 12.2 C).
Depth to argillic horizon: 1 to 3 inches (3 to 8 cm).
Depth to calcic horizon: 15 to 30 inches (40 to 75 cm).
Depth to paralithic contact: 20 to 40 inches (50 to 100 cm).
Depth to lithic contact: 30 to 60 inches (50 to 150 cm).
Lithology of rock fragments: monzonite

Particle-size control section (weighted averages)
Silicate clay content: 20 to 35 percent
Rock fragment content: 0 to 15 percent

A horizon
Hue: 7.5YR to 10YR
Value: 3 to 5 dry, 3 or 4 moist
Chroma: 3 to 5 dry or moist
Texture: sandy loam or fine sandy loam
Rock fragments: 0 to 10 percent gravel
Reaction: neutral or slightly alkaline

Bt horizons
Hue: 7.5YR to 10YR
Value: 3 to 5 dry or moist
Chroma: 3 to 6 dry or moist
Texture: loam, sandy clay loam, gravelly sandy clay loam, or clay loam
Rock fragments: 0 to 15 percent gravel and 5 percent cobbles
Reaction: neutral or slightly alkaline

Btk horizons
Hue: 7.5YR to 10YR
Value: 5 to 6 dry, 4 to 5 moist
Chroma: 3 to 6 dry or moist
Calcium carbonate equivalent: 3 to 10 percent
Texture: loam, silt loam, sandy clay loam, or clay loam
Rock fragments: 0 to 10 percent gravel and 0 to 10 percent cobbles
Reaction: moderately alkaline or strongly alkaline

BCk horizons
Hue: 2.5YR to 7.5YR
Value: 5 to 8 dry, 4 to 6 moist
Chroma: 1 to 4 dry or moist
Calcium carbonate equivalent: 15 to 50 percent
Texture: silt loam, sandy clay loam, gravelly sandy loam, gravelly sandy clay loam, or cobbly sandy clay loam
Pararock fragment content: 0 to 15 percent paragravel
Rock fragments: 0 to 15 percent gravel, and 0 to 10 percent cobbles
Reaction: moderately alkaline or strongly alkaline

COMPETING SERIES: These are the Alvey, Barx, Cerrillos, Clovis, Fernando, Flaco, Horchata, Maysdorf, Millett, Palabria, Progresso, Sanostee, Scholle, Selpats, Solirec, Spenlo, Threetop, Tuweep, and Wineg. The Alvey, Barx, Cerrillos, Clovis, Maysdorf, Millett, Scholle, Selpats and Solirec soils are very deep to bedrock. The Fernando, Palaria, and Wineg soils are deep to bedrock. The Flaco and Tuweep soils are formed in volcanic parent material. The Horchata, Progresso, Sanostee, Spenlo, and Threetop soils are moderately deep to sedimentary rock.

GEOGRAPHIC SETTING: Cabreros soils are located on toeslopes of structural benches on sills at elevations from 6,000 to 7,000 feet and slopes of 2 to 6 percent. They formed in slope alluvium and eolian material derived from monzonite. Mean annual precipitation ranges from 10 to 13 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. Mean annual air temperature ranges from 50 to 52 degrees F with a frost-free period of about 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Hagerman and Kech series found on adjacent upland areas, neither of which have calcic horizons. In addition, Kech soils are shallow to sedimentary bedrock.

DRAINAGE AND PERMEABILITY: Well drained. Permeability is moderately slow. Runoff is negligible to moderate.

USE AND VEGETATION: Dominant use is for rangeland. The historic climax vegetation is blue grama, galleta, oak, black grama, and oneseed juniper. The ecological site is Hills(R036XB124NM).

DISTRIBUTION AND EXTENT: Cabreros soils are of small extent on the Galisteo Basin part of the Mexican Highland section of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado.

SERIES ESTABLISHED: Santa Fe County (Santa Fe Area), New Mexico, 2008. The name Cabreros is taken from a mesa near the type location.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon- 0 to 2 inches (A horizon)
Argillic horizon- 2 to 25 inches (Bt and Btk horizons)
Secondary carbonates- 18 to 34 inches. (Btk and BCk horizon)
Calcic horizon- 25 to 34 inches (BCk horizon)
Particle-size control section 2 to 22 inches (upper 20 inches of the argillic horizon)
Paralithic Material- 34 to 47 inches (Cr horizon)
Lithic contact- at 47 inches (R horizon)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalent was measured with a clacimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION CAMELROCK NM

Established Series
JVC/WWJ/TWH
01/2008

CAMELROCK SERIES

The Camelrock series consists of very deep, well drained soils that formed in alluvium derived from granite, gneiss, schist, and micaceous sandstone, siltstone, and mudstone. Camelrock soils are on treads of high stream terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 11 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Fine, mixed, superactive, mesic Entic Haplotorrerts

TYPICAL PEDON: Camelrock silty clay loam--on a planar to slightly convex tread of a high stream terrace sloping 1 percent to the northwest at 6,025 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was dry from 0 to 11 inches, slightly moist from 11 to 36 inches, and dry below 36 inches.)

A--0 to 3 inches; brown (7.5YR 4/2) silty clay loam, dark brown (7.5YR 3/2) moist; weak thick platy structure parting to strong very fine granular; soft, very friable, moderately sticky and moderately plastic; common fine and common very fine roots; common very fine irregularly shaped pores; common 2 to 5 mm wide cracks; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (2 to 6 inches thick)

Bw--3 to 7 inches; brown (7.5YR 4/2) silty clay loam, dark brown (7.5YR 3/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few medium, few fine, and common very fine roots; few fine and few very fine tubular pores; few pressure faces; common 2 to 5 mm wide cracks; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary. (4 to 13 inches thick)

Bss--7 to 14 inches; dark gray (7.5YR 4/1) and brown (7.5YR 4/3) silty clay, very dark gray (7.5YR 3/1) and dark brown (7.5YR 3/3) moist; strong coarse prismatic structure parting to moderate medium and coarse wedges; very hard, firm, very sticky and very plastic; few coarse, common medium, few fine, and common very fine roots; few fine and few very fine tubular pores; few small intersecting slickensides tilted 20 to 50 degrees from horizontal; common 3 to 10 mm wide cracks; strongly effervescent, moderately alkaline (pH 8.4); clear wavy boundary. (6 to 11 inches thick)

Bkssy1--14 to 24 inches; brown (7.5YR 5/2) silty clay, dark brown (7.5YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium and coarse wedges; very hard, firm, very sticky and very plastic; few fine and common very fine roots; few very fine tubular pores; common small intersecting slickensides tilted 20 to 40 degrees from horizontal; common 3 to 15 mm wide cracks; secondary gypsum segregated as few fine crystals on faces of peds; strongly effervescent, secondary calcium carbonate segregated as common medium irregularly shaped coats on faces of peds; moderately alkaline (pH 8.2); clear wavy boundary. (5 to 11 inches thick)

Bkssy2--24 to 29 inches; brown (7.5YR 5/3 and 7.5YR 4/3) silty clay, brown (7.5YR 4/3) and dark brown (7.5YR 3/2) moist; moderate coarse prismatic structure parting to weak medium wedges; very hard, firm, very sticky and very plastic; few fine and few very fine roots; few fine and few very fine tubular pores; common small intersecting slickensides tilted 10 to 30 degrees from horizontal; few 2 to 5 mm wide cracks; secondary gypsum segregated as few fine crystals on faces of peds; strongly effervescent, secondary calcium carbonate segregated as common fine irregularly shaped coats on faces of peds; moderately alkaline (pH 8.0); clear wavy boundary. (5 to 17 inches thick)

BCky1--29 to 41 inches; light brown (7.5YR 6/3) stratified clay loam and very fine sandy loam, brown (7.5YR 4/3) moist; weak coarse and medium subangular blocky structure; hard and slightly hard, friable and very friable, moderately sticky and slightly sticky, moderately plastic and nonplastic; few fine and few very fine roots; few medium, few fine, and few very fine tubular pores; few small pieces of charcoal; few 1 to 3 mm wide cracks in clay loam material; few fine distinct strong brown (7.5YR 5/6) and few fine prominent yellowish red (5YR 5/8) masses of iron accumulation which are relict redoximorphic features; secondary gypsum segregated as few fine crystals on faces of peds; slightly and strongly effervescent, secondary calcium carbonate segregated as common fine irregularly shaped coats on faces of peds; moderately alkaline (pH 8.4); clear wavy boundary. (8 to 17 inches thick)

BCky2--41 to 55 inches; light brown (7.5YR 6/4) and light reddish brown (5YR 6/3) stratified loam and silty clay loam, brown (7.5YR 5/4) and reddish brown (5YR 4/4) moist; weak coarse prismatic structure; slightly hard and hard, very friable and friable, slightly sticky and moderately sticky, nonplastic and moderately plastic; few fine and few very fine roots; few medium, few fine, and common very fine tubular pores; few small pieces of charcoal; common fine distinct strong brown (7.5YR 5/6) and few fine prominent yellowish red (5YR 5/8) masses of iron accumulation which are relict redoximorphic features; secondary gypsum segregated in few fine filaments; slightly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of peds; moderately alkaline (pH 8.4); abrupt smooth boundary. (9 to 18 inches thick)

BCky3--55 to 71 inches; light reddish brown (5YR 6/3) and brown (7.5YR 5/3) clay, reddish brown (5YR 4/3) and brown (7.5YR 4/3) moist; weak coarse prismatic structure; very hard, firm, very sticky and very plastic; few fine and few very fine roots; few fine and few very fine tubular pores; few laminae of silt loam and carbon ash; few pressure faces; common 1 to 5 mm wide cracks; common fine distinct strong brown (7.5YR 4/6) and few fine prominent yellowish red (5YR 5/8) masses of iron accumulation which are relict redoximorphic features; secondary gypsum segregated in few fine filaments; slightly effervescent, secondary calcium carbonate segregated as few fine irregularly shaped coats on faces of

peds; moderately alkaline (pH 8.4); clear wavy boundary. (0 to 16 inches thick)

C1--71 to 98 inches; light brown (7.5YR 6/3) and brown (7.5YR 5/2) stratified loam and silty clay loam, brown (7.5YR 5/3 and 7.5YR 4/2) moist; massive; slightly hard and hard, very friable and friable, slightly sticky and moderately sticky, slightly plastic and moderately plastic; few very fine tubular pores; few laminae of carbon ash; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation, few fine distinct dark grayish brown (10YR 4/2) zones of iron depletion, and few fine prominent black (N 2/0) masses of manganese accumulation which are relict redoximorphic features; slightly and strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (7 to 27 inches thick)

C2--98 to 120 inches; yellowish brown (10YR 5/4) and brown (7.5YR 5/4) stratified fine sandy loam and silty clay, dark yellowish brown (10YR 4/4) and brown (7.5YR 4/4) moist; massive; slightly hard and very hard, very friable and firm, slightly sticky and very sticky, nonplastic and very plastic; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation, few fine distinct dark gray (10YR 4/1) zones of iron depletion, and few fine prominent black (N 2/0) masses of manganese accumulation which are relict redoximorphic features; strongly effervescent, moderately alkaline (pH 8.0).

TYPE LOCATION: Santa Fe County, New Mexico; on the Pojoaque Indian Reservation about 0.25 mile south-southeast of Cuyamungue; 300 feet west and 900 feet north of the southeast corner of section 20, T.19N., R.9E.; USGS Horcado Ranch 7.5 minute topographic quadrangle; Latitude 35 degrees 51 minutes 31 seconds North and Longitude 106 degrees 0 minutes 3 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is intermittently moist in some part from July to October and December to March. The soils are driest in May and June. Cracks are closed for less than 60 consecutive days during the periods when soil temperature at a depth of 20 inches is higher than 47 degrees F. The soil moisture regime is aridic or torric bordering on ustic.

Mean annual soil temperature - 52 to 54 degrees F.
Depth to base of mollic epipedon - 17 to 30 inches
Depth to slickensides and wedge-shaped peds - 7 to 16 inches
Cracks - few to common, 1 to 15 mm wide (and narrowing with depth), are present in clayey horizons and strata; cracks in the upper B horizons open and close periodically and incorporate the self-mulching surface horizon
Depth to calcareous material (as visible secondary calcium carbonate) - 11 to 27 inches
Depth to horizons with less than 27 percent clay - 28 to 39 inches
Lithology of rock fragments: granite, gneiss, and schist
Volcanic glass content: 5 to 15 percent in the coarse silt plus sand fraction

Particle-size control section (weighted averages)

Silicate clay content: 30 to 45 percent
Fine sand or coarser content: 5 to 15 percent
Rock fragment content: 0 to 5 percent gravel
Mica content: 1 to 5 percent (by grain count)

Organic matter content - 1 to 3 percent in the mollic epipedon

Reaction - slightly alkaline to moderately alkaline in the surface and upper part of the subsoil; moderately alkaline in the lower part of the subsoil and in the upper part of the substratum; slightly alkaline to moderately alkaline in the lower part of the substratum.

A or Ap horizon
Value: 4 or 5 dry
Chroma: 2 or 3, dry or moist
Clay content: 30 to 35 percent
Calcium carbonate equivalent: 3 to 10 percent

Bw horizon
Value: 4 or 5 dry
Chroma: 2 or 3 dry, 1 through 3 moist
Clay content: 32 to 40 percent
Texture: silty clay loam or clay loam
Calcium carbonate equivalent: 3 to 10 percent
Other features: some pedons have texture of silty clay; some pedons have few relict redox concentrations of iron

Bss horizon
Value: 4 or 5 dry
Chroma: 1 through 3, dry or moist
Clay content: 35 to 45 percent
Texture: silty clay or silty clay loam
Calcium carbonate equivalent: 3 to 10 percent
Salinity, mmhos/cm: 2 to 4
Sodicity, SAR: 0 to 4
Other features: some pedons have few or common relict redox concentrations of iron

Bkssy horizons
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 through 4, dry or moist
Clay content: 35 to 45 percent
Texture: silty clay or silty clay loam
Calcium carbonate equivalent: 3 to 10 percent

Salinity, mmhos/cm: 4 to 8
Sodicity, SAR: 4 to 13
Gypsum content: 0 to 3 percent
Other features: some pedons have few to common relict redox concentrations of iron

BCky horizon, upper part
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6, dry or moist
Clay content: averages 20 to 26 percent
Texture: stratified clay loam to sandy loam
Calcium carbonate equivalent: 3 to 10 percent
Salinity, mmhos/cm: 2 to 4
Sodicity, SAR: 0 to 4
Gypsum content: 0 to 3 percent
Other features: pedons have few to common relict redox concentrations of iron; pedons have thin strata and lenses ranging in texture from gravelly loamy coarse sand to silty clay loam

BCky horizon, lower part
Hue: 5YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 through 6, dry or moist
Clay content: 18 to 35 percent
Texture: stratified silty clay to sandy loam
Calcium carbonate equivalent: 3 to 10 percent
Salinity, mmhos/cm: 2 to 4
Sodicity, SAR: 0 to 4
Gypsum content: 0 to 2 percent
Other features: pedons have few to common relict redox concentrations of iron; some pedons have thin lenses with texture of gravelly coarse sand

C horizons
Hue: 5YR, 7.5YR, or 10YR
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 1 through 6, dry or moist
Clay content: 10 to 35 percent
Texture: stratified silty clay to sandy loam
Calcium carbonate equivalent: 1 to 10 percent
Salinity, mmhos/cm: 0 to 4
Sodicity, SAR: 0 to 4
Other features: pedons have few to common relict redox concentrations and depletions of iron, and few relict redox concentrations of manganese; minor amounts of secondary gypsum (up to 1 percent) are present in some pedons; some pedons have thin subhorizons of gravelly sandy loam

COMPETING SERIES: At present, there are no other series in this family.

GEOGRAPHIC SETTING: Camelrock soils are on treads of high stream terraces. They formed in alluvium derived from Precambrian granite, gneiss, schist, and from Tertiary micaceous sandstone, siltstone, and mudstone. Slopes are 0 to 2 percent. Elevation ranges from 5,500 to 6,500 feet. The mean annual precipitation is 10 to 12 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the El Rancho, Innacutt, and Walkibout soils. El Rancho soils are fine-silty, have ochric epipedons and cambic horizons, and occur on fan remnants. Innacutt soils are coarse-loamy, lack diagnostic surface and subsurface horizons, and occur on inset fans and narrow flood plains of gulches. Walkibout soils are coarse-silty, have ochric epipedons, and occur on side slopes of gulches.

DRAINAGE AND PERMEABILITY: Well drained; high surface runoff; slow permeability.

USE AND VEGETATION: Camelrock soils are used for urban development, livestock grazing, irrigated cropland, and recreation. The historic climax vegetation is blue grama, galleta, western wheatgrass, and fourwing saltbush. The ecological site is Clayey Bottomland (R036XB119NM).

DISTRIBUTION AND EXTENT: Camelrock soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. The name Camelrock is coined from a rock formation south of Espanola.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - The zone from the soil surface to a depth of about 24 inches. (A, Bw, Bss, and Bkssy1 horizons)

Vertic characteristics - The zone from the soil surface to a depth of about 29 inches. (A, Bw, Bss, Bkssy1, and Bkssy2 horizons)

Entic feature - The zone from 29 to 41 inches that averages less than 27 percent clay. (Bcky1 horizon)

National Cooperative Soil Survey

U.S.A.

LOCATION CANUELA NM

Established Series
Rev. JMP/CDH/TWH
01/2008

CANUELA SERIES

The Canuela series consists of shallow, well drained soils that formed in eolian material and slope alluvium over residuum derived from rhyolitic tuff. Canuela soils are on summits and beveled summits of interfluves on undulating plateaus and mesas. Slopes are 2 to 8 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 49 degrees F.

TAXONOMIC CLASS: Loamy, mixed, superactive, mesic, shallow Aridic Haplustalfs

TYPICAL PEDON: Canuela paragravelly sandy loam--on a summit of an interfluve sloping 2 percent to the north at 6,638 feet elevation-rangeland. (Colors are for dry soil unless otherwise noted. When described on September 14, 2000, the soil was dry throughout.) Surface is covered with 20 percent paragravel and 5 percent paracobbles.

A--0 to 2 inches; pale brown (10YR 6/3) paragravelly sandy loam, brown (10YR 4/3) moist; single grain; loose, slightly sticky and nonplastic; many fine and common very fine roots; 15 percent paragravel; neutral (pH 6.6); clear smooth boundary. (2 to 4 inches thick)

Bt1--2 to 7 inches; brown (7.5YR 4/4) paragravelly clay loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few coarse, few medium, common fine, and common very fine roots; common distinct clay films on faces of peds; 20 percent paragravel and 10 percent paracobbles; neutral (pH 6.6); gradual smooth boundary. (3 to 8 inches thick)

2Bt2--7 to 15 inches; brown (7.5YR 5/4) very paracobbly sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few coarse, few medium, few fine, and few very fine roots; common distinct clay films on faces of peds; 25 percent paragravel and 30 percent paracobbles; neutral (pH 6.8); abrupt wavy boundary. (4 to 8 inches thick)

2Cr--15 to 25 inches; moderately cemented rhyolitic tuff bedrock (Bandelier Tuff formation)

TYPE LOCATION: Bandelier National Monument, Los Alamos County, New Mexico; about 6.6

miles south-southeast of Los Alamos City Pond; Latitude 35 degrees 47 minutes 17.90 seconds North and Longitude 106 degrees 16 minutes 22.16 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on aridic.

Average annual soil temperature - 49 to 51 degrees F.
Depth to base of the argillic horizon and a paralithic contact - 13 to 19 inches
Lithology of pararock fragments: Rhyolitic tuff
Oxalate extractable Al + 1/2Fe: .01 to .10 percent (estimated)

Particle-size control section weighted averages:
Silicate clay content: 18 to 30 percent
Sand content: 35 to 55 percent
Fine sand or coarser content: 25 to 40 percent

A horizon
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: paragravelly sandy loam or sandy loam
Clay content: 8 to 18 percent
Volcanic glass content: 5 to 10 percent
Pararock fragments: total range is 5 to 30 percent
5 to 20 percent paragravel
0 to 10 percent paracobbles

Bt1 horizon
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 2 to 6, dry or moist
Texture: loam, clay loam, or gravelly clay loam
Clay content: 18 to 30 percent
Volcanic glass content: 5 to 15 percent
Pararock fragments: total range is 5 to 30 percent
5 to 20 percent paragravel
0 to 10 percent paracobbles

2Bt2 horizon
Hue: 7.5YR or 10YR
Value: 3 or 4 moist
Chroma: 4 or 6, dry or moist
Texture: very paracobbly sandy clay loam, very paracobbly loam, or very paracobbly clay loam
Clay content: 18 to 27 percent
Volcanic glass content: 20 to 30 percent
Pararock fragments: total range is 40 to 60 percent
20 to 30 percent paragravel
20 to 30 percent paracobbles

COMPETING SERIES: There are no competing series.

GEOGRAPHIC SETTING: Canuela soils are on summits and beveled summits of interfluves on undulating plateaus and mesas. They formed in eolian material and slope alluvium over residuum derived from rhyolitic tuff of the Quaternary age Bandelier Tuff formation. Slopes are 2 to 6 percent. Elevation ranges from 5,900 to 7,100 feet. The mean annual precipitation is 11 to 16 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 51 degrees F. The frost-free period is 130 to 160 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Abrojo, Armenta, Chiminet, and Zacaton soils. Abrojo soils are very deep and are on backslopes of interfluves. Armenta soils are very deep and are on footslopes of interfluves. Chiminet soils are very shallow and are on backslopes of interfluves. Zacaton soils are very deep and are on backslopes of interfluves.

DRAINAGE AND PERMEABILITY: Well drained; medium surface runoff; permeability is moderate and moderately slow.

USE AND VEGETATION: Canuela soils are used for recreation and wildlife habitat. The historic climax vegetation is blue grama, needleandthread, skunkbush sumac, and twoneedle pinyon. The ecological site is Pinus edulis-Juniperus monosperma/Cercocarpus montanus-Chrysothamnus nauseosus/ Bouteloua gracilis(F036XB135NM).

DISTRIBUTION AND EXTENT: Canuela soils are of small extent on the southwestern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update, 2008. Series proposed in Los Alamos County, New Mexico, Bandelier National Monument Soil Survey, 2000. Canuela is a Spanish surname.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon - The zone from the soil surface to 2 inches. (A horizon)
Argillic horizon - The zone from 2 to 15 inches. (Bt1 and 2Bt2 horizons)
Paralithic contact - at 15 inches. (2Cr layer)

Note: This soil has moderate amounts of volcanic glass in the coarse silt plus sand fractions. It has less volcanic ash than other nearby less developed soils because of the influence of introduced eolian materials. Even though lower horizons contain more glass than upper horizons, it does not contain enough glass to make a Vitritorrandic subgroup.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION CERRILLOS NM+CO UT

Established Series
Rev. BDS/CDH/TWH
01/2008

CERRILLOS SERIES

The Cerrillos series consists of very deep, well drained soils that formed from alluvial, eolian, and colluvial materials derived from monzonite, granite, shale, and sandstone on knolls and treads of fan remnants. Slopes range from 0 to 10 percent. Mean annual precipitation is about 12 inches. The mean annual temperature is 50 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Ustic Calciargids

TYPICAL PEDON: Cerrillos fine sandy loam - rangeland. (Colors are for dry soils unless otherwise noted.)

A--0 to 5 inches; brown (7.5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; scattered surface gravel less than 15 percent by volume; neutral; clear smooth boundary. (2 to 5 inches thick)

Bt--5 to 9 inches; reddish brown (5YR 4/4) clay loam, reddish brown (5YR 4/4) moist; strong fine to medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few fine roots; thin continuous clay films on faces of peds; neutral; clear smooth boundary. (4 to 9 inches thick)

Btk--9 to 13 inches; reddish brown (5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; moderate medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine roots; few thin clay films on faces of peds; slightly effervescent with few soft calcium carbonate masses and lime-coated gravel; moderately alkaline; clear wavy boundary. (4 to 6 inches thick)

Bk--13 to 30 inches; pinkish white (7.5YR 8/2) clay loam, pink (7.5YR 7/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots to 15 inches; strongly effervescent with calcium carbonate disseminated; strongly alkaline; clear smooth boundary. (7 to 20 inches thick)

C--30 to 60 inches; reddish yellow (5YR 6/6) sandy clay loam, reddish brown (5YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; slightly effervescent, strongly alkaline.

TYPE LOCATION: Santa Fe County, New Mexico; in abandoned railroad bank cut about 3.5 miles

northwest of Galisteo, in the NE 1/4 of sec. 21, T. 14N., R 9E. Latitude 35 degrees 25 minutes 57.6 seconds N and Longitude 105 degrees 59 minutes 3.70 seconds W, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is intermittently moist in some part from July to October and December to March. The soils are driest in May and June. The soil moisture regime is torric (aridic) bordering on ustic.

Mean annual soil temperature: 47 to 59 degrees F.
Depth to calcic horizon: 10 to 20 inches
Reaction: Neutral to strongly alkaline.
Rock Fragments: 0 to 15 percent in control section dominantly gravel, but may range to 35 percent in any horizon.

A horizon:
Hue - 5YR through 10YR.
Value: 5 or 6 dry, 3 or 4 moist.
Chroma 2 through 4.

Bt horizon:
Hue - 5YR or 7.5YR.
Value: 4 or 5 dry 3 or 4 moist.
Chroma: 2 through 4.
Texture: Sandy clay loam or clay loam
Clay content: 27 to 35 percent clay

Bk horizon: Calcium carbonate equivalent - more than 15 percent.
Texture: Sandy clay loam, loam, or gravelly sandy clay loam
Clay content: 20 to 27 percent clay

COMPETING SERIES: These are the Alvey, Barx, Cabreros, Clovis, Fernando, Flaco, Horchata, Maysdorf, Millett, Palabria, Progresso, Sanostee, Scholle, Selpats, Solirec, Spenlo, Threetop, Tuweep, and Wineg soils.
Alvey soils have hue of 10YR or yellower
Barx, Fernando, and Solirec soils have colder winter temperatures and higher winter precipitation
Clovis and Spenlo soils receive more than half of it annual precipitation between the months of July and October and receive more precipitation in May and June.
Cabreros, Flaco, Horchata, Progresso, Sanostee, and Threetop soils are moderately deep over bedrock.
Maysdorf, Selpats, and Threetop soils receive maximum precipitation in May and June. In addition, Maysdorf soils contains less than 15 percent carbonates in the calcic horizon.
Millett soils contains 25 to 75 percent gravel and cobbles in the lower part of the solum.
Palabria soils are deep to a lithic contact.

Scholle soils contains 15 to 35 percent gravel in the control section.
Selpats soils have skeletal lithologic discontinuity at depths ranging from 15 to 39 inches.
Tuweep soils are formed in alluvium from pyroclastics and basalt and have 10YR or yellower colors.
Wineg soils have a MAST of 56 degrees F. and MAP of over 14 inches.

GEOGRAPHIC SETTING: Cerrillos soils are on gently sloping knolls and treads of fan remnants at elevations of 5,400 to 7,200 feet. The soils formed in medium to moderately fine textured sediments of alluvial, eolian, and colluvial materials. The sediments originated principally from monzonite and granite with some shale and sandstone additions. The climate at the type location is semiarid continental with mean annual precipitation of 10 to 13 inches. Mean annual temperature is 50 to 52 degrees F. The frost free period is 140 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Sedillo and Truehill soils. Sedillo soils are loamy-skeletal and occur on adjacent higher positions on treads of fan remnants. Truehill soils are loamy-skeletal, have dark surface horizons, and occur on risers of fan remnants.

DRAINAGE AND PERMEABILITY: Well-drained, moderate to moderately slow permeability.

USE AND VEGETATION: Rangeland. The historic climax vegetation is blue grama, black grama, galleta, ring muhly, and broom snakeweed. The ecological site is Loamy(R036XB112NM).

DISTRIBUTION AND EXTENT: North-central New Mexico and southern Colorado. MLRA 35, 36, 70. These soils are of small extent.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County (Santa Fe Area), New Mexico, 1970. The name is from a range of hills in New Mexico.

REMARKS: Diagnostic Horizons and Features Recognized in this Pedon:
Ochric epipedon: The zone from 0 to 5 inches. (A horizon).
Argillic horizon: The zone from 5 to 13 inches. (Bt and Btk horizons).
Calcic horizon: The zone from 13 to 30 inches. (Bk horizon).

Revised on 1/2003 to update classification from Haplargids to Calciargids, update competing series and the update format to current standards. When established the classification was fine-loamy, mixed, mesic Ustollic Haplargids.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey

U.S.A.

LOCATION CERROPELON NM

Established Series
Rev. JLN/CDH/TWH
01/2008

CERROPELON SERIES

The Cerropelon series consists of moderately deep well drained soils that formed in slope alluvium derived from sandstone and shale. Cerropelon soils are on hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 11 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

TYPICAL PEDON: Cerropelon very cobbly sandy loam--on a hill sloping 28 percent to the north-northeast at 6,180 feet elevation in rangeland. (Colors are for dry soil unless otherwise noted. When described on June 16, 2004, the soil was moist from 0 to 3 inches and otherwise dry throughout.)

A--0 to 1 inch (0 to 3 centimeters); brown (10YR 5/3) very cobbly sandy loam, brown (10YR 4/3) moist; 16 percent clay; weak fine granular structure; very friable, soft, slightly sticky, nonplastic; common very fine to medium high-continuity interstitial pores; 20 percent gravel, 15 percent cobbles, 3 percent stones, and 1 percent boulders; moderately alkaline (pH 7.9); clear wavy boundary. (1 to 3 inches thick)

Bt1--1 to 6 inches (3 to 16 centimeters); brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; 28 percent clay; moderate coarse subangular blocky structure; very firm, hard, moderately sticky, slightly plastic; common very fine and fine roots throughout; common very fine to medium moderate-continuity interstitial and tubular pores; 15 percent patchy prominent clay films throughout; 15 percent gravel and 2 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bt2--6 to 12 inches (16 to 31 centimeters); grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; 31 percent clay; strong coarse subangular blocky structure; very firm, hard, moderately sticky, moderately plastic; common very fine and fine roots throughout; common fine and medium moderate-continuity tubular pores; 10 percent gravel; moderately alkaline (pH 7.9); clear smooth boundary. (combined thickness of the Bt horizons is 7 to 15 inches thick)

Btk--12 to 21 inches (31 to 54 centimeters); grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; 31 percent clay; strong coarse subangular blocky structure; very firm, hard, moderately sticky, moderately plastic; common very fine to coarse roots throughout; common fine low-

continuity tubular pores; 10 percent continuous prominent clay films on all faces of peds; 1 percent fine prominent irregular weakly cemented carbonate masses with clear boundaries in matrix; slightly effervescent; slightly alkaline (pH 7.5); clear smooth boundary. (6 to 11 inches thick)

BCk--21 to 28 inches (54 to 71 centimeters); light yellowish brown (2.5Y 6/3) clay loam, grayish brown (2.5Y 5/2) moist; 33 percent clay; moderate medium subangular blocky structure; very firm, hard, moderately sticky, moderately plastic; common fine roots between peds; few very fine and fine low-continuity tubular pores; 2 percent fine distinct spherical weakly cemented carbonate masses in matrix; violently effervescent; moderately alkaline (pH 8.4). (3 to 8 inches thick)

Cr--28 to 39 inches (71 to 100 centimeters); olive gray (5Y 5/2), olive gray (5Y 4/2), moist; shale bedrock.

TYPE LOCATION: Santa Fe County, New Mexico; about 1 mile east and 3 miles south of Galisteo; USGS Oscura Mountains 7.5 minute topographic quadrangle; Latitude 35 degrees 21 minutes 25.7 seconds North and Longitude 106 degrees 01 minutes 00.2 seconds West, NAD 83.

RANGE IN CHARACTERISTICS:
Soil moisture - The soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is aridic bordering ustic.

Average annual soil temperature: 52 to 54 degrees F (11.1 to 12.2 C)
Thickness of ochric epipedon: 1 to 6 inches (3 to 15 cm)
Depth to base of argillic horizon: 16 to 34 inches (48 to 86 cm)
Depth secondary carbonates: 10 to 14 inches (25 to 36 cm)
Depth to paralithic contact: 20 to 39 inches (50 to 100 cm)

Particle-size control section
Clay content: 25 to 35 percent

A horizon
Value: 5 dry, 4 moist
Chroma: 3, dry or moist
Clay content: 8 to 18 percent
Reaction: slightly alkaline or moderately alkaline
Organic matter content: 0.2 to 0.6 percent
Rock fragments: 30 to 45 percent total rock fragments
15 to 35 percent gravel
10 to 20 percent cobbles
0 to 5 percent stones

0 to 3 percent boulders

Bt horizon
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: gravelly clay loam, clay loam
Clay content: 27 to 35 percent
Rock fragment content: 5 to 25 percent gravel
0 to 5 percent cobble
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Reaction: slightly alkaline or moderately alkaline

Btk horizon
Value: 5 dry, 4 moist
Chroma: 2 or 3 dry, or moist
Clay content: 27 to 35 percent
Calcium carbonate equivalent: 1 to 10 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4

BCk horizon
Value: 6 dry, 5 moist
Chroma: 3 dry, 2 moist
Clay content: 27 to 35 percent
Salinity, mmhos/cm: 0 to 2
Sodicity, SAR: 0 to 4
Reaction: moderately alkaline or strongly alkaline

Cr horizon
Value: 5 dry or moist
Chroma: 2 dry, 3 moist
Soft shale beds

COMPETING SERIES: Current competitors are the Balon, Blancot, Bowbac, Buckle, Cambria, Chilerojo, Cumacho, Cushman, Decolney, Doakum, Forkwood, Fort, Gaddes, Gapbutte, Gapmesa, Hagerman, Hagerwest, Hiland, Mentmore, Oelop, Olney, Palacid, Penistaja, Pokeman, Potts, Pugsley, Quagwa, Redpen, Spangler, Sundance, Tamarindo, Teckla, and Yenlo series. A potential competitor still classified in the Ustollic subgroup is the Harbord series.

Balon, Blancot, Buckle, Cambria, Chilerojo, Cumacho, Decolney, Doakum, Forkwood, Fort, Harbord, Hiland, Mentmore, Oelop, Olney, Palacid, Penistaja, Potts, Quagwa, Redpen, Sundance, Tamarindo, Teckla, and Yenlo soils are deeper than 40 inches to lithic or paralithic contact.

Bowbac and Cushman soils are more moist in the moisture control section in May and June.
Gapbutte, Gapmesa, Hagerman, and Hagerwest soils have a lithic contact at depths between 20 and 40 inches.
Pokeman soils have secondary accumulations of gypsum.
Pugsley and Spangler soils are noncalcareous throughout.

GEOGRAPHIC SETTING: Cerropelon soils are on shoulder and backslope positions on sedimentary bedrock controlled hills. They formed in loamy slope alluvium derived from sandstone and shale. Slopes are 15 to 50 percent. Elevation ranges from 5,400 to 7,100 feet. The mean annual precipitation is 10 to 13 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Penistaja and Skyvillage soils. Penistaja soils are deep. Skyvillage soils do not have argillic horizons.

DRAINAGE AND PERMEABILITY: Well drained; high surface runoff; moderately slow permeability.

USE AND VEGETATION: Cerropelon soils are used for livestock grazing and recreation. The historic climax vegetation is blue grama, Gamble's oak, mountain mahogany, twoneedle pinyon, and oneseed juniper. The ecological site is Sandstone Hills(R036XB122NM)..

DISTRIBUTION AND EXTENT: Cerropelon soils are of small extent on the northern Galisteo Basin part of the Mexican Highlands section of the Basin and Range province in north central New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. The name Cerropelon is taken from a hill in Santa Fe County and its associated ranch.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon 0 to 1 inches. (A horizon)
Argillic horizon - The zone from 1 to 21 inches. (Bt1, Bt2, and Btk horizons)
Secondary carbonates - 12 to 28 inches (Btk and BCk horizons)
Particle-size control section from 1 to 21 inches (entire argillic horizon)
Paralithic contact at 28 inches (Cr layer)

Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a calcimeter. Electrical

conductivity was determined by ec meter, 1:1 water. pH was determined by pH meter 1:1 water. Texture was determined by hydrometer method.

National Cooperative Soil Survey
U.S.A.

LOCATION CHACUACO CO

Established Series
Rev. LAN/GB/WJG
02/2008

CHACUACO SERIES

The Chacuaco series consists of moderately deep to sandtone bedrock, well drained, moderately permeable soils that formed in eolian sediments, slope alluvium, and residuum derived dominantly from sandstone and shale. Chacuaco soils are on ridges and interfluves of plains and on valley sides of plateaus. Slope ranges from 0 to 10 percent. Mean annual precipitation is about 15 inches and the mean annual temperature is about 52 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Calcidic Argiustolls

TYPICAL PEDON: Chacuaco loam - range. (Colors are for dry soil unless otherwise noted.)

A--0 to 5 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; slightly alkaline (pH 7.5); clear smooth boundary (5 to 7 inches thick).

AB--5 to 10 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to moderate medium granules; soft, very friable, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary (0 to 5 inches thick).

Bt--10 to 20 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; very hard, firm, sticky and plastic; common continuous distinct clay films on faces of peds; 5 percent pebbles; violently effervescent; few fine masses of calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary (10 to 18 inches thick).

Bk--20 to 30 inches; very pale brown (10YR 8/3) and very pale brown (10YR 8/4) very gravelly loam, very pale brown (10YR 7/4) moist; massive; soft, very friable, nonsticky and nonplastic; 30 percent pebbles, 10 percent sandstone channers; violently effervescent; 37 percent calcium carbonate equivalent; moderately alkaline (pH 7.9); abrupt wavy boundary (3 to 10 inches thick).

R--30 inches; very strongly cemented Dakota sandstone.

TYPE LOCATION: Las Animas County, Colorado; about 1,000 feet north and 150 feet east of the southwest corner of Sec. 35, T. 34 S., R. 53 W.; Dennis Canyon USGS quadrangle; latitude 37 degrees 2 minutes and 10 seconds N, longitude 103 degrees 20 minutes and 2 seconds W.

RANGE IN CHARACTERISTICS:
Soil moisture: Ustic moisture regime bordering on aridic. Moist in some part April through August. Driest December through February.

Depth to lithic contact: 20 to 40 inches.
Depth to secondary calcium carbonate: 5 to 15 inches.
Thickness of the A and Bt horizons: 17 to 30 inches.
Thickness of the mollic epipedon: 7 to 15 inches.
Some pedons do not have an AB horizon.

Particle sized control section: (weighted average)
Clay content: 20 to 35 percent
Silt content: 5 to 60 percent
Sand content: 20 to 60 percent
Rock fragment content: 5 to 15 percent

The A horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3
Reaction: neutral to moderately alkaline.

The Bt horizon:
Hue: 5 YR, 7.5YR, or 10YR Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4
Texture : clay loam, loam, silty clay loam, or sandy clay loam.
Clay content: 20 to 35 percent
Rock fragment content: 0 to 15 percent
Reaction: slightly alkaline or moderately alkaline.
Calcium carbonate equivalent: 5 to 15 percent.

The Bk horizon:
Hue: 7.5YR or 10YR Value: 6 to 8 dry, 4 to 7 moist
Chroma: 2 to 4
Texture of the fine earth fraction: loam, silt loam
Clay content: 15 to 27 percent
Rock fragment content: 25 to 45 percent
Calcium carbonate equivalent: 15 to more than 40 percent.

COMPETING SERIES: These are the Asparas (NM), Capulin (NM) Rosebud (NE), Ryegate (CO) and Wapiti (CO) series.

Asparas soils: deep to limestone bedrock.
Capulin soils: 40 to 60 inches deep to a lithic contact.
Rosebud soils: paralithic contact at depths of 20 to 40 inches.
Ryegate soils: 35 percent or more fine or coarser sand; deeper than 12 inches to secondary carbonates.
Wapiti soils: very deep.

GEOGRAPHIC SETTING:
Parent material: eolian sediments and residuum derived dominantly from sandstone.
Landform: ridges and interfluves in the plains.
Slope: 0 to 10 percent.
Elevation: 5,000 to 8,000 feet.
Mean annual precipitation: 14 to 16 inches.
Mean annual air temperature: 46 to 53 degrees F.
Frost free period: 120 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Capulin, Dalerose, and Torreon series.
Capulin soils: greater than 40 inches to bedrock and are on slightly higher ridges and knolls.
Dalerose soils: less than 20 inches to a lithic contact and are on summits and shoulders.
Torreon soils: do not have bedrock above 60 inches, are in the fine family, and are on more gently sloping areas.

DRAINAGE AND PERMEABILITY: Well drained; runoff is negligible on slopes less than 5 percent and low on 5 to 10 percent slopes; moderate permeability.

USE AND VEGETATION: These soils are used mainly for livestock grazing. Principal native vegetation is blue grama, galleta, sideoats grama, and western wheatgrass.

DISTRIBUTION AND EXTENT: Chacuaco soils occur in southeastern Colorado. LRR G, MLRA's 67 and 70. The series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Temple, Texas

SERIES PROPOSED: Las Animas County, Colorado, 1986. The name is from a major drainage in the area.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon: 0 to 10 inches. (A and AB horizons)
Argillic horizon: 10 to 20 inches. (Bt horizon)
Calcic horizon: 20 to 30 inches. (Bk horizon)
Lithic contact: bedrock at 30 inches. (top of R layer)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

The soil was previously mapped within the Ryegate soil, but was determined to average less than 45 percent fine and coarser sand in the particle size control section. This soil is pronounced Cha-kwock. Laboratory data S87CO-071-003.

The assignment of cation-exchange activity class is supported by lab samples S87CO-071-003.

ADDITIONAL DATA: None

National Cooperative Soil Survey
U.S.A.

LOCATION CHARALITO NM

Established Series
Rev. AJM/CDH/TWH
01/2008

CHARALITO SERIES

The Charalito series consists of very deep, well drained soils that formed in alluvium primarily derived from shale, monzonite and sandstone. Charalito soils are on inset fans and flood plain steps of valley floors. Slopes are 1 to 3 percent. Mean annual precipitation is about 12 inches and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

TYPICAL PEDON: Charalito sandy loam--on an inset fan sloping 1 percent to the south at 5,719 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described on September 21st, 2001, the soil was dry throughout.)

A--0 to 1 inch; light gray (10YR 7/1) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; common fine and common very fine roots; 25 percent gravel, 2 percent cobbles; 40 percent paragravel; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1 to 9 inches thick)

AC--1 to 5 inches; gray (10YR 5/1) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and common very fine roots; 20 percent gravel and 5 percent cobbles; 35 percent paragravel; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (0 to 20 inches thick)

C1--5 to 22 inches; gray (10YR 5/1) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive parting to single grain; loose, nonsticky and nonplastic; very few fine and very few very fine roots; 20 percent gravel and 5 percent cobbles; 45 percent paragravel; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary. (combination of C horizons are 51 to 80 inches thick)

C2--22 to 40 inches; gray (10YR 6/1) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; very few fine and very few very fine roots; 20 percent gravel and 2 percent cobbles; 20 percent paragravel; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

C3--40 to 81 inches; light brownish gray (10YR 6/2), paragravelly sandy loam, dark gray (10YR 4/1) moist; massive; slightly hard, friable, nonsticky and nonplastic; very few fine and very few very fine roots; 10 percent gravel and 2 percent cobbles; 20 percent paragravel; violently effervescent, secondary calcium carbonate segregated as very few very fine filaments visible in matrix; moderately alkaline (pH 8.4).

TYPE LOCATION: Santa Fe County, New Mexico; about 1.5 miles west of the town of Cerrillos on North side of Waldo road; USGS Madrid 7.5 minute topographic quadrangle; Latitude 35 degrees 27 minutes 16.5 seconds North and Longitude 106 degrees 9 minutes 8.3 seconds West.

RANGE IN CHARACTERISTICS:
Soil moisture: The soil moisture control section is intermittently moist in some part from July to October and December to March. The soils are driest in May and June. The soil moisture regime is torric (aridic) bordering on ustic.

Mean ananual soil temperature: 50 to 52 degrees F.
Lithology of fragments: monzonite, shale, gneiss, and schist
Thickness of the ochric epipedon: 1 to 10 inches thick

Particle-size control section (weighted averages)
Silicate clay content: 8 to 18 percent
Sand content: 60 to 70 percent
Fine sand and coarser content: 15 to 25 percent
Rock fragment content: 5 to 35 percent

Salinity, mmhos/cm: 0 to 0.5 throughout
Sodicity, SAR: 0 to 1 in the upper part of the profile; 0 to 4 in the lower part of the profile

A horizon
Hue: 10YR or 2.5Y
Value: 4 through 7 dry, 3 through 6 moist
Chroma: 1 through 3, dry or moist
Rock fragments: total range is 15 to 35 percent
0 to 55 percent gravel
0 to 10 percent cobbles
Paragravel content: up to 40 percent
Calcium carbonate equivalent: 8 to 14 percent

AC horizon (not present in some pedons)
Hue: 10YR or 2.5Y
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 1 through 3, dry or moist

Texture: gravelly loam, gravelly coarse sandy loam, gravelly very fine sandy loam, gravelly sandy clay loam
Rock fragments: total range is 15 to 35 percent
15 to 30 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 8 to 14 percent
Paragravel content: up to 35 percent

C horizons
Hue: 10YR or 2.5Y
Value: 4 through 6 dry, 3 through 5 moist
Chroma: 1 through 3, dry or moist
Texture: gravelly sandy loam, gravelly coarse sandy loam, paragravelly sandy loam, gravelly sandy clay loam
Note: these horizons are typically stratified
Rock fragments: total range is 10 to 35 percent
10 to 30 percent gravel
0 to 5 percent cobbles
Calcium carbonate equivalent: 11 to 14 percent
Paragravel content: up to 35 percent

COMPETING SERIES: These are the Cameo, Clarkelen, Colorow, Glenberg, Innacutt, Kornman, Quitchupah, Radnik, Redbank, and Tapicito series.
Cameo soils do not have fragments of monzonite, granite, gneiss, and schist.
Clarkelen, Glenberg, and Kornman soils are more moist in June.
Colorow soils have redox features and endosaturation below 40 inches.
Innacutt and Redbank soils have hue redder than 10YR.
Kornman soils have thick ochric epipedons with high levels of nitrogen and phosphates.
Radnik soils have mean annual soil temperature higher than 52 degrees F.
Tapacito soils have less than 5 percent rock fragments in the particle-size control section.

GEOGRAPHIC SETTING: Charalito soils are on inset fans and flood plain steps of valley floors. They formed in alluvium derived from shale, sandstone and monzonite. Slopes are 1 to 3 percent. Elevation ranges from 5,300 to 7,300 feet. The mean annual precipitation is 10 to 13 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 50 to 52 degrees F. The frost-free period is 150 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Paraje, Puertecito and Sandoval soils. Paraje soils have argillic and calcic horizons and are on lower backslopes of hills. Puertecito soils are shallow, have argillic horizons, and are on shoulders and backslopes of hills. Sandoval soils are shallow and are on shoulders and backslopes of low hills.

DRAINAGE AND PERMEABILITY: Well drained, negligible surface runoff; permeability is moderate. These soils are subject to occasional, extremely brief periods of flooding between July and September. Floodwaters may have high velocity and are generally less than 1 foot deep.

USE AND VEGETATION: Charalito soils are used for wildlife, livestock grazing, a sand and gravel source, and recreation. The historic climax vegetation is blue grama, sideoats grama,little bluestem, galleta, New Mexico feather grass, and oneseed juniper. The ecological site is Gravelly (R036XB114NM).

DISTRIBUTION AND EXTENT: Charalito soils are of small extent on the northern Galisteo Basin part of the Mexican Highlands section of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Charalito is the Spanish word for the Rio Grande silvery minnow.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon: The zone from the soil surface to a depth of about 5 inches. (A and AC horizon)
Fluventic feature: Alluvial stratification and an irregular organic-carbon distribution.

The 12/2007 revision changes the CE activity class from active to superactive.

Taxonomic version: Classified according to Keys to Soil Taxonomy, Tenth Edition, 2006.

National Cooperative Soil Survey
U.S.A.

LOCATION CHILEROJO NM

Tentative Series
Rev. CDH/WJG
12/2007

CHILEROJO SERIES

The Chilerojo series consists of well drained soils that are very deep to a densic contact. They formed in alluvium derived from sandstone and shale. Chilerojo soils are on footslopes on interfluves of undulating plains. Slopes are 5 to 8 percent. Mean annual precipitation is about 13 inches and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

TYPICAL PEDON: Chilerojo loam--on a footslope of an undulating plateau sloping 4 percent to the south at 6,990 feet elevation. (Colors are for dry soil unless otherwise noted. When described on September 9, 2002, the soil was moist from 0 to 7 inches and otherwise dry throughout.)

A--0 to 2 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few fine and common very fine roots; many very fine irregularly shaped pores; 3 percent gravel; slightly effervescent (1 percent calcium carbonate equivalent); moderately alkaline (pH 8.0); abrupt smooth boundary. (1 to 3 inches thick)

Bt--2 to 9 inches; yellowish red (5YR 4/6) loam, dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and common very fine roots; common fine irregularly shaped and few very fine tubular pores; few distinct and common faint clay films on faces of peds and lining pores; 3 percent gravel; slightly effervescent (1 percent calcium carbonate equivalent); moderately alkaline (pH 8.0); clear smooth boundary. (5 to 10 inches thick)

Btk1--9 to 16 inches; reddish brown (2.5YR 5/4) loam, dark red (2.5YR 3/6) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots; few medium and few fine tubular pores; common distinct clay films lining pores and few distinct and few faint clay films on faces of peds; 5 percent gravel; strongly effervescent, secondary calcium carbonates segregated as few medium irregularly shaped coatings on faces of peds (3 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); gradual wavy boundary.

Btk2--16 to 29 inches; reddish brown (2.5YR 5/4) gravelly clay loam, dark red (2.5YR 3/6) moist;

moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few medium and common fine tubular pores; few distinct and common faint clay films on faces of peds and lining pores; 15 percent gravel; violently effervescent, secondary calcium carbonates segregated as common medium irregularly shaped coatings on faces of peds (5 percent calcium carbonate equivalent); strongly alkaline (pH 8.6); clear smooth boundary. (Combined thickness of the Btk horizons is 15 to 24 inches)

Bk1--29 to 38 inches; reddish brown (2.5YR 5/4) gravelly clay loam, dark red (2.5YR 3/6) moist; massive; hard, firm, moderately sticky and slightly plastic; common very fine roots; few very fine tubular pores; 20 percent gravel and 10 percent cobbles; 30 percent paragravel; violently effervescent, secondary calcium carbonates segregated as few fine and medium irregularly shaped coatings on faces of peds (9 percent calcium carbonate equivalent); strongly alkaline (pH 8.6); clear smooth boundary.

2Bk2--38 to 46 inches; red (2.5YR 4/6) clay loam, dark red (2.5YR 3/6) moist; massive; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; few very fine tubular pores; 5 percent gravel; 10 percent paragravel; violently effervescent, secondary calcium carbonates segregated as few fine irregularly shaped coatings on faces of peds (8 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); clear smooth boundary.

2Ctk--46 to 61 inches; red (2.5YR 4/6) very paragravelly clay loam, red (2.5YR 4/8) moist; massive; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many distinct clay films on pararock fragments; 50 percent paragravel; non to strongly effervescent, secondary calcium carbonates segregated as few fine irregularly shaped coatings on faces of peds (4 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); abrupt smooth boundary.

2Cd--61 to 80 inches; noncemented shale bedrock

TYPE LOCATION: Santa Fe County, New Mexico, about 6.5 miles south-southeast of White Lakes; 150 feet east and 138 feet north of the southwest corner of section 2, T.10N., R.11E.; USGS El Cuervo Butte 7.5 minute topographic quadrangle; Latitude 35 degrees 6 minutes 50 seconds North and Longitude 105 degrees 44 minutes 57 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:

Soil moisture - The soil moisture control section (SMCS) is intermittently moist in some part from July to October and December to March. Additional run-on occurs from July through September. The soils are driest in May and June. The soil moisture regime is ustic aridic.

Soil temperature - 51 to 53 degrees F.
Depth to base of ochric epipedon - 1 to 3 inches
Depth to base of argillic horizon - 25 to 40 inches

Particle-size control section weighted averages:
Silicate clay content: 20 to 30 percent
Sand content: 30 to 45 percent
Fine sand or coarser content: 25 to 40 percent
Rock fragment content: 0 to 5 percent gravel percent in the upper part and 15 to 25 percent in the lower part

Salinity: dS/m - 0 to 2
Sodicity: SAR - 0 to 4

A horizon
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 4 or 6, dry or moist

Bt horizon
Hue: 2.5YR or 5YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 4 or 5, dry or moist
Texture: loam or clay loam
Clay content: 20 to 30 percent
Rock fragments: 0 to 5 percent gravel
Calcium carbonate equivalent: 0 to 1 percent

Btk horizons
Hue: 2.5YR or 5YR
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 4 or 6, dry or moist
Texture: loam, clay loam, gravelly loam, or gravelly clay loam
Clay content: 22 to 30 percent
Rock fragments: 5 to 25 percent gravel
Calcium carbonate equivalent: 3 to 10 percent

Bk horizon
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 4 or 6, dry or moist
Texture: loam, clay loam, gravelly loam, or gravelly clay loam
Clay content: 20 to 30 percent
Rock fragments: total range is 5 to 35 percent
5 to 25 percent gravel
0 to 10 percent cobbles
Pararock fragments: 15 to 35 percent paragravel
Calcium carbonate equivalent: 5 to 10 percent

2Ctk horizon
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 4 or 6, dry or moist
Texture: very paragravelly loam or very paragravelly clay loam
Clay content: 25 to 35 percent
Pararock fragments: 35 to 60 percent paragravel
Calcium carbonate equivalent: 1 to 5 percent

COMPETING SERIES: These are the Balon, Blancot, Bowbac, Buckle, Cambria, Cushman, Decolney, Doakum, Forkwood, Fort, Gapbutte, Gapmesa, Hagerman, Hagerwest, Hiland, Los Alamos, Mentmore, Oelop, Olney, Palacid, Penistaja, Pokeman, Potts, Pugsley, Quagwa, Redpen, Spangler, Spenlo, Sundance, Tamarindo, Teckla, and Yenlo series. None of these series are over a densic contact.

Balon, Blancot, and Yenlo do not have visible secondary carbonates in the argillic horizon. Bowbac, Cambria, Cushman, Decolney, Forkwood, Fort, Hiland, Olney, Pokeman, Potts, Pugsley, Spangler, and Teckla soils are more moist in May and June.
Buckle, Los Alamos, Mentmore, and Quagwa soils have hues of 7.5 YR or yellower.
Spenlo soils have a calcic horizon and should be reclassified as a Calciargid.
Doakum, Oelop, Palacid, Penistaja, and Redpen soils do not have a densic contact within 80 inches.
Gapbutte, Gapmesa, Hagerman, and Hagerwest soils are moderately deep.
Tamarindo soils are greater than 40 inches to the base of the argillic.

A series that would be a competitor if assigned a superactive activity class is the Gaddes series. Gaddes soils are moderately deep to a paralithic contact of weathered granite.

GEOGRAPHIC SETTING: Chilerojo soils are on footslopes on interfluves of undulating plains. They formed in alluvium derived from sandstone and shale of the Triassic Age Chinle Formation. Slopes are 5 to 8 percent. Elevation ranges from 6,200 to 7,000 feet. The mean annual precipitation is 12 to 14 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 49 to 51 degrees F. The frost-free period is 130 to 150 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Arojomil, Clovis, Frajillo, Ildefonso, and Kinsell soils. Arojomil soils are moderately deep to a petrocalcic horizon and are on summits and shoulders of undulating plateaus. Clovis soils have a calcic horizon and occur on backslopes and footslopes. Frajillo soil are loamy, have mollic epipedons, and occur on shoulders and backslopes of undulating plains. Ildefonso soils are loamy-skeletal, have a calcic horizon, and occur on shoulders and backslopes. Kinsell soils are fine-silty, have a mollic epipedon, and are on floodplains and channels of valley floors.

DRAINAGE AND PERMEABILITY: Well drained; runoff is medium; permeability is moderately slow.

USE AND VEGETATION: Chilerojo soils are used for livestock grazing, recreation, and wildlife habitat. Present vegetation is blue grama, sand dropseed, galleta, ring muhly, bud sagebrush, Bigelow sagebrush, tree cholla, and whipple cholla.

DISTRIBUTION AND EXTENT: Chilerojo soils are of small extent in the northeastern part of the Estancia Basin in the Mexican Highland section of the Basin and Range physiographic province in northcentral New Mexico, MLRA 70C.

MLRA OFFICE RESPONSIBLE: Temple, Texas.

SERIES PROPOSED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2002. Chilerojo is a coined name from the Spanish words meaning red chile.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - 0 to a depth of about 2 inches. (A horizon)
Argillic horizon - 2 to about 29 inches. (Bt, Btk1, and Btk2 horizons)
Densic contact - 61 inches (top of 2Cd layer)

Classified according to Keys to Soil Taxonomy Tenth Edition, 2006.

ADDITIONAL DATA: Calcium carbonate equivalence was determined using a field calcimeter.

National Cooperative Soil Survey
U.S.A.

LOCATION CUYAMUNGUE NM

Established Series
Rev. JVC/CDH/TWH
01/2008

CUYAMUNGUE SERIES

The Cuyamungue series consists of very deep, excessively drained soils that formed in alluvium derived from granite, gneiss, schist, and granitic sandstone. Cuyamungue soils are on flood plains of valley floors adjacent to intermittent streams. Slopes are 0 to 2 percent. Mean annual precipitation is about 12 inches and mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Sandy-skeletal, mixed, mesic Aridic Ustifluvents

TYPICAL PEDON: Cuyamungue very gravelly coarse sand--on a planar flood plain sloping 2 percent to the northwest at 6,135 feet elevation--rangeland. (Colors are for dry soil unless otherwise noted. When described, the soil was dry from 0 to 4 and 10 to 17 inches, slightly moist from 4 to 10 inches, moist from 35 to 86 inches, and wet from 86 to 93 inches with a water table present at 93 inches.)

AC--0 to 3 inches; light brown (7.5YR 6/3) very gravelly coarse sand, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; top 0.25 inch of horizon is very gravelly loamy sand; 35 percent gravel and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary. (0 to 6 inches thick)

C1--3 to 17 inches; light brown (7.5YR 6/3) stratified gravelly sand to very gravelly coarse sand, brown (7.5YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few fine and common very fine roots; few lenses of sand and extremely gravelly coarse sand; 25 to 50 percent gravel and 0 to 5 percent cobbles; very slightly to slightly effervescent; slightly alkaline (pH 7.6); abrupt wavy boundary.

C2--17 to 24 inches; light brown (7.5YR 6/3) stratified gravelly coarse sand to very gravelly coarse sand, brown (7.5YR 4/3) moist; massive and single grain; soft and loose, very friable and loose, nonsticky and nonplastic; few very fine roots; few lenses of very gravelly coarse sand with non-pedogenic clay coating rock fragments and coarse sand grains; 30 to 50 percent gravel; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

C3--24 to 35 inches; light brown (7.5YR 6/3) very gravelly coarse sand, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 45 percent gravel and 5 percent cobbles; very slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

C4--35 to 58 inches; light brown (7.5YR 6/3) stratified gravelly coarse sand to extremely gravelly coarse sand, brown (7.5YR 4/3) moist; single grain and massive; loose and soft, loose and very friable, nonsticky and nonplastic; few lenses of coarse sand and few thin lenses of very gravelly loamy sand; 25 to 65 percent gravel and 0 to 5 percent cobbles; very slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

C5--58 to 86 inches; light brown (7.5YR 6/3) stratified very gravelly coarse sand to extremely gravelly coarse sand, brown (7.5YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few thin lenses of gravelly loamy sand; 45 to 65 percent gravel and 0 to 5 percent cobbles; very slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

C6--86 to 100 inches; brown (7.5YR 5/3) and brown (7.5YR 4/2) extremely gravelly loamy coarse sand, dark brown (7.5YR 3/2) and very dark brown (7.5YR 2.5/2) moist; single grain; loose, nonsticky and nonplastic; 65 percent gravel; slightly effervescent; moderately alkaline (pH 8.4). (Combined thickness of the C horizons is more than 80 inches)

TYPE LOCATION: Santa Fe County, New Mexico; on the Tesuque Indian Reservation about 1 mile northwest of Camel Rock; USGS Tesuque 7.5 minute topographic quadrangle; 1,600 feet south and 2,700 feet west of the northeast corner of section 33, T.19N., R.9E.; Latitude 35 degrees 50 minutes 7 seconds North and Longitude 105 degrees 59 minutes 27 seconds West, NAD 27.

RANGE IN CHARACTERISTICS:
Soil moisture - Typically, the soil moisture control section is moist in all parts during the 60 days following the winter solstice. It is moist in some part less than 40 percent and moist in all parts less than 25 percent of the time when the soil temperature at 20 inches is above 41 degrees F. The soils are driest in May and June. The soil moisture regime is ustic bordering on torric. The deepest C horizon is saturated with ground water for at least one month in most years. Water within the capillary fringe moistens horizons above the upper boundary of saturation. This soil occurs in part of its range where adjacent soils are in an aridic (torric) moisture regime bordering on ustic. Moisture from flood waters and/or capillary rise above the water table create an ustic moisture regime in the soils of these areas.

Mean annual soil temperature - 49 to 54 degrees F.

Particle-size control section weighted averages - Silicate clay content: 0 to 4 percent; Rock fragment content: 35 to 60 percent, mostly gravel, lithology of fragments is granite, gneiss, and schist; mica content: 1 to 5 percent (by grain count).

Reaction - slightly alkaline to moderately alkaline
Calcium carbonate equivalent - 0 to 1 percent
Salinity, mmhos/cm - 0 to 1
Sodicity, SAR - 0 to 1

AC horizon
Value: 4 or 5 moist
Chroma: 3 or 4, dry or moist
Rock fragments: total range is 40 to 60 percent
35 to 50 percent gravel
5 to 10 percent cobbles
Other features: this horizon is a recent stratified deposit and does not qualify as an Ochric epipedon

upper C horizons
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: stratified gravelly sand to extremely gravelly coarse sand
Rock fragments: total range is 15 to 70 percent, averaging 25 to 55 percent with:
25 to 50 percent gravel
0 to 5 percent cobbles
Other features: pedons have thin strata, lenses, and laminae ranging in texture from loamy fine sand to extremely coarse sand

lower C horizons
Value: 4 through 6 dry, 2.5 through 5 moist
Chroma: 2 through 4, dry or moist
Texture: stratified gravelly coarse sand to extremely gravelly loamy coarse sand
Rock fragments: total range is 20 to 70 percent, averaging 35 to 65 percent with:
35 to 65 percent gravel
0 to 5 percent cobbles
Other features: pedons have thin strata, lenses, and laminae ranging in texture from silt loam to fine sand; some pedons have buried horizons of very fine sandy loam, fine sandy loam, or loam below 40 inches which may have distinct to prominent relict redox concentrations.

COMPETING SERIES: At present, there are no other series in this family. A similar series in another family is the Abiquiu soil. Abiquiu soils have seasonal high water tables between 24 and 48 inches and also have ochric epipedons.

GEOGRAPHIC SETTING: Cuyamungue soils are on narrow flood plains of valley floors adjacent to intermittent streams. They formed in alluvium derived from Precambrian granite, gneiss, and schist and Tertiary granitic sandstone. Slopes are 0 to 2 percent. Elevation ranges from 5,400 to 7,500 feet. The mean annual precipitation is 9 to 14 inches with about 45 percent falling as rain from high-intensity convective thunderstorms between July and September. The mean annual air temperature is 47 to 52 degrees F. The frost-free period is 140 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Bosquecito and Jaralosa soils. The miscellaneous land type Riverwash, is also associated with Cuyamungue. Bosquecito soils are coarse-

loamy, have seasonal high water tables between 2.0 and 3.5 feet, and occur on flood plains of valley floors. Jaralosa soils are coarse-loamy over sandy or sandy-skeletal, have seasonal high water tables between 3.5 and 5 feet, and occur on flood plains of valley floors.

DRAINAGE AND PERMEABILITY: Excessively drained; negligible surface runoff; rapid to very rapid permeability in the sandy horizons. These soils are subject to frequent, extremely brief periods of flooding between July and September. Floodwaters have high velocity and are generally less than 5 feet deep. A seasonal high water table is present between 5 and 8 feet.

USE AND VEGETATION: Cuyamungue soils are used for recreation, a sand and gravel source, and livestock grazing. The historic climax vegetation is annual forbs, perennial forbs, rubber rabbitbrush, willow, and Fremont cottonwood. The ecological site is Populus fremontii/Salix exigua-salix, carex (F036XB137NM)..

DISTRIBUTION AND EXTENT: Cuyamungue soils are of small extent on the southeastern Espanola Basin part of the Basin and Range province in northcentral New Mexico. The MLRA is 36.

MLRA OFFICE RESPONSIBLE: Lakewood, Colorado

SERIES ESTABLISHED: Santa Fe County, New Mexico; Santa Fe Area Soil Survey Update; 2008. Cuyamungue is a city in New Mexico.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Entisol feature - The lack of a diagnostic epipedon or diagnostic subsurface horizons.
Fluventic feature - Alluvial stratification and an irregular organic-carbon distribution.
Endosaturation feature - The condition of ground water with an upper boundary between 5 and 8 feet.

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