United States Department of Agriculture

Soil Conservation Service

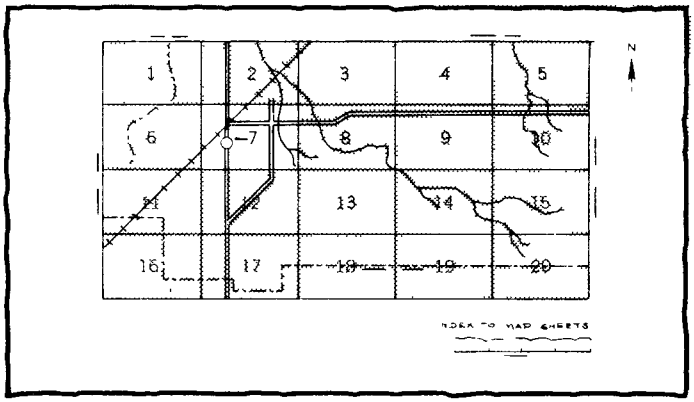
In cooperation with University of California Agricultural Experiment Station

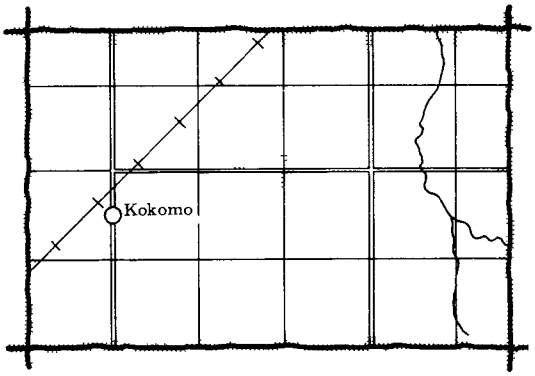
Soil Survey of San Luis Obispo County, California

Paso Robles Area

HOW TO USE

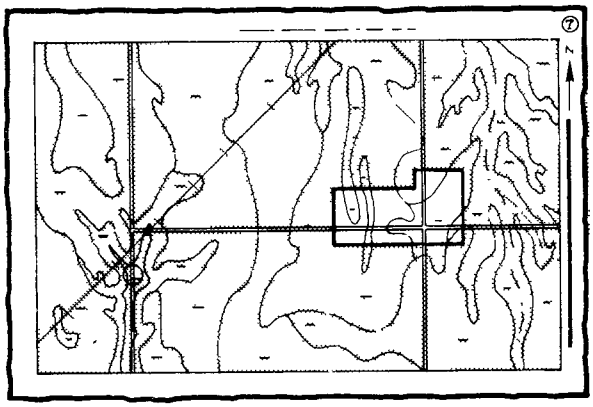
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

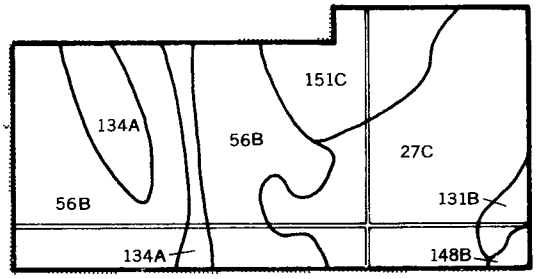




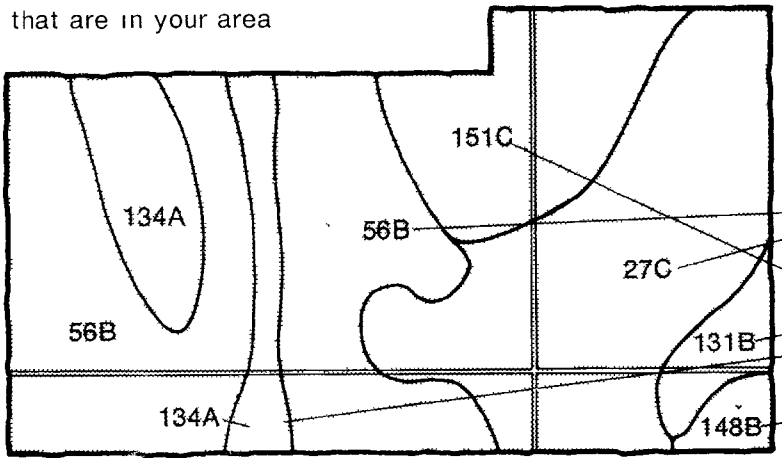
2. Note the number of the map sheet and turn to that sheet.

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





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

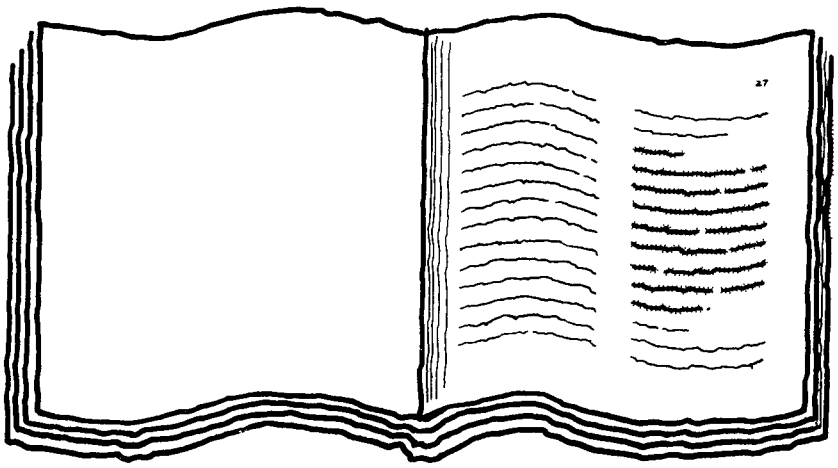


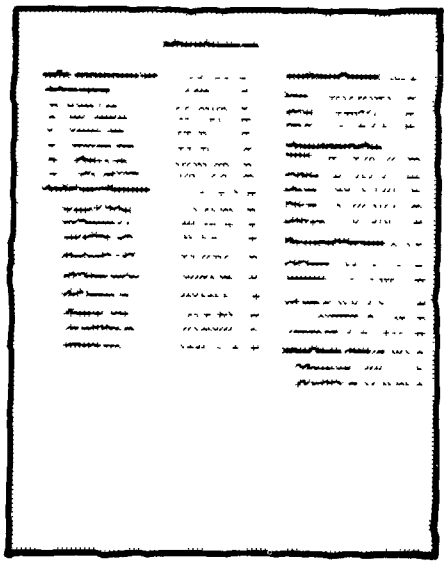
Symbols

27C
56B
131B
134A
148B
151C

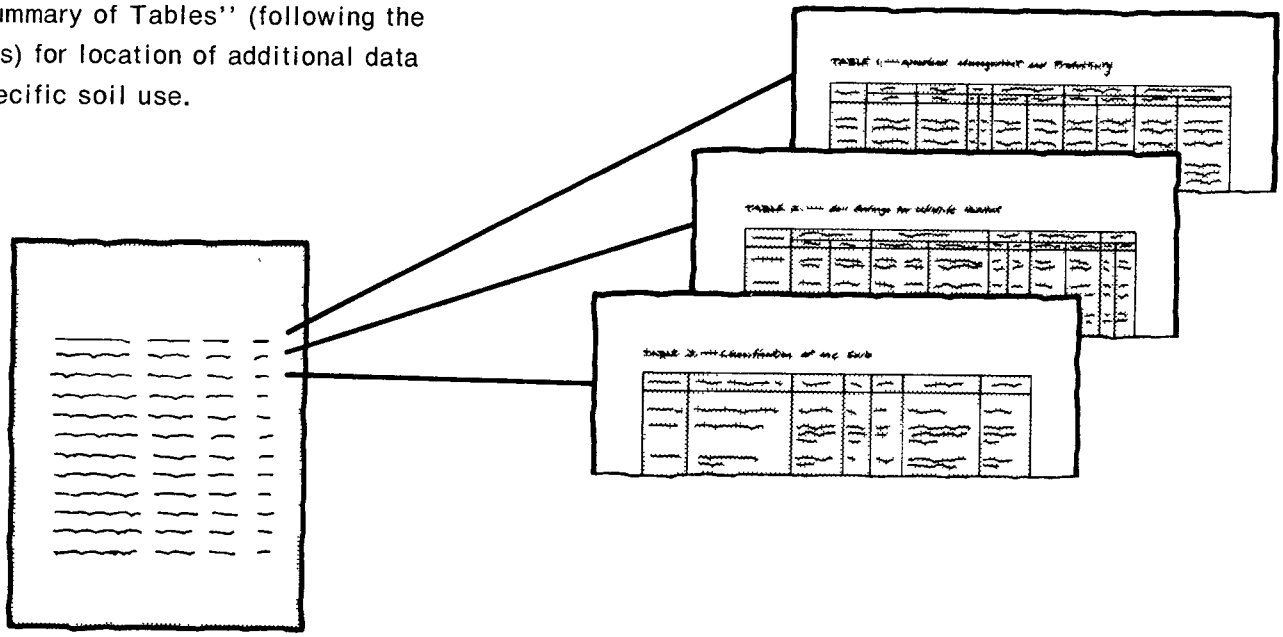
THIS SOIL SURVEY

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





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



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

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

Major fieldwork for this soil survey was completed in the period 1971-76. Soil names and descriptions were approved in 1977. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1977. This survey was made cooperatively by the Soil Conservation Service and the University of California Agricultural Experiment Station. It is part of the technical assistance furnished to the Upper Salinas Resource Conservation District and the Las Tablas Resource Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: Aerial view of Paso Robles bordered on the left by the Salinas River, and on the right by rolling hills covered with almond trees. (Photo courtesy of Mr. "B" Photography of Atascadero, California.)

Contents

Contents—Continued

Issued May 1983

Index to map units

Index to map units—Continued

Summary of tables

Summary of tables—Continued

Preface

The Soil Survey of San Luis Obispo, California, Paso Robles Area, contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to 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 kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

Soil Survey of SAN LUIS OBISPO COUNTY, CALIFORNIA PASO ROBLES AREA

By Wesley C. Lindsey, Soil Conservation Service

Fieldwork by Wesley C. Lindsey, David C. Estrada, Charles A. Ferrari, Eric N. Vison, and Charles J. Weisel, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station

Soil Survey of SAN LUIS OBISPO COUNTY, CALIFORNIA

PASO ROBLES AREA

PASO ROBLES AREA is in San Luis Obispo County, which is in the west-central part of California, 210 miles south of San Francisco and 245 miles north of Los Angeles (fig. 1).

The area surveyed includes the larger part of the northern half of San Luis Obispo County and has a total land area of 1,073 square miles, or 687,000 acres. The northern boundary is formed by the Monterey-San Luis Obispo County line. The western boundary follows the coastal ridge and includes part of the Salinas River watershed. The Pacific Ocean lies 8 to 20 miles from this boundary. The eastern boundary is the Temblor Range. To the south is the Los Padres Forest boundary where the Temblor Range merges with the rugged La Panza Range.

General nature of the area

This section provides general information about the Paso Robles area. It discusses history and agricultural development, population trends, physiography, relief and drainage, climate, water supply, and vegetation.

History and agricultural development

As far as it is known, the Indians who originally occupied San Luis Obispo County practiced little or no farming. The first settlement and development of this region took place about 1772, with the arrival of the Spanish mission fathers. On July 25, 1797, the mission at San Miguel was established. Under the guidance of the fathers, the Indians were instructed in the art of farming, including the production of wheat, beans, and various kinds of fruit. The earliest farming was intended to make the newly established mission and the Spanish soldiers in the region independent of supplies from Mexico. Cattle were imported and livestock raising became the first industry in the area. Large cattle operations began under the land grant system from the Mexican government in the 1830's. At that time California was a territory of the Republic of Mexico. Most of these grants ranged from 3,000 to 50,000 acres.

At the end of the Mexican War, in 1848, California was ceded to the United States, and admitted to the Union in 1850.

When the land grants were eventually sold, the grant name was retained as part of the legal description. The remainder of the county was surveyed into townships and sections.

Between 1862 and 1864 there were two drought seasons, both as dry as any 1 year on record. Cattle died by the thousands, and most of the owners of large ranches were forced to sell their land in smaller parcels to farmers.

The 1870's saw the beginning of wheat farming in the Paso Robles-Shandon area, and as early as 1885, there were over 80,000 acres of wheat farmed on an annual seeding basis. Summer fallowing started about 1900 and

became a standard practice in the 1920's. When modern tractors and trucks became available in the 1920's and 1930's, the wheat acreage expanded to nearly 140,000 acres. At that time Paso Robles was the largest shipping place of hard white spring wheat in the United States. However, farm storage and direct truck shipping completely altered this pattern.

Acreage control programs gradually changed the large production of wheat. Barley acreage increased from 25,000 acres in the 1930's to over 50,000 acres in the 1960's.

The drought years of the 1860's did not mean an end to the cattle business. Many new owners of large land holdings restocked the ranges that were not sold to farmers. Most wheat farmers also had a small herd of cattle. Raising beef cattle has always been the major agricultural enterprise.

Almonds became a large industry after the First World War. The highest acreage was almost 20,000 acres. At one time, Paso Robles claimed about 25 percent of the state's almond acreage. Average yields, however, were, and still are, below the state average because almonds are dryfarmed.

Irrigated farming began before the First World War. Forage crops and sugar beets are the major irrigated crops, with small acreages of apples grown in the Atascadero-Templeton area. Wine grapes are now being introduced into the area near Shandon.

A major part of the land that is dryfarmed is used for livestock grazing after the crops are harvested.

Horse breeding and training and boarding horses for show, pleasure, and racing have become established activities in the county and represent a significant and increasingly important part of the county's livestock industry. The climate and soil are satisfactory for horses, and ample supplies of high quality feed crops are produced in the area.

During recent years there has been a trend toward subdivision of large farming operations into 10- to 40-acre parcels. These parcels are being purchased and developed into retirement communities and family operations, mainly by people who desire a country life. Many pastures, family orchards, and gardens are now irrigated. Water sources for these developments come mainly from wells.

Population trends

County population growth (*5*), although fluctuating at times, was relatively slow until 1940 when the population was about 33,000. By 1970, the population had grown to 105,690.

Atascadero and Paso Robles are major urban areas, and Santa Margarita, San Miguel, Shandon, and Templeton are minor urban areas within the soil survey area. Present population is generally within these urban centers. Between 1960 and 1970 the population of the survey area increased 34 percent and presently accounts for approximately 25 percent of the county's total population.

Physiography, relief, and drainage

The northeastern part of the survey area has low rolling hills and mountains and is part of the Diablo Range. The general slope is to the southwest. If viewed from a distance, the tops of the hills and ridges strongly suggest an elevated fault block which is much dissected.

The Temblor Range of mountains, a spur of the Diablo Range, occupies the east-central part of the area and consists of low rolling hills and elevated flat-topped mesas. The Santa Lucia Mountains in the western part of the area are rugged mountainous ridges.

The highest elevation within the area is in the western part, where many of the peaks are 2,000 to 3,400 feet high. The lowest part is in the north, where elevation is 600 feet or less.

The central part of the area is traversed by a number of streams in broad valleys with many eroded terraces. The modern flood plains in these valleys are narrow.

The Salinas River is the principal drainage outlet for the area. The valleys within La Panza Range are generally narrow, widening at Pozo into a broad flood plain. Before entering the broad lowland a few miles north of Santa Margarita, the river presents the anomaly of a large and important stream flowing through a narrow, steep-walled canyon between high mountains. Paralleling the stream, a distance of 8 miles, is a well defined valley from 1 to 2 miles wide. The northwestern part of the area is drained mainly by the Nacimiento River and its tributaries. Huerhuero Creek, Estrella Creek, and San Juan Creek drain the north, central, and eastern parts of the area.

Climate

The Mediterranean climate, typical of the area, provides a wet season in winter and a dry season in summer. In general, the most rainfall is in the range of hills and mountains nearest the coast, with decreasing amounts farther inland.

Most of the survey area normally has adequate rainfall to grow dryfarmed crops, but there is a small area east of the southern half of Shedd Canyon that is not suitable for dryfarming in most years because of insufficient rainfall.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Paso Robles (*11*) for the period 1931 to 1960. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring.

In winter the average temperature is 48 degrees F, and the average daily minimum is 34 degrees F. In summer the average temperature is 70 degrees and the average daily maximum is 91 degrees.

The rainy season extends from late October to early April, though light showers occur late in spring and in

Figure 1.—Location of San Luis Obispo County, California, Paso Robles Area

summer. At Paso Robles, the total annual precipitation is 14.9 inches. About 11 percent of this precipitation falls in April through September, which includes the growing season for most crops. One year in ten there will be no rainfall during this period.

The average relative humidity at Paso Robles in midafternoon in spring is less than 35 percent. In July it is about 15 percent, and in January it is about 40 percent. Humidity is higher at night throughout the year, and the average humidity at dawn is about 45 percent. The sun shines about 70 percent of the time during the entire year; it averages 60 percent in midwinter and is near 80 percent in the fall.

At Paso Robles, the wind blows from the west-southwest through north-northwest about 38 percent of the time, and winds blow from the opposite direction, east-northeast through south-southeast, about 13 percent of the time. The strongest winds are from the southwest and south-southwest, with an average speed of 10.6 miles per hour.

Water supply

Wells furnish nearly all of the water for agricultural use and for a sizeable share of urban water supplies. Only by careful management of underground water can this important resource be protected and utilized properly.

Ground water in the survey area includes the large Paso Robles Basin and the smaller Pozo Basin. These two basins have a total surface area of about 584,000 acres (*3*). They are replenished mainly from uncontrolled runoff originating in several major and minor stream tributaries of the Salinas River and to a lesser extent from direct infiltration of precipitation. Approximately 25 percent of the Paso Robles Basin is located within Monterey County.

Water extracted from ground water storage in these basins meets over 95 percent (*3*) of the water requirement of an estimated irrigated area of 18,650 acres. In addition, the entire water requirements of the communities of San Miguel, Paso Robles, Atascadero, Templeton, Santa Margarita, Shandon, and other smaller rural communities are met by ground water supplies. Minor quantities of ground water are extracted from rock fissures, less permeable sedimentary formations, and isolated pockets of alluvium.

Systematic well measurements have been available for the Paso Robles Basin since 1952. These measurements, when coupled with estimates of extractions, indicate that the shallower western parts of the basin are generally fully recharged each winter. The limited storage capacity and poor quality of ground water in these parts of the basin have restricted the summer draft, particularly in dry years or periods of several dry years in sequence.

In the central and eastern parts of the Paso Robles Basin, ground water storage capacity is high, but annual recharge is low. The expansion of irrigated acreage in this area has caused a lowering of pumping level by 100 to 200 feet since 1952. While total estimated storage capacity below the present static water level is estimated at several million acre-feet, the present safe yield of the Paso Robles Basin is estimated to be about 45,000 acre-feet per year. The average annual draft on the basin presently exceeds the mean seasonal recharge, and in some areas the pumping levels are approaching a depth at which water cannot be economically pumped.

Since the underground storage capacity is high, the major consideration for a future increase in water needs in this area will be the depth at which water can be pumped economically.

The Pozo Basin is located upstream from the Salinas Dam and comprises a narrow strip of alluvium along the Salinas River and the valley floor of Pozo Creek. It is about 3,600 acres. The alluvium ranges in depth to 30 feet, and has a ground water storage capacity of about 2,000 acre-feet. The maximum safe ground water yield of Pozo Basin is estimated to be 1,000 acre-feet per year.

Vegetation

Natural vegetation in the soil survey area is classified into four types: grassland, wooded-grassland, woodland, and brush. Soil and climate are important factors that determine the type and extent of natural vegetation. Within each of the four vegetative groups there are intergrades and species variations.

During recent and historical times, the original vegetative pattern of the survey area has undergone major alterations which contributed to soil erosion, for example, overgrazing, cultivation, fire, and grading.

Approximately 41 percent of the area was originally grassland. About 21 percent of the grassland is now used for grazing and the rest is farmed. Most of the present annual range plants were inadvertently introduced from Europe during the early 1800's. The widespread use of fire and heavy grazing, which led into the severe droughts of the 1860's, reduced the extent of the once-dominant perennial grasses. Annual grasses, such as wild oats, soft chess, ripgut brome, and foxtail fescue predominate. Commonly associated with the grasses are herbaceous plants such as filaree and burclover. Needlegrass and native perennial grasses commonly grow on soils in the north-central part of the area. Soils in Cholame Valley that are poorly drained have salt accumulations that encourage the growth of wild barley, iodinebush, and saltbush. Along the eastern edge of the survey area, where annual rainfall is 12 inches or less, California buckwheat is common. Grasses predominate in the winter and spring, but herbaceous plants generally are more conspicuous late in summer and in autumn.

Wooded-grasslands make up about 38 percent of the area. About 23 percent is used for rangeland, and the rest has been cleared for cultivation. Principal trees growing on protected slopes and in valleys are California live oak, and the exposed drier slopes are covered with groves of blue oak and interior live oak. Buckbrush com-

monly grows on the dryer slopes. The understory and open areas produce annual grasses and forbs similar to those of the grassland.

About 15 percent of the area is brushland. Large areas lie east of Santa Margarita and along the western boundary of the area. The shrubs, which are hard and woody, include manzanita, scrub oak, leather oak, buckbrush, chamise, poison-oak, and a mixture of other brush plants. Areas of brushland provide an effective watershed cover, but under the hot, dry, windy conditions that often occur during the summer and fall months, this vegetation is a critical fire hazard. Because of their natural dryness, structure, and dense growth, these areas of brush can become almost explosive when they burn.

About 6 percent of the survey area is woodland. It covers the northern and protected slopes of soils in the western part of the area and has no commercial value. The cover consists of various broadleaf or hardwood trees that form fairly dense, closed-canopy stands. Predominant species are coast live oak, canyon live oak, California black oak, madrone, and California laurel. Woodland areas provide an effective watershed cover and protect the soil from erosion. However, they are a potential fire hazard, particularly if the undergrowth is dense.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil map for broad land use planning

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

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The fifteen general soil map units in the survey area have been divided into three groups according to landforms. The terms for texture used in the title of several

of the map units apply to the surface layer. For example, in map unit 1, the words "clay loam, silty clay, and silty clay loam," refer to texture of the surface layer.

Soils on alluvial plains, alluvial fans, and flood plains

Three of the map units are in this group. They make up about 6 percent of the survey area. The soils are mainly adjacent to stream channels. Slope is nearly level to moderately sloping. Elevation is 600 to 1,500 feet.

The soils in these areas are very deep, and poorly drained to somewhat excessively drained. Surface layers range from loamy sand to silty clay.

The major land use is for cultivated crops. A few areas are used for urban land and range.

1. Mocho-Capay-Camarillo

Very deep, nearly level to moderately sloping, poorly drained to well drained clay loams, silty clays, and silty clay loams

This map unit is along Cholame Creek in Cholame Valley (fig. 2). Elevation is about 1,100 feet. The soils in this unit formed in alluvium derived from sedimentary rock on alluvial fans and flood plains. Slope is 0 to 9 percent. Mean annual precipitation is 12 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 1 percent of the survey area. About 40 percent is Mocho soils, 25 percent is Capay soils, 15 percent is Camarillo soils, and the rest is soils of minor extent.

The well drained Mocho soils are on alluvial fans and flood plains. Typically, they have a surface layer of clay loam and underlying material of stratified clay loam, loam, or silty clay loam. Slope is 0 to 9 percent.

The moderately well drained Capay soils are on flood plains. Typically, they have a surface layer and underlying material of silty clay. Slope is 0 to 2 percent.

The poorly drained Camarillo soils are on flood plains. Typically, they have a surface layer of silty clay loam and underlying material of stratified fine sandy loam, loam, or silty clay loam. Slope is 0 to 2 percent.

The soils of minor extent are Clear Lake and San Emigdio soils. Clear Lake soils are in the basins (fig. 2). San Emigdio soils are on alluvial plains and fans.

Areas of this unit are used for cultivated crops and range. Such nonirrigated crops as small grain and grain hay are grown. The Camarillo and Capay soils are poorly suited to irrigated crops because of the flood hazard, por drainage, and salt area inclusions. These soils are well suited to range.

The soils in this unit provide openland wildlife habitat. Typical species are dove, quail, rabbits, and numerous nongame birds. Where these soils are intensively cropped, wildlife can often benefit from such cover plantings as hedgerows, windbreaks, or odd area plantings. Areas of these soils also provide food and cover for deer.

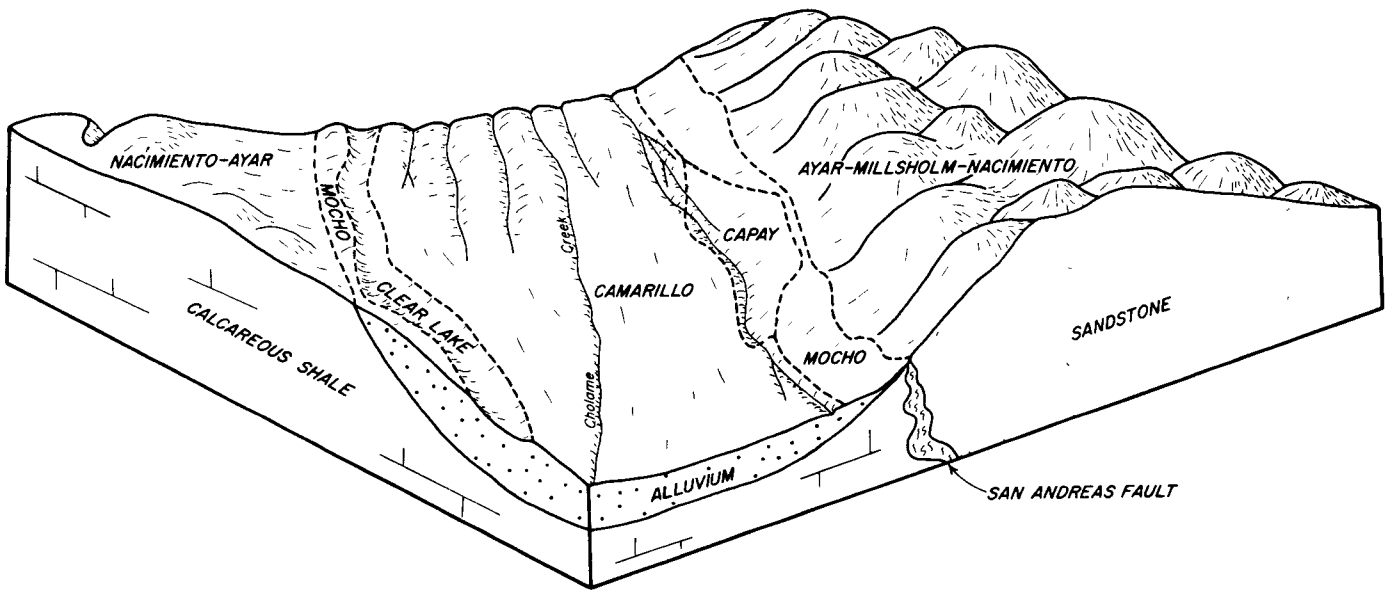


Figure 2.—Typical cross section of the Cholame Valley.

2. Pico-San Emigdio-Sorrento

Very deep, nearly level to moderately sloping, well drained fine sandy loams and clay loams

This map unit is in the Shandon area. Elevation is 600 to 1,500 feet. The soils in this unit formed in alluvium derived from sedimentary rock on alluvial fans and alluvial plains. Slope is 0 to 9 percent. Mean annual precipitation is 12 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 2 percent of the survey area. About 30 percent is Pico soils, 20 percent is San Emigdio soils, 15 percent is Sorrento soils, and the rest is soils of minor extent.

Typically, Pico soils have a surface layer and underlying material of fine sandy loam.

Typically, San Emigdio soils have a surface layer of fine sandy loam and underlying material of stratified fine sandy loam, very fine sandy loam, and loam.

Typically, Sorrento soils have a surface layer and underlying material of clay loam.

Soils of minor extent are Mocho, Still, Metz, Tujunga, Xerofluvents, and Riverwash. Metz and Tujunga soils are on flood plains. Xerofluvents and Riverwash are in stream channels. Mocho and Still soils are on alluvial plains.

Most areas of this unit are used for cultivated crops, and a small acreage is urban land. The major soils in this map unit are suited to a wide range of climatically adapted, irrigated and nonirrigated crops grown in the survey area. Where slope is 5 to 9 percent, erosion is a moderate hazard.

Pico and San Emigdio soils are well suited to building sites. Because of the moderate shrink-swell potential and low strength of the Sorrento soil, roads, streets, and building sites need to be properly designed. Septic tank filter fields need to be enlarged because of the moderately slow permeability of the Sorrento soil.

The soils in this unit are suited to openland wildlife habitat. Typical species are dove, quail, rabbits, and numerous nongame birds. Stream-associated vegetation, such as trees and shrubs, provides roosting and nesting cover for wildlife. Additional cover can be provided by hedgerow, windbreak, or odd area plantings. Areas of these soils also provide food and cover for deer.

3. Still-Elder-Metz

Very deep, nearly level to moderately sloping, well drained and somewhat excessively drained clay loams, loams, and loamy sands

This map unit is along the Salinas River and Toro Creek, in the San Margarita area and the Creston area. Elevation is 600 to 1,500 feet. The soils in this unit formed in alluvium derived from mixed rock on alluvial fans, alluvial plains, and flood plains. Slope is 0 to 9 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 3 percent of the survey area. About 30 percent is Still soils, 20 percent is Elder soils, 15 percent is Metz soils, and the rest is soils of minor extent.

The well drained Still soils are on alluvial plains and fans. Typically, they have a surface layer and underlying material of clay loam. Slope is 0 to 9 percent.

The well drained Elder soils are on flood plains and alluvial plains and fans. Typically, they have a surface layer of loam and underlying material of stratified loam, sandy loam, or loamy sand. Slope is 0 to 9 percent.

The somewhat excessively drained Metz soils are on flood plains. Typically, they have a surface layer of loamy sand and underlying material of stratified sand, loamy sand, and very fine sandy loam. Slope is 0 to 5 percent.

Soils of minor extent are 15 percent Xerofluvent soils and Riverwash in stream channels, and 20 percent Clear Lake, Hanford, and Mocho soils. The Clear Lake soils are in basins, and the Hanford soils are on first-level terraces. The Mocho soils are on alluvial plains and fans.

The soils in this unit are used for cultivated crops and urban land. The Still and Elder soils are suited to a wide range of climatically adapted irrigated and nonirrigated crops grown in the survey area. The Metz soils are too droughty for dryfarmed crops. Where slope is 5 to 9 percent, erosion is a moderate hazard. Some areas adjacent to major streams are subject to flooding.

The Still soils and nonflooded areas of Elder soils are suited to building sites, roads, and streets. Still soils have moderate shrink-swell potential and low strength limitations. Metz soils and flood-prone areas of Elder soils need to be protected from flooding if used for building sites.

The soils in this unit are suited to openland wildlife habitat. Typical species are dove, quail, rabbits, and numerous nongame birds. Stream-associated vegetation, such as trees and shrubs, provides roosting and nesting cover for wildlife. Additional cover can be provided by hedgerow, windbreak, or odd area plantings. Areas of these soils also provide food and cover for deer.

Soils on terraces

Three of the map units are in this group. They make up about 15 percent of the survey area. The soils are nearly level to very steep. Elevation is 600 to 1,600 feet.

The soils in these units are shallow to very deep, well drained, and moderately well drained. They have a surface layer of coarse sandy loam to shaly loam.

The major land use is for cultivated crops and range. A few areas are used for urban land.

4. Arbuckle-Positas-San Ysidro

Very deep, nearly level to hilly, moderately well drained and well drained fine sandy loams, coarse sandy loams, and loams

This map unit is throughout the survey area. Major areas are on terraces adjacent to the Nacimiento and

Salinas Rivers and their tributaries (fig. 3). Elevation is 600 to 1,500 feet. The soils in this unit formed in alluvium derived from mixed rock on terraces. Slope is 0 to 30 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 12 percent of the survey area. About 40 percent is Arbuckle soils, 25 percent is Positas soils, 15 percent is San Ysidro soils, and the rest is soils of minor extent.

The Arbuckle soils are well drained. Typically, they have a surface layer of fine sandy loam, a subsoil of sandy clay loam, and a substratum of sandy loam. Slope is 0 to 30 percent.

The Positas soils are well drained. Typically, they have a surface layer of coarse sandy loam, a subsoil of clay, and a substratum of sandy loam. Slope is 9 to 30 percent.

The San Ysidro soils are moderately well drained. Typically, they have a surface layer of loam, a subsoil of heavy clay loam, and a substratum of sandy loam. Slope is 0 to 9 percent.

Soils of minor extent are Hanford, Greenfield, Nacimiento, Mocho, Metz, Tujunga, and Rincon soils, and Xerofluvents and Riverwash. The Hanford and Greenfield soils are on low alluvial terraces. The Mocho and Rincon soils are on fans. The Nacimiento soils are on hills and mountains. The Metz and Tujunga soils are on flood plains. The Xerofluvents and Riverwash are in stream channels.

The soils in this unit are used for cultivated crops, range, and urban land. The Arbuckle soils are suited to a wide range of climatically adapted crops grown in the survey area. The Positas and San Ysidro soils are best suited to such shallow-rooted crops as small grain, grain hay, and pasture. Where slope is 5 to 15 percent, erosion is a moderate hazard; where slope is 15 to 30 percent, the hazard of erosion is high. These soils are well suited to range. They are suited to building sites, roads, and streets; however, moderate to high shrink-swell potential and low strength are limitations. The slow absorption of effluent and the excessive slope are limitations where septic tank absorption fields are used for sewage disposal.

The soils in this unit provide openland and rangeland wildlife habitat. Dove and many nongame birds are on the openland areas. Quail, rabbits, and deer are on the rangeland. Deer are generally on the rangeland, but they move to the openland areas for food.

5. Chanac-Camatta

Very deep, gently rolling to very steep, well drained loams; some are shallow to a hardpan

This map unit is east of Shedd Canyon. Elevation is about 1,600 feet. The soils in this unit formed in alluvium derived from mixed rock on high terraces. Slope is 5 to 75 percent. Mean annual precipitation is 9 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 1 percent of the survey area. About 45 percent is Chanac soils, 40 percent is Camatta soils, and the rest is a soil of minor extent.

The Chanac soils are very deep. Typically, they have a surface layer and subsoil of loam and a substratum of loam and fine sandy loam. Slope is 9 to 75 percent.

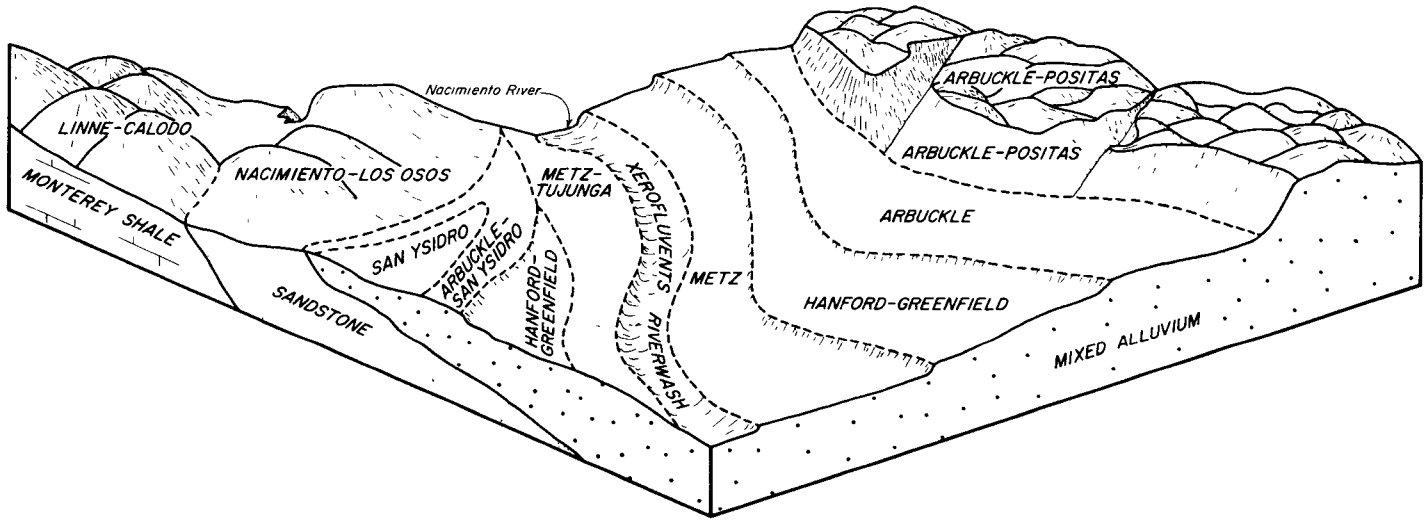


Figure 3.—Typical cross section of the Nacimiento River area.

The Camatta soils are shallow to a hardpan. Typically, they have a surface layer of loam overlying an indurated lime cemented hardpan. Below the hardpan is a very fine sandy loam substratum. Slope is 5 to 30 percent.

The soil of minor extent in this unit is Polonio soil. It is on alluvial fans.

The soils in this unit are used for rangeland. Limited precipitation in all areas of this unit and a shallow root zone in the Camatta soils result in sparse vegetative cover and low yields.

These soils provide poor rangeland wildlife habitat. Typical species are dove, deer, and various nongame birds.

6. Lockwood-Concepcion

Very deep, nearly level to rolling, moderately well drained and well drained shaly loams and sandy loams

This map unit is a large area east of Templeton and a smaller area around Paso Robles. Elevation is 600 to 1,500 feet. Soils in this unit formed in alluvium derived from sedimentary and mixed rock on terraces. Slope is 0 to 15 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 2 percent of the survey area. About 50 percent is Lockwood soils, 30 percent is Concepcion soils, and the rest is soils of minor extent.

The Lockwood soils are well drained. Typically, they have a surface layer of shaly loam and a deep subsoil of shaly clay loam. Slope is 0 to 15 percent.

The Concepcion soils are moderately well drained. Typically, they have a surface layer of sandy loam, a subsoil of clay, and a substratum of sandy loam. Slope is 2 to 15 percent.

Soils of minor extent are about 15 percent Linne soils and 5 percent Gazos soils on hills.

The soils in this unit are used for cultivated crops and urban land. Lockwood soils are suited to a wide range of the climatically adapted crops grown in the survey area. Concepcion soils are best suited to such shallow-rooted crops as small grain, grain hay, and pasture. Where slope is 5 to 15 percent, erosion is a moderate hazard. These soils are suited to building sites, roads, and streets, but they are limited for these uses mainly by the moderate to high shrink-swell potential and low strength.

The soils in this unit are suited to openland wildlife habitat. Typical species are dove and many nongame birds. Additional cover can be provided by hedgerow, windbreak, or odd area plantings. Deer also feed in these areas, but they seek cover in the adjacent upland range areas.

Soils on hills and mountains

Nine of the map units are in this group. They make up about 79 percent of the survey area. The soils are strongly sloping to very steep. Elevation is 600 to 3,400 feet.

The soils in these units are shallow to deep and excessively drained to well drained. They have a surface layer of loamy sand to silty clay.

The major land use is for cultivated crops and range. A few areas are used for urban land.

7. Nacimiento-Ayar

Moderately deep and deep, strongly sloping to steep, well drained silty clay loams and silty clays

This map unit is throughout the survey area. Elevation is 600 to 2,500 feet. Soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 50 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 8 percent of the survey area. About 40 percent is Nacimiento soils, 25 percent is Ayar soils, and the rest is soils of minor extent.

The Nacimiento soils are moderately deep. Typically, they have a surface layer and underlying material of silty clay loam over sandstone and shale.

The Ayar soils are deep. Typically, they have a surface layer of silty clay, and underlying material of clay or silty clay.

Soils of minor extent are the Balcom, Cropley, Diablo, and Rincon soils. The Cropley and Rincon soils are on alluvial fans. The Balcom soils are calcareous loamy soils, and the Diablo soils have clay texture.

Most of the soils in this unit are used for cultivated crops. A few areas are used for range. Dryfarmed grain is the main crop. These soils are the highest forage-producing rangeland soils in the survey area. The main limitations are slope and the high content of clay in the surface layer. These can result in severe erosion and surface compaction if the soils are not properly managed.

The soils in this unit are suited to habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various birds.

8. Nacimiento-Los Osos-Balcom

Moderately deep, strongly sloping to very steep, well drained silty clay loams, clay loams, and loams

This map unit is throughout the survey area. Elevation is 600 to 1,500 feet. The soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 75 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 20 percent of the survey area. About 40 percent is Nacimiento soils, 25 percent is Los Osos soils, 20 percent is Balcom soils, and the rest is soils of minor extent.

Typically, the Nacimiento soils have a surface layer and underlying material of silty clay loam underlain by weathered, calcareous shale.

Typically, the Los Osos soils have a surface layer of clay loam and subsoil of clay underlain by weathered sandstone.

Typically, the Balcom soils have a surface layer and a subsoil of loam underlain by weathered, calcareous shale.

The soils of minor extent are the Calleguas, Arbuckle, Positas, and San Ysidro soils, and Xerofluvents, Badlands, and Riverwash. The Calleguas soils are shallow, and Badlands are barren land areas. The Arbuckle, Positas, and San Ysidro soils are on terraces. The Xerofluvents and Riverwash are in stream channels.

Most areas of soils in this unit are used for cultivated crops. A few areas are used for range. Dryfarmed grain is the main crop. The main limitations are slope and the high content of clay in the surface layer. These can result in severe erosion and surface compaction if the soils are not managed properly.

The soils in this unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various birds.

9. Linne-Calodo

Shallow and moderately deep, strongly sloping to very steep, well drained shaly clay loams and clay loams

This map unit is a large area west of Paso Robles and a smaller area east of Atascadero. Elevation is 600 to 1,500 feet. The soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 75 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 11 percent of the survey area. About 30 percent is Linne soils, 25 percent is Calodo soils, and the rest is soils of minor extent.

The Linne soils are moderately deep. Typically, they have a surface layer and underlying material of shaly clay loam over weathered shale.

The Calodo soils are shallow. Typically, they have a surface layer of clay loam over weathered shale.

The soils of minor extent are the Gazos, Balcom, Los Osos, Calleguas, Santa Lucia, Zakme, Diablo, and Lockwood soils. The Gazos and Santa Lucia soils are shaly clay loam. The Balcom soils are calcareous and loamy, and the Calleguas soils are shallow. The Los Osos soils have a clay subsoil. The Zakme and Diablo soils have a clay texture. The Lockwood soils are on terraces.

The soils in this unit are used for cultivated crops and range. Dryfarmed grain and almonds are the main crops. The Linne soils are well suited to range, and the Calodo soils are moderately well suited to range. The main limitations are erosion and surface compaction.

The soils in this unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various birds.

10. Cieneba-Vista-Andregg

Shallow and moderately deep, strongly sloping to very steep, well drained and excessively drained coarse sandy loams

This map unit is a large area east of Santa Margarita and a small area along Mustard Creek. Elevation is 1,000 to 2,500 feet. The soils in this unit formed in material weathered from granitic rock. Slope is 9 to 75 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 7 percent of the survey area. About 70 percent is Cieneba soils, 15 percent is Vista soils, 10 percent is Andregg soils, and the rest is soils of minor extent.

The Cieneba soils are shallow and excessively drained. Typically, they have a surface layer of coarse sandy loam over granitic rock. Slope is 15 to 75 percent.

The Vista soils are moderately deep and well drained. Typically, they have a surface layer and subsoil of coarse sandy loam over granitic rock. They generally are on south slopes of 9 to 50 percent.

The Andregg soils are moderately deep and well drained. Typically, they have a surface layer and subsoil of coarse sandy loam over granitic rock. They generally are on north slopes of 30 to 75 percent.

The soils of minor extent are Sesame, Hanford, and Metz soils. The sandy loam Sesame soils are on hills, the fine sandy loam Hanford soils are on terraces, and the loamy sand Metz soils are on flood plains.

The soils in this unit are used for range and watershed. Erosion is the main limitation for range. Woody plants compete for soil moisture. These areas have a high hazard of wildfire.

The soils in this map unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various birds. The Cieneba soils have very little potential for establishing vegetation useful to wildlife.

11. Dibble-Gaviota-Shimmon

Shallow and moderately deep, strongly sloping to very steep, well drained clay loams, sandy loams, and loams

This map unit is throughout the western part of the survey area. Elevation is 1,000 to 2,500 feet. The soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 75 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 20 percent of the survey area. About 25 percent is Dibble soils, 20 percent is Gaviota soils, 15 percent is Shimmon soils, and the rest is soils of minor extent.

The Dibble soils are moderately deep. Typically, they have a surface layer of clay loam and a subsoil of clay underlain by weathered shale. Slope is 9 to 75 percent.

The Gaviota soils are shallow. Typically, they have a surface layer of sandy loam underlain by hard sandstone. Slope is 15 to 75 percent.

The Shimmon soils are moderately deep. Typically, they have a surface layer of loam and a subsoil of clay

loam underlain by weathered sandstone. Slope is 15 to 75 percent.

Soils of minor extent are Millsholm, Nacimiento, San Andreas, Lompico, Balcom, Arnold, Rincon, and Ryer soils, and Rock outcrop. The Millsholm soils are shallow. The Nacimiento soils are calcareous clay loam, and the Balcom soils are calcareous loamy soils. The Arnold soils have a sandy texture. The San Andreas and Lompico soils are on the north wooded slopes. The Rincon and Ryer soils are on alluvial fans.

The soils in this unit are used mainly for range. Small acreages of the Dibble soils are cultivated and used for grain. Erosion and surface compaction are the main limitations. Woody plants compete for soil moisture on the Shimmon soils. The Gaviota soils are poorly suited to range because of the shallow root zone, droughtiness, and low fertility.

The soils in this unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various nongame birds. The Gaviota soils have very little potential for establishing vegetation useful to wildlife. Rock outcrop provides denning and cover sites.

12. Los Osos-Lompico-Lodo

Shallow and moderately deep, moderately steep to very steep, well drained and somewhat excessively drained clay loams, loams, and gravelly clay loams

This map unit is along the western boundary of the survey area. Elevation is 1,000 to 3,400 feet. The soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 75 percent. The mean annual air temperature is 56 degrees F to 60 degrees F, and the frost-free season is about 200 to 250 days.

This map unit makes up about 5 percent of the survey area. About 30 percent is Los Osos soils, 25 percent is Lompico soils, 15 percent is Lodo soils, and the rest is soils of minor extent.

The Los Osos soils are moderately deep and well drained. Typically, they have a surface layer of clay loam and a subsoil of clay underlain by weathered shale. Slope is 9 to 75 percent.

The Lompico soils are moderately deep and well drained. Typically, they have a loam surface layer and subsoil of sandy clay loam underlain by weathered sandstone. Slope is 30 to 75 percent.

The Lodo soils are shallow and somewhat excessively drained. Typically, they have a surface layer of gravelly clay loam underlain by hard sandstone. Slope is 50 to 75 percent.

Soils of minor extent are the shallow McMullin soils. Rock outcrop is also in this unit.

The soils in this unit are used for range. Erosion and surface compaction are the main limitations. Because of a shallow root zone, the Lodo soils have low forage production.

The soils in this unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various nongame birds. Rock outcrop provides denning and cover sites.

13. Henneke-Rock outcrop

Shallow, moderately steep to very steep, somewhat excessively drained very cobbly clay loams, and Rock outcrop

This map unit is in the northwest corner of the survey area. Elevation is 1,000 to 3,400 feet. The soils in this unit formed in material weathered from serpentinitic rock. Slope is 15 to 75 percent. Mean annual precipitation is 20 to 30 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 250 days.

This map unit makes up about 1 percent of the survey area. About 55 percent is Henneke soils, 40 percent is Rock outcrop, and the rest is soils of minor extent.

Typically, the Henneke soils have a surface layer of very cobbly clay loam and a subsoil of very cobbly clay underlain by serpentinitic rock.

The Rock outcrop consists of areas of hard serpentinitic rock.

Soils of minor extent in this unit are Gilroy soils, which are underlain by hard, partly metamorphosed sandstone.

The soils in this unit are used for watershed. They provide poor habitat for rangeland wildlife, mostly nongame birds. The associated Rock outcrops provide denning and cover sites for predators and small mammals.

This area has aesthetic value.

14. Ayar-Millsholm-Nacimiento

Shallow to deep, strongly sloping to very steep, well drained silty clays, clay loams, and silty clay loams

This map unit is in the northeast corner of the survey area. Elevation is 1,000 to 2,500 feet. The soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 75 percent. Mean annual precipitation is 12 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 4 percent of the survey area. About 35 percent is Ayar soils, 20 percent is Millsholm soils, 20 percent is Nacimiento soils, and the rest is soils of minor extent.

The Ayar soils are deep. Typically, they have a surface layer of silty clay and underlying material of clay and silty clay underlain by sandstone or shale. Slope is 9 to 75 percent.

The Millsholm soils are shallow. Typically, they have a surface layer and subsoil of clay loam underlain by hard shale. Slope is 50 to 75 percent.

The Nacimiento soils are moderately deep. Typically, they have a surface layer and underlying material of silty clay loam underlain by calcareous shale. Slope is 9 to 50 percent.

Soils of minor extent are the Balcom, Calleguas, and Montara soils, and areas of rock outcrop. The Balcom soils are calcareous and loamy. The Calleguas and Mon-

tara soils are shallow. Rock outcrop consists of areas of exposed hard rocks.

Most of the Ayar and Nacimiento soils in this map unit are used for cultivated grain, and the Millsholm soils are used for range. Erosion and surface compaction are the main limitations. Forage production is low on the Millsholm soils because of the shallow root zone.

The soils in this unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various birds. The associated Rock outcrop provides denning and cover sites.

15. San Andreas-Arnold-Santa Lucia

Moderately deep and deep, moderately steep to very steep, well drained and somewhat excessively drained sandy loams, loamy sands, and shaly clay loams

This map unit is small areas around Atascadero, Santa Margarita, and Indian Creek. Elevation is 600 to 2,500 feet. The soils in this unit formed in material weathered from sandstone and shale. Slope is 9 to 75 percent. Mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the frost-free season is about 200 days.

This map unit makes up about 3 percent of the survey area. About 25 percent is San Andreas soils, 20 percent is Arnold soils, 15 percent is Santa Lucia soils, and the rest is soils of minor extent.

The San Andreas soils are moderately deep and well drained. Typically, they have a surface layer and subsoil of sandy loam underlain by weathered sandstone. Slope is 9 to 75 percent.

The Arnold soils are deep and somewhat excessively drained. Typically, they have a surface layer of loamy sand and underlying material of sand underlain by weathered sandstone. Slope is 9 to 75 percent.

The Santa Lucia soils are moderately deep and well drained. Typically, they have a surface layer of shaly clay loam and very shaly clay loam underlain by hard shale. Slope is 15 to 50 percent.

Soils of minor extent are about 15 percent Arujo soils, and 25 percent Lopez, Oceano, Botella, and Concepcion soils. The Arujo and Lopez soils are on hills. The Botella soils are on alluvial fans. The Concepcion soils are on terraces, and the Oceano soils are on dunes.

The soils in this unit are used for range and urban land. Erosion is the main limitation for range. The Arnold soils are poorly suited to range because of droughtiness. Woody plants compete for soil moisture on the Santa Lucia soil.

These soils are moderately suited to building sites, roads, and streets where slopes are less than 15 percent. Where slopes are more than 15 percent, slope is a severe limitation for these uses.

The soils in this unit provide habitat for such rangeland wildlife as dove, quail, rabbits, deer, and various birds.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

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

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Still clay loam, 0 to 2 percent slopes, is one of several phases within the Still series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes, soil associations, and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. The Arbuckle-Positas complex is an example.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. The Shimmon-Dibble association is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. The Ayar and Diablo soils is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Badland is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 3, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

100—Arbuckle fine sandy loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in alluvium derived from mixed rocks. It is on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout the profile.

The Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping is about 5 percent San Ysidro loam. Five percent is a soil similar to Arbuckle soil except that it has more than 1 percent organic matter in the surface layer, and 5 percent is small areas of Cropley clay and Hanford fine sandy loam.

This soil is used for cultivated crops, rangeland, and urban land.

If irrigated, this soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

This soil has no hazards or limitations for farming. Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

This soil can be irrigated by furrow, border, sprinkler, or drip methods.

This soil is well suited to use as rangeland and has few limitations. Good management includes fertilization,

range seeding, brush management, and proper grazing. Soft chess, wild oats, and filaree are important forage species.

This soil is suited to building sites and to roads and streets. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome by proper design and installation procedures. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 95.

101—Arbuckle fine sandy loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium derived from mixed rocks. It is on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout the profile.

Included with this soil in mapping is about 5 percent San Ysidro loam. Five percent is a soil similar to Arbuckle soil except that it has more than 1 percent organic matter in the surface layer. Five percent is small areas of Cropley clay and Hanford fine sandy loam.

This Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

This soil is used for cultivated crops, rangeland, and urban land. If irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and the use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if this soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rainfall, and using a crop rotation system. Orchards and vineyards can be protected by use of crop residue and by cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it to safe outlets in diversions or permanent grassed waterways.

Because of the slope and the erosion hazard, sprinkler or drip irrigation systems are best suited to this soil.

This soil is well suited to use as rangeland. Erosion is a moderate limitation and can be controlled by proper grazing. Good management includes fertilization, range seeding, brush management, and proper grazing. Soft chess, wild oats, and filaree are important forage species.

This soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome by proper design and installation procedures. The low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 85.

102—Arbuckle-Positas complex, 9 to 15 percent slopes. This complex consists of rolling soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Arbuckle fine sandy loam and 30 percent Positas coarse sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 10 percent Greenfield fine sandy loam, 10 percent of a soil similar to Positas soil except that it has a very gravelly sandy clay subsoil, and 10 percent small areas of Cropley clay and Hanford fine sandy loam. A few areas have slope of 15 to 30 percent, moderate to severe erosion, and cobbles on the surface.

The Arbuckle soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout the profile.

The Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

The Positas soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is brown coarse sandy loam about 10 inches thick. The subsoil is about 31 inches thick. The upper part of the subsoil is reddish brown and brown clay about 18 inches thick. The lower part of the subsoil is reddish yellow, calcareous sandy clay loam about 13 inches thick. The substratum is very pale brown sandy loam. A few areas contain gravel throughout the profile.

The Positas soil has very slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

These soils are used for cultivated crops, rangeland, and urban land. Some areas are used for almond or-

chards. If irrigated, the Arbuckle soil is suited to alfalfa, wine grapes, pasture, small grain, and grain hay. If irrigated, the Positas soil is suited to such shallow-rooted crops as pasture, small grain, and grain hay. If dryfarmed, the soils are best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during rainy periods, and using crop rotation. Erosion control also requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system for collecting and disposing of excess water from higher-lying areas is needed in places.

If the soils are irrigated, the amount of water applied needs to be controlled in order to prevent excessive runoff. In places, Positas soils are limited by waterlogging. Sprinkler and drip methods of irrigation are best suited to these soils because of slope and the very slow permeability of the Positas soil.

These soils are well suited to use as rangeland. During heavy periods of rain, the Positas soil is subject to waterlogging and can become compacted if it is grazed. These soils respond to fertilization, range seeding, and brush management. Soft chess, wild oats, filaree, and burclover are important forage species.

The Arbuckle soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

The Positas soil has severe limitations for building sites and roads and streets. Foundations and footings should be designed to prevent structural damage by the low strength and shrinking and swelling of the subsoil. The subsoil should be covered with suitable base material to minimize maintenance on roads and streets. The very slow absorption of effluent severely limits these soils for use as septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This complex is in capability units IIIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 59.

103—Arbuckle-Positas complex, 15 to 30 percent slopes. This complex consists of hilly soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Arbuckle fine sandy loam and 30 percent Positas coarse sandy loam. These soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 10 percent Greenfield fine sandy loam. Ten percent is a soil similar to Positas soil except that it has a very gravelly sandy clay subsoil. Five percent is Hanford fine sandy loam, and 5 percent is small areas of Ayar silty clay, Balcom loam, Nacimiento silty clay loam, and Shimmon loam. A few areas have slopes of 30 to 50 percent, moderate to severe erosion, and cobbles on the surface.

The Arbuckle soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout.

The Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. The surface runoff is rapid, and the hazard of erosion is high.

The Positas soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is brown coarse sandy loam about 10 inches thick. The subsoil is about 31 inches thick. The upper part of the subsoil is reddish brown and brown clay about 18 inches thick. The lower part of the subsoil is reddish yellow, calcareous sandy clay loam about 13 inches thick. The substratum is very pale brown sandy loam. A few areas contain gravel throughout.

The Positas soil has very slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. The surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

These soils are used for cultivated crops, rangeland, and urban land. Some areas are used for almond orchards. If irrigated, the Arbuckle soil is suited to wine grapes, pasture, small grain, and grain hay, and the Positas soil is suited to such shallow-rooted crops as pasture, small grain, and grain hay. If dryfarmed, the soils are best suited to small grain and grain hay.

Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Soil erosion can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during rainy periods, and by using crop rotation. Erosion control also requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system for collecting and disposing of excess water from higher-lying areas is needed in places.

If the soils are irrigated, the amount of water applied needs to be controlled in order to prevent excessive runoff. The Positas soil can be limited by waterlogging. Sprinkler and drip methods of irrigation are best suited to these soils because of slope and the very slow permeability of the Positas soil.

These soils are well suited to use as rangeland. Erosion is the main limitation, but can be controlled by proper grazing. During heavy periods of rain, the Positas soil is subject to waterlogging and can become compacted if it is grazed. These soils respond to fertilization, range seeding, and brush management. Soft chess, wild oats, filaree, and burclover are important forage species.

Slope and erosion severely limit these soils for building sites and roads and streets. Low strength of the Arbuckle soil is a limitation for roads and streets, but can be overcome by replacing the base material. On the Positas soil, foundations and footings should be designed to prevent structural damage by the shrinking and swelling of the subsoil, and the subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope and the slow absorption of effluent severely limit the use of these soils for septic tank absorption fields, and onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities need to be connected to commercial sewers.

This complex is in capability units IVe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 45.

104—Arbuckle-Positas complex, 30 to 50 percent slopes. This complex consists of steep soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Arbuckle fine sandy loam and 30 percent Positas coarse sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 15 percent Shimmon loam on north slopes. Ten percent is a soil similar to Positas coarse sandy loam except that it has a very gravelly sandy clay subsoil, and 5 percent is small areas of Ayar silty clay, Balcom loam, Greenfield fine sandy loam, Linne shaly clay loam, Nacimiento silty clay loam, and Badland. A few areas have slope of 50 to 75 percent.

The Arbuckle soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout.

The Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is rapid, and the hazard of erosion is high.

The Positas soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is brown coarse sandy loam about 10 inches thick. The subsoil is about 31 inches thick. The upper part of the subsoil is reddish brown and brown clay about 18 inches thick. The lower part of the subsoil is reddish yellow, calcareous sandy clay loam about 13 inches thick. The substratum is very pale brown sandy loam. A few areas contain gravel throughout.

The Positas soil has very slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential. Some areas of this soil are used for almond orchards and vineyards.

Because of steep slopes and the high hazard of erosion, the soil is not suited to cultivated crops.

Permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage help control erosion.

These soils are well suited to use as rangeland. The erosion hazard is the main limitation, but it can be controlled by maintaining adequate plant residue on the soil surface. During heavy periods of rain, the Positas soil is subject to waterlogging and can become compacted if it is grazed. These soils respond to range seeding. Soft chess, wild oats, filaree, and burclover are important forage species.

This complex is in capability subclass VIe (14) nonirrigated. The Storie index rating is 28.

105—Arbuckle-Positas complex, 50 to 75 percent slopes. This complex consists of very steep soils on terrace escarpments. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Arbuckle fine sandy loam and 25 percent Positas coarse sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 15 percent Shimmon loam on north slopes. Ten percent is Badland, 10 percent is a soil similar to Positas coarse sandy loam except that it has a very gravelly sandy clay subsoil, and 5 percent is small areas of Balcom loam, Greenfield fine sandy loam, and Nacimiento silty clay loam. A few areas have slopes of 75 to 90 percent.

The Arbuckle soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout the profile.

The Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is very rapid, and the hazard of erosion is very high.

The Positas soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is brown coarse sandy loam about 10 inches thick. The subsoil is about 31 inches thick. The upper part of the subsoil is reddish brown and brown clay about 18 inches thick. The lower part of the subsoil is reddish yellow, calcareous sandy clay loam about 13 inches thick. The substratum is very pale brown sandy loam. A few areas contain gravel throughout the profile.

The Positas soil has very slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is very rapid, and the hazard of erosion is very high. The subsoil has high shrink-swell potential.

These soils are used for rangeland but are poorly suited to this use. Both soils are limited by the hazard of erosion and slope. On these very steep soils, erosion can be controlled by maintaining adequate plant residue on the soil surface. Grazing distribution can be improved if stock trails provide better access to forage. During heavy periods of rain, the Positas soil is subject to waterlogging and can become compacted if it is grazed. Soft chess, wild oats, filaree, and burclover are important forage species.

This complex is in capability subclass VIIe (14) nonirrigated. The Storie index rating is 12.

106—Arbuckle-San Ysidro complex, 2 to 9 percent slopes. This complex consists of undulating to gently rolling soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Arbuckle fine sandy loam and 20 percent San Ysidro loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping. Soil patterns are not always predictable. Arbuckle soils are on the slightly higher terrace-like areas, and San Ysidro soils generally are in depressional areas and low parts of old meandering drainageways.

Included with these soils in mapping are about 15 percent Greenfield fine sandy loam, 10 percent of a soil similar to San Ysidro soil except that it has a very gravelly sandy clay subsoil, and 5 percent Hanford fine sandy loam. Five percent is a soil similar to Arbuckle soil except that it has more than 1 percent organic matter in the surface layer, and 5 percent is small areas of Cropley clay, Rincon clay loam, and Ryer clay loam.

The Arbuckle soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 10 inches thick. The subsoil is about 43 inches thick. The upper part of the subsoil is light yellowish brown fine sandy loam about 19 inches thick. The lower part of the subsoil is light brown and light yellowish brown sandy clay loam about 24 inches thick. The substratum is stratified, light yellowish brown sandy loam. A few areas contain gravel throughout the profile.

The Arbuckle soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

The San Ysidro soil is a very deep, moderately well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown loam about 20 inches thick. The subsurface is very pale brown loam about 3 inches thick. The subsoil is about 41 inches thick. The upper part of the subsoil is light brown heavy clay loam about 15 inches thick. The lower part of the subsoil is light yellowish brown, calcareous loam about 13 inches thick and fine sandy loam about 13 inches thick. The substratum is light yellowish brown sandy loam. Mottles are common in the subsoil.

The San Ysidro soil has very slow permeability. The effective rooting depth is 60 inches or more. The available water capacity is moderate to high. The surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

These soils are used for cultivated crops, rangeland, and urban land.

If irrigated, the Arbuckle soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. The San Ysidro soil is suited to such shallow-rooted crops as small grain, grain hay, and pasture. If dryfarmed, both soils are suited only to small grain and grain hay.

Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if the soils are cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by using cover crops and crop residue. A system is needed, in places, for collecting concentrated or excess water from higher-lying areas and conducting it to safe outlets in diversions or permanent grassed waterways.

Because of slope and the erosion hazard, sprinkler or drip irrigation systems are best suited to these soils. If the San Ysidro soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff.

These soils are well suited to use as rangeland. Erosion is a moderate limitation, but can be controlled by maintaining adequate plant residue on the soil surface. During periods of heavy rain, the San Ysidro soil is subject to waterlogging and may become compacted if it is grazed. Good management practices include fertilizing, range seeding if needed, and proper grazing. Soft chess and burclover are important forage species.

The Arbuckle soil is suitable for building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

The San Ysidro soil has severe limitations for building sites and roads and streets. Foundations and footings need to be designed to prevent structural damage caused by shrinking and swelling of the subsoil. The subsoil can be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe limitation for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This complex is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 72.

107—Arnold loamy sand, 9 to 30 percent slopes. This deep, rolling to hilly, somewhat excessively drained soil formed in material weathered from sandstone. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is about 32 inches thick. The upper part of the surface layer is light brownish gray loamy sand about 15 inches thick, and the lower part of the surface layer is pale brown sand about 17 inches thick. The underlying material is very pale brown sand to a depth of about 42 inches. Below this is weathered sandstone. Depth to the weathered sandstone ranges from 40 to 60 inches.

Included with this soil in mapping is about 10 percent San Andreas sandy loam. Five percent is a soil similar to Arnold soil except that it is calcareous, and 5 percent is small areas of Metz loamy sand, San Emigdio fine sandy loam, and Tujunga fine sand. Five percent is urban land.

This Arnold soil has rapid permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

This soil is used for rangeland and urban land.

The soil is poorly suited to use as rangeland. The main limitations are droughtiness and the hazard of erosion. Because of the loamy sand texture, forage production in dry years is so low that grazing is not desirable. Erosion can be controlled by maintaining adequate plant residue on the soil surface. Chamise, scrub oak, wild oats, and soft chess are important forage and browse species. Proper grazing helps to maintain or improve the quantity and quality of desirable vegetation.

Slope and the hazard of erosion severely limit this soil for building sites and roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit this soil for septic tank absorption fields, and onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities need to be connected to commercial sewers.

This soil is in capability subclass VIs (15) nonirrigated. The Storie index rating is 42.

108—Arnold-San Andreas complex, 30 to 75 percent slopes. This complex consists of steep and very steep soils on mountains. Elevation is 1,000 to 2,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Arnold loamy sand and 20 percent San Andreas sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 20 percent Badland, 15 percent calcareous soils, and 10 percent small areas of Cieneba coarse sandy loam, Dibble clay loam, Gaviota sandy loam, Lompico loam, and rock outcrop. Five percent of the unit is urban area.

The Arnold soil is a deep, somewhat excessively drained soil that formed in material weathered from soft sandstone. Typically, the surface layer is about 32 inches thick. The upper part of the surface layer is light brownish gray loamy sand about 15 inches thick, and the lower part of the surface layer is pale brown sand about 17 inches thick. The underlying material is very pale brown sand to a depth of about 42 inches. Below this is weathered sandstone. Depth to the weathered sandstone ranges from 40 to 60 inches.

The Arnold soil has rapid permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

The San Andreas soil is a moderately deep, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is brown sandy loam about 11 inches thick. The subsoil is light brown heavy sandy loam about 18 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to the weathered sandstone ranges from 20 to 40 inches.

The San Andreas soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland, woodland, and urban land.

If used for rangeland, both soils are limited by erosion hazard and slope. On these steep and very steep soils, erosion can be controlled by maintaining adequate plant residue on the soil surface. Stock trails can be used to help distribute grazing.

The Arnold soil is suited to use as rangeland. Because of the loamy sand texture, forage production in dry years

is so low that grazing is not desirable. Chamise, scrub oak, wild oats, and soft chess are important forage and browse species.

The San Andreas soil is suited to interior live oak, coast live oak, blue oak, and Digger pine. A net volume of 1,303 cubic feet per acre of wood fiber has been measured on this soil. Overcutting the tree cover on this soil, especially in drier areas, has resulted in the conversion from tree cover to grass and forb production.

Slope and erosion hazard severely limit these soils for building sites and roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities need to be connected to commercial sewers.

This complex is in capability subclass VIIs (15) nonirrigated. The Storie index rating is 13.

109—Ayar and Diablo soils, 9 to 15 percent slopes. This undifferentiated unit consists of soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is about 60 degrees F, and the average frost-free season is 200 days. This unit is 30 percent Ayar silty clay and 25 percent Diablo clay. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping is about 20 percent of a soil similar to Ayar silty clay, except that it has a noncalcareous clay surface layer underlain at a depth of 20 to 40 inches by calcareous shale or sandstone. Ten percent is Cropley clay, 10 percent is Zakme clay, and 5 percent is small areas of Balcom loam, Los Osos clay loam, and Nacimiento silty clay loam. A few areas have gravel and cobbles on the surface, and some areas have land slips or deep gullies.

The Ayar soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is about 39 inches thick. The upper part of the surface layer is brown silty clay about 9 inches thick, and the lower part of the surface layer is brown clay about 30 inches thick. The underlying material is brown clay about 6 inches thick, and brown and pink silty clay about 16 inches thick. Below this, at a depth of about 61 inches, is weathered, calcareous sandstone and shale. This soil is calcareous throughout. Depth to the weathered sandstone and shale ranges from 40 to 70 inches.

The Ayar soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is high to very high. Surface runoff is medium, and the hazard of erosion is moderate. The shrink-swell potential is high.

The Diablo soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray clay about 38 inches thick. The underlying material is light yellowish brown clay to a depth of 50 inches. Below this is weathered, calcareous sandstone. This soil is calcareous throughout. Depth to the weathered sandstone ranges from 40 to 60 inches.

The Diablo soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is moderate to very high. Surface runoff is medium, and the hazard of erosion is moderate. The shrink-swell potential is high.

These soils are used for cultivated crops and rangeland. Some areas are used for almond orchards.

If irrigated, these soils are suited to wine grapes, pasture, small grain, and grain hay. If dryfarmed, these soils are best suited to small grain and grain hay.

These silty clay and clay soils are hard to till unless the soil moisture is favorable. Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Soil erosion can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using a crop rotation system. Erosion control includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system for collecting and disposing of excess water from higher-lying areas is needed in some places.

If irrigation is used, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope, slow intake, and slow permeability.

These soils are well suited to use as rangeland, and are the highest forage-producing soils in the area. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction decreases if the soil is grazed when the soil moisture content is favorable. These soils respond to fertilization and range seeding. Soft chess, wild oats, and burclover are important forage species.

This map unit is in capability units IIIe-5 (15) irrigated, and IVe-5 (15) nonirrigated. The Storie index rating is 43 for the Ayar soil, and 28 for the Diablo soil.

110—Ayar and Diablo soils, 15 to 30 percent slopes. This undifferentiated unit consists of soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This unit is made up of 30 percent Ayar silty clay and 25 percent Diablo clay. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping is about 20 percent of a soil similar to Ayar silty clay, except that it has a noncalcareous clay surface layer underlain at a depth of 20 to 40 inches by calcareous shale or sandstone.

Five percent is Cropley clay, and 5 percent is Zakme clay. Five percent is a soil similar to Diablo soil, except that it formed on serpentine along fault lines. Five percent is a soil similar to Ayar silt loam, except that its colors are light brownish gray, and 5 percent is small areas of Balcom loam, Los Osos clay loam, and Nacimiento silty clay loam. Land slips or deep gullies are in a few areas.

The Ayar soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is about 39 inches thick. The upper part of the surface layer is brown silty clay about 9 inches thick, and the lower part of the surface layer is brown clay about 30 inches thick. The underlying material is brown clay about 6 inches thick, and brown and pink silty clay to a depth of about 60 inches. Below this is weathered, calcareous sandstone and shale. This soil is calcareous throughout. Depth to the weathered sandstone and shale ranges from 40 to 70 inches.

The Ayar soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is high to very high. Surface runoff is rapid, and the hazard of erosion is high. The shrink-swell potential is high.

The Diablo soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray clay about 38 inches thick. The underlying material is light yellowish brown clay to a depth of about 50 inches. Below this is weathered, calcareous sandstone. This soil is calcareous throughout. Depth to the weathered sandstone ranges from 40 to 60 inches.

The Diablo soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is moderate to very high. Surface runoff is rapid. The hazard of erosion and the shrink-swell potential are high.

These soils are used for cultivated crops and rangeland. Some areas are used for almond orchards.

If irrigated, these soils are suited to wine grapes, pasture, small grain, and grain hay. If dryfarmed, the soils are best suited to small grain and grain hay.

The silty clay and clay texture makes these soils hard to till unless the soil moisture is favorable. Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard that can be controlled by farming across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control includes use of annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system for collecting and disposing of excess water from higher-lying areas is needed in places.

If irrigation is used, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to these soils because of slope, slow intake, and slow permeability.

These soils are well suited to use as rangeland, and are the highest forage-producing soils in the area. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction decreases if the soil is grazed when the soil moisture content is favorable. These soils respond to fertilization and range seeding. Soft chess, wild oats, and burclover are important forage species.

This map unit is in capability units IVe-5 (15) irrigated, and IVe-5 (15) nonirrigated. The Storie index rating is 36 for the Ayer soil, and 23 for the Diablo soil.

111—Ayar and Diablo soils, 30 to 50 percent slopes. This undifferentiated unit consists of soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This unit is made up of 30 percent Ayar silty clay and 25 percent Diablo clay. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping is about 20 percent of a soil similar to Ayar soil except that it has a noncalcareous clay surface layer underlain at 20 to 40 inches by calcareous shale or sandstone. Five percent is Cropley clay, and 5 percent is Zakme clay. Five percent is a soil similar to Diablo soil except that it formed on serpentine along fault lines. Five percent is a soil similar to Ayar soil except that it is light brownish gray. Five percent is small areas of Balcom loam, Los Osos clay loam, and Nacimiento silty clay loam. A few areas have land slips or deep gullies, and a few areas have slopes of more than 50 percent.

The Ayar soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is about 39 inches thick. The upper part of the surface layer is brown silty clay about 9 inches thick. The lower part of the surface layer is brown clay about 30 inches thick. The underlying material is brown clay about 6 inches thick, and brown and pink silty clay to a depth of about 60 inches. Below this is weathered, calcareous sandstone and shale. This soil is calcareous throughout. Depth to the sandstone and shale ranges from 40 to 70 inches.

This Ayar soil has slow permeability. The effective rooting depth is 40 to 60 inches. The available water capacity is moderate to very high. The surface runoff is rapid, and the hazard of erosion is high. The shrink-swell potential is high.

The Diablo soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray clay about 38 inches thick. The underlying material is light yellowish brown clay to a depth of about 50 inches. Below this is weathered, calcareous sandstone. The soil is calcareous throughout. Depth to the weathered sandstone ranges from 40 to 60 inches.

The Diablo soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is moderate to very high. Surface runoff is rapid. The hazard of erosion and the shrink-swell potential are high.

These soils are not suited to cultivated crops because of steep slopes and the high hazard of erosion. Some areas of these soils are used for almond orchards and vineyards.

Erosion control includes use of permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage.

These soils are well suited to use as rangeland and are the highest forage-producing soils in the area. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction decreases if the soil is grazed when the soil moisture content is favorable. These soils respond to fertilization and range seeding. Soft chess, wild oats, and burclover are important forage species.

This map unit is in capability subclass VIe (15) nonirrigated. The Storie index rating is 22 for the Ayar soil, and 14 for the Diablo soil.

112—Badland. Badland consists of steep and very steep barren areas broken by numerous, deeply entrenched drainage channels. These areas are the severely eroded bluffs, escarpments, and gullied areas along the Salinas River and other major streams. The barren areas consist mainly of highly erodible soft sediment, and in places the sediment is covered by a thin mantle of relatively unstable soil material. Badland produces large amounts of silt and debris.

Included with this unit in mapping are about 10 percent Calleguas shaly loam, 10 percent Arnold loamy sand, 5 percent San Andreas sandy loam, 5 percent Balcom loam, and 5 percent small areas of Arbuckle fine sandy loam and Positas coarse sandy loam.

Badland is suited to wildlife habitat and watershed. Its use is limited by the potential hazard of deposition onto adjacent lands. The suitabilities and limitations for use need to be determined by onsite investigations.

This unit has not been assigned to a capability subclass.

113—Balcom-Calleguas complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Balcom loam and 25 percent Calleguas shaly loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 10 percent Nacimiento silty clay loam. Ten percent is a soil similar to Calleguas soil, except that it is underlain by hard unweathered shale. Ten percent is Badland, 5 percent is Dibble clay loam, and 5 percent is small areas of Calodo clay loam, Linne shaly clay loam, Los Osos clay loam, and rock outcrop. In a few areas, slope is 30 to 50 percent.

The Balcom soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is light brownish gray loam about 12 inches thick. The subsoil is very pale brown heavy loam to a depth of about 28 inches. Below this is weathered, calcareous shale. This soil is calcareous throughout. Depth to the weathered shale ranges from 20 to 40 inches.

This Balcom soil has moderate permeability. The effective rooting depth is 20 to 40 inches. The available water capacity is low to moderate. The surface runoff is very rapid, and the hazard of erosion is very high.

The Calleguas soil is a shallow, well drained soil that formed in material weathered from calcareous shale. Typically, the surface layer is pale brown, calcareous shaly loam to a depth of about 12 inches. Below this is weathered, calcareous shale. Depth to the weathered shale ranges from 10 to 20 inches.

This Calleguas soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low. Surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland. Limitations for both soils are erosion hazard, surface compaction, and slope. On these very steep soils, erosion can be controlled by maintaining adequate plant residue on the soil surface and by use of stock trails to obtain good grazing distribution. If the soils are grazed when the surface soil moisture is favorable, there is less compaction.

The Balcom soil is moderately suited to use as rangeland. Soft chess, wild oats, and filaree are important forage species.

The Calleguas soil is poorly suited to use as rangeland. Forage production is low because of the shallow soil depth. Soft chess, wild oats, filaree, and California buckwheat are important forage and browse species.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 10.

114—Balcom-Nacimiento association, moderately steep. This association is on hills and consists of soils that have slope of 9 to 30 percent. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 45 percent Balcom loam and 20 percent Nacimiento silty clay loam. The Balcom soil has east and south exposures. The Nacimiento soil has west and north exposures.

Included with these soils in mapping are about 10 percent Calleguas shaly loam, 10 percent Linne shaly clay loam, 5 percent Calodo clay loam, 5 percent Ca-

matta loam, and 5 percent small areas of Ayar silty clay, Metz loamy sand, Mocho clay loam, and Polonio clay loam. A few areas have been moderately and severely eroded, and some areas have slope of 30 to 40 percent.

The Balcom soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is light brownish gray loam about 12 inches thick. The subsoil is very pale brown heavy loam to a depth of about 28 inches. Below this is weathered, calcareous shale. This soil is calcareous throughout. Depth to the weathered shale ranges from 20 to 40 inches.

This Balcom soil has moderate permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material is pale brown silty clay loam to a depth of about 28 inches. Below this is weathered, calcareous shale. This soil is calcareous throughout. Depth to the weathered shale ranges from about 20 to 40 inches.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

These soils are used for cultivated crops and range. Some areas are used for almond orchards.

If irrigated, the soils are suited to wine grapes, pasture, small grain, and grain hay. If dryfarmed, they are best suited to small grain and grain hay.

Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Soil erosion can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using a crop rotation system. Erosion control includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system for collecting and disposing of excess water from higher-lying areas is needed in places.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope and moderate or moderately slow permeability.

These soils are well suited to use as rangeland. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. If the soil is grazed when the soil moisture content is favorable, there is less compaction. These soils respond to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

This association is in capability unit IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 45 for the Balcom soil, and 41 for the Nacimiento soil.

115—Balcom-Nacimiento association, steep. This association consists of soils on hills. Slope is 30 to 50 percent. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 45 percent Balcom loam and 20 percent Nacimiento silty clay loam. Balcom loam has east and south exposures. Nacimiento silty clay loam has west and north exposures.

Included with these soils in mapping are about 10 percent Calleguas shaly loam, 10 percent Linne shaly clay loam, 5 percent Calodo clay loam, 5 percent Camatta loam, and 5 percent small areas of Ayar silty clay, Metz loamy sand, Mocho clay loam, and Polonio clay loam. A few areas are moderately to severely eroded.

The Balcom soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is light brownish gray loam about 12 inches thick. The subsoil is very pale brown heavy loam to a depth of about 28 inches. Below this is weathered, calcareous shale. This soil is calcareous throughout. Depth to the weathered shale ranges from 20 to 40 inches.

The Balcom soil has moderate permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material is pale brown silty clay loam to a depth of 28 inches. Below this is weathered, calcareous shale. The soil is calcareous throughout. Depth to the weathered shale ranges from 20 to 40 inches.

The Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

These soils are used mainly for range. Some areas are used for almond orchards and vineyards.

These soils are not suited to cultivated crops because of steep slopes and a high erosion hazard. Erosion control includes permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage.

These soils are well suited to use as rangeland. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. If the soil is grazed when the soil moisture content is favorable, there is less compaction. These soils respond to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

This association is in capability subclass VIe (15) nonirrigated. The Storie index rating is 28 for the Balcom soil, and 25 for the Nacimiento soil.

116—Botella sandy loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark gray sandy loam about 21 inches thick. The subsoil is dark grayish brown and light brownish gray sandy clay loam about 39 inches thick. The substratum is light brownish gray sandy clay loam.

Included with this soil in mapping are about 5 percent Concepcion sandy loam, 5 percent Elder loam, and 5 percent small areas of Arujo sandy loam, Metz loamy sand, and San Andreas sandy loam. A few areas have wet spots.

This Botella soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high. Surface runoff is medium, and the hazard of erosion is moderate.

Most of the acreage is used for cultivated crops. A small acreage is used for urban land.

If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and the use of crop residue maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards where this soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by using cover crops and crop residue. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited to this soil because of slope and erosion hazard.

This soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and other buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 77.

117—Calleguas shaly loam, 15 to 30 percent slopes. This shallow, hilly, well drained soil formed in material weathered from calcareous shale and sandstone. It is on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer of this Calleguas soil is pale brown, calcareous shaly loam to a depth of about 12 inches. Below this is weathered, calcareous shale. Depth to the shale ranges from 10 to 20 inches.

Included with this soil in mapping are about 5 percent Balcom loam, 5 percent Nacimiento silty clay loam, and 5 percent small areas of Cropley clay, Mocho clay loam, and San Emigdio fine sandy loam. In a few areas, slope is 5 to 15 percent.

This Calleguas soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low. Surface runoff is rapid, and the hazard of erosion is high.

This soil is used mainly for range.

This soil is not suited to cultivated crops because of shallow soil depth and the erosion hazard.

This soil is suited to rangeland. The main limitations are the erosion hazard and shallow soil depth. Erosion can be controlled by proper grazing. Because of the shallow soil depth, forage production is low. Soft chess, wild oats, filaree, and California buckwheat are important forage and browse species.

This soil is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 21.

118—Camarillo sandy loam, frequently flooded. This very deep, nearly level, poorly drained soil formed in alluvium derived from sedimentary rocks. It is on flood plains in the Cholame Valley. Slope is 0 to 2 percent. Elevation is about 1,100 feet. Because of its low position along the poorly-defined channel of Cholame Creek, this soil is flooded for brief periods from November through March in about 3 out of 5 years. The mean annual precipitation is 12 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is about 34 inches thick. The upper part of the surface layer is light olive gray sandy loam overwash about 10 inches thick. The lower part of the surface layer is olive gray silty clay loam about 24 inches thick. The underlying material is stratified layers of light brownish gray and grayish brown fine sandy loam, silt loam, and silty clay loam. This soil is calcareous throughout.

Included with this soil in mapping is about 10 percent of a soil similar to Camarillo sandy loam except that it is stratified sandy loam and loamy sand throughout. Ten percent is a similar soil except that it is saline-alkali affected. Five percent is a soil similar to Camarillo soil except that it has a loamy sand overwash 8 to 15 inches thick. Five percent is a soil that has dark grayish brown, silty clay buried soil at a depth of 20 to 30 inches. Five percent is small areas of Metz loamy sand and Tujunga fine sand.

This Camarillo soil has moderate permeability. The effective rooting depth is 60 inches, and the available

water capacity is high Surface runoff is very slow. The soil is subject to deposition during the frequent periods of flooding. A layer that is slightly saline to moderately saline is at a depth of 30 to 50 inches. During winter the high water table is at a depth of 24 to 30 inches, and contains medium to high salt concentrations.

This soil is used for rangeland, but it is poorly suited to this use. In places the water table has a moderate salt concentration that limits the soil to salt-tolerant perennial plants. This soil is subject to frequent flooding and deposition of material, and should not be grazed during these periods. Soft chess, burclover, iodinebush, and alkali heath are important forage and browse species.

This soil is in capability subclass Vw (14) nonirrigated. The Storie index rating is 17.

119—Camarillo silty clay loam, partially drained. This very deep, nearly level, partially drained soil formed in alluvium derived from sedimentary rocks. It is on flood plains of the Cholame Valley. The soil formed under poor drainage conditions. Because of the drainage system developed by the San Andreas fault, the water table has been lowered. The soil is subject to rare flooding under abnormal conditions Slope is 0 to 2 percent. Elevation is about 1,100 feet. The mean annual precipitation is 12 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is olive gray silty clay loam about 24 inches thick. The underlying material is stratified layers of light brownish gray and grayish brown fine sandy loam, loam, and silty clay loam. This soil is calcareous throughout.

Included with this soil in mapping is about 10 percent Capay silty clay. Ten percent is a soil similar to Camarillo soil except that the surface layer is light brownish gray or light olive gray, and 10 percent is a soil that has a dark grayish brown, silty clay buried soil at a depth of 20 to 30 inches. Five percent is small areas that are saline-alkali affected.

This Camarillo soil has moderate permeability. The effective rooting depth is 60 inches, and the available water capacity is high. Surface runoff is very slow. The soil is subject to deposition during the rare periods of flooding. A layer that is slightly saline to moderately saline is at a depth of 40 to 46 inches. During winter the high water table is at a depth of 4 to 5 feet and contains medium to high salt concentrations.

This soil is used for cultivated crops and range.

The soil is suited to dryfarmed small grain and grain hay. It has poor potential for irrigated crops because of a possible recharge of the water table and an increase of salt concentration within the root zone.

If the soil is cultivated, proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

This soil is well suited to use as rangeland. Surface compaction decreases if the soil is grazed when the soil moisture content is favorable. Good management practices include fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

This soil is in capability unit IVw-2 (14) nonirrigated. The Storie index rating is 50.

120—Camatta loam, 5 to 15 percent slopes. This gently rolling to rolling, well drained soil formed in calcareous sediment. It is shallow to an indurated hardpan. It is on high terraces. Elevation is about 1,600 feet. The mean annual precipitation is 9 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown, calcareous loam about 12 inches thick. Underlying this is a very hard indurated lime cemented hardpan about 8 inches thick (fig. 4). Below this is very pale brown very fine sandy loam, to a depth of 60 inches or more, that has lime cemented concretions. Depth to the cemented pan ranges from 10 to 20 inches.

Included with this soil in mapping are about 10 percent barren spots that are saline-affected, 5 percent Chanac loam, and 5 percent Polonio clay loam.

This Camatta soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is medium, and the hazard of erosion is moderate.

This soil is used mainly for range.

The soil is not suited to cultivated crops because of shallow rooting depth, erosion hazard, and limited precipitation.

This soil is poorly suited to use as rangeland. Shallow rooting depth, limited precipitation, and erosion are the main limitations. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Redstem filaree, soft chess, and wild oats are important forage species.

This soil is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 16.

121—Camatta loam, 15 to 30 percent slopes. This hilly, well drained soil formed in calcareous sediment. It is shallow to an indurated hardpan. It is on high terraces. Elevation is about 1,600 feet. The mean annual precipitation is 9 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown, calcareous loam underlain at a depth of about 12 inches by a very hard indurated lime cemented hardpan.

Included with this soil in mapping are about 10 percent barren spots that are saline-affected, 5 percent Chanac loam, and 5 percent Polonio clay loam.

This Camatta soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

This soil is used mainly for range.

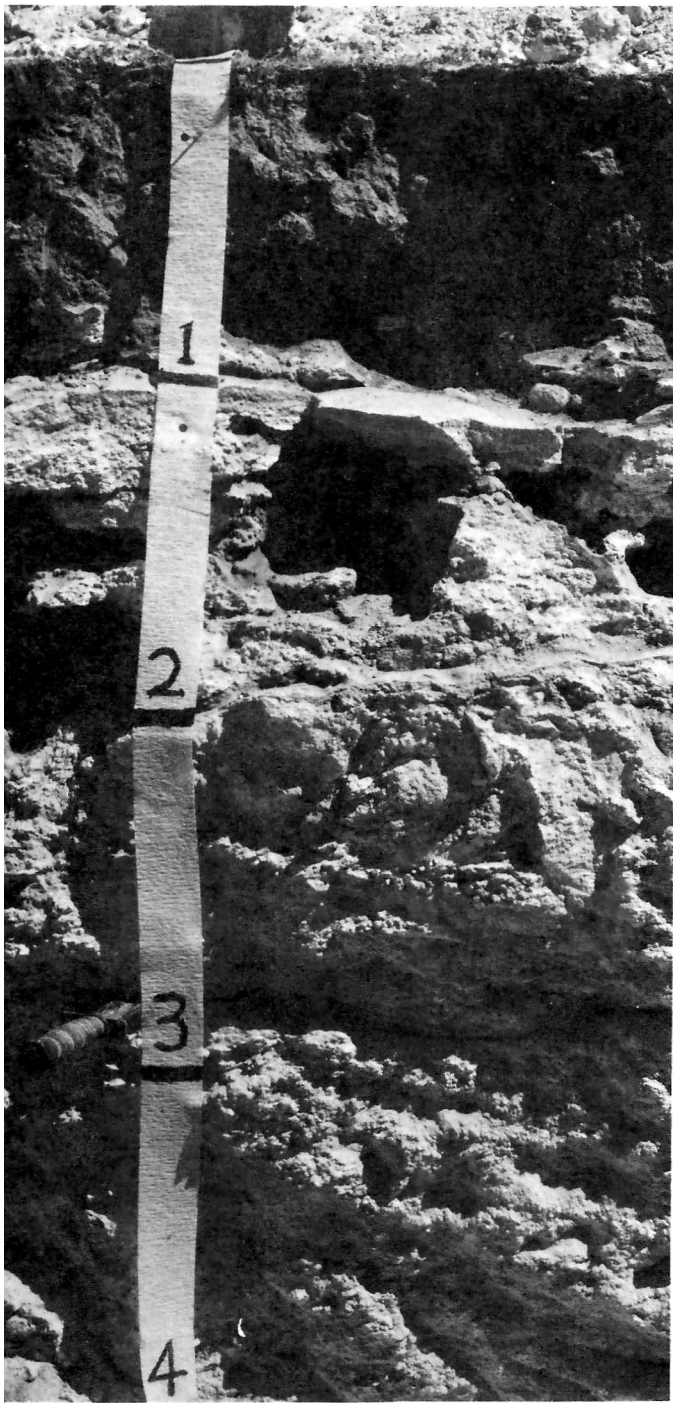


Figure 4—Profile of Camatta loam. The indurated lime hardpan (petrocalcic horizon) is at a depth of 12 inches.

The soil is not suited to cultivated crops because of shallow rooting depth, erosion hazard, and limited precipitation.

This soil is poorly suited to use as rangeland. Shallow rooting depth, limited precipitation, and erosion are its main limitations. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Redstem filaree, soft chess, wild oats, and burclover are important forage species.

This soil is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 13.

122—Capay silty clay. This very deep, nearly level, moderately well drained soil formed in alluvium derived from sedimentary rocks. It is on flood plains of the Cholame Valley. Slope is 0 to 2 percent. Elevation is about 1,100 feet. This soil is subject to rare flooding under abnormal conditions. The mean annual precipitation is 12 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown silty clay about 30 inches thick. The underlying material is olive and pale olive silty clay. This soil is calcareous throughout.

Included with this soil in mapping is about 10 percent Clear Lake clay. Ten percent is a soil similar to Capay soil except that the surface is light brownish gray or light olive gray, and 10 percent is small areas of Mocho clay loam and Camarillo silty clay loam. A few areas are saline-alkali affected.

This Capay soil has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is very slow, and there is no hazard of erosion. The shrink-swell potential is high.

This soil is used for cultivated crops and range.

The soil is suited to dryfarmed small grain and grain hay. It has fair potential for such irrigated crops as alfalfa, sugar beets, and pasture.

The clay texture of this soil makes it hard to till unless the soil moisture is favorable. Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

This soil is well suited to use as rangeland. Compaction is the main limitation. If the soil is grazed when the soil moisture content is favorable, there is less compaction. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is in capability unit IVs-5 (14) nonirrigated. The Storie index rating is 40.

123—Capay silty clay, occasionally flooded. This very deep, nearly level, moderately well drained soil formed in alluvium derived from sedimentary rocks. It is on flood plains of the Cholame Valley. Slope is 0 to 2 percent. Elevation is about 1,000 feet. About once in 10 years this soil is flooded for short periods in January and February. The mean annual precipitation is 12 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown silty clay about 30 inches thick. The underlying material is olive and pale olive silty clay. This soil is calcareous throughout.

Included with this soil in mapping is about 15 percent of a soil similar to Capay soil except that it has a grayish brown silty clay loam overwash 20 to 35 inches thick. Five percent is Camarillo silty clay loam, and 5 percent is Mocho clay loam. A few areas are saline-alkali affected.

This Capay soil has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is very slow. The soil is subject to deposition during the occasional periods of flooding. The shrink-swell potential is high.

This soil is used for cultivated crops and range.

The soil is suited to dryfarmed small grain and grain hay. It has fair potential for such irrigated crops as alfalfa, sugar beets, and pasture. Flooding is the main limitation, and can destroy the crops.

The clay texture of this soil makes it hard to till unless the soil moisture is favorable. Proper tillage and use of crop residue improves soil tilth, structure, fertility, and water infiltration.

This soil is well suited to use as rangeland Surface compaction is the main limitation. If the soil is grazed when the soil moisture content is favorable, there is less compaction. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is in capability unit IVw-5 (14) nonirrigated. The Storie index rating is 34.

124—Chanac loam, 9 to 30 percent slopes. This very deep, rolling to hilly, well drained soil formed in alluvium derived from mixed rocks. It is on high terraces. Elevation is about 1,600 feet. The mean annual precipitation is 9 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown loam about 12 inches thick. The subsoil is light brownish gray loam about 9 inches thick. The substratum is light yellowish brown loam to a depth of 55 inches, and pale brown fine sandy loam to a depth of 60 inches. This soil is calcareous throughout.

Included with this soil in mapping are about 10 percent Camatta loam and 5 percent Polonio clay loam.

This Chanac soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is high to very high.

This soil is used for cultivated crops and range.

The soil is poorly suited to dryfarmed small grain and grain hay because annual precipitation is generally low.

Proper tillage and use of crop residue improves soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion.

This soil is moderately suited to use as rangeland. The limited precipitation results in sparse vegetative cover and low yields. Erosion hazard and surface compaction are the main limitations. Erosion can be controlled by maintaining adequate residue on the soil surface. Compaction decreases if the soil is grazed when the soil moisture content is favorable. Soft chess, wild oats, and filaree are important forage species.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 65.

125—Chanac loam, 30 to 75 percent slopes. This very deep, steep to very steep, well drained soil formed in alluvium derived from mixed rock. It is on high terraces. Elevation is about 1,600 feet. The mean annual precipitation is 9 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown loam about 12 inches thick. The subsoil is light brownish gray loam about 9 inches thick. The substratum is light yellowish brown loam to a depth of 55 inches, and pale brown fine sandy loam to a depth of 60 inches. This soil is calacareous throughout.

Included with this soil in mapping are about 5 percent Camatta loam and 5 percent Polonio clay loam.

This Chanac soil has moderately slow permeability. The effective rooting depth is 60 inches or more, and the available water capacity is high to very high. Surface runoff is very rapid, and the hazard of erosion is very high.

This soil is used for rangeland.

The soil is suited to use as rangeland. Limited precipitation results in sparse vegetative cover and low yields. Erosion hazard and surface compaction are the main limitations. Erosion can be controlled by maintaining adequate crop residue on the soil surface. If the soil is grazed when the soil moisture content is favorable, there is less compaction. Soft chess, wild oats, and filaree are important forage species. Proper grazing use maintains the plant cover and makes efficient use of the limited soil moisture.

This soil is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 20.

126—Cieneba coarse sandy loam, 30 to 75 percent slopes. This shallow, steep to very steep, excessively drained soil formed in material weathered from granitic rock. It is on mountains. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is brown and pale brown coarse sandy loam about 10 inches thick. Weathered granitic rock is at a depth of about 10 inches. Depth to the weathered rock ranges from 6 to 12 inches.

Included with this soil in mapping are about 5 percent Gaviota sandy loam, 5 percent Andregg coarse sandy

loam, 5 percent Badland, 5 percent rock outcrop, and 5 percent small areas of Arnold loamy sand and a soil similar to Cieneba soil except that it is calcareous.

This Cieneba soil has moderately rapid permeability. The effective rooting depth is 6 to 12 inches, and the available water capacity is very low. Surface runoff is very rapid, and the hazard of erosion is very high.

This soil is used for wildlife habitat and watershed. The area has aesthetic value.

This soil produces sparse amounts of plants suitable for grazing. Chamise and purple needlegrass are important wildlife browse and forage species. The hazard of wildfire is high, but can be limited by controlling brush and constructing firebreaks. This soil is fragile and any disturbance can cause severe erosion.

This soil has very little potential for vegetation useful to wildlife. Its value for denning and cover sites depends on its proximity to such other wildlife needs as food and water.

This soil is in capability subclass VIIIe (15) nonirrigated. The Storie index rating is 6.

127—Cieneba-Andregg coarse sandy loams, 30 to 75 percent slopes. This complex consists of steep and very steep soils on mountains. Elevation is 1,000 and 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Cieneba coarse sandy loam and 30 percent Andregg coarse sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Vista coarse sandy loam, 10 percent Sesame sandy loam, 5 percent Shimmon loam, and 5 percent small areas of Hanford gravelly sandy loam, Metz loamy sand, and Tujunga fine sand.

The Cieneba soil is a shallow, excessively drained soil that formed in material weathered from granitic rock. Typically, the surface layer is brown and pale brown coarse sandy loam about 15 inches thick. Weathered granitic rock is at a depth of about 15 inches. Depth to the weathered rock ranges from 12 to 20 inches.

This Cieneba soil has moderately rapid permeability. The effective rooting depth is 12 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

The Andregg soil is a moderately deep, well drained soil that formed in material weathered from granitic rock. Typically, the surface layer is dark grayish brown coarse sandy loam about 9 inches thick. The subsoil is pale brown coarse sandy loam about 8 inches thick. The substratum is yellow coarse sandy loam to a depth of about 23 inches. Below this is weathered granitic rock. Depth to the weathered rock ranges from 20 to 40 inches.

This Andregg soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches. The available water capacity is very low to low. The surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for range. Both soils are limited by erosion hazard and slope. On these steep and very steep soils, erosion control requires proper grazing aided by stock trails and paths. The hazard of wildfire is high, but can be limited by controlling brush and constructing firebreaks.

The Cieneba soil is poorly suited to use as rangeland. It produces only sparse vegetation that is suitable for grazing.

Management of brush for range improvement is not economically feasible. The herbaceous vegetative cover deteriorates readily, and maintenance of adequate crop residue is needed to minimize soil erosion. Chamise and purple needlegrass are important browse and forage species.

The Andregg soil is moderately suited to use as rangeland. Competition for soil moisture by the woody plants is a limitation. The soil produces a fair cover of desirable grasses and forbs, if they can be managed economically to create open areas. Interior live oak, blue oak, soft chess, and wild oats are the main forage and browse species.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 10.

128—Cieneba-Vista coarse sandy loams, 30 to 50 percent slopes. This complex consists of steep soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 45 percent Cieneba coarse sandy loam and 30 percent Vista coarse sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Sesame sandy loam, 5 percent Andregg coarse sandy loam, and 5 percent small areas of Hanford gravelly sandy loam, Positas coarse sandy loam, and Metz loamy sand.

The Cieneba soil is a shallow, excessively drained soil that formed in material weathered from granitic rock. Typically, the surface layer is brown and pale brown coarse sandy loam about 15 inches thick. Weathered granitic rock is at a depth of 15 inches. Depth to the weathered rock ranges from 12 to 20 inches.

This soil has moderately rapid permeability. The effective rooting depth is 12 to 20 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

The Vista soil is a moderately deep, well drained soil that formed in material weathered from granitic rock. Typically, the surface layer is dark brown coarse sandy loam about 14 inches thick. The subsoil is brown coarse sandy loam to a depth of about 29 inches. Below this is

weathered granitic rock. Depth to the weathered rock ranges from 20 to 40 inches.

This soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

These soils are used for rangeland and small areas of urban land.

If used for rangeland, both soils are limited by hazard of erosion. Erosion can be controlled by maintaining adequate crop residue on the soil surface. The hazard of wildfire is high, but can be limited by controlling brush and constructing firebreaks.

The Cieneba soil is poorly suited to use as rangeland. This soil produces sparse amounts of plants suitable for grazing.

Management of brush for range improvement is not economically feasible. Chamise and purple needlegrass are important browse and forage species.

The Vista soil is suited to use as rangeland. It is limited by the low fertility and competition for soil moisture by brush. If brush control can be used economically to create open areas, the soil produces a limited cover of annual grasses and forbs. The soil responds to fertilization and range seeding. Soft chess, filaree, and chamise are important forage and browse species.

Slope, the hazard of erosion, and depth to rock severely limit these soils for building sites and roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields, and onsite investigation is needed to determine the proper method of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 11.

129—Clear Lake clay. This very deep, level, poorly drained soil formed in alluvium derived from mixed rocks. It is in basin areas of the Cholame Valley. Elevation is about 600 feet. This soil may be flooded for brief periods from December through February about once every four years. The mean annual precipitation is 12 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is 51 inches thick. The upper part of the surface layer is grayish brown clay overwash about 10 inches thick. The lower part of the surface layer is very dark gray and dark gray clay about 41 inches thick. The underlying material is grayish brown clay. This soil is calcareous throughout.

Included with this soil in mapping is about 10 percent of a soil similar to Clear Lake clay except that it is dark grayish brown silty clay throughout. Five percent is Capay silty clay, 5 percent is Camarillo silty clay loam, and 5 percent is a soil similar to Clear Lake soil except that it is saline-alkali affected.

This Clear Lake clay has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. The surface is ponded in places. The soil is subject to deposition during the occasional periods of flooding. The shrink-swell potential is high. During winter the high water table is at a depth of 1 to 3 feet and contains medium to high salt concentrations.

This soil is used for cultivated crops.

The soil is suited to dryfarmed small grain and grain hay. It is poorly suited to irrigated crops because of the high water table and hazard of flooding. Inclusions of saline areas are difficult to manage.

The clay texture of this soil makes it hard to till unless soil moisture is favorable. Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

This soil is in capability unit IVw-5 (14) nonirrigated. The Storie index rating is 21.

130—Clear Lake clay, drained. This very deep, level, drained soil formed in alluvium derived from mixed rocks. It is in basins. Elevation is 600 to 1,500 feet. This soil is subject to rare flooding under abnormal conditions. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is very dark gray and dark gray clay about 41 inches thick. The underlying material is grayish brown clay. This soil is calcareous below a depth of 10 inches.

Included with this soil in mapping is about 20 percent of a soil similar to Clear Lake soil except that the surface layer is only 20 to 40 inches thick. Fifteen percent is a soil similar to Clear Lake soil except that the surface layer is dark grayish brown, and 10 percent is small areas of Cropley clay, Mocho clay loam, Sorrento clay loam, and Still clay loam.

This Clear Lake clay has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is very slow, and erosion is not a problem. The shrink-swell potential is high. Depth to the water table is more than 60 inches because of the general lowering of ground water levels as a result of stream cutting.

This soil is used for cultivated crops and urban land.

If irrigated, the soil is suited to alfalfa, sugar beets, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

The clay texture of this soil makes it hard to till unless the soil moisture is favorable. Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

This soil can be irrigated by furrow, border, sprinkler, or drip methods. Because of a slow intake rate and slow permeability, the quantity of water must be controlled to prevent ponding and waterlogging. This can be done by using sprinkler irrigation systems.

This soil has severe limitations for building sites and roads and streets because of low strength, high shrink-swell potential, and the flood hazard. Areas used for these purposes need to be artifically drained and protected from flooding. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the soil. The upper layer of soil should be replaced or covered with a suitable base material to minimize maintenance on roads and streets. All sanitary facilities should be connected to commercial sewers and treatment facilities.

This soil is in capability units IIs-5 (14) irrigated, and IVs-5 (14) nonirrigated. The Storie index rating is 38.

131—Concepcion sandy loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, moderately well drained soil formed in alluvium derived from mixed rocks. It is on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown sandy loam about 20 inches thick. The subsurface layer is gray sandy loam about 2 inches thick. The subsoil is about 29 inches thick. The upper part of the subsoil is grayish brown clay about 14 inches thick. The lower part of the subsoil is mottled, light brownish gray sandy clay loam about 15 inches thick.

Included with this soil in mapping are about 10 percent Botella sandy loam, and 5 percent small areas of Arnold loamy sand, Elder loam, Linne shaly clay loam, and San Andreas sandy loam.

This Concepcion soil has very slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops, rangeland, and urban land.

The soil is suited to such shallow-rooted crops as small grain, grain hay, and pasture.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using a crop rotation help control these hazards. An additional control measure is a system for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

If the soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff. Sprinkler irrigation is best suited.

This soil is well suited to use as rangeland. Erosion is a moderate limitation and can be controlled by maintaining adequate crop residue on the soil surface. During heavy periods of rain, this soil is subject to waterlogging and can become compacted if it is grazed. Good management practices include fertilization and range seeding. Burclover, soft chess, and purple needlegrass are important forage species.

This soil has severe limitations for building sites and roads and streets because of the low strength and the high shrink-swell potential of the subsoil. Foundations and footings should be designed to prevent structural damage caused by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe limitation in septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IVe-3 (14) irrigated, and IVe-3 (14) nonirrigated. The Storie index rating is 32.

132—Cropley clay, 0 to 2 percent slopes. This very deep, nearly level, moderately well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark gray clay about 32 inches thick. The underlying material is grayish brown and pale brown, calcareous clay.

Included with this soil in mapping are about 15 percent Capay clay, 5 percent Clear Lake clay, and 5 percent small areas of Mocho clay loam, Rincon clay loam, and Still clay loam. A few areas have slope of 2 to 5 percent.

This Cropley soil has slow permeability. The effective rooting depth is 60 inches, and available water capacity is high to very high. Surface runoff is slow, and the hazard of erosion is slight. The shrink-swell potential is high (fig. 5).

Most areas of this soil are used for cultivated crops. A small acreage is urban land.

If irrigated, the soil is suited to alfalfa, sugar beets, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

The clay texture of this soil makes it hard to till unless the soil moisture is favorable. Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

This soil can be irrigated by furrow, border, sprinkler, or drip methods. Because of slow permeability, the quantity of water needs to be controlled to prevent ponding and waterlogging. This can be done by sprinkler irrigation systems.

This soil has severe limitations for building sites and roads and streets because of low strength and high shrink-swell potential. Foundations and footings should be designed to prevent structural damage caused by shrinking and swelling of the soil. The upper layer of soil should be replaced or covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent severely limits the soil for

Figure 5.—Cropley clay, 0 to 2 percent slopes, has high shrink-swell potential. When this soil becomes dry, the surface cracks.

septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IIs-5 (14) irrigated, and IVs-5 (14) nonirrigated. The Storie index rating is 42.

133—Cropley clay, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, moderately well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark gray clay about 32 inches thick. The underlying material is grayish brown and pale brown, calcareous clay.

Included with this soil in mapping are about 10 percent Capay clay and 5 percent small areas of Mocho clay loam, Rincon clay loam, and Still clay loam. A few areas are gravelly and cobbly on the surface. In places, slope is 9 to 15 percent.

This Cropley soil has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. Surface runoff is medium, and the hazard of erosion is moderate. The shrink-swell potential is high.

Most areas of this soil are used for cultivated crops. A small acreage is urban land.

If irrigated, the soil is well suited to alfalfa, sugar beets, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

The clay texture of this soil makes tillage difficult unless the soil moisture is favorable. Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. These hazards can be controlled by cultivating

across the slope, maintaining crop residue on or near the surface during periods of rain, and by crop rotation. Orchards and vineyards can be protected by using crop residue and cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

If the soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff caused by slow permeability. Sprinkler and drip methods of irrigation are best suited to this soil because of the slope and hazard of erosion.

This soil has severe limitations for building sites and roads and streets because of low strength and high shrink-swell potential. Foundations and footings should be designed to prevent structural damage by the shrinking and swelling or compressibility of the soil. The upper layer of soil should be replaced or covered with suitable base material to minimize maintenance of roads and streets. The slow absorption of effluent severely limits the soil for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IIe-5 (14) irrigated, and IVe-5 (14) nonirrigated. The Storie index rating is 38.

134—Dibble clay loam, 9 to 15 percent slopes. This moderately deep, rolling, well drained soil formed in material weathered from sandstone and shale. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. The underlying material, at a depth of 34 inches, is weathered shale. Depth to the weathered shale ranges from 20 to 40 inches.

Included with this soil in mapping are about 15 percent Ryer clay loam and 5 percent small areas of Arbuckle fine sandy loam, Gaviota sandy loam, Millsholm clay loam, and Xerofluvents. A few areas have deep gullies and rock outcrop.

This Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops and range.

If irrigated, the soil is suited to almonds, wine grapes, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue help to improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard, but can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion also needs to be controlled by annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to this soil because of slope, soil depth, and slow permeability.

This soil is well suited to use as rangeland. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction is less if the soil is grazed when the moisture content is less than field capacity. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

This soil is in capability units IIIe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 35.

135—Dibble clay loam, 15 to 30 percent slopes. This moderately deep, hilly, well drained soil formed in material weathered from sandstone and shale. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. The underlying material, at a depth of about 34 inches, is weathered shale. Depth to the weathered shale ranges from 20 to 40 inches.

Included with this soil in mapping is about 10 percent Millsholm clay loam. Ten percent is clay loam underlain at a depth of 20 to 40 inches by weathered sandstone, and 5 percent is small areas of Gaviota sandy loam, Gilroy gravelly loam, Ryer clay loam, and San Andreas sandy loam. A few areas have deep gullies and rock outcrop.

This Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops and range.

If irrigated, the soil is suited to almonds, wine grapes, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard that can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control also requires annual cover

crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system for collecting and disposing of excess water from higher-lying areas is needed.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to this soil because of slope, soil depth, and slow permeability.

This soil is well suited to use as rangeland. The main limitations are erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction is minimized if the soil is grazed when the moisture content is less than field capacity. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

This soil is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 29.

136—Dibble clay loam, 30 to 50 percent slopes. This moderately deep, steep, well drained soil formed in material weathered from sandstone and shale. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. The underlying material, at a depth of about 34 inches, is weathered shale. Depth to the weathered shale ranges from 20 to 40 inches.

Included with this soil in mapping is about 10 percent Millsholm clay loam. Ten percent is clay loam underlain at 20 to 40 inches by weathered sandstone, and 5 percent is small areas of Balcom loam, Gaviota sandy loam, Gilroy gravelly loam, Nacimiento silty clay loam, San Andreas sandy loam, and rock outcrop.

This Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

This soil is used mainly for range.

This soil is not suited to cultivated crops because of steep slopes and the high erosion hazard.

Some areas of this soil are used for almond orchards and vineyards. Erosion can be controlled by permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

This soil is well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. If the soil is grazed when the soil moisture content is favorable, there is less compaction. This soil responds to fertilizer and range seeding. Soft chess, wild oats, and filaree are important forage species.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 18.

137—Dibble clay loam, 50 to 75 percent slopes. This moderately deep, very steep, well drained soil formed in material weathered from sandstone and shale. It is on mountains. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. The underlying material, at a depth of about 34 inches, is weathered shale. Depth to the weathered shale ranges from 20 to 40 inches.

Included with this soil in mapping are about 5 percent San Andreas sandy loam, 5 percent Millsholm clay loam, and 5 percent small areas of Balcom loam, Gaviota sandy loam, Nacimiento silty clay loam, and rock outcrop.

This Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high. The subsoil has high shrink-swell potential.

This soil is used for rangeland but is poorly suited to this use. The erosion hazard, surface compaction, and slope are the main limitations. On this very steep soil, erosion can be controlled by maintaining adequate crop residue on the soil surface, and by use of stock trails and paths. If the soil is grazed when the surface soil moisture is favorable, there is less compaction. Soft chess, wild oats, and burclover are important forage species.

This soil is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 9.

138—Elder loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in alluvium derived from mixed rocks. It is on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is about 22 inches thick. The upper part of the surface layer is dark gray loam about 12 inches thick. The lower part of the surface layer is dark gray sandy loam about 10 inches thick. The underlying material is stratified layers of grayish brown, dark gray, and dark grayish brown sandy loam, loam, and thin strata of loamy sand.

Included with this soil in mapping are about 15 percent Still clay loam, 10 percent Pico fine sandy loam, and 5

percent small areas of Hanford fine sandy loam, Metz loamy sand, Mocho clay loam, San Emigdio fine sandy loam, and Tujunga fine sand. A few areas have wet spots.

This Elder soil has moderate permeability. The effective rooting depth is 60 inches. The available water capacity is moderate to high. The surface runoff is slow, and the hazard of erosion is slight.

Most areas of this soil are used for cultivated crops. A small acreage is urban land.

If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

This soil has slight limitations if it is cultivated. Proper tillage and use of crop residue help to maintain soil tilth and structure, and improve fertility and water infiltration.

This soil is best irrigated by furrow, border, sprinkler, or drip methods.

This soil is suited to building sites. The low strength of the soil is a limitation for roads and streets, but can be overcome by proper design and installation procedures.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated The Storie index rating is 100.

139—Elder loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium derived from mixed rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is about 22 inches thick. The upper part of the surface layer is dark gray loam about 12 inches thick. The lower part of the surface layer is dark gray sandy loam about 10 inches thick. The underlying material is stratified layers of grayish brown, dark gray, and dark grayish brown sandy loam, loam, and thin strata of loamy sand.

Included with this soil in mapping are about 15 percent Still clay loam, 10 percent Pico fine sandy loam, and 5 percent small areas of Hanford fine sandy loam, Metz loamy sand, Mocho clay loam, San Emigdio fine sandy loam, and Tujunga fine sand. A few areas have wet spots.

Most areas of this soil are used for cultivated crops. A small acreage is urban land.

If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay. Proper tillage and use of crop residue maintain soil tilth and structure, and improve fertility and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control these hazards. Orchards and vineyards can be protected by use of crop residue and cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited to this soil because of slope and the erosion hazard.

This soil is suited to building sites. Low strength of the soil is a limitation for roads and streets, but can be overcome by proper design and installation procedures.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 90.

140—Elder loam, flooded, 0 to 5 percent slopes. This very deep, nearly level to gently sloping, well drained soil formed in alluvium derived from mixed rocks. It is on flood plains along major stream channels. Elevation is 600 to 1,500 feet. The soil is subject to flooding for brief periods from November through March about once in 10 years. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is about 22 inches thick. The upper part of the surface layer is dark gray loam about 12 inches thick. The lower part of the surface layer is dark gray sandy loam about 10 inches thick. The underlying material is stratified layers of grayish brown, dark gray, and dark grayish brown sandy loam, loam, and thin strata of loamy sand.

Included with this soil in mapping is about 15 percent Metz loamy sand. Ten percent is a soil similar to Elder soil except that it has a loamy sand overwash, 5 percent is Pico fine sandy loam, 5 percent is Still clay loam, and 5 percent is small areas of Hanford fine sandy loam, Mocho clay loam, San Emigdio fine sandy loam, and Tujunga fine sand.

This Elder soil has moderate permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is slow, and the erosion hazard is slight.

This soil is used for cultivated crops and range.

If the soil is irrigated, it is suited to alfalfa, sugar beets, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Flooding is the main hazard. Damage to crops will occur unless protection is provided. Return of crop residue to the soil or the regular addition of other organic material helps to maintain fertility and increase water infiltration.

This soil can be irrigated by furrow, border, sprinkler, or drip methods.

This soil is well suited to use as rangeland. Good management includes fertilization, range seeding, and proper grazing use. Soft chess, wild oats, and filaree are important forage species.

This soil has a severe limitation for buildings and roads and streets because of the flood hazard. Areas used for these purposes need to be protected from flooding.

This soil is in capability units IIw-2 (14) irrigated, and IVw-2 (14) nonirrigated. The Storie index rating is 85.

141—Gaviota-Rock outcrop complex, 30 to 75 percent slopes. This complex consists of steep to very steep soils on mountains. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Gaviota sandy loam and 25 percent Rock outcrop. The areas of Gaviota soil and the Rock outcrop are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this complex in mapping are about 15 percent Cieneba coarse sandy loam, 10 percent San Andreas sandy loam, 5 percent Dibble clay loam, and 5 percent small areas of McMullin gravelly loam, Lompico loam, and Shimmon loam. In a few areas, slope is 15 to 30 percent.

The Gaviota soil is a shallow, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is brown and light brown sandy loam about 10 inches thick. Hard sandstone is at a depth of about 10 inches. Depth to the sandstone ranges from 6 to 12 inches.

This soil has moderately rapid permeability. The effective rooting depth is 6 to 12 inches, and the available water capacity is very low. Surface runoff is very rapid, and the hazard of erosion is very high.

Rock outcrops are areas of hard sandstone.

This soil is used for wildlife habitat and watershed. It has aesthetic value.

This soil produces sparse amounts of plants suitable for grazing. Chamise and purple needlegrass are important wildlife browse and forage species.

Wildfire hazard is high, but can be limited by brush management and properly constructed firebreaks. This soil is so fragile that any disturbance can cause severe erosion.

This soil has very little potential for establishing vegetation useful to wildlife. The associated Rock outcrop provides denning and cover sites for predators and small mammals. Its value for such use, however, depends on its proximity to such other wildlife needs as food and water.

This complex is in capability subclass VIIIe (15) nonirrigated. The Storie index rating is 6.

142—Gaviota-San Andreas association, moderately steep. This association consists of soils on hills. Slope is 15 to 30 percent. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 35 percent Gaviota sandy loam and 25 percent San Andreas sandy loam. The Gaviota soil has south and east aspects. The San Andreas soil has north and west aspects.

Included with these soils in mapping are about 20 percent Cieneba coarse sandy loam, 10 percent Shimmon loam, and 10 percent small areas of Dibble clay loam, rock outcrop, and Vista coarse sandy loam. In a few areas, slope is 30 to 50 percent.

The Gaviota soil is a shallow, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is brown and light brown sandy loam about 15 inches thick. Hard sandstone is at a depth of about 15 inches. Depth to sandstone ranges from about 12 to 20 inches.

This Gaviota soil has moderately rapid permeability. The effective rooting depth is 12 to 20 inches, and the available water capacity is very low. Surface runoff is rapid, and the hazard of erosion is high.

The San Andreas soil is a moderately deep, well drained soil that formed in material weathered from sandstone.

Typically, the surface layer is brown sandy loam about 11 inches thick. The subsoil is light brown heavy sandy loam to a depth of about 29 inches. The underlying material is weathered sandstone. Depth to the sandstone ranges from 20 to 40 inches.

The San Andreas soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

These soils are used for rangeland. Both soils are limited by the erosion hazard. Erosion can be controlled by proper grazing. The wildfire hazard is high, but can be reduced by brush control and properly constructed firebreaks.

The Gaviota soil is poorly suited to use as rangeland. This soil produces sparse amounts of plants suitable for grazing. Brush management for range improvement is not economically feasible. The herbaceous vegetative cover deteriorates readily, and adequate crop residue on the soil surface is needed to minimize soil erosion. Chamise and purple needlegrass are important browse and forage species.

The San Andreas soil is moderately suited to use as rangeland. Coast live oak, filaree, soft chess, and wild oats are important forage and browse species.

This association is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 20 for the Gaviota part, and 35 for the San Andreas part.

143—Gaviota-San Andreas association, very steep. This association consists of soils on mountains. Slope is 30 to 75 percent. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 35 percent Gaviota sandy loam and 25 percent San Andreas sandy loam. The Gaviota soil has south and east aspects. The San Andreas soil has north and west aspects.

Included with these soils in mapping are about 10 percent Dibble clay loam, 10 percent rock outcrop, 10

percent Shimmon loam, and 10 percent small areas of Arnold loamy sand, Cieneba coarse sandy loam, and Vista coarse sandy loam.

The Gaviota soil is shallow and well drained. It formed in material weathered from sandstone. Typically, the surface layer is brown and light brown sandy loam about 15 inches thick. Hard sandstone is at a depth of about 15 inches. Depth to the sandstone ranges from 12 to 20 inches.

This Gaviota soil has moderately rapid permeability. The effective rooting depth is 12 to 20 inches, and the available water capacity is very low. Surface runoff is very rapid, and the hazard of erosion is very high.

The San Andreas soil is a moderately deep, well drained soil that formed in material weathered from sandstone.

Typically, the surface layer is brown sandy loam about 11 inches thick. The subsoil is light brown heavy sandy loam about 18 inches thick. Underlying this is weathered sandstone. Depth to the sandstone ranges from 20 to 40 inches.

The San Andreas soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland. Both soils are limited by the erosion hazard and slope. On these steep and very steep soils, erosion can be controlled by maintaining adequate crop residue on the soil surface. Stock trails can be used to obtain grazing distribution. The wildfire hazard is high, but can be limited by brush management and properly constructed firebreaks.

The Gaviota soil is poorly suited to use as rangeland. This soil produces sparse amounts of plants suitable for grazing. Brush control for range improvement is not feasible. The herbaceous vegetative cover deteriorates readily, and adequate crop residue is needed to minimize soil erosion. Chamise and purple needlegrass are important browse and forage species.

The San Andreas soil is moderately suited to use as rangeland. Coast live oak, filaree, soft chess, and wild oats are important browse and forage species.

This association is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 7 for the Gaviota part, and 12 for the San Andreas part.

144—Gazos shaly clay loam, 9 to 30 percent slopes. This moderately deep, rolling to hilly, well drained soil formed in material weathered from shale. It is on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is gray shaly clay loam about 28 inches thick. Hard shale is at a depth of about 28 inches. Depth to shale ranges from 20 to 40 inches.

Included with this soil in mapping are about 5 percent Linne shaly clay loam and 5 percent San Andreas sandy loam. Five percent is a soil similar to Gazos soil except that weathered shale is at a depth 40 to 60 inches, and 5 percent is small areas of Lockwood shaly loam, Lodo gravelly clay loam, rock outcrop, and Santa Lucia shaly clay loam.

This Gazos soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

About 80 percent of this soil has been cleared for cultivated crops, and the rest is used for rangeland and urban land.

If irrigated, the soil is suited to wine grapes, almonds, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration. Generally, there is enough gravel present to interfere slightly with tillage.

Soil erosion is a hazard, but can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control also includes use of annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to this soil because of slope and soil depth.

This soil is suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction decreases if the soil is grazed when the moisture content is less than field capacity. This soil responds to fertilization and range seeding. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

Building sites and roads and streets are severely limited by slope, the erosion hazard, and depth to rock. In addition, low soil strength is a limitation for roads and streets, but can be corrected by replacing the base material. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope, slow absorption of effluent, and depth to rock severely limit this soil for septic tank absorption fields. Onsite investigation is needed to determine the proper method of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This soil is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 28.

145—Gazos shaly clay loam, 30 to 50 percent slopes. This moderately deep, steep, well drained soil formed in material weathered from shale. It is on hills. Elevation is 600 to 1,500 feet. The mean annual precipi-

tation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is gray shaly clay loam about 28 inches thick. The underlying material is hard shale. Depth to the shale ranges from 20 to 40 inches.

Included with this soil in mapping are about 5 percent Linne shaly clay loam and 5 percent San Andreas sandy loam. Five percent is a soil similar to Gazos soil except that weathered shale is at a depth of 40 to 60 inches, and 5 percent is small areas of Lockwood shaly loam, Lodo gravelly clay loam, rock outcrop, and Santa Lucia shaly clay loam.

This Gazos soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

This soil is used mainly for range and as urban land. Some areas of this soil are used for almond orchards and vineyards.

This soil is not suited to cultivated crops because of the steep slopes and high erosion hazard. Erosion can be controlled by use of permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

This soil is well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction decreases if the soil is grazed when the moisture content is less than field capacity. This soil responds to fertilization and range seeding. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

Building sites and roads and streets are severely limited by slope, the erosion hazard, and depth to rock. In addition, the low strength of the soil is a limitation for roads and streets, but can be corrected by replacing the base material. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and by establishing permanent plant cover on side slopes. Slope, slow absorption of effluent, and depth to rock severely limit this soil for septic tank absorption fields. Onsite investigation is needed to determine the proper method of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 16.

146—Gilroy-Rock outcrop complex, 30 to 50 percent slopes. This complex consists of steep soils on mountains. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 250 days. This complex is about 55 percent Gilroy gravelly loam and 30 percent Rock outcrop. Areas of the Gilroy soil and Rock outcrop are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this soil in mapping are about 5 percent Henneke very cobbly clay loam, 5 percent Dibble clay loam, and 5 percent small areas of Millsholm clay loam and Lodo gravelly clay loam. In a few areas, slope is 50 to 75 percent.

The Gilroy soil is a moderately deep, well drained soil that formed in material weathered from partly metamorphosed sandstone. Typically, the surface layer is brown gravelly loam about 9 inches thick. The subsoil is brown gravelly clay loam about 15 inches thick. Underlying this is hard metasandstone. Depth to bedrock ranges from 20 to 40 inches.

This Gilroy soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

Rock outcrops are areas of hard metasandstone.

This soil is used for rangeland, and it is well suited to this use. Erosion hazard and competition are the main limitations. Erosion can be controlled by maintaining adequate crop residue on the soil surface. If woody plants can be economically managed to create open areas, this soil produces a good cover of desirable grasses and forbs. If the soil is barren, finer material erodes and leaves a layer of gravel on the surface. This gravel tends to retard seed germination and seedling growth. Interior live oak, soft chess, and wild oats are important browse and forage species.

This soil has some potential for the establishment of vegetation useful to wildlife. The associated Rock outcrops can provide denning and cover sites for predators and small mammals. However, value for wildlife use depends on the proximity of the soil to such other wildlife needs as food and water.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 9.

147—Hanford and Greenfield fine sandy loams, 0 to 2 percent slopes. This undifferentiated unit consists of soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This unit is made up of 40 percent Hanford fine sandy loam and 30 percent Greenfield fine sandy loam. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping are about 15 percent Arbuckle fine sandy loam, 10 percent San Ysidro loam, and 5 percent small areas of Cropley clay, Metz loamy sand, Pico fine sandy loam, Rincon clay loam, and Tujunga fine sand.

The Hanford soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is light brownish gray fine sandy loam about 25 inches thick. The underlying material is pale brown and light yellowish brown fine sandy loam.

The Hanford soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the availa-

ble water capacity is moderate to high. Surface runoff is slow, and the hazard of erosion is slight.

The Greenfield soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 8 inches thick. The subsoil is pale brown, brown, and yellowish brown fine sandy loam about 46 inches thick. The substratum is light yellowish brown very gravelly sand.

The Greenfield soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is slow, and the hazard of erosion is slight.

Most areas of these soils are used for cultivated crops and range. A small acreage is urban land.

If irrigated, the soils are well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, they are suited only to small grain and grain hay.

Low rainfall is the only limitation if the soil is cultivated. Use of crop residue or the regular addition of other organic material improves fertility and increases water infiltration. Furrow, border, sprinkler, or drip methods of irrigation are best suited.

These soils are well suited to use as rangeland and have few limitations. Good management includes fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

These soils are suited to building sites, septic tank absorption fields, and roads and streets.

This map unit is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 95 for the Hanford soil, and 100 for the Greenfield soil.

148—Hanford and Greenfield fine sandy loams, 2 to 9 percent slopes. This undifferentiated unit consists of soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This unit is made up of 40 percent Hanford fine sandy loam and 30 percent Greenfield fine sandy loam. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping are about 15 percent Arbuckle fine sandy loam, 10 percent San Ysidro loam, and 5 percent small areas of Cropley clay, Metz loamy sand, Pico fine sandy loam, Rincon clay loam, and Tujunga fine sand.

The Hanford soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is light brownish gray fine sandy loam about 25 inches thick. The underlying material is pale brown and light yellowish brown fine sandy loam.

The Hanford soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

The Greenfield soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown fine sandy loam about 8 inches thick. The subsoil is pale brown, brown, and yellowish brown fine sandy loam about 46 inches thick. The substratum is light yellowish brown very gravelly sand.

The Greenfield soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

Most areas of these soils are used for cultivated crops and rangeland. A small acreage is urban land.

If irrigated, the soils are well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, they are suited only to small grain and grain hay. Return of crop residue or the regular addition of other organic material helps to improve fertility and increase water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by use of crop residue and by cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited to these soils because of slope.

These soils are well suited to use as rangeland. The erosion hazard is moderately limiting, but can be controlled by maintaining adequate residue on the soil surface. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, and filaree are the important forage species.

These soils are suited to building sites, septic tank absorption fields, and roads and streets.

This map unit is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 85 for the Hanford soil, and 90 for the Greenfield soil.

149—Hanford and Greenfield gravelly sandy loams, 0 to 2 percent slopes. This undifferentiated unit consists of soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This unit is made up of 40 percent Hanford gravelly sandy loam and 30 percent Greenfield gravelly sandy loam. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping are about 15 percent Arbuckle fine sandy loam, 10 percent San Ysidro loam, and 5 percent small areas of Cropley clay, Lockwood shaly loam, Metz loamy sand, Pico fine sandy loam, Rincon clay loam, and Tujunga fine sand.

The Hanford soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically,

the surface layer is light brownish gray gravelly sandy loam about 25 inches thick. The underlying material is pale brown and light yellowish brown gravelly sandy loam.

The Hanford soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low to moderate. Surface runoff is slow, and the hazard of erosion is slight.

The Greenfield soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown gravelly sandy loam about 8 inches thick. The subsoil is pale brown, brown, and yellowish brown gravelly sandy loam about 46 inches thick. The substratum is light yellowish brown very gravelly sand.

The Greenfield soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low to moderate. Surface runoff is slow, and the hazard of erosion is slight.

These soils are used for cultivated crops, rangeland, and urban land.

If irrigated, the soils are suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, these soils are suited only to small grain and grain hay.

Gravel in the surface layer interferes slightly with tillage operations. Return of crop residue or the regular addition of other organic material improves fertility and the available water capacity of the soil.

Furrow, border, sprinkler, or drip irrigation systems are best suited. These soils are droughty, and the application of water needs to be light and frequent. If furrow or border methods of irrigation are used, runs should be short because of the fast intake rate.

These soils are suited to use as rangeland and have few limitations. Good management includes fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

These soils are suited to building sites, septic tank absorption fields, and roads and streets.

This map unit is in capability units IIs-4 (14) irrigated, and IVs-4 (14) nonirrigated. The Storie index rating is 70 for both Hanford and Greenfield soils.

150—Hanford and Greenfield gravelly sandy loams, 2 to 9 percent slopes. This undifferentiated unit consists of soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This unit is made up of 40 percent Hanford gravelly sandy loam and 30 percent Greenfield gravelly sandy loam. Both soils can occur in a mapped area, or either soil can occur separately.

Included with these soils in mapping are about 15 percent Arbuckle fine sandy loam, 10 percent San Ysidro loam, and 5 percent small areas of Cropley clay, Lockwood shaly loam, Metz loamy sand, Pico fine sandy loam, Rincon clay loam, and Tujunga fine sand.

The Hanford soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is light brownish gray gravelly sandy loam about 25 inches thick. The underlying material is pale brown and light yellowish brown gravelly sandy loam.

The Hanford soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low to moderate. Surface runoff is medium, and the hazard of erosion is moderate.

The Greenfield soil is a very deep, well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown gravelly sandy loam about 8 inches thick. The subsoil is pale brown, brown, and yellowish brown gravelly sandy loam about 46 inches thick. The substratum is light yellowish brown very gravelly sand.

The Greenfield soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low to moderate. Surface runoff is medium, and the hazard of erosion is moderate.

These soils are used for cultivated crops, rangeland, and urban land.

If irrigated, the soils are suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, they are best suited to small grain and grain hay.

Gravel in the surface layer interferes slightly with tillage operations. Return of crop residue or the regular addition of other organic material improves fertility and the available water capacity of the soil.

Sheet and rill erosion are hazards if the soil is cultivated. These hazards can be controlled by cultivating across the slopes, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by use of crop residue and by cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited to these soils because of slope and the erosion hazard.

These soils are well suited to use as rangeland. The erosion hazard is a moderate limitation, but can be controlled by maintaining adequate crop residue on the soil surface and by proper grazing use. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, and filaree are important forage species.

These soils are suited to building sites, septic tank absorption fields, and roads and streets.

This map unit is in capability units IIe-4 (14) irrigated, and IVe-4 (14) nonirrigated. The Storie index rating is 63 for both Hanford and Greenfield soils.

151—Henneke-Rock outcrop complex, 15 to 75 percent slopes. This complex consists of moderately steep to very steep soils on mountains. Elevation is

1,000 to 3,400 feet. Cobbles and stones are on 10 to 15 percent of the surface. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 250 days. This complex is about 60 percent Henneke very cobbly clay loam and 20 percent Rock outcrop. The areas of Henneke soils and Rock outcrop are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this complex in mapping are about 10 percent of a soil similar to Henneke soil except that depth to bedrock is 20 to 40 inches, and 10 percent small areas of Gaviota sandy loam, Gilroy gravelly loam, McMullin gravelly loam, Lompico loam, Millsholm clay loam, and Shimmon loam.

The Henneke soil is a shallow, somewhat excessively drained soil that formed in material weathered from serpentinitic rock. Typically, the surface layer is reddish brown very cobbly clay loam about 8 inches thick. The subsoil is reddish brown very cobbly clay about 8 inches thick. Hard serpentinitic rock is at a depth of about 16 inches. Depth to the rock ranges from 10 to 20 inches.

This soil has moderately slow permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low. Surface runoff is very rapid, and the hazard of erosion is very high. The calcium to magnesium ratio is 1:1, or less.

Rock outcrops are areas of hard serpentinitic rock.

This soil is used for rangeland, wildlife habitat, and watershed. It also has aesthetic value.

This soil produces sparse amounts of plants suitable for grazing. Chamise, manzanita, foxtail fescue, and purple needlegrass are the main forage and browse species. The wildfire hazard is high, but can be limited by brush control and properly constructed firebreaks. This soil is unstable and any disturbance can cause severe erosion.

This soil has very little potential for the establishment of vegetation useful to wildlife. The associated Rock outcrop provides denning and cover sites for predators and small mammals, but its value for wildlife use depends on the proximity of the soil to such other wildlife needs as food and water.

This complex is in capability subclass VIIIe (15) nonirrigated. The Storie index rating is 3.

152—Linne-Calodo complex, 9 to 30 percent slopes. This complex consists of moderately steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation ranges from 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Linne shaly clay loam and 25 percent Calodo clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Nacimiento silty clay loam, 10 percent Los Osos clay loam, and 5 percent Zakme clay. Five percent is a soil similar to Linne soil except that it contains 35 to 50 percent pebbles, cobbles, and stones by volume. Five percent is a soil similar to Calodo soil except that it is underlain by hard, unweathered rock or a discontinuous, indurated lime hardpan. Five percent is small areas of Ayar silty clay, Balcom loam, Cropley clay, Diablo clay, Lockwood shaly loam, and rock outcrop.

The Linne soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray and dark grayish brown shaly clay loam about 34 inches thick (fig. 6). The underlying material, to a depth of 39 inches, is white shaly clay loam. Below that it is weathered, calcareous shale. This soil is calcareous throughout. Depth to the shale ranges from 20 to 40 inches.

Figure 6.—Typical profile of Linne shaly clay loam showing the thick, dark surface layer. Generally, this layer is 34 inches thick.

The Linne soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Calodo soil is a shallow, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is grayish brown, calcareous clay loam underlain by weathered, calcareous shale at a depth of about 16 inches. Depth to the shale ranges from 10 to 20 inches.

The Calodo soil has moderately slow permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

About 80 percent of these soils has been cleared for cultivated crops, and the rest is used for rangeland and small areas of urban land.

If irrigated, the Linne soil is suited to almonds, wine grapes, pasture, small grain, and grain hay. The Calodo soil is poorly suited to pasture, small grain, and grain hay because of shallow soil depth. If dryfarmed, both soils are suited only to small grain and grain hay.

Proper tillage and use of crop residue maintain or improve soil tilth, structure, fertility, and water infiltration. Gravel in the surface layer of the Linne soil interferes slightly with tillage operations.

Soil erosion (fig. 7) can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control also requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soils are irrigated, the amount of water applied needs to be controlled in order to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to these soils because of slope, soil depth, and slow intake.

If used for rangeland, both soils are limited by erosion and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. If the soil is grazed when the soil moisture content is favorable, there is less compaction. These soils respond to fertilization and range seeding.

The Linne soil is well suited to use as rangeland. It supports groves of live oak and blue oak. If this soil is barren, the finer material erodes and leaves a layer of shale fragments on the surface. These shale fragments tend to retard seed germination and seedling growth. Soft chess, wild oats, and filaree are important forage species.

The Calodo soil is moderately suited to use as rangeland. This soil produces a limited amount of vegetation suitable for grazing. If brush and woody plants can be managed to create open areas, the soil produces a good cover of desirable grasses and forbs. Soft chess, wild oats, filaree, chamise, and scrub oak are important forage and browse species.

Slope, erosion, and depth to rock severely limit these soils for building sites and roads and streets. Erosion can be controlled by using minimum grading, runoff and sediment control structures, and by establishing permanent plant cover on side slopes. Excessive slope, slow absorption of effluent, and limited depth to rock severely limit these soils for use as septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities need to be connected to commercial sewers.

This complex is in capability units IVe-1 (15), irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 39.

153—Linne-Calodo complex, 30 to 50 percent slopes. This complex consists of steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Linne shaly clay loam and 25 percent Calodo clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Nacimiento silty clay loam, 10 percent Los Osos clay loam, and 5 percent Zakme clay. Five percent is a soil similar to Linne soil except that pebbles, cobbles, and stones make up 35 to 50 percent of the soil by volume. Five percent is a soil similar to Calodo soil except that it is underlain by hard unweathered rock or a discontinuous indurated lime hardpan, and 5 percent is small areas of Ayar silty clay, Balcom loam, Cropley clay, Diablo clay, Lockwood shaly loam, and rock outcrop.

The Linne soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray and dark grayish brown shaly clay loam about 34 inches thick. The underlying material, to a depth of 39 inches, is white shaly clay loam. Below that it is weathered, calcareous shale. This soil is calcareous throughout. Depth to the shale ranges from 20 to 40 inches.

This Linne soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Calodo soil is a shallow, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is grayish brown, calcareous clay loam about 16 inches thick. Weathered, calcareous shale is at a depth of about 16 inches. Depth to the shale ranges from 10 to 20 inches.

This soil has moderately slow permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

About 50 percent of these soils has been cleared for cultivated crops, and the rest is used for rangeland. Small areas are used for urban land. Some areas are used for almond orchards and vineyards.

Figure 7—Linne-Calodo complex, 9 to 30 percent slopes. Erosion increases with steepness, and eroded soil materials accumulate at the base of the slope

The soils are not suited to cultivated crops because of steep slopes and the high erosion hazard. Erosion control requires permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage.

If used for rangeland, both soils are limited by erosion and compaction. Maintaining adequate crop residue on the soil surface helps control erosion. Compaction decreases if the soil is grazed when the soil moisture content is favorable. These soils respond to fertilization and range seeding.

The Linne soil is well suited to use as rangeland. It supports groves of live oak and blue oak. If this soil is barren, the finer material erodes and leaves a layer of shale fragments on the surface. These shale fragments tend to retard seed germination and seedling growth. Soft chess, wild oats, and filaree are important forage species.

The Calodo soil is moderately suited to use as rangeland. This soil produces sparse amounts of vegetation suitable for grazing. If brush and woody plants can be managed to create open areas, the soil produces a good cover of desirable grasses and forbs. Soft chess, wild

oats, filaree, chamise, and scrub oak are important forage and browse species.

Slope, erosion, and depth to rock severely limit these soils for building sites and roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and establishment of permanent plant cover on side slopes. Excessive slope, slow absorption of effluent, and limited depth to rock severely limit these soils for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities need to be connected to commercial sewers.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 22.

154—Linne-Calodo complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Linne shaly clay loam and 25 percent Calodo clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Zakme clay, 15 percent of a soil similar to Linne soil except that pebbles, cobbles, and stones make up 40 to 60 percent of the soil by volume, 10 percent of a soil similar to Calodo soil except that it is underlain by hard unweathered rock, and 5 percent small areas of Ayar silty clay, Balcom loam, Diablo clay, Los Osos clay loam, rock outcrop, and Shimmon loam. In a few areas slope is 30 to 50 percent.

The Linne soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray and dark grayish brown shaly clay loam about 34 inches thick. The underlying material, to a depth of 39 inches, is white shaly clay loam. Weathered, calcareous shale is at a depth of 39 inches. This soil is calcareous throughout. Depth to the shale ranges from 20 to 40 inches.

This Linne soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

The Calodo soil is a shallow, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is grayish brown, calcareous clay loam about 16 inches thick over weathered, calcareous shale. Depth to the shale ranges from 10 to 20 inches.

This Calodo soil has moderately slow permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland. Both soils are limited by erosion, surface compaction, and slope. On these very steep slopes, maintaining adequate plant residue on the slope surface helps control erosion. Stock trails can be used to help grazing distribution. Compaction decreases if the soils are grazed when the surface soil moisture is favorable.

The Linne soil is well suited to use as rangeland. It supports groves of live oak and blue oak. When this soil is barren, the finer material erodes and leaves a layer of shale fragments on the surface. These shale fragments tend to retard seed germination and seedling growth. Soft chess, wild oats, and filaree are important forage species.

The Calodo soil is suited to use as rangeland. This soil has sparse amounts of vegetation suitable for grazing. If brush and woody plants can be managed to create open areas, the soil produces a good cover of desirable grasses and forbs. Soft chess, wild oats, filaree, chamise, and scrub oak are important forage and browse species.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 10.

155—Linne-Diablo complex, 9 to 15 percent slopes. This complex consists of rolling soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Linne shaly clay loam and 30 percent Diablo clay. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Nacimiento silty clay loam, 10 percent Los Osos clay loam, and 5 percent small areas of Ayar silty clay, Cropley clay, and Lockwood shaly loam.

The Linne soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray and dark grayish brown shaly clay loam about 34 inches thick. The underlying material, to a depth of 39 inches, is white shaly clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the shale ranges from 20 to 40 inches.

The Linne soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is medium, and the hazard of erosion is moderate.

The Diablo soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray clay about 38 inches thick. The underlying material is light yellowish brown clay to a depth of about 50 inches. Below that is weathered, calcareous sandstone. This soil is calcareous throughout. Depth to the sandstone ranges from 40 to 60 inches.

The Diablo soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is moderate to very high. Surface runoff is

medium, and the hazard of erosion is moderate. The shrink-swell potential is high.

These soils are used for cultivated crops and rangeland.

If irrigated, the soils are suited to almonds, wine grapes, pasture, small grain, and grain hay. If dryfarmed, they are best suited to small grain and grain hay.

The clay texture of the Diablo soil makes it hard to till unless the soil moisture is favorable. Generally there is enough gravel present on the Linne soil to interfere slightly with tillage operations. Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard, but can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control also requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to these soils because of slope, soil depth, slow intake, and moderately slow and slow permeability.

These soils are well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate crop residue on the soil surface helps control erosion. If the soil is grazed when the soil moisture content is favorable, there is less compaction. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species on these soils.

This complex is in capability units IIIe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 41.

156—Linne-Zakme complex, 30 to 50 percent slopes. This complex consists of steep soils on mountains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 16 to 20 inches, the mean annual air temperature is 56 to 60 degrees F, and the average frost-free season is 200 days. This complex is about 45 percent Linne shaly clay loam and 35 percent Zakme clay. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 10 percent Calodo clay loam. Five percent is a soil similar to Linne soil except that pebbles, cobbles, and stones make up 40 to 60 percent of the soil by volume, and 5 percent is small areas of Diablo clay, Los Osos clay loam, and Still clay loam. In a few areas, slope is more than 50 percent.

The Linne soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark gray and dark grayish brown shaly clay loam about 34 inches thick. The underlying material, to a depth of 39 inches, is white shaly clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the shale ranges from 20 to 40 inches.

The Linne soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Zakme soil is a deep, well drained soil that formed in material weathered from calcareous shale. Typically, the surface layer is dark gray clay about 36 inches thick. The underlying material, to a depth of 55 inches, is light yellowish brown, calcareous clay. Below that is weathered, calcareous shale. Depth to the shale ranges from 40 to 60 inches.

This Zakme soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is high. Surface runoff is rapid, and the hazard of erosion is high. The shrink-swell potential is high.

These soils are used mainly for woodland and range. Some areas are used for almond orchards and vineyards.

These soils are not suited to cultivated crops because of steep slopes and the high erosion hazard. Erosion control requires permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

The Linne soil is suited to use as rangeland. The main limitations are the erosion hazard and compaction. Erosion can be controlled by maintaining adequate plant residue on the soil surface. If the soil is grazed when the soil moisture content is favorable, there is less compaction. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

The Zakme soil is suited to coast live oak and California laurel. A net volume of 2,344 cubic feet of wood fiber per acre has been measured on this soil. The clay surface texture limits the use of equipment during the rainy season.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 21.

157—Lockwood shaly loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in alluvium derived from sedimentary rocks. It is on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is gray shaly loam about 26 inches thick. The subsoil is brown, yellowish brown, and pale brown shaly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are about 5 percent of a soil similar to Lockwood soil except that it has a shaly clay subsoil, 5 percent of a soil similar to Lockwood except that it has a very shaly clay loam subsoil, and 5 percent small areas of Elder loam and Still gravelly loam.

This Lockwood soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to very high. Surface runoff is slow, and the hazard of erosion is slight.

Most areas of this soil are used for cultivated crops. A small acreage is urban land.

If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, this soil is suited only to small grain and grain hay.

Generally there is enough gravel present to interfere slightly with tillage operations. Proper tillage and use of crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

This soil can be irrigated by furrow, border, sprinkler, or drip methods.

This soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIs-4 (14) irrigated, and IVs-4 (14) nonirrigated. The Storie index rating is 61.

158—Lockwood shaly loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium derived from sedimentary rocks. It is on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is gray shaly loam about 26 inches thick. The subsoil is brown, yellowish brown, and pale brown shaly clay loam to a depth of 60 inches or more.

Included with this soil in mapping are about 5 percent of a soil similar to Lockwood soil except that it has a shaly clay subsoil, 5 percent of a soil similar to Lockwood except that it has a very shaly clay loam subsoil, and 5 percent small areas of Elder loam and Still gravelly loam. A few areas have cobbles on the surface, and some areas have wet spots.

This Lockwood soil has moderately slow permeability. The effective rooting depth is 60 inches. The available water capacity is moderate to very high. The surface runoff is medium, and the hazard of erosion is moderate.

Most areas of this soil are used for cultivated crops. A small acreage is urban land.

If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, this soil is suited only to small grain and grain hay.

Gravel in the surface layer interferes slightly with tillage operations. Proper tillage and use of crop residue help to maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards when the soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by use of crop residue and cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited to this soil because of slope and the erosion hazard.

This soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. The low strength of the soil is a limitation for roads and streets, but can be corrected by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIe-4 (14) irrigated, and IVe-4 (14) nonirrigated. The Storie index rating is 55.

159—Lockwood-Concepcion complex, 2 to 9 percent slopes. This complex consists of undulating to gently rolling soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Lockwood shaly loam and 25 percent Concepcion sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping. Lockwood soils are on the slightly higher terrace-like areas and Concepcion soils generally are in depressional areas and low parts of old meandering drainageways.

Included with this soil in mapping is about 15 percent of a soil similar to Concepcion soil except that pebbles make up to 35 percent by volume of the soil profile. Ten percent is Cropley clay, 10 percent is Still gravelly loam, and 5 percent is Botella sandy loam.

The Lockwood soil is a very deep, well drained soil that formed in alluvium derived from sedimentary rocks. Typically, the surface layer is gray shaly loam about 26 inches thick. The subsoil is brown, yellowish brown, and pale brown shaly clay loam to a depth of 60 inches or more.

This Lockwood soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to very high. Surface runoff is medium, and the hazard of erosion is moderate.

The Concepcion soil is a very deep, moderately well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is grayish brown sandy loam about 20 inches thick. The subsurface layer is gray sandy loam about 20 inches thick. The subsoil is about 29 inches thick. The upper part of the subsoil is grayish brown clay about 14 inches thick. The lower part of the

subsoil is mottled, light brownish gray sandy clay loam about 15 inches thick.

This Concepcion soil has very slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. The surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

These soils are used for cultivated crops and urban land.

If irrigated, the Lockwood soil is suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. The Concepcion soil is suited to such shallow-rooted crops as small grain, grain hay, and pasture. If dryfarmed, both soils are suited only to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration. The Lockwood soil generally has enough gravel to interfere slightly with tillage operations.

Sheet and rill erosion are hazards if the soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by use of crop residue and by cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited because of slope and the erosion hazard. If the Concepcion soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff.

The Lockwood soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. The low strength of this soil is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

The Concepcion soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe hazard for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This complex is in capability units IIe-4 (14) irrigated, and IVe-4 (14) nonirrigated. The Storie index rating is 45.

160—Lockwood-Concepcion complex, 9 to 15 percent slopes. This complex consists of rolling soils on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Lockwood shaly loam and 30 percent Concepcion sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 15 percent of a soil similar to Concepcion soil except that pebbles make up to 35 percent by volume of the soil profile. Five percent is Botella sandy loam, 5 percent is Rincon clay loam, and 5 percent is Still gravelly loam.

The Lockwood soil is a very deep, well drained soil that formed in alluvium derived from sedimentary rocks. Typically, the surface layer is gray shaly loam about 26 inches thick. The subsoil is brown, yellowish brown, and pale brown shaly clay loam to a depth of 60 inches or more.

This soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to very high. Surface runoff is medium, and the hazard of erosion is moderate.

The Concepcion soil is a very deep, moderately well drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is grayish brown sandy loam about 20 inches thick. The subsurface layer is gray sandy loam about 2 inches thick. The subsoil is about 29 inches thick. The upper part of the subsoil is grayish brown clay about 14 inches thick. The lower part of the subsoil is mottled, light brownish gray sandy clay loam about 15 inches thick. The substratum is very pale brown sandy loam.

This Concepcion soil has very slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

These soils are used for cultivated crops and urban land.

If irrigated, the Lockwood soil is suited to alfalfa, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. The Concepcion soil is suited to such shallow-rooted crops as pasture, small grain, and grain hay. If dryfarmed, the soils are best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration. On the Lockwood soil there is generally enough gravel to interfere slightly with tillage operations.

Soil erosion is a hazard, but can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control also requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soils are irrigated, the amount of water needs to be controlled to prevent excessive runoff. The Concep-

cion soil is subject to waterlogging. Sprinkler and drip methods of irrigation are best suited to these soils because of excessive slope and slow percolation.

The Lockwood soil is suited to building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. The low strength of this soil is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

The Concepcion soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe hazard in septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This complex is in capability units IIIe-4 (14) irrigated, and IVe-4 (14) nonirrigated. The Storie index rating is 40.

161—Lompico loam, 30 to 50 percent slopes. This moderately deep, steep, well drained soil formed in material weathered from sandstone and shale. It is on hills. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 56 degrees F, and the average frost-free season is 250 days.

Typically, the surface layer is brown loam about 10 inches thick. The subsoil is brown and reddish yellow sandy clay loam about 26 inches thick. Weathered sandstone is at a depth of about 36 inches. Depth to the sandstone ranges from 20 to 40 inches.

Included with this soil in mapping are about 10 percent McMullin gravelly loam, 10 percent of a soil similar to Lompico soil except that it is underlain by hard unweathered rock, and 5 percent small areas of Linne shaly clay loam, Nacimiento silty clay loam, and rock outcrop.

This Lompico soil has moderate permeability. The effective rooting depth is 20 to 40 inches. The available water capacity is low to moderate. The surface runoff is rapid, and the hazard of erosion is high.

This soil is used for woodland and urban land. The understory vegetation provides some grazing.

The soil is suited to coast live oak and California laurel. A net volume of 3,722 cubic feet of wood fiber per acre has been measured on this soil. The main concerns in producing and harvesting wood are erosion and steep slopes. The steepness of slope limits the kinds of equipment that can be used in woodland management. Erosion control is an essential consideration in management.

Slope and the hazard of erosion severely limit this soil for building sites. Erosion can be controlled by minimum grading, by runoff and sediment control structures, and by the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit this soil for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 25.

162—Lompico-McMullin complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 56 degrees F, and the average frost-free season is 250 days. This complex is about 40 percent Lompico loam and 35 percent McMullin gravelly loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 10 percent rock outcrop, 10 percent of a soil similar to Lompico soil except that it is underlain at a depth of 20 to 50 inches by hard unweathered rock, and 5 percent small areas of Linne shaly clay loam, Lodo gravelly clay loam, Shimmon loam, and Zakme clay. In a few areas, slope is 15 to 50 percent.

The Lompico soil is a moderately deep, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is brown loam about 10 inches thick. The subsoil is brown and reddish yellow sandy clay loam about 26 inches thick. Weathered sandstone is at a depth of about 36 inches. Depth to the sandstone ranges from 20 to 40 inches.

The Lompico soil has moderate permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

The McMullin soil is a shallow, somewhat excessively drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is brown gravelly loam about 18 inches thick. Hard shale is at a depth of about 18 inches. Depth to the shale ranges from 10 to 20 inches.

This McMullin soil has moderate permeability The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland. Both soils are limited by the erosion hazard and slope. On these very steep soils, erosion can be controlled by proper grazing, which can require stock trails and paths.

The Lompico soil is suited to coast live oak and California laurel. A net volume of 3,722 cubic feet of wood fiber per acre has been measured on this soil. The main concerns in producing and harvesting wood are erosion and the very steep slopes. The steepness of slope limits the kind of equipment that can be used in woodland management. Erosion control is essential.

The McMullin soil is suited to use as rangeland. This soil produces sparse amounts of vegetation suitable for grazing. Brush control for range improvement is not economically feasible. The herbaceous vegetative cover readily deteriorates under heavy grazing. Chamise and purple needlegrass are important browse and forage species. The wildfire hazard is high, but can be limited by brush control and properly constructed firebreaks.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 9.

163—Los Osos-Lodo complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 250 days. This complex is about 40 percent Los Osos clay loam and 30 percent Lodo gravelly clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 10 percent rock outcrop, 10 percent Dibble clay loam, and 10 percent small areas of Gaviota sandy loam, Gilroy gravelly loam, McMullin gravelly loam, Henneke very cobbly clay loam, and Lompico loam. In a few areas, slope is 30 to 50 percent.

The Los Osos soil is a moderately deep, well drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is grayish brown clay loam about 14 inches thick. The subsoil is light brownish gray clay about 10 inches thick. Weathered shale is at a depth of about 24 inches. Depth to the shale ranges from 20 to 40 inches.

The Los Osos soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high. The subsoil has high shrink-swell potential.

The Lodo soil is a shallow, somewhat excessively drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is brown gravelly clay loam about 16 inches thick. Hard sandstone is at a depth of about 16 inches. Depth to the sandstone ranges from 10 to 20 inches.

This Lodo soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland. Both soils are limited by hazard of erosion, surface compaction, and slope. On these very steep soils, erosion can be controlled by maintaining adequate crop residue on the soil surface. Stock trails can be used to help obtain grazing distribution. Compaction decreases if the soils are grazed when the surface soil moisture content is favorable.

The Los Osos soil is moderately suited to use as rangeland. Soft chess, wild oats, filaree, blue oak, and live oak are important forage and browse species.

The Lodo soil is poorly suited to use as rangeland. Forage production is low because of the shallow soil depth. Soft chess, wild oats, filaree, chamise, and scrub oak are important forage and browse species.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 6.

164—Los Osos-Rock outcrop complex, 30 to 50 percent slopes. This complex consists of steep soils on mountains. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 250 days. This complex is about 40 percent Los Osos clay loam and 15 percent Rock outcrop. Areas of the Los Osos soil and Rock outcrop are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this complex in mapping are about 10 percent Lodo gravelly clay loam, 10 percent of a soil similar to Los Osos soil except that it is underlain by hard serpentine rock, 10 percent of a soil similar to Los Osos except that it is underlain by hard metamorphosed rock, 5 percent Dibble clay loam, 5 percent Millsholm clay loam, and 5 percent Montara clay loam. In a few areas, slope is 9 to 30 percent.

The Los Osos soil is a moderately deep, well drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is grayish brown clay loam about 14 inches thick. The subsoil is light brownish gray clay about 10 inches thick. Weathered shale is at a depth of about 24 inches. Depth to the shale ranges from 20 to 40 inches.

The Los Osos soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

Rock outcrops are areas of hard sandstone and shale.

This soil is used for rangeland and is well suited to this use. The main limitations are hazard of erosion and surface compaction. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Compaction decreases if the soil is grazed when the soil moisture content is favorable. This soil responds to fertilization and range seeding. Soft chess, wild oats, filaree, blue oak, and live oak are important forage and browse species.

This soil has some potential for establishment of vegetation useful to wildlife. Rock outcrops provide denning and cover sites for predators and small mammals, but the value for wildlife use depends on the proximity of the soil to such other wildlife needs as food and water.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 9.

165—McMullin-Rock outcrop complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 20 to 30 inches, the mean annual air temperature is 56 degrees F, and the average frost-free season is 250 days. This complex is about 45 percent McMullin gravelly loam and 25 percent Rock outcrop. Areas of the McMullin soil and Rock outcrop are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this complex in mapping are about 10 percent Lompico loam, 10 percent Shimmon loam, 5 percent Henneke very cobbly clay loam, and 5 percent small areas of Gaviota sandy loam, Gilroy gravelly loam, Millsholm clay loam, and Montara clay loam. In a few areas, slope is 30 to 50 percent.

The McMullin soil is a shallow, somewhat excessively drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is brown gravelly loam about 18 inches thick. Hard shale is at a depth of 18 inches. Depth to the shale ranges from 10 to 20 inches.

The McMullin soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

Rock outcrops are areas of hard sandstone and shale.

The McMullin soil is used for rangeland, but is poorly suited to this use. This soil produces sparse amounts of vegetation suitable for grazing. Brush control for range management is not economically feasible. The herbaceous vegetative cover readily deteriorates under heavy grazing pressure. Because of slope, stock trails and paths are needed to obtain grazing distribution. Chamise and purple needlegrass are important browse and forage species. The hazard of wildfire is high, but can be limited by brush control and properly constructed firebreaks.

This soil has very little potential for the establishment of vegetation useful to wildlife. The associated Rock outcrop provides denning and cover sites for predators and small mammals, but the value for wildlife use depends on the proximity of the soil to such other wildlife needs as food and water.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 4.

166—Metz loamy sand, 0 to 5 percent slopes. This very deep, nearly level to gently sloping, somewhat excessively drained soil formed in alluvium derived from mixed rocks. It is on flood plains. Elevation is 600 to 1,500 feet. This soil is subject to rare flooding under abnormal conditions. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown loamy sand about 9 inches thick. The underlying material is stratified layers of very pale brown and pale brown loamy sand, sand, and very fine sandy loam. A few areas are gravelly loamy sand throughout.

Included with this soil in mapping are about 5 percent San Emigdio fine sandy loam, 5 percent Hanford fine sandy loam, 5 percent Tujunga fine sand, and 5 percent small areas of Elder loam, Pico fine sandy loam, and Xerofluvents. In a few areas, slope is 5 to 9 percent.

The Metz soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low to moderate. Surface runoff is slow, and the hazard of erosion is slight.

This soil is used for cultivated crops, rangeland, and urban land. It is suited to irrigated alfalfa, sugar beets, wine grapes, pasture, small grain, and grain hay. This soil is too droughty for dryfarmed crops.

Returning crop residue or adding other organic material to the soil improves fertility and increases the available water capacity.

Plants on this droughty soil need frequent, light applications of irrigation water. Because of the fast intake rate, sprinkler or drip methods are best.

This soil is moderately suited to use as rangeland. Droughtiness is its main limitation. Because of the loamy sand soil texture, forage production in dry years is so low that grazing is not desirable. Chamise, scrub oak, wild oats, and soft chess are important browse and forage species.

Stream-associated vegetation, if maintained, provides excellent food and cover for numerous types of wildlife. Where this soil and its associated vegetation break up an otherwise open area, the value of that area as wildlife habitat is greatly enhanced.

This soil has severe limitations for building sites, septic tank absorption fields, and roads and streets because of the flood hazard. Soil areas used for these purposes need to be protected from flooding.

This soil is in capability units IIIs-4 (14) irrigated, and IVs-4 (14) nonirrigated. The Storie index rating is 61.

167—Metz-Tujunga complex, occasionally flooded, 0 to 5 percent slopes. This complex consists of nearly level to gently sloping soils on flood plains. Elevation is 600 to 1,500 feet. Flooding occurs about twice every ten years. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Metz loamy sand and 35 percent Tujunga fine sand. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 20 percent Xerofluvents and 5 percent small areas of Elder loam, Pico fine sandy loam, and San Emigdio fine sandy loam. In a few areas, slope is 5 to 9 percent.

The Metz soil is a very deep, somewhat excessively drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is pale brown loamy sand about 9 inches thick. The underlying material is

stratified layers of very pale brown and pale brown loamy sand, sand, and very fine sandy loam.

This soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low to moderate. Surface runoff is slow, and the hazard of erosion is slight.

The Tujunga soil is a very deep, somewhat excessively drained soil that formed in alluvium derived from mixed rocks. Typically, the surface layer is very pale brown fine sand about 20 inches thick. The underlying material is light gray sand.

The Tujunga soil has rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is low. Surface runoff is slow, and the hazard of erosion is slight. This soil is subject to occasional flooding.

These soils are used for rangeland, but are poorly suited to this use. Droughtiness and flooding are the main limitations. Because of the sandy soil texture, forage production in dry years is so low that grazing is not desirable. Chamise, scrub oak, wild oats, and soft chess are important forage and browse species.

Stream-associated vegetation, if maintained, provides excellent food and cover for numerous types of wildlife. Where these soils and their associated vegetation break up an otherwise open area, the value of that area as wildlife habitat is greatly enhanced.

This complex is in capability unit IVw-4 (14) nonirrigated. The Storie index rating is 55.

168—Millsholm-Ayar complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Millsholm clay loam and 30 percent Ayar silty clay. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping is about 15 percent of a soil similar to the Ayar soil except that it is 10 to 40 inches deep. Ten percent is Calleguas shaly loam, 5 percent is rock outcrop, and 5 percent is small areas of Balcom loam, Calodo clay loam, and Nacimiento silty clay loam. In a few areas, slope is 30 to 50 percent.

The Millsholm soil is a shallow, well drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is pale brown clay loam about 8 inches thick. The subsoil is light yellowish brown clay loam about 8 inches thick. Hard shale is at a depth of about 16 inches. Depth to the shale or sandstone ranges from 10 to 20 inches.

The Millsholm soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

The Ayar soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is about 39 inches thick. The upper part of the surface layer is brown silty clay about 9 inches thick. The lower part of the surface layer is brown clay about 30 inches thick. The underlying material is brown clay to a depth of about 45 inches and brown and pink silty clay to a depth of about 60 inches. Weathered, calcareous sandstone and shale is at a depth of 60 inches. This soil is calcareous throughout. Depth to the sandstone and shale ranges from 40 to 70 inches.

The Ayar soil has slow permeability. The effective rooting depth is 40 to 60 inches or more, and the available water capacity is high to very high. Surface runoff is very rapid, and the hazard of erosion is very high. The shrink-swell potential is high.

These soils are used for rangeland. The main limitations are the hazards of erosion, surface compaction, and slope. On these very steep soils, maintaining adequate plant residue on the soil surface helps control erosion. Stock trails can be used to help grazing distribution. Compaction decreases if the soils are grazed when the surface moisture is less than field capacity.

The Millsholm soil is poorly suited to use as rangeland. Because of the shallow soil depth, forage production is low. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

The Ayar soil is well suited to use as rangeland. Soft chess, wild oats, and filaree are important forage species.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 9.

169—Millsholm-Dibble clay loams, 15 to 30 percent slopes. This complex consists of moderately steep soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Millsholm clay loam and 20 percent Dibble clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent rock outcrop, 10 percent Lompico loam, and 5 percent of a soil similar to Millsholm soil except that the depth to sandstone or shale is 20 to 40 inches. Five percent is McMullin gravelly loam, 5 percent is Lodo gravelly clay loam, 5 percent is Shimmon loam, and 5 percent is small areas of Balcom loam and Nacimiento silty clay loam. In a few areas, slope is 50 to 75 percent.

The Millsholm soil is a shallow, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 8 inches thick. The subsoil is light yellowish brown clay loam about 8 inches thick. Hard shale is at a depth of about 16 inches. Depth to the shale or sandstone ranges from 10 to 20 inches.

The Millsholm soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the availa-

ble water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

The Dibble soil is a moderately deep, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. Underlying that layer, at a depth of about 34 inches, is weathered shale. Depth to the shale ranges from 20 to 40 inches.

The Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

These soils are used for rangeland and urban land.

Both soils, if used for rangeland, are limited by the erosion hazard and surface compaction. Erosion can be controlled by maintaining adequate plant residue on the soil surface. Compaction is decreased if the soil is grazed when the moisture content is less than field capacity.

The Millsholm soil is poorly suited to use as rangeland. Because of the shallow soil depth, forage production is low. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

The Dibble soil is well suited to use as rangeland. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

Slope, erosion hazard, and depth to rock severely limit these soils for building sites and roads and streets. In addition, the low strength and high shrink-swell potential of the Dibble soil severely limit its use for building sites. The low strength of the Dibble soil is a limitation for roads and streets, but can be overcome by replacing the base material. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and by the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 20.

170—Millsholm-Dibble clay loams, 30 to 50 percent slopes. This complex consists of steep soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Millsholm clay loam and 20 percent Dibble clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent rock outcrop and 10 percent Lompico loam. Five percent is a soil similar to Millsholm soil except that the solum is 20 to 40 inches thick, 5 percent is McMullin gravelly loam, 5 percent is Lodo gravelly clay loam, 5 percent is Shimmon loam, and 5 percent is small areas of Balcom loam and Nacimiento silty clay loam.

The Millsholm soil is a shallow, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 8 inches thick. The subsoil is light yellowish brown clay loam about 8 inches thick. The underlying material, at a depth of about 16 inches, is hard shale. Depth to the shale or sandstone ranges from 10 to 20 inches.

The Millsholm soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

The Dibble soil is a moderately deep, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. The underlying material, at a depth of about 34 inches, is weathered shale. Depth to the shale ranges from 20 to 40 inches.

The Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

These soils are used for rangeland and urban land.

Both soils, if used for rangeland, are limited by the hazard of erosion and surface compaction. Maintaining adequate crop residue on the soil surface helps control erosion. Compaction decreases if the soil is grazed when the moisture content is less than field capacity.

The Millsholm soil is poorly suited to use as rangeland. Because of the shallow soil depth, forage production is low. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

The Dibble soil is well suited to use as rangeland. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

Slope, the hazard of erosion, and depth to rock severely limit these soils for building sites and roads and streets. In addition, the low strength and high shrink-swell potential of the Dibble soil severely limit its use for building sites. The low strength of the Dibble soils is a limitation for roads and streets, but can be overcome by replacing the base material. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields. Onsite

investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 15.

171—Millsholm-Montara clay loams, 15 to 30 percent slopes. This complex consists of moderately steep soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Millsholm clay loam and 30 percent Montara clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent rock outcrop, 15 percent Calleguas shaly loam, and 5 percent small areas of Ayar silty clay, Balcom loam, Cropley clay, Mocho clay loam, and Nacimiento silty clay loam. In a few areas, slope is 30 to 50 percent.

The Millsholm soil is a shallow, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 8 inches thick. The subsoil is light yellowish brown clay loam about 8 inches thick. Hard shale is at a depth of about 16 inches. Depth to the shale or sandstone ranges from 10 to 20 inches.

The Millsholm soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

The Montara soil is a shallow, somewhat excessively drained soil that formed in material weathered from serpentinitic rock. Typically, the surface layer is grayish brown clay loam about 15 inches thick. Hard serpentinitic rock is at a depth of about 15 inches. Depth to the rock ranges from 10 to 20 inches.

This soil has moderately slow permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. The surface runoff is rapid, and the hazard of erosion is high. The calcium to magnesium ratio is 1:1 or less.

These soils are used for rangeland but are poorly suited to this use. The main limitations are hazard of erosion, surface compaction, and shallow soil depth. Maintaining adequate plant residue on the soil surface helps control erosion. If the soil is grazed when the soil moisture content is favorable, there is less compaction. Because of shallow soil depth, forage production is low. Soft chess, wild oats, and filaree are important forage species.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 16.

172—Millsholm-Rock outcrop complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Millsholm clay loam and 30 percent Rock outcrop. Areas of the Millsholm soil and Rock outcrop are so intricately mixed or so small that it is not practical to separate them in mcpping.

Included with this complex in mapping are about 10 percent Dibble clay loam, 10 percent Lodo gravelly clay loam, 10 percent Shimmon loam, and 5 percent Montara clay loam. Small areas have slope of 30 to 50 percent.

The Millsholm soil is a shallow, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 8 inches thick. The subsoil is light yellowish brown clay loam about 8 inches thick. Hard shale is at a depth of about 16 inches. Depth to the shale or sandstone ranges from 10 to 20 inches.

The Millsholm soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

Rock outcrops are areas of hard sandstone and shale.

This soil is used for range and wildlife habitat.

The soil is poorly suited to use as rangeland. The main limitations are the erosion hazard, slope, surface compaction, and shallow soil depth. Erosion can be controlled by proper grazing, which can require stock trails and paths. Compaction decreases if the soil is grazed when the soil moisture content is favorable. Because of shallow soil depth, forage production is low. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

This soil has very little potential for establishment of vegetation useful to wildlife. The associated Rock outcrop provides denning and cover sites for predators and small mammals, but the value for wildlife use depends on the proximity of the soil to such other wildlife needs as food and water.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 4.

173—Mocho clay loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in calcareous alluvium derived from sedimentary rocks. It is on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 19 inches thick. The underlying material is stratified layers of light brownish gray and light gray clay loam, loam, and silt loam. This soil is calcareous throughout.

Included with this soil in mapping are about 10 percent Still clay loam, 5 percent of a soil having light brownish gray, calcareous loam and clay loam textures throughout, 5 percent of a soil having a gravelly sandy loam or gravelly loam overwash 4 to 10 inches thick, and 5

percent small areas of Sorrento clay loam and Tujunga fine sand.

This Mocho soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. Surface runoff is slow, and the hazard of erosion is slight.

This soil is one of the most productive soils in the survey area. Most of the acreage is used for cultivated crops, but a small acreage is used for rangeland and urban land. If irrigated, this soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

If cultivated, the main limitation is lack of adequate rainfall during the growing season. Proper tillage and use of crop residue help to maintain soil tilth and structure and to improve fertility and water infiltration.

This soil is best irrigated by furrow, border, sprinkler, or drip methods.

This soil is well suited to use as rangeland. Surface compaction is the main limitation, but it decreases if the soil is grazed when the soil moisture content is favorable. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is suitable for building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 85.

174—Mocho clay loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in calcareous alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 19 inches thick. The underlying material is stratified layers of light brownish gray and light gray clay loam, loam, gravelly sandy loam, and silt loam. The soil is calcareous throughout.

Included with this soil in mapping is about 5 percent Still clay loam. Five percent is a soil that is light brownish gray, calcareous loam and clay loam, 5 percent is gravelly sandy loam or gravelly loam overwash 4 to 10 inches thick, and 5 percent is small areas of Cropley clay, San Emigdio fine sandy loam, and Tujunga fine sand.

This Mocho soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. Surface runoff is medium, and the hazard of erosion is moderate.

This soil is one of the most productive soils in the survey area. Most of the acreage is used for cultivated crops, but a small part is used for rangeland or urban land. If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and the use of crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards if this soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during rainfall periods, and using a crop rotation. Orchards and vineyards can be protected by use of crop residue and by cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited to this soil because of slope and the erosion hazard.

This soil is well suited to use as rangeland. Compaction is the main limitation, and erosion is a moderate limitation. Compaction decreases if the soil is grazed when the soil moisture content is favorable. Erosion can be controlled by use of proper grazing. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is suitable for building sites. Moderate shrink-swell potential and low strength are limitations for dwellings and other buildings, but can be overcome if proper design and installation procedures are used. The low strength of the soil is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 76.

175—Nacimiento silty clay loam, 9 to 30 percent slopes. This moderately deep, rolling to hilly, well drained soil formed in material weathered from calcareous sandstone and shale. It is on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of about 28 inches, is pale brown silty clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to sandstone or shale ranges from 20 to 40 inches.

Included with this soil in mapping are about 15 percent Linne shaly clay loam, 5 percent Diablo clay, 5 percent Los Osos clay loam, and 5 percent small areas of Cropley clay, Calodo clay loam, Mocho clay loam, Rincon clay loam, and Sorrento clay loam.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

This soil is used for cultivated crops and range.

If irrigated, the soil is suited to almonds, wine grapes, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard, but can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Erosion control includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Because of slope and moderately slow permeability, sprinkler and drip methods of irrigation are best suited.

This soil is well suited to use as rangeland. The main limitations are the hazard of erosion and surface compaction. Maintaining adequate plant residue on the soil surface helps control erosion. If the soil is grazed when the soil moisture content is favorable, there is less compaction. This soil responds to fertilization and range seeding. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 41.

176—Nacimiento silty clay loam, 30 to 50 percent slopes. This moderately deep, steep, well drained soil formed in material weathered from calcareous sandstone and shale. It is on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of 28 inches, is pale brown silty clay loam. Below that it is weathered, calcareous shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 20 to 40 inches.

Included with this soil in mapping are about 15 percent Linne shaly clay loam, 5 percent Balcom loam, 5 percent Calodo clay loam, 5 percent Los Osos clay loam, and 5 percent small areas of Cropley clay, Mocho clay loam, Rincon clay loam, and Sorrento clay loam. A few areas are severely eroded.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches. The available water capacity is low to moderate. The surface runoff is rapid, and the hazard of erosion is high.

This soil is used for cultivated crops and rangeland. Some areas are used for almond orchards and vineyards.

This soil is not suited to cultivated crops because of steep slopes and the high erosion hazard.

Erosion control requires permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

This soil is well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate plant residue on the soil surface helps control erosion. If the soil is grazed when the soil moisture content is favorable, there is less compaction. This soil responds to fertilization and range seeding. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 25.

177—Nacimiento-Ayar complex, 9 to 30 percent slopes. This complex consists of moderately steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Nacimiento silty clay loam and 30 percent Ayar silty clay. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Linne shaly clay loam, 10 percent Diablo clay, 5 percent Balcom loam, and 5 percent small areas of Calodo clay loam, Dibble clay loam, Positas coarse sandy loam, and Shimmon loam. A few areas have deep gullies and rock outcrop.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of 28 inches, is pale brown silty clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 20 to 40 inches.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Ayar soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is about 39 inches thick. The upper part of the surface layer is brown silty clay about 9 inches thick. The lower part of the surface layer is brown clay about 30 inches thick. The underlying material is brown clay to a depth of about 45 inches, and brown and pink silty clay to a depth of about 60 inches. Below that is weathered, calcareous sandstone and shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 40 to 70 inches.

This Ayar soil has slow permeability. The effective rooting depth is 40 to 60 inches or more, and the available water capacity is high to very high. Surface runoff is rapid, and the hazard of erosion is high. The shrink-swell potential is high.

These soils are used for cultivated crops and rangeland.

If irrigated, the soils are suited to almonds, wine grapes, pasture, small grain, and grain hay. If dryfarmed, they are best suited to small grain and grain hay.

Proper tillage and use of crop residue improves soil tilth, structure, fertility, and water infiltration. Because of the silty clay surface texture of the Ayar soil, tillage is difficult and needs to be done when the soil moisture content is favorable.

Soil erosion is a hazard. Farming across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help to control erosion. Erosion control also includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to these soils because of slope, slow intake, and slow permeability.

These soils are well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate plant residue on the soil surface helps control erosion. Compaction decreases if the soil is grazed when the soil moisture content is favorable. These soils respond to fertilization and range seeding. Soft chess, wild oats, burclover, and filaree are important forage species.

This complex is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 39.

178—Nacimiento-Ayar complex, 30 to 50 percent slopes. This complex consists of steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 35 percent Nacimiento silty clay loam and 30 percent Ayar silty clay. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Linne shaly clay loam, 10 percent Diablo clay, 5 percent Balcom loam, and 5 percent small areas of Calodo clay loam, Dibble clay loam, Positas coarse sandy loam, and Shimmon loam. A few areas have deep gullies and rock outcrop.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of 28 inches, is pale brown silty clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 20 to 40 inches.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Ayar soil is a deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is about 39 inches thick. The upper part of the surface layer is brown silty clay about 9 inches thick. The lower part of the surface layer is brown clay about 30 inches thick. The underlying material is brown clay to a depth of about 45 inches and brown and pink silty clay to a depth of about 60 inches. Below that is weathered, calcareous sandstone and shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 40 to 70 inches.

This Ayar soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is high to very high. Surface runoff is rapid, and the hazard of erosion is high. The shrink-swell potential is high.

These soils are used mainly for rangeland. Some areas of these soils are used for almond orchards and vineyards.

The soil is not suited to cultivated crops because of steep slopes and the high erosion hazard.

Erosion control requires permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

These soils are well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate plant residue on the soil surface helps control erosion. Compaction decreases if the soil is grazed when the soil moisture content is favorable. These soils respond to fertilization and range seeding. Soft chess, wild oats, burclover, and filaree are important forage species.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 24.

179—Nacimiento-Los Osos complex, 9 to 30 percent slopes. This complex consists of moderately steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Nacimiento silty clay loam and 20 percent Los Osos clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this soil in mapping are about 10 percent Balcom loam, 10 percent Positas coarse sandy loam, 5 percent Ayar silty clay, 5 percent Diablo clay, and 5 percent Shimmon loam. Five percent is a soil similar to Los Osos soil except that it is calcareous throughout, 5 percent is a soil similar to Los Osos except that it has a very gravelly clay subsoil, and 5 percent is small areas of Arbuckle fine sandy loam, Greenfield fine sandy loam, and Rincon clay loam. A few areas have gravel and cobbles on the surface and have 30 to 50 percent slope.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous

sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of 28 inches, is pale brown silty clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 20 to 40 inches.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Los Osos soil is a moderately deep, well drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is grayish brown clay loam about 14 inches thick. The subsoil is light brownish gray clay about 10 inches thick. Weathered shale is at a depth of about 24 inches. Depth to the shale ranges from 20 to 40 inches.

This Los Osos soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

About 80 percent of this complex has been cleared for cultivated crops, and the rest is used for rangeland.

If the soils are irrigated, they are suited to almonds, wine grapes, pasture, small grain, and grain hay. If dry-farmed, they are best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation helps control erosion. Erosion control includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soils are irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited to these soils because of slope, soil depth, and the moderately slow and slow permeability.

These soils are suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate residue on the soil surface helps control erosion. If the soils are grazed when the soil moisture content is favorable, there is less compaction. These soils respond to fertilization and range seeding. Soft chess, wild oats, burclover, filaree, and blue oak and live oak are important forage and browse species.

This complex is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 33.

180—Nacimiento-Los Osos complex, 30 to 50 percent slopes. This complex consists of steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is about 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Nacimiento silty clay loam and 25 percent Los Osos clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 10 percent Shimmon loam, 10 percent of a soil similar to Los Osos soil except that it is calcareous throughout, 5 percent Ayar silty clay, 5 percent Balcom loam, and 5 percent Linne shaly clay loam.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of 28 inches, is pale brown silty clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 20 to 40 inches.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

The Los Osos soil is a moderately deep, well drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is grayish brown clay loam about 14 thick. The subsoil is light brownish gray clay about 10 inches thick. Weathered shale is at a depth of 24 inches. Depth to the shale ranges from 20 to 40 inches.

This Los Osos soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

About 50 percent of this unit has been cleared for cultivated crops, and the rest is used for rangeland. Some areas of these soils are used for almond orchards and vineyards.

The soils are not suited to cultivated crops because of steep slopes and the high erosion hazard.

Erosion control requires permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

These soils are well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate crop residue on the soil surface helps control erosion. If the soils are grazed when the soil moisture content is favorable, there is less compaction. These soils respond to fertilization and range seeding. Soft chess, wild oats, burclover, filaree, and blue and live oak are important forage and browse species.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 20.

181—Nacimiento-Los Osos complex, 50 to 75 percent slopes. This complex consists of very steep soils on mountains. Elevation is 600 to 1,500 feet. The mean

annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Nacimiento silty clay loam and 30 percent Los Osos clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Linne shaly clay loam, 5 percent Balcom loam, 5 percent of a soil similar to Nacimiento soil except that it is sandy loam throughout, and 5 percent of a soil similar to Los Osos soil except that it is calcareous throughout. In a few areas, slope is 30 to 50 percent.

The Nacimiento soil is a moderately deep, well drained soil that formed in material weathered from calcareous sandstone and shale. Typically, the surface layer is dark grayish brown silty clay loam about 18 inches thick. The underlying material, to a depth of 28 inches, is pale brown silty clay loam. Below that is weathered, calcareous shale. This soil is calcareous throughout. Depth to the sandstone or shale ranges from 20 to 40 inches.

This Nacimiento soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

The Los Osos soil is a moderately deep, well drained soil that formed in material weathered from sandstone or shale. Typically, the surface layer is grayish brown clay loam about 14 inches thick. The subsoil is light brownish gray clay about 10 inches thick. Weathered shale is at a depth of about 24 inches. Depth to the sandstone or shale ranges from 20 to 40 inches.

This Los Osos soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high. The subsoil has high shrink-swell potential.

These soils are used for rangeland, but are poorly suited to this use. The main limitations are the hazard of erosion, surface compaction, and slope. Maintaining adequate crop residue on the soil surface of these very steep slopes helps control erosion. Stock trails can be used to help obtain grazing distribution. Compaction decreases if the soils are grazed when the surface soil moisture is favorable. Soft chess, wild oats, burclover, filaree, and blue and live oak are important forage and browse species.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 10.

182—Oceano loamy sand, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, excessively drained soil formed in sandy eolian deposits. It is on dunes. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is light brownish gray loamy sand about 12 inches thick. The underlying material is light gray loamy sand.

Included with this soil in mapping are about 15 percent Metz loamy sand, 10 percent of a soil similar to Oceano soil except that it has a dark gray surface layer, 10 percent Arnold loamy sand, 10 percent Botella sandy loam, and 5 percent small areas of San Andreas sandy loam and San Emigdio fine sandy loam. In a few areas, slope is 9 to 15 percent.

This Oceano soil has rapid permeability. The effective rooting depth is 60 inches. The available water capacity is low. The surface runoff is medium, and the hazard of erosion is moderate.

This soil is used for cultivated crops, rangeland, and urban land.

The soil is suited to irrigated alfalfa, sugar beets, and wine grapes. This soil is too droughty for dryfarmed crops.

Returning crop residue or adding other organic material improves fertility and increases the available water capacity.

Erosion is a hazard if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation helps control erosion. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it to safe outlets in diversions or permanent grassed waterways.

Plants on this droughty soil need frequent, light applications of irrigation water. Sprinkler irrigation is the best method because of the fast intake rate.

This soil is moderately suited to rangeland. The main limitations are droughtiness and the erosion hazard. Because of the loamy sand texture, forage production in dry years is so low that grazing is not desirable. Erosion can be controlled by proper grazing use. Chamise, scrub oak, wild oats, and soft chess are important browse and forage species. Proper grazing maintains or improves the quantity and quality of desirable vegetation.

This soil is well suited to building sites, septic tank absorption fields, and roads and streets.

This soil is in capability unit IIIs-4 (14) irrigated, and capability subclass VIs (14) nonirrigated. The Storie index rating is 68.

183—Pico fine sandy loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in calcareous alluvium derived from sedimentary rocks. It is on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is gray fine sandy loam about 17 inches thick. The underlying material is stratified layers of grayish brown, light grayish brown, and light gray fine sandy loam. This soil is calcareous throughout.

Included with this soil in mapping are about 15 percent Elder loam, 5 percent gravelly sand or very gravelly sandy loam overwash 6 to 10 inches thick, and 5 percent small areas of Cropley clay and Tujunga loamy sand.

This Pico soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is slow, and the hazard of erosion is slight.

Most of this soil is used for cultivated crops, but a small acreage is urban land. If irrigated, the soil is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

This soil has no hazards or limitations if it is farmed. Proper tillage and use of crop residue help maintain soil tilth and structure, and improve fertility and water infiltration.

Furrow, border, sprinkler, or drip methods of irrigation are suited to this soil.

This soil is well suited to building sites, septic tank absorption fields, and roads and streets.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 100.

184—Pico fine sandy loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in calcareous alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is gray fine sandy loam about 17 inches thick. The underlying material is stratified layers of grayish brown, light grayish brown, and light gray fine sandy loam. This soil is calcareous throughout.

Included with this soil in mapping are about 15 percent Elder loam, 5 percent gravelly sand or very gravelly sandy loam overwash 6 to 10 inches thick, and 5 percent small areas of Cropley clay and Tujunga fine sand.

This Pico soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

Most of this soil is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay. Proper tillage and use of crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. These hazards can be controlled by cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and by using crop rotation. Orchards and vineyards can be protected by using crop residue and cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it to safe outlets in diversions or permanent grassed waterways.

Sprinkler or drip irrigation systems are best suited to this soil because of slope and the erosion hazard.

This soil is well suited to building sites, septic tank absorption fields, and roads and streets.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 90.

185—Pits. Pits are excavations from which soil and underlying material have been removed, together with areas of uneven accumulations of waste material. They are rock quarries, sand and gravel pits, and sanitary backfill excavations. The largest area is the Klaw Mine. Another typical area is the sand and gravel pit at Templeton. Drainage channels cut across some of the areas. Some sites are subject to seasonal flooding and ponding.

Pits have no agricultural value. They are used by industry for sand and gravel, borrow pits, mine pits, and waste disposal sites.

This unit has not been assigned to a capability subclass.

186—Polonio clay loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in calcareous alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is about 1,500 feet. The mean annual precipitation is 9 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is light brownish gray and pale brown clay loam about 14 inches thick. The underlying material is light yellowish brown and brown clay loam. This soil is calcareous throughout.

Included with this soil in mapping is about 10 percent of a soil similar to Polonio soil except that it consists of stratified layers of clay loam, loam, silt loam, and gravelly loam.

This Polonio soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. The surface runoff is medium, and the hazard of erosion is moderate.

This soil is used for cultivated crops and rangeland. It is poorly suited to dryfarmed small grain because annual precipitation generally is low.

Proper tillage and use of crop residue improves soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Farming across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion.

This soil is suited to use as rangeland. Limited precipitation results in sparse vegetative cover and low yields. Erosion and surface compaction are the main limitations.

Erosion can be controlled by maintaining adequate plant residue on the soil surface. Compaction decreases if the soil is grazed when the soil moisture content is favorable. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is in capability unit IVe-1 (15) nonirrigated. The Storie index rating is 76.

187—Rincon clay loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 18 inches thick. The subsoil is grayish brown and pale brown clay loam and clay to a depth of 60 inches or more. This soil is calcareous in the lower part.

Included with this soil in mapping are about 10 percent of a soil similar to Rincon soil except that it has a granular, dark gray clay loam surface layer, 5 percent San Ysidro loam, and 5 percent small areas of Cropley clay and Lockwood shaly loam.

This Rincon soil has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. Surface runoff is slow, and the hazard of erosion is slight. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops, rangeland, and urban land.

If the soil is irrigated, it is suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, this soil is suited only to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

If the soil is irrigated, the amount of water needs to be controlled to prevent ponding and waterlogging because of the slow permeability of the subsoil. Sprinkler irrigation is the best system.

This soil is well suited to rangeland. Surface compaction is the main limitation. If the soil is grazed when the soil moisture content is favorable, there is less compaction. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance of roads and streets. The slow absorption of effluent is a severe limitation for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil unit is in capability units IIs-3 (14) irrigated, and IVs-3 (14) nonirrigated. The Storie index rating is 65.

188—Rincon clay loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 18 inches thick. The subsoil is grayish brown and pale brown clay loam and clay to a depth of 60 inches or more. This soil is calcareous in the lower part.

Included with this soil in mapping are about 10 percent of a soil similar to Rincon soil except that it has a granular surface layer of dark gray clay loam, 5 percent Arbuckle fine sandy loam, and 5 percent small areas of Cropley clay, Lockwood shaly loam, and San Ysidro loam.

This Rincon soil has slow permeability. The effective rooting depth is 60 inches. The available water capacity is high to very high. The surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops, rangeland, and urban land.

If the soil is irrigated, it is suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, this soil is suited only to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation helps to control these hazards. Orchards and vineyards can be protected by use of crop residue and cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

If the soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff because of the slow permeability of the subsoil. A sprinkler irrigation system is best suited because of slope and the erosion hazard.

This soil is well suited to use as rangeland. Surface compaction is the main limitation. The hazard of erosion is moderate. Compaction decreases if the soil is grazed when the soil moisture content is favorable. Maintaining adequate plant residue on the soil surface helps control erosion. Good management includes fertilization, range seeding, and proper grazing. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material

to minimize maintenance on roads and streets. The slow absorption of effluent is a severe limitation for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IIe-3 (14) irrigated, and IVe-3 (14) nonirrigated. The Storie index rating is 58.

189—Rincon clay loam, 9 to 15 percent slopes. This very deep, strongly sloping, well drained soil formed in alluvium. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is about 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 18 inches thick. The subsoil is grayish brown and pale brown clay loam and clay to a depth of 60 inches or more. This soil is calcareous in the lower part.

Included with this soil in mapping are about 5 percent Los Osos clay loam, 5 percent Lockwood shaly loam, and 5 percent small areas of Ayar silty clay and Cropley clay.

This Rincon soil has slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. Surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops and rangeland. If the soil is irrigated, it is suited to alfalfa, wine grapes, sugar beets, almonds, walnuts, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation helps control erosion. Erosion control requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope and slow permeability.

This soil is well suited to use as rangeland. The main limitations are the erosion hazard and surface compaction. Maintaining adequate plant residue on the soil surface helps control erosion. Compaction decreases if the soil is grazed when the soil moisture content is favorable. This soil responds to fertilization and range seeding. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil is in capability units IVe-3 (14) irrigated, and IVe-3 (14) nonirrigated. The Storie index rating is 52.

190—Rock outcrop-Gaviota complex, 30 to 75 percent slopes. This complex is on mountains. Elevation is 1,000 to 3,400 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 60 percent Rock outcrop and 20 percent Gaviota sandy loam. The areas in this unit are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with this complex in mapping are about 10 percent Cieneba coarse sandy loam and 10 percent small areas of Dibble clay loam, McMullin gravelly loam, Lompico loam, San Andreas sandy loam, and Shimmon loam.

Rock outcrops are areas of hard sandstone.

The Gaviota soil is a shallow, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is brown and light brown sandy loam about 10 inches thick. Hard sandstone is at a depth of about 10 inches. Depth to sandstone ranges from 6 to 12 inches.

This Gaviota soil has moderately rapid permeability. The effective rooting depth is 6 to 12 inches, and the available water capacity is very low. Surface runoff is very rapid, and the hazard of erosion is very high.

This complex is used for wildlife and watershed. The area has aesthetic value.

The Gaviota soil produces sparse amounts of plants suitable for grazing. Chamise and purple needlegrass are important browse and forage species. The hazard of wildfire is high, but can be limited by brush management and properly constructed firebreaks. This soil is unstable, and any disturbance can cause severe erosion.

This soil has very little potential for the establishment of vegetation useful to wildlife. Rock outcrops provide denning and cover sites for predators and small mammals, but the value for wildlife use depends on the proximity of the soil to food and water.

This complex is in capability subclass VIIIe (15) nonirrigated. The Storie index rating is 1.

191—Ryer clay loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium derived from mixed rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 35 inches thick. The upper part of the subsoil is pale brown heavy clay loam about 7 inches thick. The lower part of the subsoil is brown and light yellowish brown clay about 28 inches thick. The substratum is brownish yellow clay loam. This soil is calcareous in the lower part.

Included with this soil in mapping are about 10 percent Positas coarse sandy loam and 5 percent small areas of Dibble clay loam, Gaviota sandy loam, and Rincon clay loam. A few areas have deep gullies and rock outcrops.

This Ryer soil has slow permeability. The effective rooting depth is 60 inches. The available water capacity

is high to very high. The surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops, rangeland, and urban land.

If the soil is irrigated, it is suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, this soil is suited only to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation helps control these hazards. Orchards and vineyards can be protected by use of crop residue and cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

If the soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff because of the slow permeability of the subsoil. A sprinkler irrigation system is best suited because of slope and the erosion hazard.

This soil is well suited to use as rangeland. The main limitation is surface compaction. The erosion hazard is moderate. Compaction decreases if the soil is grazed when the moisture content is less than field capacity. Maintaining adequate plant residue on the soil surface helps control erosion. Good management includes fertilization and range seeding. Soft chess, wild oats, burclover, and filaree are important forage species.

This soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe problem for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IIe-3 (14) irrigated, and IVe-3 (14) nonirrigated. The Storie index rating is 58.

192—San Andreas sandy loam, 15 to 30 percent slopes. This moderately deep, moderately steep, well drained soil formed in material weathered from sandstone. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is brown sandy loam about 11 inches thick. The subsoil is light brown heavy sandy loam about 18 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to the sandstone ranges from 20 to 40 inches.

Included with this soil in mapping are about 5 percent Arnold loamy sand, 5 percent Shimmon loam, 5 percent of a soil similar to San Andreas soil except that it is 30 to 50 inches deep to hard sandstone, and 5 percent small areas of Cieneba coarse sandy loam and Gaviota sandy loam.

This San Andreas soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

About 50 percent of this soil has been cleared and is used for cultivated crops, and the rest is used for woodland.

If the soil is irrigated, it is suited to wine grapes, almonds, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Erosion control requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope and soil depth.

This San Andreas soil is suited to interior live oak, coast live oak, blue oak, and Digger pine. A net volume of 1,303 cubic feet per acre of wood fiber has been measured on this site. Overcutting the tree cover on this soil, especially in drier areas, results in conversion from tree cover to grass and forb production.

This soil is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 35.

193—San Andreas-Arujo sandy loams, 9 to 15 percent slopes. This complex consists of rolling soils on hills. Elevation is 1,000 to 1,600 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent San Andreas sandy loam and 25 percent Arujo sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 10 percent Concepcion sandy loam, 10 percent Shimmon loam, 5 percent of a soil similar to San Andreas soil except it is calcareous, and 5 percent of a soil similar to San Andreas except it is underlain by sandstone at a depth of 10 to 20 inches. Five percent is small areas of Arnold loamy sand, Botella sandy loam, Elder loam, Oceano loamy sand, Lopez very shaly clay loam, and Santa Lucia shaly clay loam, and 10 percent is urban areas. In a few areas, slope is 15 to 30 percent.

The San Andreas soil is a moderately deep, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is dark gray sandy loam about 12 inches thick. The subsoil is light brownish gray and light gray sandy loam about 17 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to the sandstone is 20 to 40 inches.

This San Andreas soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to moderate. Surface runoff is medium, and the hazard of erosion is moderate.

The Arujo soil is a deep, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is dark gray sandy loam about 10 inches thick. The subsoil is grayish brown and light grayish brown sandy clay loam about 21 inches thick. The substratum is light gray sandy loam underlain at a depth of 47 inches by weathered sandstone. Depth to the sandstone ranges from 40 to 60 inches.

This Arujo soil has moderately slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

These soils are used for cultivated crops, rangeland, and urban land.

If the soils are irrigated, they are suited to wine grapes, almonds, pasture, small grain, and grain hay. If dryfarmed, they are best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Erosion control requires annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope, soil depth, and the moderately slow permeability of the Arujo soil.

The Arujo soil is suited to rangeland. Erosion hazard is moderate, but can be controlled by proper grazing. Good management includes fertilization, range seeding, and proper grazing. Coast live oak, soft chess, wild oats, and filaree are important forage and browse species.

The San Andreas soil is suited to interior live oak, coast live oak, blue oak, and Digger pine. A net volume of 1,303 cubic feet per acre of wood fiber has been measured on this site. Overcutting the tree cover on this soil, especially in drier areas, results in conversion from tree cover to grass and forb production.

These soils are suited to building sites and roads and streets. Slope is a limitation. The moderate shrink-swell potential of the Arujo soil is a limitation for dwellings and other buildings, but can be overcome if proper design and installation procedures are used. The moderate shrink-swell potential and low strength of the Arujo soil are limitations for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent on the Arujo soil and the moderate soil depth of the San Andreas soil severely limit them for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This complex is in capability units IIIe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 50.

194—San Emigdio fine sandy loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in calcareous alluvium. It is on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is light brownish gray fine sandy loam about 7 inches thick. The underlying material is stratified layers of pale yellow fine sandy loam, loam, and very fine sandy loam. This soil is calcareous throughout.

Included with this soil in mapping are about 5 percent of a soil similar to San Emigdio soil except that it has a stratified, very gravelly sandy loam and loamy sand profile, and 10 percent small areas of Elder loam, Mocho clay loam, and Tujunga fine sand.

This San Emigdio soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is slow, and the hazard of erosion is slight.

Most of this soil is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Lack of sufficient rainfall during the growing season is the only limitation if the soil is cultivated. Proper tillage and use of crop residue help maintain soil tilth and structure, and improve fertility and water infiltration.

Furrow, border, sprinkler, or drip methods of irrigation are best suited.

This soil is well suited to building sites, septic tank absorption fields, and roads and streets.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 100.

195—San Emigdio fine sandy loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in calcareous alluvium. It is on alluvial fans. Elevation is 600 to 1,500 feet. The

mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is light brownish gray fine sandy loam about 7 inches thick. The underlying material is stratified layers of pale yellow fine sandy loam, loam, and very fine sandy loam. This soil is calcareous throughout.

Included with this soil in mapping are about 5 percent of a soil similar to San Emigdio soil except that it has a stratified, very gravelly sandy loam and loamy sand profile and 10 percent small areas of Elder loam, Mocho clay loam, and Tujunga fine sand.

This San Emigdio soil has moderately rapid permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is medium, and the hazard of erosion is moderate.

Most of this soil is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay. Proper tillage and the use of crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Orchards and vineyards can be protected by use of crop residue and by cover crops. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited because of slope and the erosion hazard.

This soil is well suited to building sites, septic tank absorption fields, and roads and streets.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 90.

196—San Ysidro sandy loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, moderately well drained soil formed in alluvium derived from mixed rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown sandy loam about 18 inches thick. The subsurface layer is clay or light brownish gray sandy loam about 1 inch thick. The subsoil extends to a depth of 40 inches. The upper part of the subsoil is grayish brown clay about 13 inches thick. The lower part of the subsoil is brown clay loam about 8 inches thick. The substratum is pale brown sandy loam.

Included with this soil in mapping are about 5 percent Rincon clay loam, 5 percent Oceano loamy sand, and 5 percent small areas of Arbuckle fine sandy loam, Cropley clay, and Metz loamy sand.

This San Ysidro soil has very slow permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate. The surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops, rangeland, and urban land.

If the soil is irrigated, it is best suited to such shallow-rooted crops as small grain, grain hay, and pasture. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

If the soil is irrigated, the amount of water needs to be controlled to prevent waterlogging and excessive runoff. Sprinkler and drip methods of irrigation are best suited to this soil.

This soil is well suited to use as rangeland. The erosion hazard is a moderate limitation. Maintaining adequate crop residue on the soil surface helps control erosion. During heavy periods of rain, this soil is subject to waterlogging and should not be grazed because of surface compaction. Good management includes fertilization, range seeding, and proper grazing. Burclover, soft chess, and purple needlegrass are important forage species.

This soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe limitation for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IVe-3 (14) irrigated, and IVe-3 (14) nonirrigated. The Storie index rating is 41.

197—San Ysidro loam, 0 to 2 percent slopes. This very deep, nearly level, moderately well drained soil formed in alluvium derived from mixed rocks. It is on terraces. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is pale brown loam about 20 inches thick. The subsurface layer is very pale brown loam about 3 inches thick. The subsoil extends to a depth of 64 inches or more. It is light brown heavy clay

loam to a depth of about 38 inches; light yellowish brown, calcareous loam to a depth of about 51 inches; and light yellowish brown fine sandy loam to a depth of 64 inches or more. A few mottles are in the subsoil.

Included with this soil in mapping are about 10 percent Arbuckle fine sandy loam, 10 percent of a soil similar to San Ysidro soil except that it has a grayish brown surface layer, and 5 percent small areas of Cropley clay, Greenfield fine sandy loam, and Rincon clay loam.

This San Ysidro soil has very slow permeability. The effective rooting depth is 60 inches. The available water capacity is moderate to high. The surface runoff is slow, and the hazard of erosion is slight. The subsoil has high shrink-swell potential.

This soil is used for cultivated crops, rangeland, and urban land.

If the soil is irrigated, it is suited to such shallow-rooted crops as small grain, grain hay, and pasture. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

If the soil is irrigated, the amount of water needs to be controlled to prevent ponding and waterlogging. Sprinkler irrigation is the best system because of the very slow soil permeability.

This soil is well suited to use as rangeland. During heavy periods of rain, this soil is subject to ponding or waterlogging and should not be grazed because of surface compaction. Good management includes fertilization, range seeding, and proper grazing. Burclover, soft chess, and purple needlegrass are important forage species.

This soil has severe limitations for building sites and roads and streets because of the high shrink-swell potential and low strength of the subsoil. Foundations and footings should be designed to prevent structural damage by shrinking and swelling of the subsoil. The subsoil should be covered with a suitable base material to minimize maintenance on roads and streets. The slow absorption of effluent is a severe limitation for septic tank absorption fields. Onsite investigation is needed to determine the method of disposal.

This soil is in capability units IVs-3 (14) irrigated, and IVs-3 (14) nonirrigated. The Storie index rating is 45.

198—Santa Lucia-Lopez complex, 15 to 50 percent slopes. This complex consists of moderately steep to steep soils on hills. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Santa Lucia shaly clay loam and 25 percent Lopez very shaly clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Gazos shaly clay loam, 5 percent Calodo clay loam, 5 percent Linne shaly clay loam, 5 percent Zakme clay, and 5 percent of a soil similar to Santa Lucia soil except that it is 40 to 60 inches deep to bedrock. Five percent is Urban land, and 5 percent is small areas of Lockwood shaly loam and rock outcrop. In a few areas, slope is 9 to 15 percent.

The Santa Lucia soil is a moderately deep, well drained soil that formed in material weathered from shale. Typically, the surface layer is about 21 inches thick. It is dark gray shaly clay loam in the upper 4 inches and dark gray and dark grayish brown very shaly heavy clay in the lower 17 inches. Hard shale is at a depth of about 21 inches. Depth to the hard shale ranges from 20 to 40 inches.

This soil has moderate permeability. The effective rooting depth is 20 to 30 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

The Lopez soil is a shallow, somewhat excessively drained soil that formed in material weathered from shale. Typically, the surface layer is gray very shaly clay loam about 14 inches thick. Hard shale is at a depth of 14 inches. Depth to the shale ranges fom 10 to 20 inches.

This Lopez soil has moderate permeability. The effective rooting depth is 10 to 20 inches, and the available water capacity is very low. The surface runoff is rapid, and the hazard of erosion is high.

These soils are used for rangeland and urban land.

Both soils are poorly suited to use as rangeland. The main limitations are the erosion hazard and competition for soil moisture by woody plants. Maintaining adequate crop residue on the soil surface helps control erosion. If woody plants are managed economically to create open areas, these soils produce a fair cover of desirable grasses and forbs. If the soils are barren, the finer materials erode, leaving a layer of shale fragments on the surface. These shale fragments tend to retard seed germination and seedling growth.

Important forage and browse species on the Santa Lucia soil are soft chess, wild oats, filaree, and live oak.

Important browse and forage species on the Lopez soil are chamise, buckbrush, purple needlegrass, and red brome.

Slope, depth to rock, and the erosion hazard severely limit these soils for building sites and roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields. Onsite investigation is needed to determine the proper method of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 10.

199—Santa Lucia-Gazos complex, 50 to 75 percent slopes. This complex consists of very steep soils on

mountains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 30 percent Santa Lucia shaly clay loam and 25 percent Gazos shaly clay loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Lopez very shaly clay loam, 10 percent of a soil similar to Santa Lucia soil except that it is 40 to 60 inches deep to bedrock, and 10 percent Linne shaly clay loam. Five percent is rock outcrop, and 5 percent is Zakme clay and a few areas of Lockwood shaly loam.

The Santa Lucia soil is a moderately deep, well drained soil that formed in material weathered from shale. Typically, the surface layer is about 21 inches thick. It is dark gray shaly clay loam in the upper 4 inches and dark gray and dark grayish brown very shaly heavy clay loam in the lower 17 inches. Hard shale is at a depth of 21 inches. Depth to shale ranges from 20 to 40 inches.

This Santa Lucia soil has moderate permeability. The effective rooting depth is 20 to 30 inches, and the available water capacity is very low to low. Surface runoff is very rapid, and the hazard of erosion is very high.

The Gazos soil is a moderately deep, well drained soil that formed in material weathered from shale. Typically, the surface layer is gray shaly clay loam about 28 inches thick. Hard shale is at a depth of about 28 inches. Depth to shale ranges from 20 to 40 inches.

This Gazos soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. The surface runoff is very rapid, and the hazard of erosion is very high.

These soils are used for rangeland and urban land.

If they are used for rangeland, both soils are limited by the erosion hazard and the competition for soil moisture by woody plants. Erosion can be controlled by maintaining adequate crop residue on the soil surface. Stock trails can be used to help grazing distribution. If woody plants are managed economically to create open areas, these soils produce a fair cover of desirable grasses and forbs. If the soils are barren, the finer materials erode, leaving a layer of shale fragments on the surface. These shale fragments tend to retard seed germination and seedling growth.

The Santa Lucia soil is poorly suited to use as rangeland. Soft chess, wild oats, filaree, and live oak are important forage and browse species.

The Gazos soil is suited to use as rangeland. Surface compaction is a limitation that decreases if the soil is grazed when the moisture content is less than field capacity. Soft chess, wild oats, filaree, and scrub oak are important forage and browse species.

Slope, depth to rock, and the erosion hazard severely limit these soils for building sites and roads and streets. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and by establishing permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields. Onsite investigation is needed to determine the proper method of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This complex is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 7.

200—Sesame sandy loam, 9 to 30 percent slopes. This moderately deep, moderately steep, well drained soil formed in material weathered from granitic rock. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown sandy loam about 10 inches thick. The subsoil is brown sandy clay loam about 15 inches thick. Weathered granitic rock is at a depth of about 25 inches. Depth to rock ranges from 20 to 40 inches.

Included with this soil in mapping are about 10 percent Arbuckle fine sandy loam, 5 percent Vista coarse sandy loam, 5 percent Cieneba coarse sandy loam, and 5 percent small areas of Hanford fine sandy loam, Metz loamy sand, and Positas coarse sandy loam. A few areas have deep gullies or rock outcrop.

This Sesame soil has moderate permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. The surface runoff is rapid, and the erosion hazard is high.

This soil is used for cultivated crops and rangeland.

If the soil is irrigated, it is suited to wine grapes, almonds, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Erosion control includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope and soil depth.

This soil is well suited to use as rangeland. The erosion hazard is the main limitation. Maintaining adequate plant residue on the soil surface helps control erosion. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

This soil is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 29.

201—Shimmon loam, 15 to 30 percent slopes. This moderately deep, moderately steep, well drained soil formed in material weathered from sandstone. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark gray loam about 10 inches thick. The subsoil is yellowish brown and very pale brown clay loam about 19 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to sandstone ranges from 20 to 40 inches.

Included with this soil in mapping are about 10 percent of a soil similar to Shimmon soil except that it is underlain by hard sandstone, 5 percent Dibble clay loam, 5 percent Concepcion sandy loam, and 5 percent small areas of Linne shaly clay loam, Lodo gravelly clay loam, or Balcom loam. A few areas have deep gullies and rock outcrop.

This Shimmon soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

About half of this soil has been cleared and is used for cultivated crops. The rest is used for rangeland.

If the soil is irrigated, it is suited to wine grapes, almonds, pasture, small grain, and grain hay. If dryfarmed, it is best suited to small grain and grain hay.

Proper tillage and use of crop residue help maintain soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Erosion control includes annual cover crops, permanent cover crops, or permanent cover crops in conjunction with weed-free nontillage. A system is needed for collecting and disposing of excess water from higher-lying areas.

If the soil is irrigated, the amount of water needs to be controlled to prevent excessive runoff. Sprinkler and drip methods of irrigation are best suited because of slope and soil depth.

This soil is well suited to use as rangeland. The main limitations are the erosion hazard and the competition for soil moisture by the woody plants. Erosion can be controlled by maintaining adequate plant residue on the soil surface. If woody plants can be managed economically to create open areas, the soil produces a good cover of desirable grasses and forbs. Interior live oak, blue oak, soft chess, and wild oats are important browse and forage species.

This soil is in capability units IVe-1 (15) irrigated, and IVe-1 (15) nonirrigated. The Storie index rating is 37.

202—Shimmon loam, 30 to 50 percent slopes. This moderately deep, steep, well drained soil formed in material weathered from sandstone. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark gray loam about 10 inches thick. The subsoil is yellowish brown and very pale brown clay loam about 19 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to sandstone ranges from 20 to 40 inches.

Included with this soil in mapping are about 10 percent of a soil similar to Shimmon soil except that it is underlain by hard sandstone, 5 percent Dibble clay loam, and 5 percent small areas of Balcom loam, Linne shaly clay loam, and Lodo gravelly clay loam. A few areas have deep gullies and rock outcrop.

This Shimmon soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is rapid, and the hazard of erosion is high.

This soil is used for rangeland, and a few areas have been cleared and used for cultivated crops.

This soil is not suited to cultivated crops because of steep slopes and the high erosion hazard. Some areas of this soil are used for almond orchards and vineyards.

Erosion control requires permanent cover crops or permanent cover crops in conjunction with weed-free nontillage.

This soil is well suited to use as rangeland. The main limitations are the erosion hazard and competition from woody plants. Maintaining adequate plant residue on the soil surface helps control erosion. If woody plants are managed economically to create open areas, the soil produces a good cover of desirable grasses and forbs. Interior live oak, blue oak, soft chess, and wild oats are important browse and forage species.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 23.

203—Shimmon-Dibble association, steep. This association consists of soils on mountains. Slope is 30 to 50 percent. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 40 percent Shimmon loam and 35 percent Dibble clay loam. Shimmon soil has north and west aspects. Dibble soil is on ridge crests and has south and east aspects.

Included with these soils in mapping are about 15 percent Millsholm clay loam, 5 percent rock outcrop, and 5 percent small areas of Balcom loam, Gaviota sandy loam, Los Osos clay loam, Nacimiento silty loam, and San Andreas sandy loam.

The Shimmon soil is a moderately deep, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is dark gray loam about 10 inches thick. The subsoil is yellowish brown and very pale brown clay loam about 19 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to sandstone ranges from 20 to 40 inches.

This Shimmon soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches. The available water capacity is low to moderate. The surface runoff is rapid, and the hazard of erosion is high.

The Dibble soil is a moderately deep, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. Weathered shale is at a depth of about 34 inches. Depth to shale or sandstone ranges from 20 to 40 inches.

This Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. The surface runoff is rapid, and the hazard of erosion is high. The subsoil has high shrink-swell potential.

These soils are used for rangeland. Small areas are urban land.

These soils are well suited to use as rangeland. The erosion hazard is a limitation. Maintaining adequate crop residue on the soil surface helps control erosion.

The Shimmon soil is limited by competition for soil moisture by the woody plants. If woody plants are managed economically to create open areas, the soil produces a good cover of desirable grasses and forbs. Interior live oak, blue oak, soft chess, and wild oats are important browse and forage species.

The Dibble soil is limited by surface compaction. If the soil is grazed when the soil moisture content is favorable, there is less compaction. This soil responds to fertilization and range seeding. Soft chess, wild oats, and filaree are important forage species.

Slope and the erosion hazard severely limit these soils for building sites and roads and streets. In addition, the low strength of these soils is a limitation for roads and streets, but can be corrected by replacing the base material. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and establishing permanent plant cover on side slopes. Slope and depth to rock severely limit these soils for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This association is in capability subclass VIe (15) nonirrigated. The Storie index rating is 23 for the Shimmon part, and 18 for the Dibble part.

204—Shimmon-Dibble association, very steep. This association consists of soils on mountains. Slope is 50 to 75 percent. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 40 percent Shimmon loam and 35 percent Dibble clay loam. The Shimmon soil has north and west aspects. The Dibble soil is on ridge crests and has south and east aspects.

Included with these soils in mapping are about 15 percent San Andreas sandy loam, 5 percent rock outcrop, and 5 percent small areas of Balcom loam, Gaviota sandy loam, Los Osos clay loam, Nacimiento silty clay loam, and Millsholm clay loam.

The Shimmon soil is a moderately deep, well drained soil that formed in material weathered from sandstone. Typically, the surface layer is dark gray loam about 10 inches thick. The subsoil is yellowish brown and very pale brown clay loam about 19 inches thick. Weathered sandstone is at a depth of about 29 inches. Depth to the sandstone ranges from 20 to 40 inches.

This Shimmon soil has moderately slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high.

The Dibble soil is a moderately deep, well drained soil that formed in material weathered from sandstone and shale. Typically, the surface layer is pale brown clay loam about 12 inches thick. The subsoil is about 22 inches thick. The upper part of the subsoil is light yellowish brown and brownish yellow clay about 14 inches thick. The lower part of the subsoil is brownish yellow clay loam about 8 inches thick. Weathered shale is at a depth of about 34 inches. Depth to the shale or sandstone ranges from 20 to 40 inches.

This Dibble soil has slow permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is low to moderate. Surface runoff is very rapid, and the hazard of erosion is very high. The subsoil has high shrink-swell potential.

These soils are used for rangeland and are moderately suited to this use. Both soils are limited by the erosion hazard and slope. On these very steep soils, maintaining adequate crop residue on the soil surface helps control erosion. Stock trails can be used to help obtain grazing distribution.

The Shimmon soil is limited by competition for soil moisture by woody plants. If woody plants can be managed economically to create open areas, the soil produces a good cover of desirable grasses and forbs. Interior live oak, blue oak, soft chess, and wild oats are important browse and forage species.

Surface compaction is a limitation on Dibble soils. If the soil is grazed when the soil moisture content is favorable, there is less compaction. Soft chess, wild oats, and filaree are important forage species.

This association is in capability subclass VIIe (15) nonirrigated. The Storie index rating is 11 for the Shimmon part, and 9 for the Dibble part.

205—Sorrento clay loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in calcareous alluvium derived from sedimentary rocks. It is

on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 19 inches thick. The underlying material is light brownish gray and light gray, calcareous clay loam.

Included with this soil in mapping are about 10 percent Still clay loam and 5 percent small areas of Cropley clay, Rincon clay loam, and San Emigdio fine sandy loam.

This Sorrento soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is very high. The surface runoff is slow, and the hazard of erosion is slight.

This soil is one of the most productive soils in the survey area. Most of the acreage is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

This soil has few limitations if it is farmed. Proper tillage and use of crop residue help to maintain soil tilth and structure and improve fertility and water infiltration.

If the soil is irrigated, furrow, border, sprinkler, or drip methods are best suited.

This soil is suited to building sites and roads and streets. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 85.

206—Sorrento clay loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in calcareous alluvium. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown clay loam about 19 inches thick. The underlying material is light brownish gray and light gray, calcareous clay loam.

Included with this soil in mapping are about 5 percent Still clay loam and 5 percent small areas of Cropley clay, Rincon clay loam, San Emigdio fine sandy loam, and Tujunga fine sand.

This Sorrento soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is very high. Surface runoff is slow, and the hazard of erosion is moderate.

This soil is one of the most productive soils in the survey area. Most of the acreage is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and use of crop residue help to maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Orchards and vineyards can be protected by using cover crops and crop residue. A system is needed for collecting concentrated or excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation systems are best suited because of slope and the erosion hazard.

This soil is suitable for building sites and roads and streets. Moderate shrink-swell potential and low strength are limitations for dwellings and buildings, but can be overcome if proper design and installation procedures are used. Low strength is a limitation for roads and streets, but can be corrected by replacing the base material. The slow absorption of effluent for septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 76.

207—Still gravelly loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is grayish brown gravelly loam about 28 inches thick. The underlying material is stratified layers of gray gravelly loam and clay loam.

Included with this soil in mapping are about 5 percent Clear Lake clay and 5 percent small areas of Metz loamy sand and Riverwash. In a few areas, slope is 2 to 9 percent. Some areas have wet spots.

This Still soil has moderate permeability. The effective rooting depth is 60 inches, and the available water capacity is moderate to high. Surface runoff is slow, and the hazard of erosion is slight.

Most of this soil is used for cultivated crops, but a small acreage is used for urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, this soil is suited only to small grain and grain hay.

There is generally enough gravel present to interfere slightly with tillage operations. Proper tillage and use of

crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

Furrow, border, sprinkler, or drip methods of irrigation are best suited.

This soil is suitable for building sites and roads and streets. Moderate shrink-swell potential is a limitation for dwellings and buildings, but can be overcome if proper design and installation procedures are used. The moderate shrink-swell potential and low strength of the soil are limitations for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIs-4 (14) irrigated, and IVs-4 (14) nonirrigated. The Storie index rating is 80.

208—Still clay loam, 0 to 2 percent slopes. This very deep, nearly level, well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark grayish brown clay loam about 25 inches thick. The underlying material is stratified layers of grayish brown, dark grayish brown, and brown clay loam.

Included with this soil in mapping are about 15 percent Mocho clay loam and 5 percent small areas of Metz loamy sand. South of Five Mile Bridge and along Trout Creek, small areas are underlain by dark gray clay at a depth of 20 to 30 inches. About 50 acres along Yerba Buena Creek south of Santa Margarita is poorly drained and subject to overflow about once in 3 years.

This Still soil has moderately slow permeability. The effective rooting depth is 60 inches, and the available water capacity is high to very high. Surface runoff is slow, and the hazard of erosion is slight.

This soil is one of the most productive soils in the survey area. Most of the acreage is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

This soil has few limitations if it is farmed. Proper tillage and use of crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

Furrow, border, sprinkler, or drip methods of irrigation are best suited.

This soil is suitable for building sites and roads and streets. Moderate shrink-swell potential is a limitation for dwellings and buildings, but can be overcome if proper design and installation procedures are used. The moderate shrink-swell potential and low strength of the soil are limitations for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent in septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability class I (14) irrigated, and capability unit IVc-1 (14) nonirrigated. The Storie index rating is 85.

209—Still clay loam, 2 to 9 percent slopes. This very deep, gently sloping to moderately sloping, well drained soil formed in alluvium derived from sedimentary rocks. It is on alluvial fans. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark grayish brown clay loam about 25 inches thick. The underlying material is stratified layers of grayish brown, dark grayish brown, and brown clay loam.

Included with this soil in mapping is about 15 percent Mocho clay loam and 5 percent small areas of Metz loamy sand. A few areas have wet spots.

This Still soil has moderately slow permeability. The effective rooting depth is 60 inches. The available water capacity is high to very high. The surface runoff is medium, and the hazard of erosion is moderate.

This soil is one of the most productive soils in the survey area. Most of the acreage is used for cultivated crops, but a small acreage is urban land.

If the soil is irrigated, it is well suited to alfalfa, sugar beets, wine grapes, walnuts, almonds, pasture, small grain, and grain hay. If dryfarmed, it is suited only to small grain and grain hay.

Proper tillage and use of crop residue help maintain soil tilth and structure and improve fertility and water infiltration.

Sheet and rill erosion are hazards if the soil is cultivated. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. Orchards and vineyards can be protected by using cover crops and crop residue. A system is needed for collecting excess water from higher-lying areas and conducting it in diversions or permanent grassed waterways to safe outlets.

Sprinkler or drip irrigation methods are best suited because of slope and the erosion hazard.

This soil is suitable for building sites and roads and streets. Moderate shrink-swell potential is a limitation for dwelling and buildings, but can be overcome if proper design and installation procedures are used. The moderate shrink-swell potential and low strength of the soil are limitations for roads and streets, but can be overcome by replacing the base material. The slow absorption of effluent for septic tank absorption fields can be overcome by increasing the size of the absorption area.

This soil is in capability units IIe-1 (14) irrigated, and IVe-1 (14) nonirrigated. The Storie index rating is 76.

210—Vista coarse sandy loam, 9 to 15 percent slopes. This moderately deep, rolling, well drained soil formed in material weathered from granitic rock. It is on hills. Elevation is 1,000 to 2,500 feet. The mean annual

precipitation is 12 to 20 inches, the mean annual air temperature is about 60 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark brown coarse sandy loam about 14 inches thick. The subsoil is brown coarse sandy loam about 15 inches thick. Weathered granitic rock is at a depth of about 29 inches. Depth to the granitic rock ranges from 20 to 40 inches.

Included with this soil in mapping are about 10 percent Greenfield gravelly sandy loam, 5 percent Sesame sandy loam, 5 percent Positas coarse sandy loam, and 5 percent Cieneba coarse sandy loam.

This Vista soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and available water capacity is very low to low. The surface runoff is medium, and the hazard of erosion is moderate.

Most of this soil has been cleared and is used for rangeland. A few areas are used for cultivated crops.

If the soil is dryfarmed, it is best suited to small grain and grain hay. Crop yields are low because of the low available water capacity and low natural fertility. Proper tillage and use of crop residue improve soil tilth, structure, fertility, and water infiltration.

Soil erosion is a hazard. Cultivating across the slope, maintaining crop residue on or near the surface during periods of rain, and using crop rotation help control erosion. A system is needed for collecting and disposing of excess water from higher-lying areas.

This soil is suited to use as rangeland. The main limitations are the erosion hazard, low fertility, and competition for soil moisture by brush. If brush can be managed economically to create open areas, this soil produces a limited cover of annual grasses and forbs. Maintaining plant residue on the soil surface helps control erosion. This soil responds to fertilization and range seeding. Soft chess, filaree, and chamise are important forage and browse species. Proper grazing is important in maintaining or improving the quantity and quality of desirable vegetation. The hazard of wildfire is high, but can be limited by brush control and properly constructed firebreaks.

This soil is in capability unit IVe-1 (15) nonirrigated. The Storie index rating is 36.

211—Vista-Cieneba coarse sandy loams, 15 to 30 percent slopes. This complex consists of moderately steep soils on hills. Elevation is 1,000 to 2,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This complex is about 40 percent Vista coarse sandy loam and 35 percent Cieneba coarse sandy loam. Areas of these soils are so intricately mixed or so small that it is not practical to separate them in mapping.

Included with these soils in mapping are about 15 percent Sesame sandy loam, 5 percent Andregg coarse sandy loam, and 5 percent small areas of Positas coarse sandy loam, Hanford gravelly sandy loam, and Metz loamy sand.

The Vista soil is a moderately deep, well drained soil that formed in material weathered from granitic rock. Typically, the surface layer is dark brown coarse sandy loam about 14 inches thick. The subsoil is brown coarse sandy loam about 15 inches thick. Weathered granitic rock is at a depth of about 29 inches. Depth to the granitic rock ranges from 20 to 40 inches.

This Vista soil has moderately rapid permeability. The effective rooting depth is 20 to 40 inches, and the available water capacity is very low to low. Surface runoff is rapid, and the hazard of erosion is high.

The Cieneba soil is a shallow, excessively drained soil that formed in material weathered from granitic rock. Typically, the surface layer is brown and pale brown coarse sandy loam about 15 inches thick. Weathered granitic rock is at a depth of about 15 inches. Depth to the granitic rock ranges from 12 to 20 inches.

This Cieneba soil has moderately rapid permeability. The effective rooting depth is 12 to 20 inches, and the available water capacity is very low to low. The surface runoff is rapid, and the hazard of erosion is high.

These soils are mainly used for rangeland. A few areas are used for urban land.

If used for range, both soils are limited by the erosion hazard. This limitation can be controlled by proper grazing. The hazard of wildfire is high, but can be limited by brush control and properly constructed firebreaks.

The Vista soil is moderately suited to use as rangeland. The main limitations are low fertility and competition for soil moisture by brush. If brush can be managed economically to create open areas, the soil produces a limited cover of annual grasses and forbs. This soil responds to fertilization and range seeding. Soft chess, filaree, and chamise are important forage and browse species. Proper grazing is important in maintaining or improving the quantity and quality of desirable vegetation.

The Cieneba soil is poorly suited for rangeland. This soil produces sparse amounts of vegetation suitable for grazing. Brush management for range improvement is not economically feasible. Because the herbaceous vegetative cover deteriorates readily, proper grazing use is needed. Chamise and purple needlegrass are important browse and forage species.

This complex is in capability subclass VIe (15) nonirrigated. The Storie index rating is 22.

212—Xerofluvents-Riverwash association. This association consists of soils and barren areas on flood plains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 12 to 20 inches, the mean annual air temperature is 60 degrees F, and the average frost-free season is 200 days. This association is about 50 percent Xerofluvents and 30 percent Riverwash. Xerofluvents are on the flood plains and are flooded about twice every 4 years. Riverwash is on barren areas in and along stream channels and is generally flooded every year.

Included with this association in mapping are about 20 percent small areas of Elder loam, Metz loamy sand, and Tujunga fine sand.

Xerofluvents consists of variably colored stratified sand, loamy sand, gravelly sandy loam, and gravel. Permeability is variable. Effective rooting depth is 36 to 60 inches, and available water capacity is very low. Surface runoff is medium. The erosion and deposition hazards are very high.

Riverwash consists of barren areas of unstabilized sand and gravelly sediment which are generally flooded, washed, and reworked by streams every year.

This association is used for watershed and wildlife habitat. A few areas along the larger streams are used as a source of sand and gravel.

The soils in this association generally have very poor potential for establishment of vegetation useful to wildlife. Native vegetation already present provides some food and cover for wildlife. Value to wildlife depends on the proximity of the soil to additional sources of food and water.

This association is in capability subclass VIIIw (14) nonirrigated. The Storie index rating is 17 for the Xerofluvents part, and 2 for the Riverwash part.

213—Zakme clay, 30 to 50 percent slopes. This deep, steep, well drained soil formed in material weathered from calcareous shale and sandstone. It is on mountains. Elevation is 600 to 1,500 feet. The mean annual precipitation is 16 to 20 inches, the mean annual air temperature is 56 degrees F, and the average frost-free season is 200 days.

Typically, the surface layer is dark gray clay about 47 inches thick. The underlying material, to a depth of 55 inches, is light yellowish brown, calcareous clay. Below that, it is weathered, calcareous shale. Depth to the shale ranges from 40 to 60 inches.

Included with this soil in mapping are about 5 percent Ayar silty clay, 5 percent Linne shaly clay loam, and 5 percent a soil similar to Zakme soil except that it is underlain by hard, calcareous shale at a depth of 30 to 50 inches.

This Zakme soil has slow permeability. The effective rooting depth is 40 to 60 inches, and the available water capacity is moderate to high. Surface runoff is rapid, and the hazard of erosion is high. The shrink-swell potential is high.

This soil is used for woodland and urban land.

The soil is suited to coast live oak and California laurel. A net volume of 2,344 cubic feet of wood fiber per acre has been measured on this soil. The main concerns in woodland management are steep slopes, erosion control, and the clay texture. During the rainy season the clay texture and steep slopes limit woodland operations. Erosion control is needed in woodland management.

Slope, the erosion hazard, high shrink-swell potential, and low strength severely limit this soil for building sites and roads and streets. For roads and streets, the high shrink-swell potential, and low strength of this soil can be overcome by replacing the base material. Soil erosion can be controlled by minimum grading, runoff and sediment control structures, and the establishment of permanent plant cover on side slopes. Slope, depth to rock, and slow absorption of effluent severely limit this soil for septic tank absorption fields. Onsite investigation is needed to determine proper methods of disposal. In highly populated areas, sanitary facilities should be connected to commercial sewers.

This soil is in capability subclass VIe (15) nonirrigated. The Storie index rating is 16.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, rangeland, and woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this

soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service and the Storie Index rating are explained; and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Major soil management concerns for crops and pasture

This section was prepared by Raymond C Cooper, soil conservationist, and Clarence U Finch, conservation agronomist, of the Soil Conservation Service

In the paragraphs that follow, the chief management practices are discussed for all soils of the Paso Robles soil survey area suitable for tilled crops and pasture. If the soils are farmed, the major concerns are maintaining or improving the production capacities and preventing erosion. Management practices include, but are not limited to, the following: a conservation cropping system, use of crop residue, proper tillage, management of irrigation water, cover crops, control of erosion, removal of excess water, pasture management, and summer fallow. Technical assistance in planning and applying practices suitable for the soil on a particular farm can be obtained from local representatives of the Soil Conservation Service and the Cooperative Extension Service.

A conservation cropping system consists of growing crops in combination with necessary cultural and management measures. If soil-improving crops and methods more than offset the soil-depleting crops and deteriorating practices, then it is a good conservation cropping system. Cropping systems are necessary on all tilled soils in the survey area.

Soil-improving methods in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Methods also include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, weed and pest control, and other good soil culture or management practices.

Many diverse cropping systems are used in the survey area along with several combinations of individual crops. A typical example is alfalfa grown for 3 to 5 years, followed by barley and sugar beets. The crop residue of barley and sugar beets is returned to the soil, and tillage is minimized.

Crop residue utilization is the return of crop residue to the soil. This residue helps to maintain soil tilth, organic matter, and fertility, and to control erosion. On sloping lands, residue should be left on or near the soil surface during critical erosion periods.

Proper tillage is the minimum number of operations necessary to control weeds, incorporate crop residue, obtain favorable air and water movement in the soil, and prepare an adequate seedbed. Tillage operations break down soil structure, reduce soil organic matter, and commonly create a plowpan below the tillage implements. These conditions increase the hazards of soil erosion, and the plowpan limits permeability and restricts root penetration. Varying the depth of tillage operations prolongs the development of the plowpan, and infrequent shallow chiseling breaks up the pan. Combining tillage operations to reduce the number of trips over a field, and delaying tillage operations if soils are wet are other important factors in maintaining soil tilth and preventing compaction.

Irrigation water management is achieved by controlling the rate, amount, and timing of irrigation water to soils in order to supply crop water in a planned and efficient manner. This utilizes the avilable irrigation water and supplies moisture to minimize soil erosion and loss of plant nutrients. Water management also controls undesirable water loss and protects water quality. Irrigation methods used in the soil survey area are furrow, border, sprinkler, and drip. Furrow and border irrigation should be limited to slopes of not more than 3 percent. Sprinkler irrigation is suited to all tillable soils of the area. Drip irrigation is suited to orchards and vineyards. Irrigation water should be applied at a rate and in the amount to meet crop needs and soil characteristics without excess runoff or deep percolation.

Cover crops are necessary in orchards and vineyards and on other soils left fallow during the rainy season. Cover crops provide protection from erosion and maintain or improve water penetration, soil tilth, and fertility. Cover crops generally are volunteer native plants. If a seeded cover is needed or desired, barley, Blando brome, Cucamonga brome, or Wimmera 62 ryegrass can be used. It can be seeded alone or in combination with lana vetch.

Erosion control is generally needed on sloping soils. As the steepness of the slope increases, erosion hazards increase. Erosion can be recognized by the accumulation of soil material at the base of the slopes (fig. 7), in

drainageways, and against fence lines, or as rills and gullies on the slope.

Good land leveling or smoothing, selection of the best method of irrigation, and control of irrigation water help prevent erosion on irrigated soils. Other erosion prevention methods include cover crops, use of crop residue, use of vegetative cover in rotation, proper tillage, and cross slope farming.

Structural measures also help control erosion, either individually or in combination. These measures include diversions, grassed waterways, grade stabilization structures, water retention structures, or streambank stabilization.

Excess water removal can be a problem in low-lying areas, swales, or at the lower end of irrigated fields because of an accumulation of excess water, either from rainfall or irrigation. Excess water results in decreased crop production, and provides a habitat for unwanted weeds and mosquitoes.

Excess water can be controlled by shaping and grading, proper land leveling, construction of open drainage ditches, the use of irrigation tailwater recovery systems, and proper management of irrigation water.

Pasture management is needed for irrigated pastures to prevent soil deterioration, provide for maximum production, maintain a desirable plant community, and extend the life of the pasture. Methods in a pasture management program include irrigation water management, rotation grazing using a minimum of three fields, fertilization, harrowing or dragging to scatter droppings, and clipping to maintain uniform growth. Grazing begins when plants are 8 to 10 inches high, and livestock are removed when 3 to 4 inches of stubble remains.

Selection of an adaptable plant mixture is important when a pasture is established. For most soils in the survey area, well-adapted mixtures contain Akaroa orchardgrass or Goars fescue, in combination with birdsfoot trefoil or Ladino clover. With proper pasture management, these species produce an abundance of high quality forage.

Summer fallow is a means of storing moisture in the soil for later use by crops. It also helps control weeds, plant diseases, and insects. Summer fallow keeps the land free of vegetation during one crop season so that moisture can be stored for crop production the following season. Under a fallow system of farming, crop production tends to become more stabilized, and complete crop failures are less frequent during low rainfall years. In this survey area, a cropping sequence consists of small grain or grain hay planted and harvested one year, and summer fallow one year. The danger of erosion on sloping soils is lessened by keeping as much vegetation as possible on the surface of the land. The safest method of controlling erosion on sloping soils is to use subsurface tillage implements of sweep or blade types. Delaying the first operation until the spring following harvest also helps control erosion.

Crops and pasture plants best suited to the soils

Soils strongly influence the kind of crops and pasture plants that can be grown in a soil survey area. In areas with similar climate and topography, crops that can be grown are related closely to the kind of soil. Crops suited to soils of the survey area are listed and discussed under two broad categories: field crops and fruit and nut crops. Suitability of a crop for each soil is presented in the section "Soil maps for detailed planning."

Field crops suited to the soils in the survey area where irrigation water is available include alfalfa, sugar beets, and pasture. These crops are grown on soils on the alluvial plains, flood plains, and terraces along the Salinas River, in the Creston area, and around Shandon. Irrigated pasture is suited to moderately deep soils on hills where water is available. Akaroa orchardgrass or Goars fescue, in combination with birdsfoot trefoil or Ladino clover, are pasture plant mixtures that are well suited to soils in the survey area.

Grain hay and small grain crops are mainly grown under dryfarmed conditions. Dryfarmed grain is well suited to the large areas of moderately deep to deep, well drained, calcareous silty clay loam and silty clay soils of the central and north-central part of the survey area. Grain crops include barley, oats, safflower, and wheat; however, most of the acreage is planted to barley. Grain hay is grown throughout the central part of the area on soils on alluvial fans, terraces, and hills. Oat hay is the main hay crop. A minor acreage of vetch or barley hay is also grown.

Fruit and nut crops suited to the soils in the survey area include almonds, apples, walnuts, and grapes.

Almonds are adapted to the soils on hills west and south of Paso Robles, where air drainage is good. They are the main tree crop grown in the area, and most of the almond acreage is not irrigated. Apples are suited to deep soils on alluvial fans west of Templeton. Walnuts are suited to deep soils that are protected from frost.

Grapes of excellent quality are suited to the soils on terraces and hills near York Mountain, Templeton, and Shandon. New large vineyards were planted on the hilly soils east of Paso Robles off of Highway 46, and also on the soils on alluvial plains, flood plains, and terraces in the Shandon area. Most of the acreages of grapes are irrigated.

Capability classes, subclasses, and units

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticul-

tural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

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, IIe. The letter *e* shows that the main limitation is 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 too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Thus, the capability unit is a convenient grouping for making many statements about management of soils for cropland. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIIs-3 or IVe-5. The numbers used to designate units within the subclasses are as follows:

0.—Indicates that a problem or limitation is caused by stony, cobbly, or gravelly material in the substratum.
1.—Indicates that a problem or limitation is caused by slope or by actual or potential erosion hazard.
2.—Indicates that a problem or limitation of wetness is caused by poor drainage or flooding.
3.—Indicates that a problem or limitation of slow or very slow permeability of the subsoil or substratum is caused by a clayey subsoil or a substratum that is semiconsolidated.
4.—Indicates that a problem or limitation is caused by sandy or gravelly soils with a low available water-holding capacity.
5.—Indicates that a problem or limitation is caused by a fine textured or very fine textured surface layer.
6.—Indicates that a problem or limitation is caused by salt or alkali.
7.—Indicates that a problem or limitation is caused by rocks, stones, or cobblestones.
8.—Indicates that a problem or limitation exists in the root zone, which generally is less than 40 inches over massive bedrock and lacks moisture for plants.
9.—Indicates that a problem or limitation is caused by low or very low fertility, acidity, or toxicity that cannot be corrected by adding average amounts of fertilizer, lime, or other amendments.

No unit designations are shown for class I soils because soil characteristics are similar for all soils in this class. Unit designations are also deleted from classes V through VIII soils because these soils are generally not intensively managed for cropland.

Land resource areas

In the Paso Robles soil survey area, capability classifications are further refined by designating land resource areas in which the soils in a unit occur. A land resource area is a broad geographic area that has a distinct combination of climate, soils, vegetation, cropping, and management systems. Parts of two of these areas occur in the Paso Robles soil survey area. These areas and their numbers are the Central California Coastal Valleys (14) and the Central California Coastal Range (15). The resource areas are further divided into sub-areas by evapotranspiration zones. The numbers of the resource areas are added in parenthesis to the class, subclass, and unit designations.

Land Resource Area 14 includes approximately 20 percent of the soil survey area. It includes the valley floors and adjacent alluvial fans and terraces of the Salinas, Nacimiento, and Estrella Rivers, and the San Juan, Cholame, Huerhuero, and Paso Robles Creeks. The soils are nearly level to very steep.

Elevation in the resource area ranges from 600 to 1,500 feet. Average annual rainfall ranges from 12 to 20

inches. Water for irrigation is generally available. Most soils are irrigated and intensively farmed. Other soils are used for dryfarmed grains and pasture.

Land Resource Area 15 includes approximately 80 percent of the soil survey area. It includes the hills and mountains adjacent to Resource Area 14. Soils are gently rolling to very steep. Elevation ranges from 700 to 3,400 feet. Average annual rainfall ranges from 9 to 30 inches. Water for irrigation is generally not available. Soils are used for dryfarmed grains and grain hay, almond and walnut orchards, vineyards, pasture, and range.

Capability classes, subclasses, and units, and land resource areas are identified in the description of each soil map unit in the section "Soil maps for detailed planning."

Storie index rating

This section was prepared by Gordon L Huntington, lecturer and soil specialist, Department of Land, Air and Water Resources, University of California, Davis

The soils of the Paso Robles Area are rated according to the Storie Index (*7, 8*). This index expresses numerically the relative degree of suitability of a soil for general intensive agriculture as it exists at the time of evaluation. The rating is based on soil characteristics only, and is obtained by evaluating such factors as soil depth, surface texture, subsoil characteristics, drainage, salts and alkali, and relief. Other factors, such as availability of water for irrigation, climate, and distance from markets that might determine the desirability of growing certain plants in a given locality are not considered. Therefore, in itself, the index should not be considered as a direct index of land value. However, where economic factors are known to the user, the Storie Index provides additional objective information for land tract value comparisons. In this report, the index rating is given at the end of each soil description.

Four general factors are considered in the index rating. These factors are: (A) the characteristics of the soil profile and soil depth; (B) the texture of the surface soil; (C) the dominant slope of the soil body; and (X) other factors more readily subject to mangement or modification. In the Paso Robles Area, the X factors include drainage, flooding, salinity, sodicity, general nutrient level of the soil, and surface microrelief. For some soils more than one X factor may be used. Each of the four general factors is evaluated on the basis of 100 percent. A rating of 100 percent expresses the most favorable or ideal condition for general crop production; lower percentage ratings are assigned for conditions that are less favorable. Factor ratings are selected from tables prepared from data and observations that related soil properties, plant growth, and crop yield (*6*). Where ranges of values for these factors exist within a given soil unit, the modal condition for a factor is used in assigning a rating value.

The index rating for a soil is obtained by multiplying the four factors, A, B, C, and X; thus any factor may dominate or control the final rating. For example, a soil such as Camarillo silty clay loam, partially drained, is a deep soil with a moderately permeable profile. This warrants a rating of 100 percent for factor A. The soil has a workable, silty clay loam surface texture, requiring some care in handling. It warrants a rating of 90 percent for factor B. A smooth, nearly level surface to the soil justifies 100 percent for factor C. A moderate drainage problem with occasional flooding, as well as subsoil salinity, nets a rating of 56 percent for factor X. Multiplying these four factors gives a Storie Index of 50 percent for this soil. If, in time, the drainage problem and subsoil salinity is corrected, the Storie Index can be revised by assigning an appropriate higher value to the X factor to reflect the changed conditions.

Soil complexes in this survey area, for example, Arnold-San Andreas complex, 30 to 75 percent slopes, are rated to reflect the proportion of the dominant soils present in the unit, in the same manner that tracts or fields containing several different soil map units ca be rated. This rating is done by weighted averaging of the sum of the Storie Index values for the soils present based on the acreages of the soils in the tract or field. The soils in soil associations, for example, Balcom-Nacimiento association, steep, and in undifferentiated soil groups such as Ayar and Diablo soils, 9 to 15 percent slopes, are rated separately. Two index values are given at the end of the map unit description and relate, respectively, to the two soils indicated in the map unit name.

Ratings for each of the map units in this area are for the dominant soil or soils within the unit as described and do not take into account smaller inclusions of other kinds of soils or land types.

Soils are placed in grades according to their suitability for general intensive agriculture as shown by their Storie Index ratings. The six grades and their range in index ratings are:

	Index rating
Grade 1	80 to 100
Grade 2	60 to 80
Grade 3	40 to 60
Grade 4	20 to 40
Grade 5	10 to 20
Grade 6	Less than 10

Soils of Grade 1 are excellent or well suited to general intensive agriculture. Grade 2 soils are good and are also well suited to agriculture, although they are not as desirable as soils of Grade 1. Grade 3 soils are only fairly well suited; Grade 4 soils are poorly suited; and Grade 5 soils are very poorly suited. Grade 6 consists of soils and miscellaneous areas that are not suited to agriculture.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 4. In any given year, yields may be

higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 4.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown; that good quality irrigation water is uniformly applied in proper amounts as needed; and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 4 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Rangeland

This section was prepared by Dick R McCleery, range conservationist, Soil Conservation Service

About 50 percent of the soil survey area is used for rangeland. Approximately half of the farm and ranch income is derived from livestock, principally cattle. Cow and calf operations as well as stocker calf operations are common. Beef cattle production provides the largest single agronomic income in the area surveyed.

Rangeland and farmland uses are interdependent and support each other economically. Such field crops as alfalfa hay, grain hay, and irrigated pasture are important supplements to the natural range forage. Calves and stocker calves are creep-fed on some ranches to increase their market weight. Grain and silage, along with hay, are provided extensively in feed lots to finish range-fed livestock. A major part of the farmland is grazed by livestock on the stubble remaining after the crops are harvested.

Range management in this area is based on an understanding of the main type of forage and the annual grassland. A major disadvantage of the annual grasses is that they are short-lived. The shallow root systems enable these grasses to remain green only as long as the surface soil is moist. Annual grasses start growth on the arrival of winter rains, but drought follows shortly thereafter. The grasses generally begin to mature by April and soon die. The dried material cures poorly and leaches rapidly. Protein deficiencies in the cattle become serious in early summer, and normal gains thereafter can be expected only through careful supplementing. Consequently, the main grazing season is in the winter and spring, although in many operations grazing is year long. Quality forage is available in most years from February to June.

Soils strongly influence the natural vegetation. In the central and northern parts of the survey area, the soils generally are moderately deep to deep, well drained, calcareous silty clay loam and silty clay soils underlain by calcareous sandstone and shale. They are the highest forage-producing soils in the area. In the northeastern corner there are large areas of shallow clay loam soils underlain by hard shale. These soils are low in forage production because of the shallow rooting depth. East of Santa Margarita and along the western boundary of the area the soils are shallow and coarse textured. They have a strong tendency to produce brush, and only sparse amounts of plants suitable for grazing. In the western part of the survey area the soils on north slopes produce a dense cover of broadleaf or hardwood trees. If these soils can be managed economically to create open areas, they produce a good cover of desirable grasses and forbs.

For each kind of soil, information about rangeland is presented in the section "Soil maps for detailed planning." Planners of range management systems for individual fields or ranches should consider the information given in the description of each soil.

Where climate and topography are about the same, differences in the kind and amount of vegetation that rangeland can produce are related closely to the kind of soil. Effective management is based on the relationships among soils, vegetation, and water.

Table 5 shows, for each kind of soil, the name of the range site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the expected percentage of each

species in the composition of the potential natural plant community. Soils not listed are not being used for rangeland in the survey area, or are unsuited to that use by grazing animals. The following are explanations of column headings in table 5.

A *Range site* is a distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. Soils that produce a similar kind, amount, and proportion of range plants are grouped into range sites. For those areas where the relationship between soils and vegetation has been established, range sites can be interpreted directly from the soil map. Properties that determine the capacity of the soil to supply moisture and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Total production refers to the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. 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 are such that growing conditions are substantially better than average; in a normal year these conditions are about average for the area; in an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight refers to the total air-dry vegetation produced per acre each year by the potential natural plant community. Vegetation that is highly palatable to livestock and vegetation that is unpalatable are included. Some of the vegetation can also be grazed extensively by wildlife.

Characteristic vegetation—the grasses, grasslike plants, forbs, and shrubs that make up most of the potential natural plant community on each soil—are listed by common name. Under *Composition*, the expected proportion of each species is presented as the percentage, in air-dry weight, of the total annual production. This includes the current year's growth of leaves, twigs, and fruits of woody plants. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season. Generally all of the vegetation produced is not used.

Range management requires, in addition to knowledge of the kinds of soil and the potential natural plant community, an evaluation of the present composition of the range vegetation in relation to its potential. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the maximum production of vegetation, conservation of water, and control of erosion. Sometimes, however, a plant composition somewhat below the potential meets management objectives, provides wildlife habitat, and protects soil and water resources.

Major soil management concerns for rangeland

In the paragraphs that follow, the chief management concerns for all soils used for range in the survey area are discussed briefly. The major concerns include, but are not limited to, proper grazing use, fertilization, range seeding, planned grazing systems, and brush management. Technical assistance about planning rangeland management and applying practices suitable for the soil on a particular farm can be obtained from local representatives of the Soil Conservation Service and the Cooperative Extension Service.

Proper grazing use requires grazing at an intensity which maintains enough cover to protect the soil, and maintains or improves the quantity and quality of desirable vegetation. This increases the vigor and reproduction of key plants, and accumulates litter and mulch necessary to conserve soil and water. Proper grazing also helps to maintain vegetation, increase forage production, and maintain natural beauty.

Proper cover needed to protect soils from surface erosion changes with the length and degree of slope. Normally, an average two-inch stubble height on slopes to 30 percent and an average three-inch stubble height on slopes over 30 percent is adequate. This stubble, when left on the ground, amounts to approximately 700 to 1,000 pounds of two-inch stubble and 1,000 to 2,000 pounds of three-inch stubble of the current year's growth. These residue levels encourage a desirable grass-forb balance and, at the same time, help to prevent excessive soil erosion.

Practices needed to obtain proper grazing use and proper distribution of grazing are fencing, livestock water distribution and development, stock trails, location of salt, minerals, and supplemental feeding and herding.

Fertilization is the addition of natural or manufactured plant nutrient-containing materials, usually inorganic, to the soil to aid in the initial establishment of desirable plant species for erosion control or to improve existing plant cover for erosion control. Fertilization increases forage production and lengthens the grazing season. In areas where rainfall is less than 12 inches, fertilization is not generally desirable. Whenever a range reseeding program is used, fertilization should be considered.

Range seeding establishes plants on rangeland to produce more forage or to convert land in other uses to range. This improves the natural beauty of grazing land and prevents soil and water loss.

Planned grazing systems are important to achieve uniform levels of grazing use. In any grazing system, high-producing plants that are locally abundant should be selected. Proper use of salting, nutrient supplements, proper grazing use, and regulating the intensity of grazing to the growth and maturity of plants allow maximum use of range forage.

Brush management eliminates or reduces the competition of woody vegetation and facilitates the establishment or reestablishment of a satisfactory cover to pre-

vent soil and water loss. Forage production increases and provides better fire control. Also, good brush management improves recreation sites, natural beauty, and habitat for some species of wildlife. Mechanical, chemical, or biological methods are used to kill or suppress brush.

Engineering

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreation uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 6 shows, for each kind of soil, the degree and kind of limitations for building site development; table 7, for sanitary facilities; and table 9, for water management. Table 8 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 6. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by

slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 6 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 6 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classification of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 7 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 7 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 8 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 12 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 8 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 12.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 9, soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material. Slope is also considered a site limitation.

Embankments, dikes, and levees require soil material that is resistant to seepage and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

This section was prepared by Glenn I Wilcox, biologist, Soil Conservation Service

The demand for recreation facilities within the Paso Robles soil survey area will increase as population and leisure time increase. Some of this increased demand needs to be met by private recreational development.

Private recreation facilities can be developed as a supplemental enterprise to farming or ranching. Enterprises in the survey area could include guest ranches or horse breeding, training, and boarding units. Where game and fish production are possible, supplemental income can be derived from hunting and fishing clubs.

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 7, and interpretations for dwellings without

basements and for local roads and streets, given in table 6.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Wildlife habitat

This section was prepared by Glenn I Wilcox, biologist, Soil Conservation Service

Wildlife and fish are important resources within the Paso Robles soil survey area. They provide numerous opportunities for recreation, and in many instances, they improve the quality of the environment. Such wildlife-related activities as nature study, bird watching, hunting, and fishing have an effect on the area's economy. In addition, many types of wildlife help in the natural control of weeds and insect and animal pests.

Warm water fish, including largemouth bass, smallmouth bass, black crappie, catfish, and sunfish inhabit the lakes and ponds within the survey area. Trout and steelhead are in the rivers in the area, and trout can be stocked in some lakes and ponds where water temperatures permit.

Such animals as the badger and coyote are useful rodent predators. Golden eagles and red-tailed hawks also feed on rodents. Dove, quail, and such small birds as sparrows and finches eat a variety of seeds, many of which are considered rangeland or cropland weeds. Woodpeckers and swallows eat insects which can be harmful to crops and trees.

Man's activities have varied effects on wildlife populations. Many wildlife species, such as house sparrows, blackbirds, and ground squirrels, can tolerate man's activities and actually thrive in close association with man. In contrast, the existence of some species has been threatened by man and his activities.

Several forms of wildlife listed as rare or endangered occur within the Paso Robles soil survey area. The San Joaquin kit fox, presently listed as rare, is in the Cholame area. The conversion of valley lands to irrigated agriculture is reducing the habitat of this species and confining it to valley areas unsuited to farming and rolling foothills and canyons. Additional wildlife on the endangered list includes the Southern bald eagle, California condor, American peregrine falcon, and the blunt-nosed leopard lizard. The Soil Conservation Service is concerned that critical habitat for these rare and endangered species be preserved.

Such important game species as California mule deer, black-tailed deer, feral pig, turkey, California quail, band-tailed pigeon, and mourning dove are hunted within the soil survey area.

The feral pig is prized as a game animal, but it can cause severe crop and range damage. Ground squirrels and starlings also cause crop damage and may require control measures.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 11, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of

fair means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, hardinggrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are California needlegrass, wild oats, filaree, soft chess, and turkey mullein.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are oak, poplar, hollyleaf, cherry, California bay, sycamore, madrone, and blueberry. Examples of fruit-producing trees and shrubs that are commercially available and suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and pyracantha.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, or foliage used by wildlife or that provide cover and shade for some species of wildlife. Major soil properties that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and moisture. Examples of shrubs are mountain-mahogany, toyon, ceanothus, California sagebrush, and quail-bush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, spikerush, saltgrass, and cordgrass and bulrushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include valley quail, pheasant, meadowlark, field sparrow, cottontail rabbit, and skunk.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, band-tailed pigeon, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Rangeland habitat consists of areas of wild herbaceous plants and shrubs. Wildlife attracted to rangeland include coyote, black-tailed deer, California mule deer, meadowlark, and horned lark.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features.

Engineering properties

Table 12 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 12 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 12 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*1*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested in the survey area, with group index numbers in parentheses, is given in table 13. The estimated classification, without group index numbers, is given in table 12. Also in table 12 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observatio s of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Engineering test data

The results of analyses of engineering properties of several typical soils of the survey area are given in table 13.

The data presented are for soil samples that were collected from carefully selected sites. The soil profiles sampled are typical of the series discussed in the section "Soil series and morphology." The soil samples were analyzed by the Bureau of Public Roads.

The methods used in obtaining the data are listed by code in the next paragraph. Most of the codes, in parentheses, refer to the methods assigned by the American Association of State Highway and Transportation Officials. The codes for shrinkage, Unified classification, and California bearing ratio are those assigned by the American Society for Testing and Materials.

The methods and codes are AASHTO classification (M-145-66); Unified classification (D-2487-69); mechanical analysis (T88-57); liquid limit (T89-60); plasticity index (T90-56); and moisture-density, method A (T99-57).

Physical and chemical properties

Table 14 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Salinity is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of the nonirrigated soils. The salinity of individual irrigated fields is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of individual fields can differ greatly from the value given in table 14. Salinity affects the suitability of a soil for crop production, its stability when used as a construction material, and its potential to corrode metal and concrete.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 15 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils

that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Cemented pans are hard subsurface layers, within a depth of 5 or 6 feet, that are strongly compacted (indurated). Such pans cause difficulty in excavation. The hardness of pans is similar to that of bedrock. A rippable pan can be excavated, but a hard pan generally requires blasting.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetical order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*9*). Unless otherwise noted, colors described are for dry soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units of each soil series are described in the section "Soil maps for detailed planning."

Andregg series

The Andregg series consists of moderately deep, well drained soils that formed in material weathered from granitic rocks. The soils are on hills and mountains.

Slope is 30 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Andregg soils are similar to San Andreas and Shimmon soils. They are near the Cieneba, Vista, and Sesame soils. San Andreas soils are underlain by weathered sandstone. Shimmon soils have a clay loam or sandy clay loam B horizon underlain by weathered sandstone. Cieneba soils are less than 20 inches thick. Vista soils have less than 1 percent organic matter in the A horizon. Sesame soils have a sandy clay loam B horizon.

A typical pedon of Andregg coarse sandy loam, in an area of Cieneba-Andregg complex, 30 to 75 percent slopes, 2,700 feet west and 1,500 feet south of the northeast corner of sec. 11, T. 29 S., R. 13 E.

01—1 inch to 0; leaves, needles, and twigs, some partially decomposed; abrupt smooth boundary.

A11—0 to 4 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial and common very fine tubular pores; neutral; clear smooth boundary.

A12—4 to 9 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial and common very fine tubular pores; neutral; clear smooth boundary.

B2—9 to 17 inches; pale brown (10YR 6/3) coarse sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, medium and coarse roots; many very fine interstitial and common very fine and medium tubular pores; common thin clay films bridging mineral grains; slightly acid; gradual wavy boundary.

C—17 to 23 inches; yellow (10YR 7/6) coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, medium and coarse roots; many very fine interstitial and common very fine and medium tubular pores; medium acid; clear wavy boundary.

Cr—23 to 33 inches; yellow (10YR 7/6) weathered granitic rock.

Depth to weathered granitic rock ranges from 20 to 40 inches. Solum thickness ranges from 15 to 30 inches.

The A horizon is dark grayish brown, dark brown, grayish brown, or brown (10YR 4/2, 4/3, 5/2, 5/3). Reaction ranges from slightly acid to neutral. Thickness of the A horizon ranges from 7 to 15 inches.

The B horizon is brown, pale brown, yellowish brown, or light yellowish brown (10YR 5/3, 5/4, 6/3, 6/4, and 7.5YR 6/4). It is sandy loam or coarse sandy loam. Reaction ranges from medium acid to neutral. The B horizon averages 1 to 2 percent more clay than the A horizon.

The C horizon is present in most pedons. Reaction ranges from medium acid to neutral.

Arbuckle series

The Arbuckle series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. The soils are on terraces. Slope is 0 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is 60 degrees F.

Arbuckle soils are similar to Positas, Ryer, and Sesame soils. They are near Greenfield, Hanford, Positas, and San Ysidro soils. Positas soils have an abrupt boundary between the A and B horizons, and more than a 15 percent increase of clay in the Bt horizon. Ryer soils have a fine textural control secton. Sesame soils are underlain by weathered granitic rock at a depth of 20 to 40 inches. Greenfield soils have a coarse-loamy textural control section. Hanford soils have a coarse-loamy textural control section and do not have an argillic horizon. San Ysidro soils have an abrupt boundary between the A and B horizons, and more than 15 percent clay increase in the Bt horizon.

A typical pedon of Arbuckle fine sandy loam, in an area of Arbuckle fine sandy loam, 0 to 2 percent slopes, 2,000 feet west and 2,300 feet south of the northeast corner of sec. 18, T. 25 S., R. 11 E.

A1—0 to 10 inches; pale brown (10Yr 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; hard, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine and few fine and medium tubular pores; 9 percent gravel by volume; slightly acid; clear wavy boundary.

B1t—10 to 20 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, nonsticky and nonplastic; few very fine, fine and medium roots; many very fine and few fine and medium tubular pores; 5 percent gravel by volume; slightly acid; gradual wavy boundary.

B21t—20 to 29 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few fine and medium roots; many very fine and few fine and medium tubular pores; common moderately thick clay films bridging mineral grains and lining pores; 5 percent gravel by volume; slightly acid; gradual wavy boundary.

B22t—29 to 43 inches; light brown (7.5YR 6/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium and coarse subangular blocky structure;

very hard, firm, sticky and plastic, few very fine, fine and medium roots; many very fine and few fine and medium tubular pores; many moderately thick clay films bridging mineral grains and lining pores; slightly acid; gradual wavy boundary.

B3t—43 to 53 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine medium and coarse roots; many very fine and few fine and medium tubular pores; common moderately thick clay films bridging mineral grains and lining pores, mildly alkaline; gradual wavy boundary.

C1—53 to 62 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic, few fine, medium and coarse roots; many very fine and few fine and medium tubular pores, few thin clay films bridging mineral grains; mildly alkaline

Thickness of the solum ranges from 40 to 60 inches

The A horizon is light brownish gray, pale brown, grayish brown, or brown (10YR 6/2, 6/3, 5/2, 5/3). Organic matter is less than 1 percent. Gravel content is 3 to 15 percent by volume. Reaction is slightly acid to neutral. Thickness of the A horizon ranges from 8 to 14 inches

The Bt horizon is light brown, reddish yellow, pink, light yellowish brown, brownish yellow, very pale brown, or yellow (7.5YR 6/4, 6/6, 7/6, 7/4, or 10YR 6/4, 6/6, 7/4, 7/6). Reaction is slightly acid to mildly alkaline. The B2t horizon is loam, clay loam, or sandy clay loam. Gravel is as much as 15 percent by volume

The C horizon is stratified sandy loam to very gravelly sandy clay loam.

Arnold series

The Arnold series consists of deep, somewhat excessively drained soils that formed in material weathered from sandstone. The soils are on hills and mountains. Slope is 9 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F

Arnold soils are similar to Metz, Oceano, and Tujunga soils They are near Balcom and San Andreas soils Metz soils are stratified loamy sands on flood plains. Oceano soils formed in sandy eolian deposits and are on dunes. They have lamellae below a depth of 20 inches. Tujunga soils are stratified sand and loamy sands on flood plains Balcom soils are calcareous loamy soils that are moderately deep to calcareous sandstone and shale

A typical pedon of Arnold loamy sand, in an area of Arnold loamy sand, 9 to 30 percent slopes, 2,700 feet east and 450 feet north of the southwest corner of sec 15, T. 25 S., R. 10 E.

A11—0 to 15 inches; light brownish gray (10YR 6/2) loamy sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, loose, nonsticky and nonplastic; common fine and very fine roots; common very fine and fine interstitial pores, few medium tubular pores; neutral; clear wavy boundary.

A12—15 to 32 inches, pale brown (10YR 6/3) sand, brown (10YR 5/3) moist; single grain; soft, loose, nonsticky and nonplastic; few very fine roots, common very fine and fine interstitial pores, few medium tubular pores; neutral; clear wavy boundary.

C1—32 to 42 inches; very pale brown (10YR 7/3) sand, pale brown (10YR 6/3) moist; single grain; soft, loose, nonsticky and nonplastic; few very fine roots; neutral; clear wavy boundary.

C2r—42 inches; light gray (10YR 7/2) weathered, massive sandstone that crushes to sand, very easily dug with handtools; dissolves within an hour when placed in water.

Depth to weathered sandstone ranges from 40 to 60 inches. Texture is sand or loamy sand. In some pedons, gravel ranges from 1 to 15 percent by volume. Reaction is higher as depth increases and ranges from medium acid to neutral.

The A horizon is light brownish gray or pale brown (10YR 6/2, 6/3). Thickness of the A horizon ranges from 15 to 32 inches.

Arujo series

The Arujo series consists of deep, well drained soils that formed in material weathered from sandstone The soils are on hills Slope is 9 to 15 percent. The mean annual precipitation is 12 to 20 inches, and the mean annual air temperature is 60 degrees F

Arujo soils are similar to Botella, Concepcion, and Lockwood soils. They are near Elder, San Andreas, and Shimmon soils Botella and Lockwood soils are on alluvial fans. Concepcion soils have a fine textural control section Elder soils have an irregular decrease in organic matter and do not have an argillic horizon. San Andreas and Shimmon soils have a mollic epipedon less than 20 inches thick.

A typical pedon of Arujo sandy loam, in an area of San Andreas-Arujo complex, 9 to 15 percent slopes, on the Santa Margarita Ranch, 0.75 miles west on Highway 58 from the Highway 58 and Pozo Road intersection, and 0.15 mile north in Santa Margarita Land Grant, T. 29 S., R. 13 E.

A1—0 to 10 inches; dark gray (10YR 4/1) sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic, common very fine roots; common very fine and fine tubular pores, slightly acid; abrupt smooth boundary.

B2t—10 to 22 inches; grayish brown (2.5Y 5/2) sandy clay loam, very dark grayish brown (2.5Y 3/2) moist;

weak coarse prismatic structure, very hard, firm, slightly sticky and plastic; many very fine and common fine tubular pores; many thin clay films on ped faces and in pores, slightly acid, gradual wavy boundary.

B3t—22 to 31 inches; light brownish gray (2 5Y 6/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure, hard, firm, nonsticky and nonplastic, few very fine and fine tubular pores; few thin clay films on ped faces and lining pores and bridging mineral grains, slightly acid; gradual wavy boundary.

C1—31 to 47 inches; light gray (2 5Y 7/2) sandy loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few very fine and fine tubular pores; few thin clay films on ped faces; slightly acid; gradual wavy boundary

Cr—47 inches, white weathered sandstone.

Depth to weathered shale or sandstone ranges from 40 to 60 inches Solum thickness ranges from 30 to 50 inches. Reaction ranges from slightly acid to mildly alkaline.

The A horizon is gray, grayish brown, dark gray, or very dark gray (10YR 5/1, 5/2, 4/1 and 2 5Y and N 3/0). Thickness of the A horizon ranges from 9 to 15 inches.

The Bt horizon is very dark gray, dark gray, or grayish brown (2.5Y N3/, 5/2 or 10YR 4/1, 5/2) to a depth of more than 20 inches and in most pedons the value or chroma or both increase in the lower part.

The C horizon is light brownish gray, light gray, or white (2.5Y 7/2 or 10YR 6/2, 8/2, 8/1)

Arujo soils in this survey area have a yellower hue than is defined in the range for the series This difference, however, does not significantly affect their use and management

Ayar series

The Ayar series consists of deep, well drained soils that formed in material weathered from calcareous sandstone and shale The soils are on hills and mountains. Slope is 9 to 50 percent. Mean annual precipitation ranges from 12 to 20 inches, and mean annual air temperature is about 60 degrees F

Ayar soils are similar to Capay, Cropley, and Diablo soils They are near Nacimiento and Zakme soils Capay soils do not have a paralithic contact Cropley and Diablo soils have chroma of 1 in the A horizon. Cropley soils are on alluvial fans. Nacimiento soils have a fine-loamy textural control section. Zakme soils do not have intersecting slickensides and wedge-shaped structural aggregates.

A typical pedon of Ayar silty clay, in an area of Ayar and Diablo soils, 15 to 20 percent slopes, 200 feet southeast of center of sec. 20, T. 26 S., R. 10 E.

A11—0 to 1 inch, brown (7.5YR 4/2) silty clay, dark brown (7 5YR 3/3) moist, strong medium granular structure, hard, friable, sticky and plastic; many very fine roots, many very fine tubular pores; slight effervescence, disseminated lime; moderately alkaline, abrupt smooth boundary

A12—1 to 9 inches, brown (7 5YR 4/3) silty clay, dark brown (7.5YR 3/3) moist, moderate medium subangular blocky structure, hard, firm, sticky and plastic; many very fine roots, many very fine tubular pores; slight effervescence, disseminated lime, moderately alkaline; clear smooth boundary.

A13—9 to 24 inches, brown (7 5YR 5/3) clay, dark brown (7.5YR 3/3) moist, moderate coarse subangular blocky structure; hard, firm, sticky and very plastic, common very fine roots; many very fine tubular pores; few slickensides that intersect; slight effervescence, disseminated lime; moderately alkaline, clear smooth boundary

A14—24 to 39 inches, brown (7.5YR 5/4) clay, brown (7 5YR 4/4) moist; weak medium prismatic structure that parts to strong coarse subangular blocky, hard, firm, sticky and plastic; common very fine roots, common very fine tubular pores, few nearly vertical slickensides that intersect, strong effervescence, disseminated lime; moderately alkaline, clear smooth boundary.

C1ca—39 to 45 inches, brown (7.5YR 5/4) clay, brown (7 5YR 4/3) moist; weak coarse subangular blocky structure, hard, friable, sticky and plastic; common very fine and few fine and medium roots; few very fine tubular pores, common slickensides that intersect, strong effervescence, segregated lime as common very fine, fine and medium soft masses; moderately alkaline, clear smooth boundary

C2ca—45 to 55 inches, brown (7.5YR 5/4) silty clay, brown (7.5YR 4/3) moist, massive; slightly hard, friable, sticky and plastic; few very fine and medium roots, few very fine tubular pores, common slickensides that intersect; violent effervescence, segregated lime as many fine and medium soft masses, moderately alkaline; abrupt smooth boundary.

C3—55 to 61 inches; pink (7.5YR 7/4) silty clay, strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) moist, massive, slightly hard, friable, slightly sticky and plastic; few fine roots, few fine tubular pores; violent effervescence, disseminated lime, moderately alkaline; gradual wavy boundary.

Cr—61 inches; reddish yellow (7.5YR 6/6) and pink (7.5YR 7/4) shale

Depth to weathered sandstone and shale ranges from 40 to more than 60 inches. Dry soils have cracks 0.5 inch to 2.5 inches wide at the surface and 0.5 to 1 inch wide at a depth of 20 to 38 inches. Cracks close when soil becomes wet late in October, and cracks remain closed until the soil dries between April and early in June. Slickensides intersect in the lower part of the hori-

zon between a depth of 8 and 38 inches. Some pedons have up to 5 percent pebbles and cobbles. Some pedons are noncalcareous in the upper 10 inches.

The A horizon is brown, dark grayish brown, or grayish brown (7.5YR 5/2, 5/4 and 10YR 4/2, 5/2, 5/3). Reaction ranges from mildly alkaline to moderately alkaline. Thickness of the A horizon ranges from 18 to 40 inches.

Balcom series

The Balcom series consists of moderately deep, well drained soils that formed in material weathered from calcareous shale and sandstone. The soils are on hills and mountains. Slope is 9 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Balcom soils are similar to Millsholm and Vista soils. They are near the Calleguas and Nacimiento soils. Millsholm soils are noncalcareous and less than 20 inches to hard shale or sandstone. Vista soils are noncalcareous, coarse sandy loam over granitic rock. Calleguas soils are underlain at a depth of 10 to 20 inches by weathered, calcareous shale. Nacimiento soils have a mollic epipedon.

A typical pedon of Balcom loam, in an area of Balcom-Nacimiento association, 9 to 30 percent slopes, 2,100 feet west and 3,500 feet south of the northeast corner of sec. 12, T. 27 S., R. 14 E.

A11—0 to 6 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; many very fine, common fine and few medium tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

A12—6 to 12 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; many very fine and common fine and few medium tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

B2ca—12 to 28 inches; very pale brown (10YR 7/3) heavy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine, common fine and medium tubular pores; violent effervescence, soft masses of lime; moderately alkaline; abrupt wavy boundary.

Cr—28 inches; white (10YR 8/2); weathered, calcareous shale that has violently effervescent, segregated seams of lime on the exterior of shale fragments.

Soil depth to weathered, calcareous shale ranges from 20 to 40 inches. Carbonates are strongly to violently effervescent, with disseminated lime on the surface and segregated lime in soft masses and filaments in the substratum.

The A horizon is light gray, light brownish gray, or pale brown (10YR 6/1, 6/2, 6/3 or 2.5Y 6/2). Thickness ranges from 10 to 20 inches.

The B2ca horizon is very pale brown, light gray, light yellowish brown, pale brown, or light brownish gray (10YR 7/3, 7/2, 7/4, 6/4, 6/3 or 2.5Y 7/2, 6/2, 6/4). Texture is loam or silt loam with a fine-loamy textural control section. The B horizon has 1 to 2 percent more clay than the A horizon.

Botella series

The Botella series consists of very deep, well drained soils that formed in alluvium derived from sedimentary rocks. The soils are on alluvial fans. Slope is 2 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Botella soils are similar to the Concepcion and Lockwood soils. They are near Arnold, Oceano, and San Andreas soils. Concepcion soils have a clay B horizon. Lockwood soils are shaly throughout. Arnold and San Andreas soils are underlain by sandstone. Oceano soils have a sandy textural control section.

A typical pedon of Botella sandy loam, from an area of Botella sandy loam, 2 to 9 percent slopes, on Santa Margarita Ranch, south on the dirt road from the end of Encina Avenue, 2 miles to Miller Flat corrals, then south into a field 200 feet in the Santa Margarita Land Grant, T. 29 S., R. 13 E.

A11—0 to 16 inches; dark gray (10YR 4/1) sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; very hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine and few fine tubular and interstitial pores; neutral; clear wavy boundary.

A12—16 to 21 inches; dark gray (10YR 4/1) sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine tubular and few very fine and fine interstitial pores; medium acid; clear wavy boundary.

B21t—21 to 46 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure; very hard, firm, slightly sticky and plastic; common very fine roots; common very fine tubular and interstitial pores; continuous moderately thick clay films on face of peds and lining pores; medium acid; clear wavy boundary.

B22t—46 to 60 inches; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky

and slightly plastic, few very fine roots; few very fine interstitial pores, common thin clay films on face of peds and lining pores; medium acid, gradual wavy boundary

C—60 to 65 inches; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; medium acid.

Thickness of the solum ranges from 36 inches to more than 60 inches Reaction ranges from medium acid to neutral.

The A horizon ranges from 16 to 28 inches in thickness. The B2t horizon is dark grayish brown, grayish brown, or light brownish gray (10YR 4/2, 5/2, 6/2), and in most pedons the value or chroma, or both, increase in the lower part.

Calleguas series

The Calleguas series consists of shallow, well drained soils that formed in material weathered from calcareous shale. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Calleguas soils are similar to Calodo, Cieneba, and Gaviota soils. They are near Nacimiento soils. Calodo soils have a mollic epipedon. Cieneba soils have a coarse sandy loam, neutral A horizon. Gaviota soils are underlain by hard sandstone. Nacimiento soils have a mollic epipedon and are moderately deep.

A typical pedon of Calleguas shaly loam, in an area of Calleguas shaly loam, 15 to 30 percent slopes, 2,600 feet west and 2,400 feet south of the northeast corner of sec. 2, T 26 S., R. 16 E

Ap—0 to 6 inches; pale brown (10YR 6/3) shaly loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots, many very fine and fine interstitial and tubular pores; 20 percent by volume shale fragments; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

A12—6 to 12 inches, pale brown (10YR 6/3) shaly loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine interstitial and tubular pores; 20 percent by volume shale fragments, violent effervescence, disseminated lime; moderately alkaline; abrupt wavy boundary.

Cr—12 inches; strongly weathered, calcareous shale, rock structure clearly visible; moderately alkaline; can be dug easily with handtools.

Depth to strongly weathered, calcareous shale ranges from 10 to 20 inches.

The A horizon is light brownish gray or pale brown (10YR 6/2, 6/3). Shale fragments range from 15 to 25 percent by volume.

Calodo series

The Calodo series consists of shallow, well drained soils that formed in material weathered from calcareous shale or sandstone The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F

Calodo soils are similar to the Linne and Nacimiento soils They are near the Balcom, Calleguas, Linne, and Los Osos soils. Balcom and Calleguas soils have ochric epipedons. Linne soils have a mollic epipedon more than 20 inches thick. Los Osos soils have a fine textural control section Nacimiento soils are moderately deep.

A typical pedon of Calodo clay loam, in an area of Linne-Calodo complex, 50 to 75 percent slopes, at Camp Roberts on a ridge northeast of Nacimiento Lake Road, 2,000 feet northwest along the ridge from a communication tower, and 600 feet northeast down the slope, 1,800 feet west and 1,300 feet north of the southeast corner of sec. 32, T. 25 S., R. 11 E.

A11—0 to 9 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist, moderate fine granular structure; hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; strong effervescence, disseminated lime; moderately alkaline, clear wavy boundary.

A12ca—9 to 16 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine, few fine and medium roots; common very fine and and fine and few medium tubular pores; violent effervescence, segregated lime in the form of many very fine filaments and common fine soft masses; moderately alkaline, abrupt wavy boundary.

Cr—16 inches; weathered, calcareous shale.

Depth to weathered, calcareous sandstone or shale is 10 to 20 inches.

The A horizon is grayish brown, gray, and dark gray (10YR 4/1, 5/1, 5/2 or 2.5YR 5/2). Gravel, cobbles, and stones make up 3 to 15 percent of the soil by volume.

Camarillo series

The Camarillo series consists of very deep, poorly drained soils that formed in alluvium derived mainly from sedimentary rock The soils are on flood plains Slope is 0 to 2 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Camarillo soils are similar to Metz and San Emigdio soils. They are near Capay and Tujunga soils. Metz and

Tujunga soils have a sandy textural control section. San Emigdio soils have a coarse-loamy textural control section. Capay soils are Vertisols.

A typical pedon of Camarillo silty clay loam, in an area of Camarillo silty clay loam, partially drained, 4 1/4 miles north on Cholame Valley Road from the intersection with Highway 46, then 3/8 of a mile northeast into a field 300 feet east of Cholame Creek in Cholame Rancho Land Grant, T. 25 S , R. 15 E.

Ap—0 to 7 inches; olive gray (5Y 5/2) silty clay loam, dark olive gray (5Y 3/2) moist, massive, hard, friable, sticky and plastic; few very fine roots, many very fine interstitial and few very fine and fine tubular pores; slight effervescence, disseminated lime; moderately alkaline, clear smooth boundary.

A12—7 to 24 inches; olive gray (5Y 5/2) silty clay loam, dark olive gray (5Y 3/2) moist, massive; hard, friable, sticky and plastic, few very fine roots, many very fine interstitial and few very fine and fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; abrupt smooth boundary.

C1—24 to 29 inches, light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown, (2.5Y 4/2) moist, massive, soft, very friable, slightly sticky and slightly plastic, few very fine and fine roots; common very fine tubular pores; slight effervescence, disseminated lime, moderately alkaline; clear smooth boundary.

C2—29 to 43 inches, light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; many fine distinct mottles, yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4); massive; hard, friable, sticky and plastic, few very fine roots; common very fine tubular pores, free water at a depth of 40 inches; slight effervescence, disseminated lime; moderately alkaline, clear smooth boundary.

IIAb—43 to 62 inches, grayish brown (2 5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist, massive, hard, friable, sticky and plastic; many very fine tubular pores; strong effervescence, disseminated lime; strongly alkaline

The textural control section is stratified layers of sandy loam, loam, and silty clay loam, and averages 18 to 30 percent clay Depth to the water table is 40 to 60 inches late in summer and 24 to 48 inches during the wet months of winter.

The A horizon is olive gray (5Y 5/2) or grayish brown (2.5Y 5/2). It is slightly to strongly effervescent Thickness of the A horizon is 22 to 26 inches. The C horizon is slightly to violently effervescent The IIAb horizon is grayish brown or dark grayish brown (2.5Y 5/2, 4/2) and has more organic matter than the overlying C horizon. Texture of most buried horizons is silty clay loam; however, some horizons are silty clay The electrical conductivity of a saturation extract at 25 degrees C ranges from 2 to 12 millimhos per centimeter and the percentage of exchangeable sodium ranges from 12 to 34. Water-soluble salt accumulations fluctuate with the water table, and in most pedons the electrical conductivity is less than 2 millimhos per centimeter above a depth of 40 inches

Camatta series

The Camatta series consists of shallow to indurated hardpan, well drained soils that formed in alluvium derived from calcareous sediment. The soils are on high terraces. Slope is 5 to 30 percent. Mean annual precipitation is about 9 inches, and the mean annual air temperature is about 60 degrees F.

Camatta soils are near Chanac and Polonio soils. Chanac soils do not have a petrocalcic horizon, and are more than 20 inches deep to a paralithic contact. Polonio soils do not have a petrocalcic horizon and are on alluvial fans

A typical pedon of Camatta loam, in an area of Camatta loam, 5 to 15 percent slopes, near McDonald Canyon, about 800 feet west and 200 feet south of the northeast corner of sec. 32, T. 27 S., R. 15 E.

Ap—0 to 7 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine and common fine tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

A12—7 to 12 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist, weak medium subangular blocky structure, slightly hard, friable, slightly sticky and slightly plastic; few very fine roots, many very fine and common fine tubular pores; strong effervescence, disseminated lime, moderately alkaline; abrupt wavy boundary.

C1cam—12 to 20 inches; white (10YR 8/1) indurated lime hardpan, very pale brown (10YR 8/3) moist, massive; very hard, very firm, upper 1/2 inch is a laminar capping; violent effervescence; moderately alkaline, gradual wavy boundary

C2ca—20 to 60 inches; very pale brown (10YR 8/4) very fine sandy loam, brownish yellow (10YR 6/6) moist; moderate medium platy structure; hard, friable, nonsticky and nonplastic; violent effervescence, lime segregated in seams and common medium and large concretions; calcium carbonate is 60 percent of the soil volume; moderately alkaline

Depth to the indurated Ccam horizon ranges from 10 to 20 inches The calcium carbonate equivalent in the control section is about 15 to 35 percent. The conductivity of the saturation extract at 25 degrees C ranges from 1 to 1.5 millimhos per centimeter.

The A horizon is light brownish gray or pale brown (10YR 6/2, 6/3). Thickness of the A horizon ranges from 8 to 19 inches.

The Ccam horizon is white or very pale brown (10YR 8/1, 8/3, 7/3). The uppermost 1/2 to 1 inch is a very

dense laminar capping, containing no pores. It is stratified with thin laminae and strongly to weakly lime-cemented materials. Thickness of the Ccam horizon ranges from 8 to 20 inches. The Cca horizon is weakly cemented and ranges from very fine sandy loam to loamy sand in texture. Calcium carbonate equivalent of the C horizon is 30 to 75 percent by volume.

Capay series

The Capay series consists of very deep, moderately well drained soils that formed in alluvium weathered from sandstone and shale. The soils are on flood plains. Slope is 0 to 2 percent. Mean annual precipitation ranges from 10 to 12 inches, and the mean annual air temperature is about 60 degrees F.

Capay soils are similar to Ayar and Cropley soils They are near Camarillo, Clear Lake, and Mocho soils The Ayar soils have slopes of more than 9 percent and are underlain by calcareous shale. Clear Lake soils have chroma of less than 1 5 in the A horizon and are poorly drained Cropley soils have chroma of 1 in the upper part of the A horizon. Camarillo and Mocho soils have a fine-loamy textural control section.

A typical pedon of Capay silty clay in an area of Capay silty clay, 1 mile northeast on Highway 41 from the intersection of Highway 46, northwest on a dirt road 2 1/4 miles, in a field 1,800 feet southwest along a cross fence in the Cholame Rancho Land Grant, T. 25 S., R. 16 E.

Ap—0 to 6 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist, strong coarse angular blocky structure; very hard, firm, very sticky and very plastic; many very fine roots, common very fine tubular pores, strong effervescence, disseminated lime; moderately alkaline; abrupt smooth boundary.

A12—6 to 19 inches, grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure with tilted wedge-shaped aggregates; very hard, firm, very sticky and very plastic; many very fine roots; common very fine tubular pores; many slickensides that intersect; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

A13—19 to 30 inches; grayish brown (2.5Y 5/2) silty clay, very dark grayish brown (2.5Y 3/2) moist; moderate coarse prismatic structure with tilted wedge-shaped aggregates; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; many slickensides that intersect, strong effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

C1—30 to 42 inches; olive (5Y 5/3) silty clay, dark olive gray (5Y 3/2) moist; faint mottles of pale olive (5Y 6/3), olive (5Y 4/3) moist; massive, very hard, firm, very sticky and very plastic; common very fine tubular pores; strong effervescence, disseminated lime; moderately alkaline; diffuse wavy boundary.

C2—42 to 60 inches; pale olive (5Y 6/3) silty clay, olive (5Y 5/3) moist; massive; very hard, firm, very sticky and very plastic; common very fine tubular pores; strong effervescence, disseminated lime; moderately alkaline.

Dry soils have cracks 0.5 inch to 2.5 inches wide at the surface and 0.5 to 1 inch wide at a depth of 20 to 30 inches. Cracks close when the soil becomes wet late in October, and cracks remain closed until the soil dries between April and early in June. Slickensides intersect at depths ranging between 5 and 30 inches.

The A horizon is grayish brown or dark grayish brown (10YR or 2.5Y 5/2, 4/2) Thickness ranges from 27 to 34 inches.

Chanac series

The Chanac series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. The soils are on high terraces. Slope is 9 to 75 percent. Mean annual precipitation is about 9 inches, and the mean annual air temperature is 60 degrees F.

Chanac soils are near Camatta and Polonio soils. The Camatta soils are shallow, and have a petrocalcic horizon. The Polonio soils do not have a B horizon and are on alluvial fans

A typical pedon of Chanac loam, in an area of Chanac loam, 30 to 75 percent slopes, 2,000 feet north and 300 feet east of the southwest corner of sec. 21, T. 27 S., R. 15 E.

Ap—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; slightly hard, friable, slightly sticky and plastic; many very fine roots; many very fine tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

A12—2 to 12 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine roots, many very fine and common medium tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

B2ca—12 to 21 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; strong medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; many very fine and common fine and medium tubular pores; few thin clay films lining pores; violent effervescence, segregated lime as common fine filaments and soft masses; moderately alkaline; clear wavy boundary.

C1ca—21 to 35 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate

medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine and common fine and medium tubular pores; violent effervescence, common fine filaments and soft masses; moderately alkaline; clear wavy boundary.

C2ca—35 to 55 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic, many very fine and few fine tubular pores; violent effervescence, common fine filaments and soft masses; moderately alkaline; gradual wavy boundary.

C3—55 to 60 inches; pale yellow (10YR 7/4) fine sandy loam, light yellowish brown (10YR 6/4) moist; massive, slightly hard, very friable, nonsticky and nonplastic; strong effervescence, disseminated lime; moderately alkaline.

The A horizon is gray, grayish brown, or brown (10YR 5/1, 5/2, 5/3) The B horizon is light brownish gray, pale brown, or light yellowish brown (10YR 6/2, 6/3, 6/4). Texture is loam or sandy clay loam. There is a 1 to 2 percent clay increase between the A and B horizons. Lime appears as soft masses and few to common filaments, or as coatings on faces of peds. Texture of the C horizon is fine sandy loam, sandy loam, or loam.

Cieneba series

The Cieneba series consists of shallow, excessively drained soils that formed in material weathered from granitic rock. The soils are on hills and mountains Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Cieneba soils are similar to Calleguas, Gaviota, and Lodo soils. They are near Andregg and Vista soils Calleguas soils have a shaly loam, calcareous A horizon underlain by calcareous shale. Gaviota soils are underlain by hard sandstone. Lodo soils have a gravelly clay loam mollic epipedon underlain by hard sandstone Andregg soils are moderately deep and have a mollic epipedon. Vista soils are moderately deep.

A typical pedon of Cieneba coarse sandy loam, in an area of Cieneba coarse sandy loam, 30 to 75 percent slopes, 2,300 feet west and 1,300 feet north of the southeast corner of sec. 2, T. 29 S., R. 13 E.

A11—0 to 3 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 3/3) moist, weak fine and medium granular structure; soft, loose, nonsticky and nonplastic; many very fine, few fine and medium roots, many very fine and common fine interstitial pores, neutral; gradual smooth boundary.

A12—3 to 10 inches; pale brown (10YR 6/3) coarse sandy loam, brown (10YR 4/3) moist; massive, soft, loose, nonsticky and nonplastic; common very fine, few fine and medium roots; many very fine and common fine interstitial pores; neutral; abrupt wavy boundary.

Cr—10 inches; strongly weathered light yellowish brown granitic rock that can be dug easily with handtools.

Depth to weathered rock ranges from 6 to 20 inches. Reaction ranges from medium acid to neutral. In some pedons, gravel content is 5 to 10 percent, and cobble content is 3 to 5 percent by volume. A few areas are underlain by coarse-grained sandstone.

The A horizon is grayish brown, brown, light brownish gray, or pale brown (10YR 5/2, 5/3, 6/2, 6/3). Content of organic matter is less than 1 percent.

Clear Lake series

The Clear Lake series consists of very deep, poorly drained soils that formed in alluvium derived from sedimentary rock. The soils are in basins. Slope is less than 1 percent Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Clear Lake soils are similar to Capay, Cropley, and Diablo soils. They are near Camarillo, Capay, and Still soils. The Capay soils have chroma of 2 in the A horizon, and are moderately well drained. Cropley soils have chroma of 2 or more within 40 inches of the surface and are moderately well drained. Diablo soils have chroma of 2 within 40 inches of the surface and are underlain by calcareous sandstone and shale. Camarillo and Still soils have a fine-loamy textural control section.

A typical pedon of Clear Lake clay, in an area of Clear Lake clay, drained, 1,200 feet north of the intersection of F Street and Margarita Avenue at Santa Margarita, in the Santa Margarita Land Grant, T. 29 S , R. 13 E.

A11—0 to 10 inches; very dark gray (N 3/0) clay, black (N 2/0) moist; strong coarse angular blocky structure, extremely hard, very firm, very sticky and very plastic; many very fine roots; many very fine tubular pores; moderately alkaline; clear smooth boundary.

A12—10 to 25 inches; very dark gray (N 3/0) clay, black (N 2/0) moist; strong coarse prismatic structure with tilted wedge-shaped aggregates; extremely hard, very firm, very sticky and very plastic; few very fine roots; many very fine tubular pores; many slickensides that intersect; slight effervescence, disseminated lime; moderately alkaline; gradual wavy boundry

A13—25 to 41 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist, with distinct fine mottles, brown (10YR 5/3) dry and dark brown (10YR 4/3) moist, strong coarse prismatic structure with tilted wedge-shaped aggregates; extremely hard, very firm, very sticky and very plastic; few very fine roots, common very fine tubular pores; many slickensides that intersect; slight effervescence, disseminated lime, moderately alkaline; gradual wavy boundary.

Cca—41 to 60 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist, with common fine prominent mottles, brown (10YR 5/3) dry and dark brown (10YR 4/3) moist; massive; very hard, firm, very sticky and very plastic; common very fine tubular pores; strong effervescence, soft lime masses and filaments; moderately alkaline.

Dry soils have cracks 0.5 inch to 2.5 inches wide at the surface and 0.5 to 1 inch wide at a depth of 20 to 38 inches. Cracks close when the soil becomes wet late in October, and cracks remain closed until the soil dries between April and early in June. Slickensides intersect at a depth ranging from 5 to 40 inches.

The A horizon is dark gray, very dark gray, or black (10YR 4/1, 3/1, 2/1 and neutral hue). Some pedons are not calcareous in the A horizon. Thickness ranges from 40 to 45 inches. The water table is below a depth of 4 feet late in summer and is 1 to 3 feet deep during the wet months of winter. In areas near stream channels the water table is at a greater depth.

Concepcion series

The Concepcion series consists of very deep, moderately well drained soils that formed in alluvium derived from mixed rock sources. The soils are on terraces. Slope is 2 to 15 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Concepcion soils are similar to Positas and San Ysidro soils. They are near Arujo, Botella, and San Andreas soils. Positas soils have a hard and massive A horizon and do not have an A2 horizon. San Ysidro soils have an ochric epipedon. Arujo soils have a fine-loamy textural control section and are underlain by sandstone. Botella soils have a fine-loamy textural control section. San Andreas soils have a coarse-loamy textural control section and are underlain by sandstone.

A typical pedon of Concepcion sandy loam, in an area of Concepcion sandy loam, 2 to 9 percent slopes, 2,200 feet northeast on El Bordo Avenue from the El Camino Real intersection, then 200 feet southeast into the field in the Asuncion Land Grant, T. 28 S., R. 12 E.

A11—0 to 4 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure; slightly hard, friable, nonsticky and nonplastic; many very fine roots; common very fine tubular and interstitial pores; slightly acid; abrupt wavy boundary.

A12—4 to 20 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine tubular and interstitial pores; slightly acid; gradual wavy boundary.

A2—20 to 22 inches; gray (10YR 5/1) sandy loam, dark gray (10YR 4/1) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine tubular and interstitial pores; medium acid; abrupt smooth boundary.

B2t—22 to 36 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; strong, coarse columnar structure; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular and common very fine interstitial pores; many moderately thick clay films on faces of peds and lining tubular pores; strongly acid; gradual wavy boundary.

B3t—36 to 51 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; few fine distinct mottles, yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure; very hard, firm, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; strongly acid; gradual wavy boundary.

C—51 to 64 inches; very pale brown (10YR 8/3) sandy loam, light gray (10YR 7/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; slightly acid.

The solum is 46 to 57 inches thick.

The A1 horizon is gray, grayish brown, dark gray, and dark grayish brown (10YR 5/1, 4/1, 5/2, 4/2). Reaction is medium acid to slightly acid. Thickness ranges from 19 to 22 inches. The A2 horizon is gray, light gray, and light grayish brown (10YR 6/1, 7/1, 6/2). Reaction is medium acid. Thickness ranges from 1 to 3 inches.

The Bt horizon is grayish brown, brown, pale brown, or light brownish gray (10YR 5/2, 5/3, 6/3, 6/2).

The C horizon is sandy loam or sandy clay loam. Reaction is slightly acid to moderately alkaline.

Cropley series

The Cropley series consists of very deep, moderately well drained soils that formed in alluvium derived from sedimentary rock sources. The soils are on alluvial fans. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Cropley soils are similar to the Ayar, Capay, and Clear Lake soils. They are near Linne, Still, and Zakme soils. Ayar soils have chroma of 2 or more in all horizons underlain by calcareous shale. Capay soils have chroma of 2 or more in all horizons. Clear Lake soils are poorly drained, and have mottles in the C horizon. Linne soils have a fine-loamy textural control section underlain by shale. Still soils are not Vertisols, and have a fine-loamy textural control section. Zakme soils lack slickensides, wedge-shaped structural aggregates, or gilgai, and are underlain by calcareous shale.

A typical pedon of Cropley clay, in an area of Cropley clay, 2 to 9 percent slopes, 4,000 feet west and 1,800 feet south of northeast corner of sec. 25, T. 26 S., R. 10 E.

Ap1—0 to 2 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong medium and coarse granular structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine interstitial pores; slightly acid; abrupt smooth boundary.

Ap2—2 to 8 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong coarse angular blocky structure; extremely hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; slightly acid; clear smooth boundary.

A13—8 to 32 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong coarse prismatic structure with tilted wedge-shaped aggregates; extremely hard, very firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; many slickensides that intersect; slightly acid; gradual wavy boundary.

C1—32 to 51 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; weak coarse angular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; many slickensides that intersect; slightly calcareous, disseminated lime; moderately alkaline; gradual wavy boundary.

C2—51 to 66 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; massive; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; strongly calcareous, soft lime masses; moderately alkaline.

Dry soils have cracks 0.5 inch to 2.0 inches wide at the surface and 0.5 to 1 inch wide at a depth of 20 to 46 inches. Cracks close when the soil becomes wet in November, and cracks remain closed until the soil dries between April and early in June. Slickensides intersect at depths ranging from 8 to 40 inches.

The lower part of the A horizon, below a depth of 12 inches, may range to grayish brown or dark grayish brown (10YR 5/2, 4/2). Thickness of the A horizon ranges from 30 to 40 inches.

Diablo series

The Diablo series consists of deep, well drained soils that formed in material weathered from calcareous sandstone and shale. The soils are on hills and mountains. Slope is 9 to 50 percent. Mean annual precipitation ranges from 12 to 20 inches, and mean annual air temperature is about 60 degrees F.

Diablo soils are similar to Ayar, Capay, and Cropley soils. They are near Linne, Positas, and Zakme soils. Ayar and Capay soils have chroma of 2 or more in the upper part of the A horizon. Cropley soils are on alluvial fans that have slopes of less than 9 percent and are moderately well drained. Linne soils are not Vertisols and have a fine-loamy textural control section. Zakme soils have a very fine textural control section and do not have slickensides, wedge-shaped structural aggregates, or gilgai.

A typical pedon of Diablo clay, in an area of Ayar and Diablo soils, 15 to 30 percent slopes, 2,500 feet west, 1,400 feet south of northeast corner of sec. 16, T. 26 S., R. 13 E.

Ap—0 to 5 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; common very fine roots; many very fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

A12—5 to 26 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong coarse prismatic structure with tilted wedge-shaped aggregates; extremely hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; many slickensides that intersect; slight effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

A13ca—26 to 38 inches; dark gray (10YR 4/1) clay with fine and medium blotches of light yellowish brown (10YR 6/4), very dark gray (10YR 3/1) moist with fine and medium blotches of yellowish brown (10YR 5/4); strong coarse prismatic structure with tilted wedge-shaped aggregates; extremely hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; many slickensides that intersect; strong effervescence, lime in soft masses; moderately alkaline; clear wavy boundary.

C1ca—38 to 50 inches; light yellowish brown (2.5Y 6/4) clay with fine and medium mottles of yellowish brown (10YR 5/6), light olive brown (2.5Y 5/4) moist with fine and medium mottles of yellowish brown (10YR 5/6), weak coarse angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; common very fine tubular pores; strong effervescence, lime in soft masses; moderately alkaline; clear wavy boundary.

Cr—50 inches; pale yellow (2.5Y 7/4) calcareous, soft weathered sandstone.

Depth to calcareous sandstone or shale ranges from 40 to 60 inches. Dry soils have cracks 0.5 inch to 2.0 inches wide at the surface, and 0.5 to 1 inch wide at a depth of 20 to 38 inches. Cracks close when the soil becomes wet late in October, and cracks remain closed until the soil dries between April and early in June. Slickensides intersect in the lower part of the A horizon at a depth of 5 and 40 inches. Some pedons have as much as 5 percent pebbles and cobbles.

The A horizon is dark gray or gray (10YR 4/1, 5/1). It is mildly alkaline or moderately alkaline, with disseminated or segregated lime. Thickness of the A horizon

ranges from 28 to 40 inches in depth. Segregated lime in the C horizon is in soft masses or filaments.

Dibble series

The Dibble series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. The soils are on hills and mountains. Slope is 9 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Dibble soils are similar to Los Osos, Rincon, and Ryer soils. They are near Gaviota, Millsholm, and San Andreas soils. Los Osos soils have a mollic epipedon. Rincon soils are in a mollic subgroup and are on alluvial fans. Ryer soils are on alluvial fans. Gaviota soils are underlain by sandstone at 10 to 20 inches. Millsholm soils are underlain by sandstone or shale at a depth of 10 to 20 inches. San Andreas soils have a mollic epipedon and a coarse-loamy textural control section.

A typical pedon of Dibble clay loam, in an area of Dibble clay loam, 30 to 50 percent slopes, 300 feet west and 4,700 feet south of the northeast corner of sec. 5, T. 26 S., R. 11 E.

A1—0 to 12 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine roots; many very fine and fine tubular and interstitial pores; slightly acid; clear wavy boundary.

B21t—12 to 16 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse subangular blocky structure; very hard, firm, very sticky and very plastic; common very fine roots; common very fine and fine tubular pores; many thin clay films line pores and are on ped faces; slightly acid; gradual wavy boundary.

B22t—16 to 26 inches; brownish yellow (10YR 6/6) clay, dark yellowish brown (10YR 4/6) moist; moderate medium subangular structure; very hard, firm, very sticky and very plastic; few very fine and few medium roots; common very fine and fine tubular pores; many thin clay films line pores and are on ped faces; slightly acid; gradual wavy boundary.

B3t—26 to 34 inches; brownish yellow (10YR 6/6) clay loam, yellowish brown (10YR 5/6) moist; massive; hard, friable, sticky and plastic; few fine and few medium roots; common very fine tubular pores; few thin clay films bridging mineral grains; slightly acid; gradual wavy boundary.

Cr—34 inches; yellow (10YR 7/6) weathered shale.

Depth to weathered shale or sandstone ranges from 20 to 40 inches.

The A horizon is pale brown or light brownish gray (10YR 6/3, 6/2). It is slightly acid to medium acid. It ranges from 8 to 16 inches thick.

The B horizon is brownish yellow, light yellowish brown, or yellowish brown (10YR 6/6, 5/4, 6/3, 6/4 or 2.5Y 6/4). It is slightly acid or neutral. Some pedons do not have a B3t horizon.

Elder series

The Elder series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. The soils are on alluvial fans, alluvial plains, and flood plains. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Elder soils are similar to Pico and Still soils. They are near Clear lake, Metz, and Mocho soils. Pico soils have a calcareous mollic epipedon less than 20 inches thick. Still soils have a fine-loamy textural control section. Clear Lake soils are poorly drained, and have a fine control section. Metz soils have a sandy textural control section. Mocho soils have a calcareous mollic epipedon less than 20 inches thick.

A typical pedon of Elder loam, in an area of Elder loam, 0 to 2 percent slopes, south of Creston about 2 miles on Creston-O'Donovan Road, and 300 feet west in field in the Huerhuero Land Grant, T. 28 S. and R. 14 E.

Ap—0 to 8 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; many very fine interstitial pores and common very fine and fine tubular pores; slightly acid; clear smooth boundary.

A12—8 to 12 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; many very fine interstitial pores and many very fine and fine tubular pores; slightly acid; clear wavy boundary.

A13—12 to 22 inches; dark gray (10YR 4/1) sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores and many very fine and fine tubular pores; slightly acid; abrupt wavy boundary.

C1—22 to 26 inches; grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine tubular pores; neutral; abrupt wavy boundary.

C2—26 to 35 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine tubular pores and few medium tubular pores; neutral; clear wavy boundary.

Ab—35 to 46 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; strong medium suban-

gular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine tubular pores and few medium tubular pores; slight effervescence, disseminated lime; moderately alkaline, gradual wavy boundary.

C3—46 to 60 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic, many very fine and fine tubular pores and few medium tubular pores; strong effervescence, fine threads of lime; moderately alkaline.

The soils are either stratified or have a buried A horizon. The textural control section is stratified layers of loam, sandy loam, fine sandy loam, and loamy sand which averages 9 to 18 percent clay.

The A horizon is grayish brown, gray, dark grayish brown, or dark gray (10YR 5/2, 5/1, 4/2, 4/1). It ranges from medium acid to neutral. Thickness ranges from 22 to 34 inches in depth.

The C horizon ranges from neutral to moderately alkaline.

The Ab horizon is absent in some profiles

Gaviota series

The Gaviota series consists of shallow, well drained soils that formed in material weathered from sandstone The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Gaviota soils are similar to Calleguas, Cieneba, and Calodo soils. They are near Cieneba, San Andreas, and Shimmon soils. Calleguas soils have a calcareous A horizon underlain by calcareous shale. Cieneba soils are underlain by granitic rock. Calodo soils have a mollic epipedon underlain by calcareous shale or sandstone. San Andreas soils are moderately deep with a mollic epipedon Shimmon soils are moderately deep and have a mollic epipedon and a fine-loamy textural control section.

A typical pedon of Gaviota sandy loam, in an area of Gaviota-Rock outcrop complex, 30 to 75 percent slopes, located 400 feet east and 1,500 feet south of the northwest corner of sec. 28, T. 25 S., R. 9 E.

A11—0 to 2 inches, brown (7 5YR 5/2) sandy loam, dark brown (7.5YR 3/2) moist, moderate fine and medium granular structure, slightly hard, very friable, nonsticky and nonplastic; common very fine and fine tubular pores; 5 percent gravel by volume; slightly acid; clear wavy boundary

A12—2 to 10 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine and few medium roots; many very fine, fine and few medium tubular pores; 5 percent gravel by volume; slightly acid; abrupt irregular boundary.

R—10 inches; light gray, hard sandstone.

Depth to hard sandstone ranges from 6 to 20 inches. Reaction is medium acid to neutral. Gravel and cobbles range up to 15 percent by volume.

In most pedons the surface from 1 to 3 inches is brown or grayish brown (7.5YR 5/2, 5/4 or 10YR 5/2, 5/3) underlain by light brown, light brownish gray, pale brown, or light yellowish brown (7.5YR 6/4, 10YR 6/2, 6/3, 6/4).

Gazos series

The Gazos series consists of moderately deep, well drained soils that formed in material weathered from shale. The soils are on hills and mountains. Slope is 15 to 50 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Gazos soils are similar to Arujo, Linne, and Santa Lucia soils. They are near Lodo, Lopez, and Zakme soils Arujo soils have an argillic horizon and are underlain by sandstone. Linne soils are calcareous and are underlain by calcareous shale or sandstone. Santa Lucia soils have base saturation between 65 and 75 percent and have more than 35 percent shale fragments by volume Lodo and Lopez soils are shallow. Zakme soils have a fine textural control section

A typical pedon of Gazos shaly clay loam, in an area of Gazos shaly clay loam, 30 to 50 percent slopes, 1 1/4 miles west on Highway 46 from the intersection of Bethel Road, then 900 feet northwest uphill in Paso de Robles Land Grant, T. 27 S , R. 11 E.

Ap—0 to 6 inches; gray (10YR 5/1) shaly clay loam, very dark gray (10YR 3/1) moist; moderate fine and medium granular structure, hard, very friable, sticky and plastic; many very fine roots; many very fine tubular and interstitial pores, about 20 percent shaly fragments by volume; medium acid; clear smooth boundary

A12—6 to 15 inches; gray (10YR 5/1) shaly clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic; common very fine roots; many very fine and fine tubular pores; about 20 percent shaly fragments by volume; slightly acid; gradual wavy boundary.

A13—15 to 28 inches; gray (10YR 5/1) shaly clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic, few very fine and fine roots; many very fine and fine tubular pores; 30 percent shaly fragments by volume; slightly acid; abrupt irregular boudary

R—28 inches; very pale brown (10YR 7/4), hard Monterey shale.

Depth to hard Monterey shale ranges from 20 to 40 inches. The solum is medium acid to neutral. Shale fragments make up 15 to 30 percent by volume.

The A horizon is gray, grayish brown, dark gray, or dark grayish brown (10YR 5/1, 5/2, 4/1, 4/2).

Gilroy series

The Gilroy series consists of moderately deep, well drained soils that formed in material weathered from partly metamorphosed sandstone. The soils are on mountains. Slope is 30 to 50 percent. Mean annual precipitation ranges from 20 to 30 inches, and the mean annual air temperature is about 60 degrees F.

Gilroy soils are similar to Gazos, Lompico, and Shimmon soils. They are near Henneke, Lompico, and Los Osos soils. Gazos soils have a mollic epipedon more than 20 inches thick and do not have an argillic horizon. Lompico soils have a mesic temperature regime. Shimmon soils have less than 15 percent gravel in the profile. Henneke soils are shallow and have a clayey-skeletal textural control section. They are underlain by serpentinitic rock. Los Osos soils have a fine textural control section.

A typical pedon of Gilroy gravelly loam, in an area of Gilroy-Rock outcrop complex, 30 to 50 percent slopes, 3,700 feet west and 2,900 feet south of the northeast corner of sec. 28, T. 25 S., R. 8 E.

A1—0 to 9 inches; brown (7.5YR 5/2) gravelly loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; gravel is 15 percent by volume; slightly acid; gradual wavy boundary.

B21t—9 to 15 inches; brown (7.5YR 5/2) gravelly clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; many very fine and fine tubular and interstitial pores; common thin clay films bridging mineral grains; gravel is 20 percent and cobbles are 5 percent by volume; slightly acid; gradual wavy boundary.

B22t—15 to 24 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and few fine and medium tubular pores; common thin clay films line pores and faces of peds; gravel is 15 percent and cobbles are 20 percent by volume; slightly acid; abrupt irregular boundary.

R—24 inches; hard metasandstone.

Depth to hard metasandstone ranges from 20 to 40 inches. Gravel content is 15 to 25 percent by volume. The solum ranges from medium acid to neutral.

The A horizon is brown or dark brown (7.5YR 4/2, 5/2) and grayish brown, brown, or dark grayish brown (10YR 5/2, 5/3, 4/2). It is 8 to 12 inches thick.

The B2t horizon is pinkish gray, light brown, or brown (7.5YR 6/2, 6/4, 5/2, 5/4) or reddish brown (5YR 5/3, 5/4, 4/3, 4/4). It is gravelly loam or gravelly clay loam.

Greenfield series

The Greenfield series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. Greenfield soils are on terraces. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Greenfield soils are similar to the Arbuckle, Hanford, and Sesame soils. They are near Arbuckle, Hanford, Metz, and San Ysidro soils. Arbuckle soils have a fine-loamy textural control section. Hanford soils do not have an argillic horizon. Metz soils have a sandy textural control section. San Ysidro soils have an abrupt boundary between the A and B horizons and have a fine textural control section. Sesame soils have a fine-loamy textural control section and are moderately deep to weathered granitic rock.

A typical pedon of Greenfield fine sandy loam, in an area of Hanford and Greenfield soils, 0 to 2 percent slopes, 4,000 feet west and 2,200 feet south of the northeast corner of sec. 9, T. 24 S., R. 11 E.

Ap—0 to 8 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine and few fine tubular pores; slightly acid; clear wavy boundary.

B1t—8 to 23 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine and few fine tubular pores; slightly acid; gradual wavy boundary.

B22t—23 to 41 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, very friable, nonsticky and nonplastic; few very fine roots; common very fine and few fine tubular pores; many thin clay films lining pores and bridging mineral grains; neutral; gradual wavy boundary.

B3t—41 to 54 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard, very friable, nonsticky and nonplastic; common very fine and few fine tubular pores; mildly alkaline; clear wavy boundary.

IIC—54 to 60 inches; light yellowish brown (10YR 6/2) very gravelly sand, yellowish brown (10YR 5/4) moist; massive; loose, nonsticky and nonplastic; mildly alkaline.

Thickness of the solum ranges from 40 to 60 inches. Textures are sandy loam, fine sandy loam, or gravelly sandy loam throughout the profile. Gravel makes up to 25 percent by volume.

The A horizon is brown, grayish brown, light brownish gray, or pale brown (10YR 5/3, 5/2, 6/2, 6/3). It is slightly acid or neutral. Thickness ranges from 8 to 12 inches. Organic matter content is less than 1 percent.

The Bt horizon is pale brown, very pale brown, light brown, brown, light yellowish brown, brownish yellow, or yellow (7.5YR 6/4, or 10YR 5/3, 5/4, 6/4, 6/6, 7/4). It ranges from slightly acid to mildly alkaline. There is about 4 to 5 percent more clay in the Bt horizon than in the overlying A horizon.

The IIC horizon is gravelly sand, very gravelly sand, gravelly sandy loam, very gravelly coarse sandy loam, or sandy loam. Gravel and cobbles make up 5 to 55 percent by volume. The IIC horizon ranges from slightly acid to moderately alkaline.

Hanford series

The Hanford series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. The soils are on terraces. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Hanford soils are similar to Cieneba, Greenfield, and Metz soils. They are near Arbuckle, Greenfield, Metz, and San Ysidro soils. Arbuckle soils have an argillic horizon and a fine-loamy textural control section. Cieneba soils are shallow and underlain by granitic rock. Greenfield soils have an argillic horizon. Metz soils have a sandy textural control section. San Ysidro soils have an abrupt boundary between the A and B horizons and have a fine textural control section.

A typical pedon of Hanford fine sandy loam, in an area of Hanford and Greenfield soils, 0 to 2 percent slopes, 1,500 feet west and 2,800 feet south of the northeast corner of sec. 18, T. 25 S., R. 11 E.

Ap—0 to 8 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial and tubular pores; neutral; clear smooth boundary.

A12—8 to 25 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial and tubular pores; neutral; gradual wavy boundary.

C1—25 to 39 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial and tubular pores; neutral; gradual wavy boundary.

C2—39 to 60 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial and tubular pores; neutral.

Texture is sandy loam, fine sandy loam, or gravelly sandy loam. Gravel makes up to 35 percent by volume.

The A horizon is grayish brown, light brownish gray, or pale brown (10YR 5/2, 6/2, 6/3). Content of organic matter is less than 1 percent. It is slightly acid or neutral. Thickness ranges from 14 to 30 inches.

The C horizon ranges from slightly acid to mildly alkaline. Some pedons are gravelly loamy coarse sand below a depth of 40 inches.

Henneke series

The Henneke series consists of shallow, somewhat excessively drained soils that formed in material weathered from serpentinitic rock. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 20 to 30 inches, and the mean annual air temperature is about 60 degrees F.

Henneke soils are similar to Lodo, Lopez, and Montara soils. They are near Gaviota, McMullin, and Millsholm soils. Lodo soils have a loamy textural control section underlain by sandstone and shale. Lopez soils have a loamy-skeletal textural control section and are underlain by shale. Montara soils have a loamy textural control section. Gaviota soils have an ochric epipedon. McMullin soils have a loamy textural control section underlain by shale. Millsholm soils have a loamy textural control section underlain by shale and sandstone. None of these soils has an argillic horizon.

A typical pedon of Henneke very cobbly clay loam, in an area of Henneke-Rock outcrop complex, 15 to 75 percent slopes, 1,800 feet west and 4,600 feet south of the northeast corner of sec. 12, T. 25 S., R. 8 E.

A1—0 to 8 inches; reddish brown (5YR 5/3) very cobbly clay loam, dark reddish brown (5YR 3/3) moist; moderate fine and medium granular structure; slightly hard, very friable, sticky and plastic; common very fine, fine and medium roots; many very fine and fine tubular and interstitial pores; about 20 percent is cobbles, 10 percent is stones, and 15 percent is gravel by volume; neutral; clear wavy boundary.

B2t—8 to 16 inches; reddish brown (5 YR 5/4) very cobbly clay, dark reddish brown (5YR 3/4) moist; strong fine and medium subangular blocky structure; hard, firm, very sticky and very plastic; few fine and very fine and common medium and coarse roots; many very fine, fine and few medium tubular pores; continuous moderately thick clay films on the faces of peds; 30 percent is cobbles, 10 percent is stones, and 15 percent is gravel by volume; neutral; abrupt irregular boundary.

R—16 inches; hard serpentinitic rock.

Depth to hard serpentinitic rock ranges from 10 to 20 inches. Gravel makes up 10 to 20 percent, and cobbles and stones make up 30 to 40 percent of the solum

The A horizon is reddish brown (5YR 5/3, 5/4, 4/3, 4/4) or weak red (2.5YR 4/2). It ranges from slightly acid to mildly alkaline. Thickness ranges from 5 to 9 inches.

The B2t horizon is reddish brown or reddish yellow (5YR 4/3, 4/4, 5/3, 5/4, 6/6). It is very cobbly heavy clay loam or very cobbly clay. It ranges from neutral to moderately alkaline.

Linne series

The Linne series consists of moderately deep, well drained soils that formed in material weathered from calcareous shale and sandstone. The soils are on hills and mountains. Slope is 9 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Linne soils are similar to Arujo, Gazos, and Santa Lucia soils. They are near Nacimiento, Calodo, and Zakme soils. Arujo soils have a sandy loam A horizon and an argillic horizon. Gazos soils are medium acid to neutral, underlain by hard shale. Santa Lucia soils are strongly acid to slightly acid, with a clayey-skeletal textural control section and are underlain by hard shale. Nacimiento soils have a mollic epipedon less than 20 inches thick. Calodo soils have a mollic epipedon less than 20 inches thick and are shallow. Zakme soils have a fine textural control section and mesic temperature regime.

A typical pedon of Linne shaly clay loam, in an area of Linne-Calodo complex, 30 to 50 percent slopes, 650 feet west and 400 feet south of the northeast corner of sec. 4, T. 26 S., R. 11 E.

A11—0 to 10 inches; dark gray (10YR 4/1) shaly clay loam, very dark gray (10YR 3/1) moist; moderate medium granular structure, upper 3 inches parting to weak medium subangular blocky; hard, friable, sticky and plastic; many very fine and few coarse, medium and fine roots; many very fine and fine tubular and interstitial pores; about 20 percent shale fragments by volume; strong effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

A12—10 to 20 inches; dark gray (10YR 4/1) shaly clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine, fine and few coarse and medium roots; many fine and very fine tubular pores; about 20 percent shale fragments by volume; strong effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

A13ca—20 to 34 inches; dark grayish brown (10YR 4/2) shaly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; hard, friable, sticky and plastic; common very fine, fine and few coarse and medium roots; common very fine and fine tubular pores; about 20 percent shale fragments by volume; violent effervescence, soft masses and filaments of lime; moderately alkaline; abrupt irregular boundary.

C1ca—34 to 39 inches; white (N 8/0) shaly clay loam, white (10YR 8/2) moist; massive; hard, friable, sticky and plastic; violent effervescence, lime is mostly disseminated and in seams on the faces of fragments; moderately alkaline; clear irregular boundary.

C2r—39 inches; white weathered, calcareous shale.

Depth to weathered, calcareous shale or sandstone ranges from 20 to 40 inches. Gravel-size shale fragments make up 15 to 25 percent by volume.

The A horizon is gray, dark gray, or very dark gray (10YR 3/1, 4/1, 5/1) and in places it increases by 1 chroma below a depth of 20 inches.

Lockwood series

The Lockwood series consists of very deep, well drained soils that formed in alluvium derived from sedimentary rock. The soils are on terraces. Slope is 0 to 15 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Lockwood soils are similar to Arujo, Botella, and Linne soils. They are near Concepcion, Rincon, and Still soils. Arujo soils are on hills and are underlain by sandstone. Botella soils have a sandy loam A horizon. Linne soils are on hills and mountains and are underlain by calcareous sandstone and shale. Concepcion soils have a sandy loam A horizon and a fine textural control section. Rincon soils have a fine textural control section. Still soils have an irregular decrease in content of organic matter and do not have an argillic horizon.

A typical pedon of Lockwood shaly loam, in an area of Lockwood shaly loam, 2 to 9 percent slopes, 450 feet west and 4,900 feet south of the northeast corner of sec. 19, T. 26 S., R. 12 E.

Ap—0 to 7 inches; gray (10YR 5/1) shaly loam, very dark gray (10YR 3/1) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial and tubular pores; about 25 percent shale fragments by volume; neutral; gradual smooth boundary.

A12—7 to 26 inches; gray (10YR 5/1) shaly loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; many very fine and fine interstitial and tubular pores; about 30 percent shale fragments by volume; slightly acid; gradual wavy boundary.

B1t—26 to 39 inches, brown (10YR 5/3) shaly clay loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic, few very fine and fine and common medium roots, common very fine, fine and medium tubular pores, few moderately thick clay films line pores and faces of peds, about 25 percent shale fragments by volume, slightly acid, clear wavy boundary.

B21t—39 to 44 inches, yellowish brown (10YR 5/4) shaly clay loam, dark yellowish brown (10YR 4/4) moist, weak medium subangular blocky structure; hard, friable, sticky and plastic, few very fine and fine roots, common very fine and fine tubular pores; many moderately thick clay films line pores and faces of peds, about 35 percent shale fragments by volume, slightly acid, gradual wavy boundary

B22t—44 to 62 inches, pale brown (10YR 6/3) shaly clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; few very fine roots, common very fine and fine tubular pores, many moderately thick clay films on faces of peds and lining the pores; about 30 percent shale fragments by volume, slightly acid; gradual wavy boundary.

Thickness of the solum ranges from 50 to 60 inches or more

The A horizon is gray, dark gray, grayish brown, or dark grayish brown (10YR 5/1, 4/1, 5/2, 4/2) Reaction is slightly acid to neutral. Shale fragments make up 15 to 35 percent by volume. Thickness ranges from 22 to 30 inches.

The B2t horizon is grayish brown, brown, yellowish brown, light brownish gray, pale brown, or light yellowish brown (10YR 5/2, 5/3, 5/4, 6/2, 6/3, 6/4) It is shaly loam or shaly clay loam Reaction ranges from slightly acid to mildly alkaline Shale fragments make up 15 to 35 percent by volume.

The C horizon, where present, is slightly acid to mildly alkaline. It is shaly loam, and in some pedons is very shaly loam with 30 to 50 percent shale fragments by volume.

Lodo series

The Lodo series consists of shallow, somewhat excessively drained soils that formed in material weathered from sandstone and shale. The soils are on mountains. Slope is 50 to 75 percent. Mean annual precipitation ranges from 20 to 30 inches, and the mean annual air temperature is about 60 degrees F.

Lodo soils are similar to McMullin, Lopez, and Montara soils. They are near Dibble, Gilroy, and Los Osos soils. McMullin soils have a gravelly loam A horizon and are in a mesic temperature regime. Lopez soils have more than 35 percent shale fragments by volume. Montara soils are underlain by serpentinitic rock. Dibble soils have a clayey subsoil Gilroy soils are moderately deep soils that have an argillic horizon. Los Osos soils have a clay B horizon.

A typical pedon of Lodo gravelly clay loam, in an area of Los Osos-Lodo complex, 50 to 75 percent slopes, 1,100 feet east and 1,100 feet north of the southwest corner of sec. 29, T. 26 S., R. 10 E.

A11—0 to 10 inches, brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist, moderate medium granular and angular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine and fine tubular and interstitial pores; 15 percent gravel and 5 percent cobbles by volume, neutral; gradual irregular boundary.

A12—10 to 16 inches, brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist, weak medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; common very fine and fine tubular and interstitial pores; 15 percent gravel and 5 percent cobbles by volume; neutral; abrupt irregular boundary.

R—16 inches; hard sandstone.

Depth to hard sandstone and shale ranges from 10 to 20 inches. Gravel makes up 15 to 25 percent, and cobbles 0 to 5 percent by volume

The A horizon is grayish brown, brown, dark grayish brown, or dark brown (10YR 5/2, 5/3, 4/2, 4/3) Reaction is slightly acid or neutral

Lompico series

The Lompico series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. The soils are on mountains. Slope is 30 to 75 percent. Mean annual precipitation ranges from 20 to 30 inches, and the mean annual air temperature is about 56 degrees F.

Lompico soils are similar to Gazos, Gilroy, and Shimmon soils. They are near Dibble, McMullin, Millsholm, and Gazos soils. All the soils have a thermic temperature regime except the McMullin soils. Gazos soils have a mollic epipedon more than 20 inches thick and do not have an argillic horizon. Gilroy soils are underlain by partly metamorphosed sandstone. Shimmon soils have a base saturation of more than 75 percent in the upper 10 inches or more of the profile. Dibble soils have an ochric epipedon and a fine textural control section. McMullin soils are shallow and do not have an argillic horizon. Millsholm soils are shallow and have a cambic horizon.

A typical pedon of Lompico loam, in an area of Lompico-McMullin complex, 30 to 50 percent slopes, 300 feet west and 1,700 feet south of the northeast corner of sec. 31, T. 27 S , R. 11 E.

01—1 inch to 0; leaves, needles and twigs, some partially decomposed; abrupt smooth boundary.

A11—0 to 3 inches; brown (7.5YR 5/2) loam, dark brown (7.5YR 3/2) moist; weak medium granular

structure; slightly hard, very friable, slightly sticky and slightly plastic, many very fine and fine and few medium and coarse roots; many very fine and fine tubular and interstitial pores; slightly acid; clear wavy boundary.

A12—3 to 10 inches; brown (7.5YR 5/2) loam, dark brown (7.5YR 3/2) moist, weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium and coarse roots; many very fine and fine tubular and interstitial pores; slightly acid; gradual wavy boundary.

B21t—10 to 22 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic, common very fine, fine, medium and coarse roots, many very fine and fine tubular and interstitial and few medium and coarse tubular pores; few thin clay films lining pores and bridging mineral grains; medium acid; gradual wavy boundary.

B22t—22 to 36 inches; reddish yellow (7 5YR 6/6) sandy clay loam, strong brown (7.5YR 5/6) moist; moderate medium subangular blocky structure, hard, friable, sticky and plastic; few fine, medium and coarse roots, common very fine and fine and few medium and coarse tubular pores; common thin clay films lining pores and bridging mineral grains; medium acid; gradual wavy boundary.

Cr—36 inches; sandstone.

Depth to sandstone ranges from 20 to 40 inches. Gravel is 3 to 14 percent by volume Base saturation ranges from 55 to 75 percent throughout the profile.

The A horizon is brown or grayish brown (10YR 5/2, 5/3 or 7.5YR 5/2) Thickness ranges from about 8 to 12 inches. The B horizon is brown, light brown, light yellowish brown, reddish yellow, or pale brown (7.5YR 5/4, 6/4, 6/6 or 10YR 6/3, 6/4). It is sandy clay loam or clay loam.

Lopez series

The Lopez series consists of shallow, somewhat excessively drained soils that formed in material weathered from shale. The soils are on mountains Slope is 15 to 50 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F

Lopez soils are similar to McMullin, Lodo, and Montara soils. They are near Calodo, Gazos, and Santa Lucia soils. McMullin soils are underlain by shale and are in a mesic temperature regime. Lodo soils have less than 35 percent shale fragments by volume. Montara soils are underlain by serpentinitic rock. Calodo soils are calcareous and are underlain by calcareous shale. Gazos soils are moderately deep and have a mollic epipedon more than 20 inches thick. Santa Lucia soils are clayey-skeletal, moderately deep soils and have a mollic epipedon more than 20 inches thick.

A typical pedon of Lopez very shaly clay loam in an area of Santa Lucia-Lopez complex, 15 to 50 percent slopes, 1,700 feet west and 2,100 feet south of the northeast corner of sec. 10, T. 27 S , R. 11 E.

Ap—0 to 7 inches; gray (10YR 5/1) very shaly clay loam, dark gray (10YR 3/1) moist; moderate fine and medium granular structure and moderate fine and medium subangular blocky; slightly hard, friable, sticky and plastic, many very fine and few fine and medium roots, many very fine and fine interstitial and tubular pores, about 35 percent shale fragments by volume; medium acid; gradual wavy boundary

A12—7 to 14 inches, gray (10YR 5/1) very shaly clay loam, dark gray (10YR 3/1) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine and few medium roots, many very fine and fine interstitial and tubular pores, 40 percent shale fragments by volume; medium acid; abrupt irregular boundary

R—14 inches; hard shale (fig. 8).

Depth to hard shale ranges from 10 to 20 inches. Shale fragments make up 35 to 50 percent by volume

The A horizon is gray or dark gray (10YR 5/1, 4/1 or 2 5Y 5/1, 4/1). Base saturation ranges from 65 to 75 percent

Los Osos series

The Los Osos series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. The soils are on hills and mountains. Slope is 9 to 75 percent. Mean annual precipitation ranges from 12 to 30 inches, and the mean annual air temperature is about 60 degrees F

Los Osos soils are similar to Gazos, Gilroy, and Shimmon soils. They are near Linne, Lodo, and Nacimiento soils. Gazos soils have a mollic epipedon more than 20 inches thick and do not have an argillic horizon. Gilroy soils have a fine-loamy textural control section. Shimmon soils have a fine-loamy textural control section. Linne soils have a calcareous mollic epipedon more than 20 inches thick and do not have an argillic horizon. Lodo soils are shallow and do not have an argillic horizon. Nacimiento soils have a fine-loamy textural control section, are underlain by calcareous sandstone and shale, and do not have an argillic horizon.

A typical pedon of Los Osos clay loam, in an area of Los Osos-Rock outcrop complex, 30 to 50 percent slopes, 1,100 feet west and 4,550 feet south of the northeast corner of sec. 30, T. 26 S., R. 10 E.

A1—0 to 14 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist;

Figure 8—Typical profile of Lopez very shaly clay loam. Hard shale is at a depth of 14 inches.

strong medium angular blocky structure; hard, friable, sticky and plastic; common very fine roots; common very fine tubular pores; neutral; gradual wavy boundary.

B2t—14 to 24 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; strong medium angular blocky structure; very hard, firm, very sticky and very plastic; few very fine roots; moderately thick clay films on the faces of the peds; neutral; clear wavy boundary.

Cr—24 inches; weathered shale.

Depth to weathered shale ranges from 20 to 40 inches. Gravel makes up to 10 percent and, in some pedons, cobbles make up to 5 percent by volume.

The A horizon is grayish brown, brown, or dark grayish brown (10YR 5/2, 5/3, 4/2 or 2.5Y 5/2, 4/2). It ranges from medium acid to neutral.

The B2t horizon is brown, yellowish brown, light brownish gray, pale brown, or light yellowish brown (10YR 5/3, 5/4, 6/2, 6/3, 6/4.) It is clay, silty clay, or heavy clay loam. Reaction is slightly acid or neutral. Some pedons have a calcareous Cr horizon.

McMullin series

The McMullin series consists of shallow, somewhat excessively drained soils that formed in material weathered from shale. The soils are on mountains. Slope is 30 to 75 percent. Mean annual precipitation ranges from 20 to 30 inches, and the mean annual air temperature is about 56 degrees F.

McMullin soils are similar to Lodo, Lopez, and Montara soils. They are near Henneke, Lompico, and Los Osos soils. All the soils have a thermic temperature regime except the Lompico soils. Lodo soils have a gravelly clay loam A horizon. Lopez soils have a clayey-skeletal textural control section. Montara soils are underlain by serpentinitic rock. Henneke soils have a clayey-skeletal textural control section with an argillic horizon and are underlain by serpentinitic rock. Lompico soils have an argillic horizon and are moderately deep. Los Osos soils have a fine textural control section, an argillic horizon, and are moderately deep.

A typical pedon of McMullin gravelly loam, in an area of McMullin-Rock outcrop complex, 50 to 75 percent slopes, 700 feet east and 1,100 feet north of the southwest corner of sec. 22, T. 27 S., R. 10 E.

A11—0 to 7 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, few fine and medium roots; many very fine, few fine and medium interstitial and tubular pores; gravel is 20 percent by volume; slightly acid; clear wavy boundary.

A12—7 to 18 inches; brown (7.5YR 4/2) gravelly loam, dark brown (7.5YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine, few medium and coarse roots; many very fine, common fine and medium interstitial and tubular pores; gravel is 30 percent and cobbles are 5 percent by volume; slightly acid; abrupt irregular boundary.

R—18 inches; hard shale.

Depth to hard sandstone or shale ranges from 10 to 20 inches. Gravel makes up 20 to 30 percent, and cobbles make up to 3 percent by volume. Base saturation ranges from 55 to 75 percent throughout the profile. The A horizon is grayish brown, brown (10YR 5/2, 5/3), or brown (7.5YR 5/2, 4/2). It is medium acid or slightly acid. Thickness of the A horizon ranges from 10 to 20 inches.

Metz series

The Metz series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from mixed rock sources. The soils are on flood plains. Slope is 0 to 5 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Metz soils are similar to Tujunga and San Emigdio soils. They are near Hanford, Mocho, Pico, San Emigdio, and Tujunga soils. San Emigdio soils are calcareous and have a coarse-loamy textural control section. Hanford soils have a coarse-loamy textural control section. Pico soils have a mollic epipedon and a coarse-loamy textural control section. Tujunga soils are sandy throughout and have no strata finer than loamy fine sand in the textural control section

A typical pedon of Metz loamy sand in an area of Metz loamy sand, 0 to 5 percent slopes, 900 feet west and 1,300 feet south of the northeast corner of sec. 8, T. 25 S., R. 11 E.

A1—0 to 9 inches, pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; many very fine and common fine roots; many very fine interstitial and few tubular pores; neutral; clear smooth boundary.

C1—9 to 22 inches; very pale brown (10YR 7/3) loamy sand, brown (10YR 5/3) moist, single grain; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; mildly alkaline; clear smooth boundary.

C2—22 to 32 inches, very pale brown (10YR 7/3) sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few fine and medium roots; many very fine interstitial pores, mildly alkaline, clear smooth boundary.

C3—32 to 60 inches, pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic, few fine and medium roots, common very fine tubular pores; slight effervescence, disseminated lime; moderately alkaline, gradual smooth boundary.

The textural control section is stratified layers of sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam, or very fine sandy loam. In some strata, gravel makes up to 35 percent by volume

The A horizon is pale brown, light brownish gray, light gray, grayish brown, or brown (10YR 6/1, 6/2, 6/3, 5/2, 5/3). It ranges from moderately alkaline to neutral. Thickness ranges from 5 to 15 inches. Content of organic matter is less than 1 percent.

Millsholm series

The Millsholm series consists of shallow, well drained soils that formed in material derived from weathered sandstone and shale. The soils are on hills and mountains Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F

Millsholm soils are similar to Gaviota and Vista soils. They are near Ayar, Dibble, and Montara soils. Gaviota soils are sandy loam throughout and do not have a B horizon Vista soils have a coarse-loamy textural control section and are underlain by granitic rock. Ayar soils are deep and are calcareous clay throughout. Dibble soils are moderately deep and have a fine textural control section. Montara soils have a mollic epipedon underlain by serpentinitic rock.

A typical pedon of Millsholm clay loam, in an area of Millsholm-Dibble complex, 30 to 50 percent slopes, 2,500 feet west and 2,350 feet south of the northeast corner of sec. 25, T. 27 S., R. 10 E.

A1—0 to 8 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; hard, friable, sticky, and plastic; many very fine roots; many very fine and fine tubular pores; slightly acid; clear wavy boundary.

IB2—8 to 16 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine roots, many very fine, fine and few medium tubular pores; slightly acid; abrupt irregular boundary.

R—16 inches; hard shale.

Depth to hard shale or sandstone ranges from 10 to 20 inches The soil is slightly acid or neutral Gravel makes up 5 to 10 percent by volume.

The A horizon is light brownish gray or pale brown (10YR 6/2, 6/3). Thickness ranges from 6 to 8 inches The B horizon is pale brown, light yellowish brown, brownish gray, yellowish brown, or brown (10YR 6/3, 6/4, 5/4, 5/3) or light olive brown (2 5Y 5/4) The soil is loam or clay loam and has a 1 to 2 percent clay increase in the B horizon.

Mocho series

The Mocho series consists of very deep, well drained soils that formed in alluvium derived from calcareous sedimentary rock. The soils are on alluvial fans and alluvial plains. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Mocho soils are similar to Pico, Elder, and Still soils They are near Metz, San Emigdio, and Still soils. Pico soils have a coarse-loamy textural control section. Elder soils have a mollic epipedon more than 20 inches thick and a coarse-loamy textural control section. Still soils have a mollic epipedon more than 20 inches thick. Metz soils have a sandy textural control section. San Emigdio

soils have an ochric epipedon, and a coarse-loamy textural control section.

A typical pedon of Mocho clay loam, in an area of Mocho clay loam, 0 to 2 percent slopes, 1,900 feet west and 2,800 feet south of the northeast corner of sec. 28, T. 25 S., R. 13 E.

Ap—0 to 8 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine roots; many very fine and fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

A12—8 to 19 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; common very fine roots; many very fine, fine and few medium tubular pores; stratified with 2 thin layers of sandy loam 1/4 to 1/2 inch thick, and 1 silt layer 1/4 inch thick; slight effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

C1—19 to 30 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, friable, sticky and plastic; many very fine, fine and few medium tubular pores; stratified with 2 thin layers of sandy loam 1/4 to 1 inch thick; strong effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

C2—30 to 44 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; many very fine, fine and few medium tubular pores; stratified with 3 thin layers of sandy loam 1/4 to 1/2 inch thick, and 1 silt loam layer 1 inch thick; strong effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

IIC3—44 to 58 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine tubular pores; 15 percent by volume of the soil mass is rounded pebbles 1/4 to 1 inch in diameter; slight effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

IIIC4—58 to 64 inches; light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; many very fine and fine tubular pores; strong effervescence, disseminated lime; moderately alkaline.

The textural control section is stratified layers of loam, silt loam, and clay loam, and averages 22 to 34 percent clay. The soils are either stratified or have a buried A horizon.

The A horizon is grayish brown or brown (2.5Y 5/2 or 10YR 5/2, 5/3). Thickness of the A horizon is 12 to 19 inches.

The C horizon is light brownish gray, light gray, or pale brown (10YR 6/2, 6/3, 7/2 or 2.5Y 6/2, 7/2). Gravel content ranges from 5 to 15 percent by volume.

A IIAb horizon is present in some pedons.

Montara series

The Montara series consists of shallow, somewhat excessively drained soils that formed in material weathered from serpentinitic rock. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Montara soils are similar to Henneke, Lodo, and Lopez soils. They are near Gaviota, McMullin, and Millsholm soils. Henneke soils have a clayey-skeletal textural control section that has an argillic horizon. Lodo soils are underlain by sandstone and shale. Lopez soils have a loamy-skeletal control section underlain by shale. Gaviota soils are underlain by sandstone. McMullin soils are underlain by shale and have a mesic temperature regime. Millsholm soils have an ochric epipedon and are underlain by sandstone and shale.

A typical pedon of Montara clay loam, in an area of Millsholm-Montara complex, 15 to 30 percent slopes, 3,400 feet west and 2,800 feet south of the northeast corner of sec. 25, T. 25 S., R. 16 E.

A11—0 to 3 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium and fine granular structure; hard, very friable, sticky and plastic; many very fine and fine roots; many very fine and fine tubular and interstitial pores; moderately alkaline; clear wavy boundary.

A12—3 to 15 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine and common fine tubular pores; moderately alkaline; abrupt irregular boundary.

R—15 inches; greenish gray hard serpentinitic rock.

Depth to hard serpentinitic rock ranges from 10 to 20 inches. The calcium-magnesium ratio is 1:1 or less. In some pedons, gravel makes up about 5 percent and cobbles make up about 5 percent by volume.

The A horizon is gray, dark gray, grayish brown, or dark grayish brown (10YR 5/1, 4/1, 5/2, 4/2) and grayish brown or dark grayish brown (2.5Y 5/2, 4/2). The soil is neutral to moderately alkaline. Thickness of the A horizon is 10 to 20 inches. Some pedons have a C horizon about 4 inches thick.

Nacimiento series

The Nacimiento series consists of moderately deep, well drained soils that formed in material weathered from

calcareous sandstone and shale. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Nacimiento soils are similar to Ayar, Balcom, and Calodo soils. They are near Linne and Los Osos soils. Ayar soils have intersecting slickensides and a fine textural control section. Balcom soils have an ochric epipedon. Calodo soils are shallow. Linne soils have a mollic epipedon more than 20 inches thick. Los Osos soils have an argillic horizon and a fine textural control section.

A typical pedon of Nacimiento silty clay loam, in an area of Nacimiento silty clay loam, 9 to 30 percent slopes, in a pit on the east side of the road about 500 feet south of the northwest corner of sec. 24, T. 26 S., R. 13 E.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine roots; many very fine, common fine interstitial and tubular pores; strong effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

A12—5 to 18 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic; many very fine roots; many very fine interstitial and many very fine and few medium tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

C1ca—18 to 28 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, very friable, sticky and plastic; common very fine roots; many very fine interstitial and many very fine and few medium tubular pores; violent effervescence, many fine lime filaments on peds and in pores; moderately alkaline; abrupt wavy boundary.

Cr—28 inches; light yellowish brown (10YR 6/4) and light gray (10YR 7/2) firm shale, yellowish brown (10YR 5/4) moist; broken with handtools to strong medium angular blocky structure; very hard, firm; few fine roots outside of shale fragments; exterior of shale fragments coated with lime; violent effervescence.

Depth to weathered, calcareous sandstone or shale ranges from 20 to 40 inches. In some pedons, rock fragments make up 0 to 15 percent by volume.

The A horizon is grayish brown, dark grayish brown, or brown (10YR 5/2, 4/2, 5/3). Thickness of the A horizon ranges from 12 to 19 inches. The Cca horizon is clay loam or silty clay loam.

Oceano series

The Oceano series consists of very deep, excessively drained soils that formed in sandy eolian deposits. The soils are on dunes. Slope is 2 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Oceano soils are similar to Arnold, Metz, and Tujunga soils. They are near Arnold, Botella, Elder, and San Andreas soils. Arnold soils are moderately deep and are underlain by sandstone. Metz soils are stratified sand to sandy loam and have an irregular decrease in organic matter throughout the profile. San Andreas soils have a mollic epipedon and are moderately deep to sandstone. Tujunga soils are stratified sand to loamy sand and have an irregular decrease in organic matter throughout the profile. Botella soils have an argillic horizon and a fine-loamy textural control section. Elder soils have a mollic epipedon and a coarse-loamy textural control section.

A typical pedon of Oceano loamy sand from an area of Oceano loamy sand, 2 to 9 percent slopes, 0.4 mile west of Santa Margarita Cemetery on Highway 58 and 0.4 mile south of the highway in the Santa Margarita Land Grant, T. 29 S., R. 13 E.

A—0 to 12 inches; light brownish gray (10YR 6/2) loamy sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine roots; many very fine tubular and interstitial pores; slightly acid; clear wavy boundary.

C—12 to 60 inches; light gray (10YR 7/2) loamy sand, grayish brown (10YR 5/2) moist; single grain; soft, very friable, nonsticky and nonplastic; common very fine roots, many very fine tubular and interstitial pores; 3 horizontal and broken lamellae 6 to 10 inches apart and 1/4 to 1/2 inch wide below a depth of 25 inches; slightly acid.

Thickness of the A horizon ranges from 12 to 20 inches.

Pico series

The Pico series consists of very deep, well drained soils that formed in alluvium derived from calcareous sedimentary sources. The soils are on alluvial fans and plains. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Pico soils are similar to Camarillo, Elder, and Metz soils. They are near Hanford, Mocho, San Emigdio, and Still soils. Camarillo soils have a fine-loamy textural control section and are poorly drained. Elder soils have a mollic epipedon more than 20 inches thick. Metz soils have an ochric epipedon and a sandy textural control section. Hanford soils have an ochric epipedon and a regular decrease in organic matter. Mocho soils have a fine-loamy textural control section. San Emigdio soils

have an ochric epipedon. Still soils have a mollic epipedon more than 20 inches thick and a fine-loamy textural control section.

A typical pedon of Pico fine sandy loam, in an area of Pico fine sandy loam, 0 to 2 percent slopes, 5,000 feet west and 4,000 feet south of the northeast corner of sec. 21, T. 26 S., R. 15 E.

Ap—0 to 7 inches; gray (10YR 5/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak medium and coarse subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; few very fine and fine roots; many very fine and few medium tubular pores; moderately alkaline; abrupt smooth boundary.

A12—7 to 17 inches; gray (10YR 5/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; few very fine and fine roots; many very fine, fine and medium tubular pores; very slight effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

C1—17 to 26 inches; grayish brown (2.5Y 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, nonsticky and slightly plastic; few very fine and fine roots; many very fine and fine tubular pores; strong effervescence, lime in filaments; moderately alkaline; gradual wavy boundary.

C2—26 to 38 inches; light brownish gray (10YR 6/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; hard, friable, nonsticky and slightly plastic; few very fine roots; many very fine and fine tubular pores; strong effervescence, lime in filaments; moderately alkaline; gradual wavy boundary.

C3—38 to 47 inches; light gray (10YR 7/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; hard, friable, nonsticky and slightly plastic; few very fine roots; many very fine tubular pores; violent effervescence, lime in filaments; moderately alkaline; clear smooth boundary.

IIAb—47 to 60 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; hard, friable, nonsticky and slightly plastic; few very fine roots; many very fine tubular pores; violent effervescence, lime segregated in filaments and seams; moderately alkaline.

The textural control section is stratified layers of mainly fine sandy loam with thin layers of loamy sand, silt loam, and clay loam. Clay content averages 14 to 18 percent. The soils are either stratified or have a buried A horizon.

The A horizon is gray, grayish brown, or brown (10YR 5/1, 5/2, 5/3, and 2.5Y 5/2). Carbonates range from slightly to strongly effervescent. Some pedons have an A horizon with 1 to 15 percent gravel by volume. Thickness ranges from 12 to 19 inches.

Carbonates of the C horizon range from slightly effervescent to violently effervescent. Some pedons have horizons with up to 25 percent gravel by volume.

The IIAb horizon, which is present in most horizons, has more organic matter than the overlying C horizon.

Polonio series

The Polonio series consists of very deep, well drained soils that formed in calcareous alluvium derived from sedimentary rock. The soils are on alluvial fans. Slope is 2 to 9 percent. The mean annual precipitation is about 9 inches, and the mean annual air temperature is about 60 degrees F.

Polonio soils are near Camatta and Chanac soils. Camatta soils are shallow and are underlain by a petrocalcic horizon. Chanac soils are on terrace escarpments and have a cambic horizon.

A typical pedon of Polonio clay loam, in an area of Polonio clay loam, 2 to 9 percent slopes, in McDonald Canyon, about 600 feet west and 1,700 feet north of the southeast corner of sec. 33, T. 27 S., R. 15 E.

Ap—0 to 6 inches; light brownish gray (10YR 6/2) clay loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; hard, friable, slightly sticky and plastic; common very fine roots; common very fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; clear smooth boundary.

A12—6 to 14 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; common very fine and fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

C1ca—14 to 49 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine roots; few very fine and fine tubular pores; strong effervescence, segregated lime in many fine lime filaments and seams; moderately alkaline; gradual wavy boundary.

C2ca—49 to 69 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine tubular pores; few thin clay films lining pores; violent effervescence, segregated lime in many fine lime filaments and seams; moderately alkaline.

The A horizon is grayish brown, gray, light brownish gray, or pale brown (10YR 5/2, 6/1, 6/2, 6/3).

The C horizon is brown, yellowish brown, pale brown, light yellowish brown, light gray, or very pale brown (7.5YR 5/4; 10 YR 5/4, 6/3, 6/4, 7/2, 7/3, 7/4, 8/3, 8/4), loam, clay loam, silty clay loam, or heavy sandy loam.

Positas series

The Positas series consists of very deep, well drained soils that formed in alluvium derived from mixed rock. The soils are on terraces Slope is 9 to 75 percent Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Positas soils are similar to Rincon, Ryer, and San Ysidro soils They are near Arbuckle, Hanford, and Greenfield soils. Rincon soils have a gradual boundary between the A and B horizons and have a clay loam A horizon. Ryer soils have an ochric epipedon and less than 15 percent clay increase between the A and B horizons San Ysidro soils have an ochric epipedon and are moderately well drained Arbuckle soils have a fine-loamy textural control section Hanford soils have a coarse-loamy textural control section and do not have a B horizon Greenfield soils have a coarse-loamy textural control section

A typical pedon of Positas coarse sandy loam, in an area of Arbuckle-Positas complex, 15 to 30 percent slopes, approximately 6,000 feet north and 200 feet east of the town of Creston T. 27 S., R. 13 E.

A—0 to 10 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 3/3) moist; massive, hard, friable, nonsticky and nonplastic, common very fine roots, common very fine and fine tubular pores, 5 percent gravel by volume, slightly acid; abrupt smooth boundary

B21t—10 to 19 inches; reddish brown (5 YR 5/4) clay, reddish brown (5YR 4/4) moist, thin 1/4 inch capping of A2 material on top of prisms, strong coarse prismatic structure, extremely hard, very firm, very sticky and very plastic, few very fine roots, common very fine tubular pores; many moderately thick clay films line pores and faces of peds; neutral; gradual wavy boundary

B22t—19 to 28 inches, brown (7.5YR 5/4) clay, dark brown (7 5YR 4/4) moist; weak coarse angular blocky structure; extremely hard, very firm, very sticky and very plastic; few very fine roots between peds; common very fine tubular pores, organic staining on faces of peds; many moderately thick clay films line pores and mineral grains; slight effervescence, disseminated lime, moderately alkaline; gradual wavy boundary.

B3ca—28 to 41 inches; reddish yellow (7.5YR 6/6) sandy clay loam, strong brown (7.5YR 5/6) moist, weak coarse angular blocky structure; hard, firm, sticky and plastic; few very fine roots between peds; common very fine tubular pores; few thin clay bridges; violent effervescence, lime segregated in filaments, seams and soft masses; moderately alkaline; gradual wavy boundary.

C—41 to 60 inches, very pale brown (10YR 7/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine interstitial pores, moderately alkaline

Thickness of the solum ranges from 33 to more than 60 inches. Gravel makes up 5 to 15 percent by volume.

The A horizon is brown or grayish brown (10YR 5/3, 5/2). It is medium acid or slightly acid Thickness ranges from 9 to 20 inches

The B2t horizon is reddish brown, yellowish red, brown, or yellowish brown in hues of 5YR, 7.5YR and 10YR, and is clay or gravelly clay. Reaction increases with depth and ranges from slightly acid to moderately alkaline Reaction of the B3 horizon ranges from neutral to moderately alkaline with lime disseminated or in seams and filaments Some areas are gravelly throughout.

Rincon series

The Rincon series consists of very deep, well drained soils that formed in alluvium derived from sedimentary rock. The soils are on alluvial fans. Slope is 0 to 15 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Rincon soils are similar to Positas, Ryer, and San Ysidro soils. They are near Arbuckle, Cropley, and Lockwood soils Positas soils have an abrupt boundary between the A and B horizons. Ryer soils have an ochric epipedon. San Ysidro soils have an ochric epipedon and an abrupt boundary between the A and B horizons. Arbuckle soils have a fine-loamy textural control section. Cropley soils are clay throughout the profile. Lockwood soils have a mollic epipedon more than 20 inches thick and a fine-loamy textural control section

A typical pedon of Rincon clay loam, in an area of Rincon clay loam, 2 to 9 percent slopes, 2,600 feet west and 3,100 feet south of the northeast corner of sec. 25, T. 26 S , R. 16 E.

Ap—0 to 6 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; medium-size clods; hard, friable, slightly sticky and plastic; many very fine and fine roots; many very fine and common fine tubular pores; neutral, abrupt smooth boundary

A12—6 to 18 inches, grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; massive; hard, friable, sticky and plastic; few very fine and fine roots; many very fine and common fine tubular pores; neutral; gradual wavy boundary.

B1t—18 to 24 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist, strong coarse subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; many very fine tubular pores; common thin clay films on faces of peds and lining pores; neutral; clear wavy boundary.

B21t—24 to 38 inches, pale brown (10YR 6/3) heavy clay loam, dark brown (10YR 4/3) moist, moderate medium and coarse prismatic structure; very hard, very firm, very sticky and very plastic, few very fine roots; many very fine tubular pores; common moderately thick clay films on faces of peds and lining pores, mildly alkaline; gradual wavy boundary

B22t—38 to 52 inches; pale brown (10YR 6/3) clay, dark brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; very hard, very firm, very sticky and very plastic; few very fine roots, many very fine tubular pores; many moderately thick clay films on faces of peds and lining pores; slight effervescence, lime segregated into soft masses and filaments along faces of peds; moderately alkaline; clear wavy boundary.

B3tca—52 to 64 inches; pale brown (10YR 6/3) heavy clay loam, dark brown (10YR 4/3) moist, moderate medium and coarse subangular blocky structure; very hard, firm, very sticky and plastic, few very fine roots, common very fine tubular pores; many thin clay films on faces of peds and lining pores, strong effervescence, lime segregated into soft masses and filaments along faces of peds, moderately alkaline

Thickness of the solum ranges from 37 to more than 60 inches Some pedons have up to 15 percent gravel by volume below the A horizon.

The A horizon is grayish brown or gray (10YR 5/2, 5/1). It is slightly acid or neutral. Thickness ranges from 10 to 20 inches.

The B2t horizon is pale brown, brown, light brownish gray, grayish brown, light yellowish brown, yellowish brown, grayish brown, or light olive brown (10YR 6/3, 5/3, 6/2, 5/2, 6/4, 5/4 or 2.5Y 5/2, 5/4). It is heavy clay loam or clay. Reaction ranges from neutral to moderately alkaline. Segregated lime is present as soft masses or filaments in the lower part of the B2t horizon.

The C horizon, where present, is sandy clay loam or clay loam It is mildly alkaline or moderately alkaline with lime present as soft masses or filaments.

Ryer series

The Ryer series consists of very deep, well drained soils that formed in alluvium derived from mixed rock. The soils are on alluvial fans Slope is 2 to 9 percent Mean annual precipitation ranges from 12 to 20 inches, and mean annual air temperature is about 60 degrees F.

Ryer soils are similar to Arbuckle, Dibble, and Rincon soils. They are near Dibble, Nacimiento, and Shimmon soils. Arbuckle soils have a fine-loamy textural control section Dibble soils are moderately deep and are underlain by weathered shale Nacimiento soils have a mollic epipedon and do not have an argillic horizon Rincon soils have more than 0 7 percent organic carbon and have a moist value of less than 3 5 in the upper 4 inches. Shimmon soils have a mollic epipedon and are moderately deep to weathered sandstone

A typical pedon of Ryer clay loam, in an area of Ryer clay loam, 2 to 9 percent slopes, 1,800 feet west and 600 feet north of the southeast corner of sec. 5, T. 26 S., R. 11 E.

Ap—0 to 3 inches, pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; massive, hard, friable, sticky and plastic; many very fine roots; many very fine, few fine tubular pores, slightly acid; clear smooth boundary.

A12—3 to 12 inches, pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist, massive, hard, friable, sticky and plastic; common very fine roots, common very fine tubular pores; slightly acid; clear wavy boundary.

B21t—12 to 19 inches; pale brown (10YR 6/3) heavy clay loam, dark brown (10YR 4/3) moist; weak medium prismatic structure, very hard, firm, sticky and plastic; few very fine roots, many very fine tubular pores; 10 percent gravel; common moderately thick reddish brown (5YR 5/4) dry, dark reddish brown (5YR 3/4) moist; clay films on faces of peds and lining pores; slightly acid; gradual wavy boundary.

B22t—19 to 35 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist, moderate coarse prismatic structure; very hard, firm, very sticky and very plastic; few very fine roots; common very fine tubular pores, many thick clay films on faces of peds and lining pores, neutral; clear smooth boundary.

B3t—35 to 47 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; very hard, firm, very sticky and very plastic; common very fine tubular pores; common thick clay films on faces of peds and lining pores; slight effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

Cca—47 to 60 inches; brownish yellow (10YR 6/6) clay loam, yellowish brown (10YR 5/6) moist, massive; hard, friable, sticky, plastic; common very fine tubular pores; strong effervescence, lime in seams and disseminated; moderately alkaline.

Thickness of the solum ranges from 38 to more than 60 inches.

The A horizon is light brownish gray or pale brown (10YR 6/2, 6/3). It ranges from medium acid to neutral. Thickness ranges from 12 to 20 inches.

The B2t horizon is pale brown, light brown, brown, light yellowish brown, or yellowish brown (10YR 6/3, 6/4, 5/4, or 7.5YR 6/4, 5/4). It is heavy clay loam or clay. Gravel or cobbles make up 10 to 15 percent by volume. Reaction ranges from slightly acid to mildly alkaline, with disseminated lime in the lower part of some pedons.

The C horizon ranges from neutral to moderately alkaline, with lime disseminated or in seams of pedons.

San Andreas series

The San Andreas series consists of moderately deep, well drained soils that formed in material weathered from sandstone. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges fom 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

San Andreas soils are similar to Andregg, Nacimiento, and Gazos soils. They are near Arnold, Arujo, and Gaviota soils. Andregg soils are underlain by granitic rocks. Nacimiento soils are calcareous and are underlain by calcareous sandstone and shale. Gazos soils have a mollic epipedon more than 20 inches thick and a fine-loamy textural control section. Arnold soils have an ochric epipedon and a sandy textural control section. Arujo soils have a mollic epipedon more than 20 inches thick, an argillic horizon, and a fine-loamy textural control section. Gaviota soils are shallow and have an ochric epipedon.

A typical pedon of San Andreas sandy loam, in an area of Gaviota-San Andreas association, very steep, 4,600 feet west and 500 feet south of the northeast corner of sec. 28, T. 25 S., R. 9 E.

A11—0 to 2 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and few medium roots; common very fine, fine and few medium pores; slightly acid; clear wavy boundary.

A12—2 to 11 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium and coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and few medium roots; common very fine, fine and few medium pores; slightly acid; gradual wavy boundary.

B2—11 to 29 inches; light brown (7.5YR 6/4) heavy sandy loam, brown (7.5YR 4/4) moist; weak medium and coarse subangular blocky structure, soft, very friable, nonsticky and nonplastic; few very fine, fine, medium and coarse roots; common very fine, fine and few medium and coarse pores; slightly acid; clear wavy boundary.

Cr—29 inches; weathered sandstone.

Depth to weathered sandstone ranges from 20 to 40 inches. In some pedons, gravel makes up to 10 percent and cobbles make up to 5 percent by volume. The solum is medium acid or slightly acid.

The A horizon is dark gray, grayish brown, brown, or dark grayish brown (10YR 4/1, 5/2, 5/3, 4/2). It ranges from 8 to 16 inches.

The B2 horizon is pinkish gray, light brown, or brown (7.5YR 6/2, 6/4, 5/4); light yellowish brown, pale brown or brown (10YR 6/4, 6/3, 5/3); or light brownish gray (2.5Y 6/2). It is fine sandy loam, sandy loam, or loam. Clay increase is about 3 percent less than the overlying A horizon.

San Emigdio series

The San Emigdio series consists of very deep, well drained soils that formed in alluvium derived from calcareous sedimentary rock. The soils are on alluvial fans and plains. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

San Emigdio soils are similar to Camarillo, Metz, and Pico soils. They are near Elder, Metz, Pico, and Tujunga soils. Camarillo soils have a fine-loamy textural control section. Metz and Tujunga soils have a sandy textural control section. Pico soils have a mollic epipedon less than 20 inches thick. Elder soils have a mollic epipedon more than 20 inches thick.

A typical pedon of San Emigdio fine sandy loam, in an area of San Emigdio fine sandy loam, 2 to 9 percent slopes, 2,500 feet west and 1,000 feet south of the northeast corner of sec. 28, T. 26 S., R. 15 E.

Ap—0 to 7 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine and few fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; gradual wavy boundary.

C1—7 to 18 inches; pale yellow (2.5Y 7/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine and few fine tubular pores; slight effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

C2—18 to 33 inches; pale yellow (2.5Y 7/4) very fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

C3—33 to 45 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; many very fine and few fine tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

C4—45 to 60 inches; pale yellow (2.5Y 7/4) very fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; soft, friable, slightly sticky and slightly plastic; many very fine tubular pores; strong effervescence, disseminated lime; moderately alkaline.

The control section is stratified layers of fine sandy loam, sandy loam, very fine sandy loam, loam, or loamy sand and averages from 12 to 18 percent clay. Some pedons are stratified with 1/4 to 1 inch silt lenses.

The A horizon is light brownish gray or pale brown (10YR 6/2, 6/3 or 2.5Y 6/2). It is slightly or strongly effervescent. Thickness of the A horizon is 7 to 18 inches.

Carbonates in the C horizon are slightly to violently effervescent with lime disseminated or segregated in filaments and soft masses.

San Ysidro series

The San Ysidro series consists of very deep, moderately well drained soils that formed in alluvium derived from mixed rock. The soils are on terraces. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

San Ysidro soils are similar to Positas, Rincon, and Ryer soils. They are near Arbuckle, Greenfield, and Hanford soils. Positas soils have more than 0.7 percent organic carbon and have a moist value of less than 3.5 in the upper 4 inches. Rincon soils have less than 15 percent clay increase between the A and B horizons. Ryer soils have an ochric epipedon and less than a 15 percent clay increase between the A and B horizons. Arbuckle soils have a fine-loamy textural control section. Greenfield soils have a coarse-loamy textural control section. Hanford soils do not have an argillic horizon and have a coarse-loamy textural control section.

A typical pedon of San Ysidro loam, in an area of San Ysidro loam, 0 to 2 percent slopes, 600 feet west and 1,200 feet south of the northeast corner of sec. 7, T. 25 S., R. 11 E.

A11—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; hard, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine and few fine tubular pores; slightly acid; clear smooth boundary.

A12—2 to 9 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine and few fine tubular pores; slightly acid; gradual wavy boundary.

A13—9 to 20 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; common fine faint mottles of brown (10YR 5/3), dark brown (10YR 3/3) moist; massive; hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine and few fine tubular pores; few fine iron and manganese stains and manganese concretions; slightly acid; gradual wavy boundary.

A2—20 to 23 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; few fine faint mottles of pale brown (10YR 6/3), dark brown (10YR 4/3) moist; massive; hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine and few fine tubular pores; few fine iron and manganese stains and manganese concretions; medium acid; abrupt smooth boundary.

B2t—23 to 38 inches; light brown (7.5YR 6/4) heavy clay loam, dark brown (7.5YR 4/4) moist; few fine distinct mottles of light brownish gray (10YR 6/2), dark grayish brown (10YR 4/2) moist; few fine distinct mottles of light brownish gray (10YR 6/2), dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; extremely hard, firm, very sticky and very plastic; many very fine tubular pores; many moderately thick reddish brown (5YR 5/4) clay films on ped faces and lining pores; few slickensides and pressure faces; moderately alkaline; gradual wavy boundary.

B31t—38 to 51 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; very hard, friable, sticky and plastic; many very fine tubular pores; common thin clay films on ped faces and lining pores, one percent by volume of lime filaments; moderately alkaline; gradual wavy boundary.

B32t—51 to 64 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine tubular pores; few thin clay films on ped faces; moderately alkaline.

Solum thickness ranges from 40 to more than 60 inches.

The A1 horizon is pale brown or light brownish gray (10YR 6/3, 6/2). Reaction ranges from medium acid to neutral. Thickness ranges from 20 to 32 inches. The A2 horizon is very pale brown or light gray (10YR 7/3, 7/2). Thickness ranges from 1/2 inch to 5 inches.

The B2t horizon is brown, light brown, yellowish brown, light yellowish brown, brownish yellow, or very pale brown (7.5YR 5/4, 6/4 or 10YR 5/4, 6/4, 6/6, 7/4). Few fine brown or light brownish gray (10YR 5/3, 6/2) mottles are present in some pedons in and below the lower part of the A horizon.

The surface layer of San Ysidro loam, 2 to 9 percent slopes, is grayish brown (10YR 5/2). This is darker than is defined in the range recognized for the series. This difference, however, does not significantly affect use and management.

Santa Lucia series

The Santa Lucia series consists of moderately deep, well drained soils that formed in material weathered from shale. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Santa Lucia soils are similar to Arujo, Gazos, and Linne soils. They are near Gazos, Lopez, Linne, and Zakme soils. Arujo soils have a fine-loamy textural con-

trol section and are underlain by sandstone. Gazos soils have a fine-loamy textural control section. Linne soils are calcareous and are underlain by calcareous sandstone and shale. Lopez soils have a loamy-skeletal textural control section and are shallow. Zakme soils have a fine textural control section and are deep.

A typical pedon of Santa Lucia shaly clay loam, in an area of Santa Lucia-Lopez complex, 15 to 50 percent slopes, 3,100 feet west and 2,700 feet south of the northeast corner of sec. 28, T. 28 S., R. 15 E.

A11—0 to 4 inches; dark gray (10YR 4/1) shaly clay loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; 30 percent shale fragments by volume; slightly acid; clear smooth boundary.

A12—4 to 11 inches; dark gray (10YR 4/1) very shaly heavy clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine, fine and medium roots; many very fine, common fine and few medium tubular pores; 40 percent shale fragments by volume; slightly acid; clear wavy boundary.

A13—11 to 21 inches; dark grayish brown (10YR 4/2) very shaly heavy clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine, fine and medium roots; many very fine, few fine, medium and coarse tubular pores; 40 percent shale fragments and 5 percent cobbles by volume; medium acid; clear wavy boundary.

R—21 inches; hard shale.

Depth to hard shale ranges from 20 to 40 inches. Shale fragments make up 35 to 65 percent, and cobbles make up 5 to 10 percent by volume.

The A horizon ranges from strongly acid to slightly acid.

Sesame series

The Sesame series consists of moderately deep, well drained soils that formed in material weathered from granitic rock. The soils are on hills. Slope is 9 to 30 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Sesame soils are similar to Arbuckle, Greenfield, and Ryer soils. They are near Andregg, Hanford, and Vista soils. Arbuckle soils formed in alluvium on terraces and do not have a Cr horizon. Ryer soils have a fine textural control section and do not have a Cr horizon. Andregg and Vista soils have a coarse-loamy textural control section and do not have an argillic horizon. Hanford soils formed in alluvium and do not have an argillic horizon.

A typical pedon of Sesame sandy loam, in an area of Sesame sandy loam, 9 to 30 percent slopes, 4,700 feet west and 3,000 feet south of the northeast corner of sec. 18, T. 26 S., R. 12 E.

Ap—0 to 6 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; hard, friable, nonsticky and nonplastic; common fine and very fine roots; common fine tubular pores; slightly acid; clear smooth boundary.

A12—6 to 10 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive, hard, friable, nonsticky and nonplastic; common fine roots; common fine tubular pores; slightly acid; clear wavy boundary.

B2t—10 to 25 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate coarse subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few fine roots; common fine and few medium tubular pores; few thin clay films bridging mineral grains and lining pores; slightly acid; clear wavy boundary.

Cr—25 inches; weathered granitic rock.

Depth to weathered granitic rock ranges from 20 to 40 inches. Gravel makes up 5 to 15 percent by volume.

The A horizon is brown, dark brown, grayish brown, or dark grayish brown (10YR 5/2, 5/3, 4/2, 4/3). It ranges from slightly acid to medium acid. Thickness ranges from 8 to 16 inches. The content of organic matter is less than 1 percent.

The B horizon is brown or light brown (10YR 5/3, or 7.5YR 6/4, 5/4). It ranges from slightly acid to neutral. Some pedons have a B3t horizon.

Shimmon series

The Shimmon series consists of moderately deep, well drained soils that formed in material weathered from sandstone. The soils are on hills and mountains. Slope is 15 to 75 percent. Mean annual precipitation is 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Shimmon soils are similar to the Arujo, Lompico, and Los Osos soils. They are near Dibble, Gaviota, and San Andreas soils. Arujo soils have a mollic epipedon that is more than 20 inches thick. Lompico soils have a mesic temperature regime. Los Osos soils average more than 35 percent clay in the textural control section. Dibble soils do not have a mollic epipedon, and average more than 35 percent clay in the textural control section. Gaviota soils are less than 20 inches to hard sandstone. San Andreas soils do not have an argillic horizon.

A typical pedon of Shimmon loam, in an area of Shimmon loam, 30 to 50 percent slopes, 2,800 feet west and 4,100 feet south of the northeast corner of sec. 2, T. 25 S., R. 9 E.

A1—0 to 10 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine tubular and interstitial pores; slightly acid; gradual wavy boundary.

B21t—10 to 21 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure; very hard, very firm, sticky and very plastic; few fine and medium roots; common very fine and fine tubular pores; common thin clay films lining pores and on faces of peds; slightly acid; gradual wavy boundary.

B22t—21 to 29 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; weak coarse prismatic structure; very hard, firm, sticky and very plastic; few fine and medium roots; common very fine and fine tubular pores; many thin clay films lining pores and on faces of peds; slightly acid, gradual irregular boundary.

Cr—29 inches; weathered fine-grain sandstone.

Depth to weathered sandstone is 20 to 40 inches.

The A horizon is gray, dark gray, grayish brown, dark grayish brown, or brown (10YR 4/1, 4/2, 5/1, 5/2, 5/3). It is slightly acid or neutral. Thickness of the A horizon is 8 to 17 inches

The B2t horizon is brown, yellowish brown, pale brown, light yellowish brown, very pale brown, or light brown (10YR 5/3, 5/4, 6/3, 6/4, 7/4 or 7.5YR 5/4, 6/4). It is clay loam or sandy clay loam. Reaction ranges from slightly acid to moderately alkaline.

Some pedons have a calcareous Cr horizon.

Sorrento series

The Sorrento series consists of very deep, well drained soils that formed in alluvium derived from calcareous sedimentary sources. The soils are on alluvial fans and plains. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Sorrento soils are similar to Linne, Mocho, and Still soils. They are near Cropley, Mocho, Rincon, and San Emigdio soils. Linne soils have a mollic epipedon more than 20 inches thick and are underlain by calcareous sandstone and shale. Mocho soils have an irregular decrease in content of organic matter. Still soils have an irregular decrease in content of organic matter and a mollic epipedon more than 20 inches thick. Cropley soils average more than 35 percent clay in the textural control section. Rincon soils average more than 35 percent clay in the textural control section and have an argillic horizon. San Emigdio soils have a coarse-loamy textural control section.

A typical pedon of Sorrento clay loam, in an area of Sorrento clay loam, 2 to 9 percent slopes, 1,600 feet west and 600 feet south of the northeast corner of sec. 4, T. 26 S., R. 13 E.

Ap—0 to 7 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium and fine subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine and common fine tubular pores; moderately alkaline; clear smooth boundary.

A12—7 to 19 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many very fine and common fine tubular pores; moderately alkaline; clear wavy boundary.

C1—19 to 36 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; Yhard, friable, sticky and plastic; many fine and very fine tubular pores; slight effervescence, lime disseminated; moderately alkaline; gradual wavy boundary.

C2ca—36 to 60 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, sticky and plastic; many fine and very fine tubular pores; strong effervescence, lime segregated and in soft masses and filaments; moderately alkaline.

The A horizon is grayish brown, dark grayish brown, or brown (10YR 5/2, 5/3, 4/2 or 2/5Y 5/2, 4/2). It ranges from neutral to moderately alkaline. Thickness ranges from 15 to 20 inches.

The C horizon is clay loam, loam, or silty clay loam. It is mildly alkaline or moderately alkaline. Gravel makes up 5 to 25 percent by volume in some pedons.

Still series

The Still series consists of very deep, well drained soils that formed in alluvium derived from sedimentary rock. The soils are on alluvial plains and fans. Slope is 0 to 9 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Still soils are similar to the Elder, Pico, and Sorrento soils. They are near Clear Lake and Mocho soils. Elder soils have less than 18 percent clay in the textural control section. Pico and Mocho soils have calcareous, mollic epipedons less than 20 inches thick. Sorrento soils have a regular decrease of organic carbon, and a calcareous substratum. Clear Lake soils are poorly drained clay soils in basins.

A typical pedon of Still clay loam, in an area of Still clay loam, 0 to 2 percent slopes, about 1/4 mile east of El Camino Real on Quarry Road in the Santa Margarita Land Grant, T. 29 S., R. 13 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) clay loam, very dark gray (10YR 3/1) moist; moderate medium granular structure; hard, friable, sticky and plastic; many fine and very fine roots; many very

fine, common fine and medium tubular pores; slightly acid; clear smooth boundary.

A12—8 to 25 inches; dark grayish brown (10YR 4/2) clay loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many fine and very fine roots; many very fine, common fine and medium tubular pores; slightly acid; gradual wavy boundary.

C1—25 to 34 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine roots; many very fine, common fine and few medium tubular pores; moderately alkaline; clear smooth boundary.

Ab—34 to 53 inches; dark grayish brown (10YR 4/2) clay loam, very dark gray (10YR 3/1) moist; moderate coarse subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots; many very fine, common fine and few medium tubular pores; moderately alkaline; gradual wavy boundary.

C2—53 to 60 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; hard, friable, sticky and plastic; many very fine and common fine tubular pores; moderately alkaline.

The soils are either stratified or they have buried A horizons. The 10- to 40-inch control section is clay loam, loam, or gravelly loam. Rock fragments, mostly gravel, range from 0 to 35 percent of the soil by volume.

The A horizon is grayish brown, dark grayish brown, or dark gray (2.5Y 5/2, 4/2, or 10YR 5/2, 4/2, 4/1) clay loam or gravelly loam. It is slightly acid or neutral. Thickness of the A horizon is 20 to 30 inches.

The C horizon is brown or grayish brown (2.5Y 5/2 or 10YR 5/2, 5/3). Some pedons have mottles below a depth of 30 inches that are brown, dark brown, or yellowish brown (10YR 5/3, 5/4, 4/3). The soil ranges from neutral to moderately alkaline.

The Ab horizon is gray, dark gray, grayish brown, or brown (10YR 4/1, 5/1, 5/2, 5/3 or 2.5Y 5/2). It is clay loam or loam. Some pedons have disseminated lime.

Tujunga series

The Tujunga series consists of very deep, somewhat excessively drained soils that formed in alluvium derived from mixed rock. These soils are on flood plains. Slope is 0 to 5 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Tujunga soils are similar to the Arnold and Oceano soils. They are near Metz, Mocho, and San Emigdio soils. Arnold soils are underlain by sandstone. Oceano soils have lamellae in the C horizon. Metz soils have strata finer than loamy fine sand in the textural control section. Mocho soils have a fine-loamy textural control section. San Emigdio soils have a coarse-loamy textural control section.

A typical pedon of Tujunga fine sand, in an area of Metz-Tujunga complex, occasionally flooded, 0 to 5 percent slopes, 1,300 feet west and 1,600 feet south of the northeast corner of sec. 8, T. 25 S., R. 11 E.

A1—0 to 20 inches; very pale brown (10YR 7/4) fine sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine roots; neutral; clear smooth boundary.

C—20 to 60 inches; light gray (10YR 7/2) sand, light brownish gray (10YR 6/2) moist; single grain; loose, nonsticky and nonplastic; neutral.

The A and C horizons are very pale brown, pale brown, light gray, or light brownish gray (10YR 7/4, 7/3, 7/2, 6/3, 6/2, 6/1). Texture below the surface layer is sand, fine sand, and loamy sand. In some pedons, rock fragments make up to 15 percent of the soil by volume. A few pedons are gravelly below a depth of 40 inches. The soils are slightly acid or neutral in the upper part and slightly acid to mildly alkaline in the lower part.

Vista series

The Vista series consists of moderately deep, well drained soils that formed in material weathered from granitic rock. These soils are on hills and mountains. Slope is 9 to 50 percent. Mean annual precipitation ranges from 12 to 20 inches, and the mean annual air temperature is about 60 degrees F.

Vista soils are similar to Balcom and Millsholm soils. They are near Andregg, Cieneba, and Sesame soils. Balcom soils are calcareous loamy soils underlain by calcareous shale and sandstone. Millsholm soils are shallow to shale. Andregg soils have a mollic epipedon. Cieneba soils are shallow and do not have a cambic horizon. Sesame soils have a fine-loamy textural control section.

A typical pedon of Vista coarse sandy loam, in an area of Vista-Cieneba complex, 15 to 30 percent slopes, 3,300 feet west and 2,200 feet south of the northeast corner of sec. 23, T. 28 S., R. 13 E.

A11—0 to 4 inches; dark brown (10YR 4/3) coarse sandy loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; hard, friable, nonsticky and nonplastic; many very fine roots; many very fine tubular pores; slightly acid; clear smooth boundary.

A12—4 to 14 inches; dark brown (10YR 4/3) coarse sandy loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine tubular pores; slightly acid; gradual wavy boundary.

B2—14 to 29 inches; brown (7 5YR 5/4) coarse sandy loam, dark brown (7.5YR 4/4) moist, weak medium subangular blocky structure, slightly hard, very friable, nonsticky and nonplastic, few very fine and common fine roots; many very fine and few fine and medium tubular pores; few thin clay films bridging mineral grains and lining pores; slightly acid; clear wavy boundary

Cr—29 inches; reddish yellow (7.5YR 6/6) weathered granitic rock.

Depth to weathered granitic rock ranges from 20 to 40 inches. The soil is slightly acid or neutral.

The A horizon is dark brown, grayish brown, or brown (10YR 4/3, 5/2, 5/3). Thickness ranges from 9 to 19 inches

The B horizon is pale brown, light yellowish brown (10YR 6/3, 6/4), or brown, light brown (7 5YR 5/4, 6/4). It is sandy loam or coarse sandy loam. Organic matter is less than 1 percent throughout The B horizon has 1 to 2 percent more clay than the A horizon

Zakme series

The Zakme series consists of deep, well drained soils that formed in material weathered from calcareous sandstone and shale. The soils are on mountains. Slope is 30 to 50 percent Mean annual precipitation ranges from 16 to 20 inches, and mean annual air temperature is about 56 degrees F.

Zakme soils are similar to the Ayar, Diablo, and Santa Lucia soils. They are near the Calodo, Lompico, and Los Osos soils. Ayar and Diablo soils have slickensides that intersect. Calodo soils are shallow. Lompico and Los Osos soils have an argillic horizon. Santa Lucia soils have a clayey-skeletal textural control section

A typical pedon of Zakme clay, in an area of Zakme clay, 30 to 50 percent slopes, 1 3/4 miles west on a jeep road from the entrance of Willow Creek Ranch, 1,100 feet east and 600 feet north of the southwest corner of sec. 35, T. 26 S., R. 10 E.

O1—1 inch to 0, mat of leaves and twigs, partially decomposed; abrupt smooth boundary

A11—0 to 3 inches, dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong medium and coarse granular structure; hard, firm, very sticky and very plastic; common very fine and few fine roots; many very fine and common fine tubular and interstitial pores, neutral; gradual wavy boundary.

A12—3 to 14 inches, dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist, moderate medium and coarse subangular blocky structure and weak coarse prismatic; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine, fine and medium tubular pores; mildly alkaline; gradual wavy boundary.

A13—14 to 22 inches, dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; weak coarse subangular blocky structure; very hard, very firm, very sticky and very plastic; common very fine, few fine, medium and coarse roots; common very fine, fine and medium tubular pores; 5 percent by volume weathered 3 to 5 millimeter shale fragments; mildly alkaline, clear wavy boundary

A14—22 to 36 inches, dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist, massive; very hard, firm, very sticky and very plastic; common very fine and few fine, medium and coarse roots; many very fine and fine and few medium tubular pores; slight effervescence, disseminated lime; mildly alkaline; clear wavy boundary

AC—36 to 47 inches; finely mixed dark gray (10YR 4/1) and light yellowish brown (10YR 6/4) clay, black (10YR 2/1) and dark yellowish brown (10YR 4/4) moist, massive; hard, firm, sticky and plastic; common medium and coarse roots; common fine and few medium tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

C1—47 to 55 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; common medium and coarse roots, common fine and few medium tubular pores; strong effervescence, disseminated lime; moderately alkaline; clear wavy boundary.

C2r—55 inches; weathered, calcareous shale.

Depth to weathered, calcareous shale and sandstone ranges from 40 to 60 inches. From August until October the soil cracks 0 5 inch to 1 5 inches wide at the surface, and 0.5 inch wide at a depth of 20 inches. Some pedons have slickensides in the lower part of the A horizon, but not close enough to intersect.

The A horizon is gray, dark gray, grayish brown, or dark grayish brown (10YR 5/1, 4/1, 5/2, 4/2). It is mildly alkaline or moderately alkaline. Thickness of the A horizon ranges from 28 to 39 inches.

The C1 horizon is clay or silty clay. It is mildly or moderately alkaline.

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (*10*)

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected

for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 16, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Xeroll (*Xeros*, meaning dry, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haploxerolls (*Hapl*, meaning simple horizons, plus *xeroll*, the suborder of Entisols that have a xeric moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haploxerolls.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is coarse-loamy, mixed, thermic Typic Haploxerolls.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Orders, suborders, and subgroups

This section was prepared by Charles A Ferrari, soil scientist, Soil Conservation Service

This section discusses the orders, suborders, and subgroups recognized in the soil survey area. Unless otherwise stated, the soils in this area have a xeric moisture regime and a thermic temperature regime. Therefore, unless the soil is irrigated, the moisture control section is moist in some part from December until May and is dry in all parts from July until October in 6 out of 10 years. The mean annual soil temperature ranges from 59 to 62 degrees F. The Paso Robles station, where the climatic data in Table 1 was recorded, is in the central part of the area. However, the moisture regime varies from xeric to xeric bordering on aridic, and the temperature regime varies from thermic to mesic in the survey area.

Soils of this survey are classified into six orders: Alfisols, Aridisols, Entisols, Inceptisols, Mollisols, and Vertisols. In the following paragraphs, each of the six orders and their categories of suborders and subgroups are discussed.

Alfisols

Alfisols are soils in the area that have a massive and hard A horizon and a finer textured B horizon. They have high base saturation in which water is held at less than 15-bar tension during at least 3 months each year when the soil is warm enough for plants to grow.

Alfisols in this area have been placed in the Xeralf suborder, which has a clay-enriched B horizon. The Xeralfs are divided into two great groups: the Haploxeralfs and Palexeralfs. Soils that have less than 15 percent clay increase between the A and B horizons have been placed in the Haploxeralf great group. Soils that have an abrupt boundary with more than 15 percent clay increase between the A and B horizons have been placed in the Palexeralfs great group.

The subgroup of Typic Haploxeralfs consists of Haploxeralfs that have a pale A horizon with less than 1 percent organic matter throughout. Arbuckle, Dibble, Greenfield, Ryer, and Sesame soils have been placed in this subgroup. Arbuckle, Greenfield, and Ryer soils formed in alluvium from mixed rock sources. Dibble and Sesame soils are on hills or mountains.

The subgroup of Mollic Haploxeralfs consists of Haploxeralfs that have a dark A horizon and between 1 and 4 percent organic matter in the upper 4 inches. Rincon soil, which is on alluvial fans and formed in alluvium from mixed rock sources, has been placed in this subgroup.

The subgroup of Typic Palexeralfs consists of Palexeralfs that have a pale A horizon with less than 1 percent organic matter throughout. San Ysidro soil, which is on terraces and formed in alluvium from mixed rock sources, has been placed in this subgroup.

The subgroup of Mollic Palexeralfs consists of Palexeralfs that have a dark A horizon and between 1 and 4

percent organic matter in the upper 4 inches. Positas soil, which is on terraces and formed in alluvium from mixed rock sources, has been placed in this subgroup Organic matter is about 1 percent in the first 4 inches and about 0 7 percent in the next 10 inches.

Aridisols

Aridisols are soils in the area that for long periods lack water for mesophytic plants During most of the time when the soil is warm enough for plants to grow, water is held at a tension of more than 15 bars.

Aridisols in this area have been placed in the Orthids suborder These soils formed in a xeric moisture regime bordering on an aridic moisture regime. They have horizons of accumulations of carbonates, and lack argillic or natric horizons The Orthids are divided into two great groups, the Camborthids and Paleorthids. Soils that have a cambic horizon have been placed in the Camborthid great group Soils that have a petrocalcic horizon (fig. 4) with an upper boundary within 1 meter of the soil surface, and not underlain by a duripan, have been placed in the Paleorthid great group.

The subgroup of Xerollic Camborthids has a 1 to 2 percent clay increase in the B horizon, and lime accumulation is mainly in the form of soft masses. The accumulation is not strong enough to qualify as a calcic horizon The organic-matter content in the first 10 inches of these soils is about 0.8 percent. Chanac soil, which is on high terraces and formed in alluvium from mixed rock sources, has been placed in this subgroup

The subgroup of Xerollic Paleorthids is similar to Xerollic Camborthids, except for a petrocalcic horizon. Camatta soil, which is on high terraces and formed in calcareous alluvium, has been placed in this subgroup.

Entisols

Entisols are soils in this area that have little or no evidence of development of pedogenic horizons. These Entisols are in the Orthent, Fluvent, and Psamment suborders. All of these soils lack a B horizon and generally have organic matter of less than 1 percent.

The Orthents are loamy very fine sand or finer in the textural control section The organic-matter content decreases regularly with depth to less than 0.3 percent at a depth of 50 inches. Most of these soils are on fans and terraces. A few are on hills and mountains.

Fluvents are similar to Orthents, except that the organic-matter content decreases irregularly to a depth of at least 50 inches. These deep and very deep soils are on fans and plains.

Psamments are loamy fine sand or coarser in the control section Most of these soils are on fans and terraces. A few are on hills and mountains.

The Orthents, Fluvents, and Psamments have been placed in the Xerorthent, Xerofluvent, and Xeropsamment great groups because they have a xeric moisture regime. Soils with a xeric moisture regime bordering on an aridic moisture regime have been placed in the Torriorthent great group.

The subgroup of Typic Xerorthents consists of Orthents that have a pale brown, brown, or light brownish gray A horizon with less than 1 percent organic matter throughout. Calleguas and Cieneba soils have been placed in this subgroup They are on hills and mountains and formed in calcareous shale and granitic rock, respectively. Hanford soil is on terraces and formed in alluvium from mixed rock sources.

The subgroup of Lithic Xerorthents consists of Xerorthents that have a brown A horizon and are underlain between a depth of 6 and 20 inches by sandstone. Gaviota soil has been placed in this subgroup.

The subgroup of Xeric Torriorthents consists of Torriorthents that have a xeric moisture regime bordering on an aridic moisture regime. Polonio soil has been placed in this subgroup.

The subgroup of Typic Xerofluvents consists of Xerofluvents that formed in alluvium from mixed rock sources on flood plains Metz and San Emigdio soils have been placed in this subgroup.

The subgroup of Aquic Xerofluvents has a zone of saturation between a depth of 40 and 60 inches in most years. Camarillo soil has been placed in this subgroup.

The Xeropsamments placed in the subgroup of Typic Xeropsamments are Arnold and Tujunga soils. Arnold soil is on hills and mountains and is underlain by sandstone. The Tujunga soil is on flood plains and formed in alluvium from mixed rock sources.

The subgroup of Alfic Xeropsamments consists of Xeropsamments that have lamallae in which silicate clay has accumulated. The lamallae are too few and too thin to meet the requirements for an argillic horizon. Oceano soil, which is on dunes, has been placed in this subgroup.

Inceptisols

Inceptisols are soils in this area that have altered horizons that have lost bases or iron and aluminum but retain some weatherable minerals.

The Inceptisols in this area are in the Ochrepts suborder. They have an ochric epipedon and a cambic horizon. The color, organic matter, or structure is lacking for a mollic epipedon. The cambic horizon has a 1 to 2 percent clay increase and has structure. The texture is coarse sandy loam or finer. These soils are on hills and mountains. Because they have a xeric moisture regime, they have been placed in the Xerochrepts great group.

Vista soil has been placed in the Typic Xerochrept subgroup. The organic matter is less than 1 percent throughout the profile. The cambic horizon has a few thin clay films

Balcom soil has been placed in the Calcixerollic Xerochrept subgroup. The soil has pale colors. The cambic horizon has soft masses and filaments of powdery lime. The soil is on hills and mountains and is underlain by calcareous sandstone and shale.

Millsholm soil has been placed in the Lithic Xerochrepts subgroup. It is similar to Typic Xerochrepts, but is shallow and underlain by sandstone and shale.

Mollisols

Mollisols are soils in this area that typically have a dark surface layer more than 10 inches thick that has more than 1 percent organic matter and is not both hard and massive. Most of the soils have a thermic temperature regime. Lompico, McMullin, and Zakme soils, however, have a mesic temperature regime.

The Mollisols in this area are in the Xeroll and Alboll suborders. The Xerolls and Albolls are divided into three great groups: Haploxerolls, Argixerolls, and Argialbolls. Soils that do not have a clay-enriched B horizon and generally lack layers strong in calcium carbonate are classified in the Haploxeroll great group. Soils that have a clay-enriched B horizon, a clear to gradual boundary between the A and B horizons, and lack strong calcium carbonate layers are placed in the Argixeroll great group. Soils that have an albic horizon that lies immediately below the dark surface layer and have a clay-enriched B horizon are classified in the Argialboll great group.

The subgroup of Typic Haploxerolls consists of soils formed under good drainage that lack hard rock at a depth of less than 20 inches. It has more than 75 percent base saturation in the upper 30 inches of the profile and an organic-matter content that decreases regularly with depth. The mollic epipedon is less than 20 inches thick and has 1 to 4 percent organic matter. Andregg and San Andreas soils are placed in this subgroup. Both soils are on hills and mountains and formed in granitic rock and sandstone, respectively.

The subgroup of Calcic Haploxerolls is similar to Typic Haploxerolls, but has soft, powdery, secondary lime accumulations between a depth of 10 and 40 inches in the pedon. Calodo, Nacimiento, and Sorrento soils have been placed in this subgroup. Soil depth is shallow, moderately deep, and deep, respectively. Calodo and Nacimiento soils are on hills and mountains and formed in calcareous sandstone and shale. Sorrento soil is on alluvial fans and plains and formed in alluvium from calcareous sedimentary sources.

The subgroup of Calcic Pachic Haploxerolls is similar to Calcic Haploxerolls. It has a mollic epipedon more than 20 inches thick that ranges from 2 to 6 percent in organic matter. Linne soil has been placed in this subgroup (fig. 6).

The subgroup of Cumulic Haploxerolls has a mollic epipedon more than 20 inches thick with 1 to 4 percent organic matter and an irregular decrease in organic matter. Elder and Still soils on alluvial and flood plains and fans have been placed in this subgroup.

The subgroup of Fluventic Haploxerolls has a mollic epipedon less than 20 inches thick with 1 to 4 percent organic matter and an irregular decrease in organic matter. Mocho and Pico soils have been placed in this subgroup.

The subgroup of Lithic Haploxerolls is similar to Typic Haploxerolls, but is less than 20 inches deep to bedrock (fig. 8). Lodo and Montara soils have been placed in this subgroup. They are on hills and mountains. The Lodo soil formed in shale and sandstone. The Montara soil formed on serpentinitic rock.

The McMullin soil has a base saturation of less than 75 percent, therefore it has been placed in the Lithic Ultic Haploxeroll great group.

The Lopez soil is similar to Lithic Haploxerolls, except that it has base saturation between 65 and 75 percent. It has been placed in the Lithic Ultic Haploxeroll subgroup. It is on mountains and formed in shale.

The subgroup of Pachic Haploxerolls has a mollic epipedon more than 20 inches thick with 1 to 4 percent organic matter. The Gazos soil has been placed in this subgroup. It is on hills and mountains and formed in shale.

The Santa Lucia soil, which is similar to Pachic Haploxerolls, has a base saturation between 65 and 75 percent and has 2 to 10 percent organic matter in the mollic epipedon. It has been placed in the Pachic Ultic Haploxeroll subgroup.

The subgroup of Vertic Haploxerolls forms cracks at some time of the year and has more than 60 percent clay to a depth of more than 20 inches. However, this subgroup does not have gilgai, slickensides close enough to intersect, and wedge-shaped structural aggregates. The Zakme soil has been placed in this subgroup. It is on mountains and formed in calcareous sandstone and shale.

The subgroup of Typic Argixerolls consists of soils formed under good drainage that do not have hard rock at a depth of less than 20 inches. These soils have a mollic epipedon less than 20 inches thick with 2 to 4 percent organic matter, and base saturation of 75 percent or more throughout the profile. The Gilroy, Los Osos, and Shimmon soils have been placed in this subgroup. They are on hills and mountains and formed in sandstone or shale. The Lompico soil is similar to the Typic Argixerolls, but has base saturation of less than 75 percent. Lompico soil has been placed in the Ultic Argixeroll great group.

The Botella and Lockwood soils are similar to Typic Argixerolls, but they have a mollic epipedon more than 20 inches thick. Therefore, they have been placed in the Pachic Argixeroll subgroup. They are on alluvial fans, and formed in alluvium from sedimentary rock.

The subgroup of Xeric Argialbolls consists of Argialbolls with a xeric moisture regime. The Concepcion soil has been placed in this subgroup.

Vertisols

Vertisols are soils in this area that are fine textured throughout and consist in part of clays that swell and shrink significantly on wetting and drying. Unless irrigated, these soils dry in summer and crack from the surface

downward to a depth of at least 20 inches (fig. 5). (Specific ranges in width and depth of cracks are described in the soil series.) Because of negligible rainfall in the summer, these cracks remain open for more than 60 consecutive days each year. Typically, these soils have an A horizon that is firm and massive when moist, but becomes granular or blocky and hard or very hard when dry. The surface soil falls into the cracks and causes internal displacement. Because of the internal churning that takes place in these soils, development of a B horizon is not possible. This churning also results in the formation of intersecting slickenside faces in the clayey substratum. Vertisols in this area have been placed in the Xerert suborder, which has a xeric moisture regime. The Xererts are divided into two great groups, Chromoxererts and Pelloxererts. Soils that have a moist chroma of 1.5 or more to a depth of 12 inches or more are classified in the Chromoxerert great group. Soils that have a moist chroma of 1.5 or less to a depth of 12 inches or more and extend to more than 40 inches have been placed in the Pelloxerert great group.

The Ayar and Capay soils have been placed in the Typic Chromoxerert subgroup. The Ayar soil is on hills and mountains, and formed in calcareous sandstone and shale. The Capay soil is on flood plains and formed in alluvium from sedimentary rock.

The Clear Lake soil has been placed in the Typic Pelloxerert subgroup. The Clear Lake soil is poorly drained, is in basins, and formed in alluvium from mixed rock sources.

The Cropley and Diablo soils are similar to Typic Pelloxererts, except that they lack chroma of 1.5 or less extending beyond 40 inches. Cropley soil is moderately well drained, is on alluvial fans, and formed in alluvium from mixed rock sources. The Diablo soil is well drained, is on hills and mountains, and formed in calcareous sandstone and shale.

Formation of soils

This section was prepared by Charles A Ferrari, soil scientist, Soil Conservation Service.

This section discusses the factors of soil formation, relates them to the formation of soils in the survey area, and explains the processes of soil formation.

Soil, in which plants grow, is a natural body on the surface of the earth. It is a mixture of rocks and minerals, organic matter, water, and air, all of which occur in varying proportions. The rocks and minerals are fragmented and are partly or wholly weathered. Soils have more or less distinctive layers, or horizons, that are the product of environmental forces acting upon materials deposited or accumulated by geological agencies.

The characteristics of the soil at any given point are determined by the interaction of: (1) the physical and mineralogical composition of the parent material; (2) the climate in which the soil material has accumulated and has existed since accumulation; (3) the relief, or topography, which influences the local, or internal, environment of the soil, its drainage, moisture content, aeration, susceptibility to erosion, and exposure to sun and wind; (4) biological forces that act upon the soil material, such as the plants and animals living on and in the soil; and (5) the length of time the forces of development have acted on the soil material.

These five soil-forming factors are dependent on each other. In the following sections are examples of how a single soil-forming factor has affected the soil.

Parent material

In this section, some of the most extensive soil series are mentioned in conjunction with their parent material. However, many series are mapped on more than one formation, because many formations, or varying components of a formation, give rise to similar soils. Also, there are other formations too small to mention; however, by comparing the detailed mapping with the basic geology of the area, more conclusions can be drawn.

The largest single geologic unit in the area is the Paso Robles Formation. This is north of the La Panza Range, east of the Nacimiento fault zone, and widely distributed along the Santa Margarita syncline. It overlies the granitic rocks formation, Monterey Formation, Vaqueros Formation, and Santa Margarita Formation.

Parent material from which the soils in the Paso Robles area have developed is both residual and alluvial. The Paso Robles Formation consists of poorly sorted gravel, sand, silt, and clay. The composition varies, depending upon the original rock source. In many areas it is difficult to distinguish between older alluvium and this formation. Therefore, in many areas the Nacimiento and Los Osos soils are the main soils, with terrace cappings of Positas soil.

The exposed cretaceous granitic rocks mainly occur east of Santa Margarita. The rocks are deeply weathered and commonly decomposed, resulting in a highly dissected terrain. The bulk of this rock consists of biotitic granodiorite and adamellite. This rock composition gives rise to coarse-textured soils. The Cieneba, Andregg, and Vista soils are the main soils on this material. However, Sesame soil, with a moderately fine textured subsoil, has formed on many of the lower slopes.

The Monterey Formation is a well-bedded marine Miocene sequence mainly composed of siliceous and calcareous sedimentary rocks. The Santa Lucia, Lopez, Gazos, and McMullin soils are mainly on silicious shale, and the Linne and Calodo soils are mainly on calcareous shale.

The Dibble, Gaviota, and Shimmon soils are the most extensive soils mapped on the Atascadero Formation and an unnamed sandstone and conglomerate formation. These formations are of the Upper Cretaceous period. The Atascadero Formation is interbedded layers of siltstone and mudstone of varying thickness. The complexity of the bedding gives rise to a wide range in

soil texture and soil depth. Moderately deep, fine textured Dibble soils formed on the Atascadero Formation. Shallow, coarse textured Gaviota soils formed on the unnamed sandstone and conglomerate formation.

The Santa Margarita Formation consists of thick beds of weakly consolidated arkosic sandstone. This formation is mainly exposed around Atascadero and Santa Margarita. The Concepcion soil, which is the most developed soil in this area, is found only on this formation. The San Andreas and Arnold soils are the main soils, but these also occur on other formations.

Because many of the streams dissect different residual materials, most of the alluvial material has been mixed. The composition of gravel, sand, silt, and clay of the alluvial material has been basically altered by water movement and gravity. The coarse textured soils are found mainly at the beginning of streams or where the velocity of the stream is high. The Metz and Tujunga soils are examples of these coarse textured soils, and are found next to or in the present stream channels. The fine textured soils are found where the velocity of the stream is low or in basin positions. The Clear Lake and Camarillo soils (fig. 2) are examples of soils that formed in areas where water remained still long enough to let the clays settle out.

As this area became uplifted, many terraces formed along the stream channels (fig. 3). The age of this relatively older alluvium is expressed by the degree of development in the soil profile. Geologically, the older alluvium is probably of Pleistocene age (*4*). Similarity of the composition between the older alluvium and the modern stream channel deposits indicates that drainage patterns have remained fairly constant. However, the parent material of the Clear Lake soil and other geographically related soils suggests that there may have been a different drainage pattern in this area when this terrace material was deposited.

Climate

The climate, or the amount and distribution of heat and moisture received, has a marked influence on the kind of soil that forms. Heat and moisture strongly influence the amount and kind of vegetation, the rate at which organic matter decomposes, the rate at which minerals weather, and the removal or accumulation of material in different soil horizons.

Most of the climate in the Paso Robles soil survey area is similar to the climate under which the soils formed. It is a subhumid, mesothermal climate that is characterized by cool, moist winters and hot, dry summers.

Sharp differences in rainfall and temperature are influenced by the high and rough topography on the western edge of the survey area. Mean annual precipitation ranges from 30 inches in the western part of the area to 9 inches in some areas of the eastern part. Mean annual air temperature ranges from 56 degrees F in the western part of the area to 60 degrees F throughout the rest of the area.

Effects of high precipitation and low temperature are evident in the vegetation and the soils in the Santa Lucia Range. Woody and herbaceous vegetation is more abundant and the organic matter is higher. Also, the higher acidity and lower base saturation indicate greater leaching. The Lompico and McMullin soils are examples of soils occurring in this area.

As the temperature increases and rainfall decreases, woody vegetation is generally restricted to north slopes. On the south slopes the dark, granular surface soil is replaced by light colored massive soils. The Millsholm and Dibble soils are examples of this change.

The Camatta and Polonio soils are examples of soils in the areas of lowest rainfall and highest temperatures in the survey area.

Relief

The relief of the Paso Robles Area was determined mainly by past geological history. The area is in three prominent physiographic units: (1) the terraces, plains, and fans of the Salinas River and its tributaries; (2) the mountains of the Santa Lucia and La Panza Ranges; and (3) the foothills of the Temblor Range and the Cholame Hills.

All drainageways lead eventually to the Salinas River. The Nacimiento River, Huerhuero Creek, and Estrella Creek are the main tributaries of the Salinas River. These streams dissect the Paso Robles Formation.

The stream plains are paralleled by three to four levels of terraces (fig. 3), and most of the weakly consolidated Paso Robles Formation has been well rounded.

In contrast to this gentle, rolling topography are the Santa Lucia and La Panza Ranges in the western and southern parts of the survey area. The greater resistance of most of the parent material and the rapid uplift as a result of increased faulting have caused long winding ridges with relatively steep side slopes to form. The ridgetops are narrow, somewhat angular, and have slopes of more than 25 percent. Because of the steep and very steep slopes and the type of parent material, most of the soils are well drained to somewhat excessively drained. Northern and southern aspects are more pronounced on these Ranges than in the Paso Robles Formation. Because north slopes generally have more soil moisture than south slopes, there is a greater buildup of organic matter and more weathering. The Gaviota and San Andreas soils are examples of the effect of aspect on soil. The Gaviota soil is shallow and low in organic matter on south slopes. The San Andreas soil is moderately deep and relatively high in organic matter on north slopes.

Biological activity

Vegetation, burrowing animals, insects, bacteria, and fungi are important contributors to the formation of soils.

They cause gains or losses in organic matter and plant nutrients and changes in structure and porosity. Accumulation of organic matter has been an important process in horizon differentiation of soils in the Paso Robles Area. The north slopes of the hills and mountains are protected from direct sunlight. They support a fairly dense canopy of various broadleaf plants and hardwood trees, which make up about 5 percent of the humus and organic matter of the soils. This organic material has influenced the dark color, structure, and physical condition of the soils. The Shimmon, Lompico, San Andreas, Andregg, and Linne soils are on these north slopes. In contrast, the vegetation on the south slopes is mainly brush. This cover provides little shade and the soils are dry for longer periods of time, creating an undesirable habitat for micro-organisms. Organic matter is less than 1 percent. The Calleguas, Cieneba, Millsholm, and Gaviota soils are on these south slopes.

As the rainfall decreases from the mountains to the hills and higher terraces toward the east, the organic matter decreases in many soils. This decrease affects the structure and porosity of the surface horizon. The Dibble, Sesame, and Positas soils are examples of this change in organic matter.

The biological activity of alluvial plain, flood plain, and basin soils is related to excessive drainage and accumulation of organic matter. The Metz and Tujunga soils, which are sandy and excessively drained, cannot support an abundance of plants. Therefore, organic matter is less than 1 percent. However, such soils as the Clear Lake soil occupy a basin position and are poorly drained. As a result, they have accumulated a large amount of organic matter. Water is readily available on this soil, and native plants grow abundantly.

Time

The degree of alteration of parent material by the interacting forces of climate, living organisms, and relief is determined by the length of time these factors have acted on the soils.

The oldest soils generally are those in which the parent material has been most altered. Generally, the older soils are characterized by distinct boundaries between horizons. Soils having few or indistinct horizon differences are considered to be of intermediate age. Soils having few or no horizon differences are considered to be young. However, differences among horizons or layers that were caused by accidents in the placement of the parent material are not considered in determining the age of a soil. In addition, soils having the greatest horizon differences are not necessarily the oldest in time. In some soils, the dominant influence of some other factor, such as highly resistant parent material, may largely determine the features of the soil.

In general, the lowest stream bottoms consist of most recent alluvium, and the highest terraces or fans are composed of the oldest alluvium. The age of the highest terrace or fan established the range in age for various alluvial soils.

The block diagram of the Nacimiento River area (fig. 3) shows the topographic relationship of terrace soils in this area. In most places, at least three distinct terrace levels can be recognized, and time has influenced the amount of clay movement in the B horizon.

References

(1) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed 10, 2 vol., illus.
(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.
(3) CDM, Inc., Environmental Engineers, Pasadena, Calif. 1972. Report on master water and sewerage plan. 83 pp., illus.
(4) Hart, Earl W. 1976. Basic geology of the Santa Margarita area, San Luis Obispo County, Calif. Bull. 199. Calif. Div. of Mines and Geol., Sacramento, Calif. 45 pp., illus.
(5) Planning Department, San Luis Obispo County, Calif. 1975. Basic planning studies. 65 pp., illus.
(6) Storie, R. E. 1953. Revision of the soil rating chart. Calif. Agric. Exp. Stn. 4 pp., illus.
(7) Storie, R. E. 1964. Handbook of soil evaluation. Univ. of Calif., Berkeley, Calif. 225 pp.
(8) Storie, R. E. 1933. An index for rating agricultural value of soil. Calif. Agric. Exp. Stn. Bull. 566, 48 pp., illus. [Revised 1937, 1944, 1953]
(9) United States Department of Agriculture. 1951. Soil survey manual. U. S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]
(10) United States Department of Agriculture. 1975. Soil taxonomy: a basic system of classification for making and interpreting soil surveys. Soil Conserv. Serv. U. S. Dep. of Agric. Handb. 436, 754 pp., illus.
(11) U. S. Department of Commerce, National Oceanic and Atmospheric Administration. 1971. The climate of San Luis Obispo County, Calif. 81 pp., illus.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.
AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.
Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.5
Low	2 5 to 5.0
Moderate	5 0 to 7.5
High	7 5 to 10 0
Very high	More than 10 0

Badland. Steep or very steep, commonly nonstony barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

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.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Coarse textured (light textured) soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the bases of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A map unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

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. A delay in grazing until range plants have reached a specified stage of growth. Grazing is deferred in order to increase the vigor of forage and to allow desirable plants to produce seed. Contrasts with continuous grazing and rotation grazing.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess alkali. Excess exchangeable sodium. The resulting poor physical properties restrict the growth of plants.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime. Excess carbonates. Excessive carbonates, or lime, restrict the growth of some plants.

Excess salts. Excess water soluble salts. Excessive salts restrict the growth of most plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake. The rapid movement of water into the soil.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forb. Any herbaceous plant not a grass or a sedge.

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. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Green manure (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gypsum. Hydrous calcium sulphate.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming 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.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hummocky. Refers to a landscape of hillocks, separated by low sags, having sharply rounded tops and steep sides. Hummocky relief resembles rolling or undulating relief, but the tops of ridges are narrower and the sides are shorter and less even.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration 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.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants are those that follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

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. Inadequate strength for supporting loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or struc-

ture by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Moderately fine textured (moderately heavy textured) soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characteristic that affects management. These differences are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Polypedon. A volume of soil having properties within the limits of a soil series, the lowest and most homogeneous category of soil taxonomy. A "soil individual."

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Range condition. The health or productivity of forage plants on a given range, in terms of the potential productivity under normal climate and the best practical management. Condition classes generally recognized are—*excellent, good, fair,* and *poor*. The classification is based on the percentage of original, or assumed climax vegetation on a site, as com-

pared to what has been observed to grow on it when well managed.

Range site. An area of range where climate, soil, and relief are sufficiently uniform to produce a distinct kind and amount of native vegetation.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil."

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline-alkali soil. A soil that contains a harmful concentration of salts and exchangeable sodium; contains harmful salts and is strongly alkaline; or contains harmful salts and exchangeable sodium and is very strongly alkaline. The salts, exchangeable sodium, and alkaline reaction are in the soil in such location that growth of most crop plants is less than normal.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-alumina ratio. The molecular ratio of silica to alumina in soil, clay, or any alumino-silicate mineral.

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.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slicken-

sides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. Locally, a small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Slow refill. The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.005 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stone line. A concentration of coarse fragments in soils that generally marks an old weathering surface. In a cross section, the line may be one fragment or more thick. The line generally overlies material that weathered in place and marks the top of a paleosol. It is ordinarily overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining 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).

Stubble mulch. Stubble or other crop residue left on the soil, or partly worked into the soil, to provide protection from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitaion is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface soil. 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."

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 or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Trace elements. The chemical elements in soils, in only extremely small amounts, essential to plant growth. Examples are zinc, cobalt, manganese, copper, and iron.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

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 table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1931-60 at Paso Robles, California]

Month	Temperature					Precipitation			
				2 years in 10 will have--			1 year in 10 will have--		Average number of days with 0.10 inch or more
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average	Less than--	More than--	
	°F	°F	°F	°F	°F	In	In	In	
January----	60	32	46	73	19	3.1	1.0	6.1	6
February---	63	36	50	73	25	3.3	.2	8.2	5
March------	68	38	53	81	28	2.2	(1)	6.1	4
April------	74	40	57	90	31	1.2	.1	3.4	3
May--------	80	44	62	94	36	.3	0	.7	1
June-------	87	47	67	101	40	.1	0	.7	(2)
July-------	94	50	72	105	43	(1)	0	.3	(2)
August-----	93	49	71	105	42	(1)	0	.1	(2)
September--	90	46	68	103	39	.1	0	.4	(2)
October----	81	42	62	96	30	.4	0	1.3	1
November---	71	35	53	84	22	1.1	0	2.6	2
December---	62	33	48	72	21	3.1	.3	7.0	5
Year-------	77	41	59	110	18	14.9	7.6	23.1	27

[1]Less than .05 inch.

[2]Less than one-half day.

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1931-60 at Paso Robles, California]

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--	March 12	April 11	May 6
2 years in 10 later than--	March 3	March 30	April 26
5 years in 10 later than--	February 11	March 6	April 6
First freezing temperature in fall:			
1 year in 10 earlier than--	October 27	October 19	October 9
2 years in 10 earlier than--	November 4	October 26	October 15
5 years in 10 earlier than--	November 21	November 9	October 27

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
100	Arbuckle fine sandy loam, 0 to 2 percent slopes	2,050	0.3
101	Arbuckle fine sandy loam, 2 to 9 percent slopes	3,005	0.4
102	Arbuckle-Positas complex, 9 to 15 percent slopes	16,365	2.4
103	Arbuckle-Positas complex, 15 to 30 percent slopes	13,345	1.9
104	Arbuckle-Positas complex, 30 to 50 percent slopes	5,835	0.8
105	Arbuckle-Positas complex, 50 to 75 percent slopes	4,545	0.7
106	Arbuckle-San Ysidro complex, 2 to 9 percent slopes	24,300	3.5
107	Arnold loamy sand, 9 to 30 percent slopes	2,565	0.4
108	Arnold-San Andreas complex, 30 to 75 percent slopes	3,580	0.5
109	Ayar and Diablo soils, 9 to 15 percent slopes	5,610	0.8
110	Ayar and Diablo soils, 15 to 30 percent slopes	8,525	1.2
111	Ayar and Diablo soils, 30 to 50 percent slopes	2,530	0.4
112	Badland	2,885	0.4
113	Balcom-Calleguas complex, 50 to 75 percent slopes	26,000	3.8
114	Balcom-Nacimiento association, moderately steep	24,500	3.6
115	Balcom-Nacimiento association, steep	13,720	2.0
116	Botella sandy loam, 2 to 9 percent slopes	840	0.1
117	Calleguas shaly loam, 15 to 30 percent slopes	1,930	0.3
118	Camarillo sandy loam, frequently flooded	345	*
119	Camarillo silty clay loam, partially drained	915	0.1
120	Camatta loam, 5 to 15 percent slopes	2,020	0.3
121	Camatta loam, 15 to 30 percent slopes	1,695	0.2
122	Capay silty clay	650	0.1
123	Capay silty clay, occasionally flooded	1,290	0.2
124	Chanac loam, 9 to 30 percent slopes	1,355	0.2
125	Chanac loam, 30 to 75 percent slopes	2,830	0.4
126	Cieneba coarse sandy loam, 30 to 75 percent slopes	22,130	3.2
127	Cieneba-Andregg coarse sandy loams, 30 to 75 percent slopes	10,470	1.5
128	Cieneba-Vista coarse sandy loams, 30 to 50 percent slopes	4,700	0.7
129	Clear Lake clay	605	0.1
130	Clear Lake clay, drained	830	0.1
131	Concepcion sandy loam, 2 to 9 percent slopes	445	0.1
132	Cropley clay, 0 to 2 percent slopes	675	0.1
133	Cropley clay, 2 to 9 percent slopes	3,790	0.6
134	Dibble clay loam, 9 to 15 percent slopes	2,605	0.4
135	Dibble clay loam, 15 to 30 percent slopes	4,410	0.6
136	Dibble clay loam, 30 to 50 percent slopes	12,945	1.9
137	Dibble clay loam, 50 to 75 percent slopes	8,805	1.3
138	Elder loam, 0 to 2 percent slopes	1,495	0.2
139	Elder loam, 2 to 9 percent slopes	405	0.1
140	Elder loam, flooded, 0 to 5 percent slopes	1,785	0.3
141	Gaviota-Rock outcrop complex, 30 to 75 percent slopes	15,020	2.2
142	Gaviota-San Andreas association, moderately steep	2,015	0.3
143	Gaviota-San Andreas association, very steep	6,600	1.0
144	Gazos shaly clay loam, 9 to 30 percent slopes	2,335	0.3
145	Gazos shaly clay loam, 30 to 50 percent slopes	2,405	0.3
146	Gilroy-Rock outcrop complex, 30 to 50 percent slopes	290	*
147	Hanford and Greenfield fine sandy loams, 0 to 2 percent slopes	2,515	0.4
148	Hanford and Greenfield fine sandy loams, 2 to 9 percent slopes	4,815	0.7
149	Hanford and Greenfield gravelly sandy loams, 0 to 2 percent slopes	1,595	0.2
150	Hanford and Greenfield gravelly sandy loams, 2 to 9 percent slopes	2,895	0.4
151	Henneke-Rock outcrop complex, 15 to 75 percent slopes	7,450	1.1
152	Linne-Calodo complex, 9 to 30 percent slopes	20,130	2.9
153	Linne-Calodo complex, 30 to 50 percent slopes	12,680	1.8
154	Linne-Calodo complex, 50 to 75 percent slopes	13,675	2.0
155	Linne-Diablo complex, 9 to 15 percent slopes	790	0.1
156	Linne-Zakme complex, 30 to 50 percent slopes	3,345	0.5
157	Lockwood shaly loam, 0 to 2 percent slopes	630	0.1
158	Lockwood shaly loam, 2 to 9 percent slopes	3,700	0.5
159	Lockwood-Concepcion complex, 2 to 9 percent slopes	5,370	0.8
160	Lockwood-Concepcion complex, 9 to 15 percent slopes	1,955	0.3
161	Lompico loam, 30 to 50 percent slopes	2,580	0.4
162	Lompico-McMullin complex, 50 to 75 percent slopes	14,165	2.1
163	Los Osos-Lodo complex, 50 to 75 percent slopes	10,885	1.6
164	Los Osos-Rock outcrop complex, 30 to 50 percent slopes	2,315	0.3
165	McMullin-Rock outcrop complex, 50 to 75 percent slopes	8,325	1.2
166	Metz loamy sand, 0 to 5 percent slopes	4,060	0.6
167	Metz-Tujunga complex, occasionally flooded, 0 to 5 percent slopes	2,915	0.4

See footnote at end of table.

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
168	Millsholm-Ayar complex, 50 to 75 percent slopes	3,415	0.5
169	Millsholm-Dibble clay loams, 15 to 30 percent slopes	1,845	0.3
170	Millsholm-Dibble clay loams, 30 to 50 percent slopes	14,140	2.1
171	Millsholm-Montara clay loams, 15 to 30 percent slopes	1,065	0.2
172	Millsholm-Rock outcrop complex, 50 to 75 percent slopes	5,655	0.8
173	Mocho clay loam, 0 to 2 percent slopes	1,960	0.3
174	Mocho clay loam, 2 to 9 percent slopes	4,545	0.7
175	Nacimiento silty clay loam, 9 to 30 percent slopes	6,800	1.0
176	Nacimiento silty clay loam, 30 to 50 percent slopes	5,550	0.8
177	Nacimiento-Ayar complex, 9 to 30 percent slopes	15,695	2.3
178	Nacimiento-Ayar complex, 30 to 50 percent slopes	6,260	0.9
179	Nacimiento-Los Osos complex, 9 to 30 percent slopes	53,095	7.7
180	Nacimiento-Los Osos complex, 30 to 50 percent slopes	38,070	5.5
181	Nacimiento-Los Osos complex, 50 to 75 percent slopes	9,130	1.3
182	Oceano loamy sand, 2 to 9 percent slopes	1,315	0.2
183	Pico fine sandy loam, 0 to 2 percent slopes	2,695	0.4
184	Pico fine sandy loam, 2 to 9 percent slopes	1,975	0.3
185	Pits	375	0.1
186	Polonio clay loam, 2 to 9 percent slopes	1,235	0.2
187	Rincon clay loam, 0 to 2 percent slopes	1,390	0.2
188	Rincon clay loam, 2 to 9 percent slopes	7,930	1.2
189	Rincon clay loam, 9 to 15 percent slopes	1,880	0.3
190	Rock outcrop-Gaviota complex, 30 to 75 percent slopes	19,050	2.8
191	Ryer clay loam, 2 to 9 percent slopes	2,125	0.3
192	San Andreas sandy loam, 15 to 30 percent slopes	765	0.1
193	San Andreas-Arujo sandy loams, 9 to 15 percent slopes	4,905	0.7
194	San Emigdio fine sandy loam, 0 to 2 percent slopes	1,035	0.2
195	San Emigdio fine sandy loam, 2 to 9 percent slopes	2,835	0.4
196	San Ysidro sandy loam, 2 to 9 percent slopes	905	0.1
197	San Ysidro loam, 0 to 2 percent slopes	3,245	0.5
198	Santa Lucia-Lopez complex, 15 to 50 percent slopes	4,865	0.7
199	Santa Lucia-Gazos complex, 50 to 75 percent slopes	6,020	0.9
200	Sesame sandy loam, 9 to 30 percent slopes	1,825	0.3
201	Shimmon loam, 15 to 30 percent slopes	1,165	0.2
202	Shimmon loam, 30 to 50 percent slopes	3,100	0.5
203	Shimmon-Dibble association, steep	3,105	0.5
204	Shimmon-Dibble association, very steep	10,955	1.6
205	Sorrento clay loam, 0 to 2 percent slopes	575	0.1
206	Sorrento clay loam, 2 to 9 percent slopes	2,190	0.3
207	Still gravelly loam, 0 to 2 percent slopes	695	0.1
208	Still clay loam, 0 to 2 percent slopes	4,420	0.6
209	Still clay loam, 2 to 9 percent slopes	1,615	0.2
210	Vista coarse sandy loam, 9 to 15 percent slopes	850	0.1
211	Vista-Cieneba coarse sandy loams, 15 to 30 percent slopes	4,995	0.7
212	Xerofluvents-Riverwash association	7,670	1.1
213	Zakme clay, 30 to 50 percent slopes	1,475	0.2
	Water	5,815	0.8
	Total	687,000	100.0

* Less than 0.05 percent.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield figure indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Alfalfa hay I	Sugar beets I	Pasture I	Wine grapes I	Almonds N	Barley N	Grain hay N
	Ton	Ton	AUM*	Ton	Lb nut meats	Lb	Ton
100---------- Arbuckle	8	25	15	8	200	1,400	1.5
101---------- Arbuckle	8	25	15	8	200	1,400	1.5
102---------- Arbuckle	6	---	12	6	150	1,200	1
103---------- Arbuckle	---	---	12	6	150	1,200	1
104. Arbuckle	---	---	---	---	---	---	---
105. Arbuckle	---	---	---	---	---	---	---
106---------- Arbuckle	6	20	12	6	150	1,300	1
107. Arnold	---	---	---	---	---	---	---
108. Arnold	---	---	---	---	---	---	---
109---------- Ayar	---	---	12	4	200	2,200	2
110---------- Ayar	---	---	12	4	200	2,200	2
111. Ayar	---	---	---	---	---	---	---
112**. Badland							
113. Balcom	---	---	---	---	---	---	---
114**: Balcom----------	---	---	9	4	---	1,400	1
Nacimiento----------	---	---	12	6	---	2,200	2
115**: Balcom.	---	---	---	---	---	---	---
Nacimiento.	---	---	---	---	---	---	---
116---------- Botella	8	25	15	8	200	1,400	---
117. Calleguas	---	---	---	---	---	---	---
118. Camarillo	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Alfalfa hay I	Sugar beets I	Pasture I	Wine grapes I	Almonds N	Barley N	Grain hay N
	Ton	Ton	AUM*	Ton	Lb nut meats	Lb	Ton
119--- Camarillo	---	---	---	---	---	1,400	1
120, 121. Camatta	---	---	---	---	---	---	---
122--- Capay	---	---	---	---	---	1,200	1
123--- Capay	---	---	---	---	---	1,200	1
124--- Chanac	---	---	---	---	---	800	---
125. Chanac	---	---	---	---	---	---	---
126. Cieneba	---	---	---	---	---	---	---
127. Cieneba	---	---	---	---	---	---	---
128. Cieneba	---	---	---	---	---	---	---
129--- Clear Lake	---	---	---	---	---	1,800	1.5
130--- Clear Lake	7	20	12	---	---	2,200	2
131--- Concepcion	---	---	12	---	---	1,000	1
132--- Cropley	7	20	12	---	---	2,200	2
133--- Cropley	7	20	12	---	---	2,200	2
134--- Dibble	---	---	12	4	100	1,400	1.5
135--- Dibble	---	---	12	4	100	1,400	1.5
136. Dibble	---	---	---	---	---	---	---
137. Dibble	---	---	---	---	---	---	---
138--- Elder	9	25	16	8	200	2,000	2
139--- Elder	9	25	16	8	200	2,000	2
140--- Elder	8	25	16	---	---	2,000	2
141. Gaviota	---	---	---	---	---	---	---

See footnotes at end of table.

Table 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Alfalfa hay I	Sugar beets I	Pasture I	Wine grapes I	Almonds N	Barley N	Grain hay N
	Ton	Ton	AUM*	Ton	Lb nut meats	Lb	Ton
142**: Gaviota.	---	---	---	---	---	---	---
San Andreas.	---	---	---	---	---	---	---
143**: Gaviota.	---	---	---	---	---	---	---
San Andreas.	---	---	---	---	---	---	---
144---------- Gazos	---	---	12	6	200	1,600	1.5
145. Gazos	---	---	---	---	---	---	---
146. Gilroy	---	---	---	---	---	---	---
147---------- Hanford	8	25	15	8	200	1,000	1.5
148---------- Hanford	8	25	15	8	200	1,000	1.5
149---------- Hanford	5	20	10	6	200	500	1
150---------- Hanford	5	20	10	6	200	500	1
151. Henneke	---	---	---	---	---	---	---
152---------- Linne	---	---	8	4	200	1,500	1.5
153. Linne	---	---	---	---	---	---	---
154. Linne	---	---	---	---	---	---	---
155---------- Linne	---	---	12	5	200	2,200	2
156. Linne	---	---	---	---	---	---	---
157---------- Lockwood	8	25	15	8	200	2,000	2
158---------- Lockwood	8	25	15	8	200	2,000	2
159---------- Lockwood	4	25	12	7	200	1,500	1.5
160---------- Lockwood	4	25	12	7	200	1,500	1.5
161. Lompico	---	---	---	---	---	---	---
162. Lompico	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Alfalfa hay I	Sugar beets I	Pasture I	Wine grapes I	Almonds N	Barley N	Grain hay N
	Ton	Ton	AUM*	Ton	Lb nut meats	Lb	Ton
163. Los Osos	---	---	---	---	---	---	---
164. Los Osos	---	---	---	---	---	---	---
165. McMullin	---	---	---	---	---	---	---
166---------- Metz	4	---	8	6	---	---	---
167---------- Metz	---	18	---	---	---	---	---
168. Millsholm	---	---	---	---	---	---	---
169. Millsholm	---	---	---	---	---	---	---
170. Millsholm	---	---	---	---	---	---	---
171. Millsholm	---	---	---	---	---	---	---
172. Millsholm	---	---	---	---	---	---	---
173---------- Mocho	10	30	16	8	200	2,800	2.5
174---------- Mocho	10	30	16	8	200	2,800	2.5
175---------- Nacimiento	---	---	12	6	200	2,200	2
176. Nacimiento	---	---	---	---	---	---	---
177---------- Nacimiento	---	---	12	6	200	2,200	2
178. Nacimiento	---	---	---	---	---	---	---
179---------- Nacimiento	---	---	12	5	150	1,800	1.5
180. Nacimiento	---	---	---	---	---	---	---
181. Nacimiento	---	---	---	---	---	---	---
182---------- Oceano	4	18	8	6	---	---	---
183---------- Pico	9	25	16	8	200	2,000	2
184---------- Pico	9	25	16	8	200	2,000	2

See footnotes at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Alfalfa hay I	Sugar beets I	Pasture I	Wine grapes I	Almonds N	Barley N	Grain hay N
	Ton	Ton	AUM*	Ton	Lb nut meats	Lb	Ton
185**. Pits							
186---------- Polonio	---	---	---	---	---	1,000	---
187---------- Rincon	8	25	15	6	200	1,800	2
188---------- Rincon	8	25	15	6	200	1,800	2
189---------- Rincon	8	20	15	6	200	1,800	2
190. Rock outcrop	---	---	---	---	---	---	---
191---------- Ryer	8	18	15	6	200	1,800	2
192---------- San Andreas	---	---	15	4	---	1,200	1
193---------- San Andreas	---	---	15	5	---	1,400	1.5
194---------- San Emigdio	8	25	15	8	200	1,500	1.5
195---------- San Emigdio	8	25	15	8	200	1,500	1.5
196---------- San Ysidro	---	---	12	---	---	1,200	1
197---------- San Ysidro	---	---	12	---	---	1,200	1
198. Santa Lucia	---	---	---	---	---	---	---
199. Santa Lucia	---	---	---	---	---	---	---
200---------- Sesame	---	---	10	6	---	1,000	1
201---------- Shimmon	---	---	12	6	---	1,200	1
202. Shimmon	---	---	---	---	---	---	---
203**: Shimmon.	---	---	---	---	---	---	---
Dibble.	---	---	---	---	---	---	---
204**: Shimmon.	---	---	---	---	---	---	---
Dibble.	---	---	---	---	---	---	---
205---------- Sorrento	9	30	16	8	200	2,800	2.5

See footnotes at end of table.

TABLE 4.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Alfalfa hay I	Sugar beets I	Pasture I	Wine grapes I	Almonds N	Barley N	Grain hay N
	Ton	Ton	AUM*	Ton	Lb nut meats	Lb	Ton
206---------- Sorrento	9	30	16	8	200	2,800	2.5
207, 208, 209---------- Still	9	25	16	8	200	2,800	2.5
210---------- Vista	---	---	---	---	---	1,200	1
211. Vista	---	---	---	---	---	---	---
212**: Xerofluvents.							
Riverwash.							
213. Zakme	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

[Only the soils that support rangeland vegetation are listed]

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
100, 101---------- Arbuckle	Coarse Loamy----------	Favorable Normal Unfavorable	2,800 2,500 1,700	Soft chess---------- Wild oats---------- Blue oak---------- Foxtail fescue---------- Red brome---------- Buckbrush---------- Filaree----------	15 10 10 10 5 5 5
102*, 103*: Arbuckle----------	Coarse Loamy----------	Favorable Normal Unfavorable	2,800 2,500 1,700	Soft chess---------- Wild oats---------- Blue oak---------- Foxtail fescue---------- Red brome---------- Buckbrush---------- Filaree----------	15 10 10 10 5 5 5
Positas----------	Coarse Loamy Claypan----------	Favorable Normal Unfavorable	4,200 3,100 2,050	Soft chess---------- Filaree---------- Wild oats---------- Oak---------- Needlegrass---------- Burclover---------- Foxtail fescue----------	20 10 10 10 10 5 5
104*: Arbuckle----------	Coarse Loamy----------	Favorable Normal Unfavorable	2,800 2,500 1,700	Soft chess---------- Wild oats---------- Blue oak---------- Foxtail fescue---------- Red brome---------- Buckbrush---------- Filaree----------	15 10 10 5 5 5 5
Positas----------	Coarse Loamy Claypan----------	Favorable Normal Unfavorable	4,200 3,100 2,050	Soft chess---------- Filaree---------- Wild oats---------- Oak---------- Needlegrass---------- Burclover----------	20 10 10 10 10 5
105*: Arbuckle----------	Coarse Loamy----------	Favorable Normal Unfavorable	2,800 2,500 1,700	Soft chess---------- Wild oats---------- Blue oak---------- Foxtail fescue---------- Red brome---------- Buckbrush---------- Filaree----------	15 10 10 10 5 5 5
Positas----------	Coarse Loamy Claypan----------	Favorable Normal Unfavorable	4,200 3,100 2,050	Soft chess---------- Filaree---------- Wild oats---------- Oak---------- Needlegrass---------- Burclover---------- Foxtail fescue----------	20 10 10 10 10 5 5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
106*:					
Arbuckle	Coarse Loamy	Favorable	2,800	Soft chess	15
		Normal	2,500	Wild oats	10
		Unfavorable	1,700	Foxtail fescue	10
				Blue oak	5
				Oak	5
				Red brome	5
				Filaree	5
San Ysidro	Loamy Claypan	Favorable	2,700	Soft chess	15
		Normal	2,000	Clover	10
		Unfavorable	1,400	Filaree	10
				Burclover	10
				Plantain	5
				Nodding needlegrass	5
				Brome	5
				Wild oats	5
107	Sandy	Favorable	1,500	Wild oats	15
Arnold		Normal	1,200	Red brome	10
		Unfavorable	1,000	Redstem filaree	10
				Soft chess	10
				Foxtail fescue	10
				Oak	10
				Goldenbush	5
				Chamise	5
				Common deerweed	5
108*:					
Arnold	Sandy	Favorable	1,500	Wild oats	15
		Normal	1,200	Red brome	10
		Unfavorable	1,000	Redstem filaree	10
				Soft chess	10
				Foxtail fescue	10
				Oak	10
				Goldenbush	5
				Chamise	5
				Common deerweed	5
109*:					
Ayar	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	10
				Filaree	10
				Barley	5
				Needlegrass	5
				Foxtail fescue	5
Diablo	Clayey	Favorable	5,000	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	10
				Filaree	10
				Barley	5
				Foxtail fescue	5
110*:					
Ayar	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	8
				Filaree	8
				Barley	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
110*:					
Diablo	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	10
				Filaree	10
				Barley	5
				Foxtail fescue	5
111*:					
Ayar	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	10
				Filaree	10
				Barley	5
				Needlegrass	5
				Foxtail fescue	5
Diablo	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	10
				Filaree	10
				Barley	5
				Foxtail fescue	5
113*:					
Balcom	Loamy South	Favorable	2,000	Soft chess	15
		Normal	1,700	Wild oats	10
		Unfavorable	1,300	Foxtail fescue	10
				Filaree	10
				Brome	5
				Turkey mullein	5
Calleguas	Shallow Gravelly Loamy	Favorable	1,500	Wild oats	15
		Normal	1,250	Soft chess	10
		Unfavorable	1,100	Filaree	10
				Red brome	10
				Rattail fescue	5
				Foxtail fescue	5
				California buckwheat	5
114*, 115*:					
Balcom	Loamy South	Favorable	2,000	Soft chess	15
		Normal	1,700	Wild oats	10
		Unfavorable	1,300	Foxtail fescue	10
				Filaree	10
				Brome	5
				Turkey mullein	5
Nacimiento	Fine Loamy	Favorable	3,900	Soft chess	15
		Normal	2,900	Wild oats	10
		Unfavorable	2,200	Burclover	10
				Clover	10
				Filaree	10
				Oak	10
				Foxtail fescue	5
117 Calleguas	Shallow Gravelly Loamy	Favorable	1,500	Wild oats	15
		Normal	1,250	Soft chess	10
		Unfavorable	1,100	Filaree	10
				Red brome	10
				Rattail fescue	5
				California buckwheat	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
118---------- Camarillo	Basin----------	Favorable	1,700	Alkali barley----------	20
		Normal	1,450	Filaree----------	10
		Unfavorable	1,200	Soft chess----------	5
				Burclover----------	5
				Alkali heath----------	5
				Iodinebush----------	5
119---------- Camarillo	Fine Loamy Flat----------	Favorable	1,800	Alkali barley----------	12
		Normal	1,500	Filaree----------	10
		Unfavorable	1,250	Burclover----------	10
				Wild oats----------	10
				Red brome----------	10
				Soft chess----------	5
120, 121---------- Camatta	Shallow Loamy----------	Favorable	1,500	Red brome----------	10
		Normal	1,350	Soft chess----------	10
		Unfavorable	1,000	Redstem filaree----------	10
				Barley----------	10
				Wild oats----------	10
				Burclover----------	5
122---------- Capay	Fine Loamy Flat----------	Favorable	1,700	Wild oats----------	15
		Normal	1,500	Burclover----------	10
		Unfavorable	1,350	Redstem filaree----------	10
				Red brome----------	10
				Valley saltbrush----------	10
				Alkali barley----------	10
				Quailbush saltbush----------	5
				Soft chess----------	5
123---------- Capay	Fine Loamy Flat----------	Favorable	1,700	Alkali barley----------	20
		Normal	1,500	Burclover----------	10
		Unfavorable	1,100	Red brome----------	10
				Filaree----------	10
				Iodinebush----------	10
				Saltgrass----------	10
				Wild oats----------	5
				Soft chess----------	5
124, 125---------- Chanac	Loamy----------	Favorable	1,700	Soft chess----------	15
		Normal	1,550	Wild oats----------	15
		Unfavorable	1,300	Redstem filaree----------	15
				Mediterranean barley----------	10
				Red brome----------	10
				Clover----------	8
127*:					
Cieneba----------	Shallow Coarse Loamy----------	Favorable	1,900	Chamise----------	35
		Normal	1,700	Buckbrush----------	10
		Unfavorable	1,250	Redstem filaree----------	10
				Red brome----------	10
				Foothill stipa----------	5
				Rattail fescue----------	5
Andregg----------	Coarse Loamy North----------	Favorable	2,200	Soft chess----------	15
		Normal	1,800	Wild oats----------	15
		Unfavorable	1,500	Blue oak----------	10
				Filaree----------	10
				Buckbrush----------	10
				Needlegrass----------	5
				Blue wildrye----------	5
				Lupine----------	5
				Oak----------	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
128*:					
Cieneba	Shallow Coarse Loamy	Favorable	1,900	Chamise	35
		Normal	1,700	Buckbrush	10
		Unfavorable	1,250	Redstem filaree	10
				Red brome	10
				Foothill stipa	5
				Rattail fescue	5
Vista	Coarse Loamy	Favorable	2,550	Wild oats	15
		Normal	2,000	Soft chess	10
		Unfavorable	1,500	Filaree	10
				Interior live oak	10
				Red brome	5
				Bluegrass	5
				Needlegrass	5
				Chamise	5
				Common deerweed	5
131 Concepcion	Coarse Loamy Claypan	Favorable	3,100	Soft chess	15
		Normal	2,600	Wild oats	10
		Unfavorable	1,700	Burclover	10
				Red brome	10
				Filaree	10
				Needlegrass	5
				Clover	5
				Lupine	5
				Coyotebrush	5
134, 135, 136, 137- Dibble	Fine Loamy	Favorable	3,900	Soft chess	15
		Normal	2,900	Blue oak	15
		Unfavorable	1,800	Burclover	10
				Wild oats	10
				Clover	5
				Trefoil	5
				Filaree	5
140 Elder	Loamy Bottom	Favorable	3,800	Soft chess	15
		Normal	2,800	Wild oats	15
		Unfavorable	2,050	Burclover	10
				Filaree	10
				Purple needlegrass	10
				Willow	5
				Meadow barley	5
142*, 143*:					
Gaviota	Shallow Coarse Loamy	Favorable	1,900	Chamise	35
		Normal	1,700	Buckbrush	10
		Unfavorable	1,250	Redstem filaree	10
				Red brome	10
				Manzanita	5
				Foothill stipa	5
				Soft chess	5
				Wild oats	5
				Rattail fescue	5
144, 145 Gazos	Gravelly Fine Loamy	Favorable	2,100	Soft chess	15
		Normal	1,700	Blue oak	15
		Unfavorable	1,500	Wild oats	10
				Filaree	10
				Red bome	5
				Burclover	5
				Scrub oak	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
146* Gilroy	Coarse Loamy North	Favorable	2,550	Soft chess	15
		Normal	1,850	Wild oats	15
		Unfavorable	1,550	Blue oak	10
				Buckbrush	8
				Needlegrass	5
				Blue wildrye	5
				Oak	5
147*, 148*: Hanford	Coarse Loamy Bottom	Favorable	2,700	Soft chess	20
		Normal	2,200	Wild oats	15
		Unfavorable	1,700	Redstem filaree	10
				Burclover	5
				Foxtail fescue	5
				Valley oak	5
Greenfield	Coarse Loamy Bottom	Favorable	2,700	Soft chess	20
		Normal	2,200	Wild oats	15
		Unfavorable	1,700	Redstem filaree	10
				Burclover	5
				Foxtail fescue	5
				Valley oak	5
149*: Hanford	Coarse Loamy Bottom	Favorable	2,300	Soft chess	20
		Normal	1,900	Wild oats	15
		Unfavorable		Redstem filaree	10
				Burclover	5
				Foxtail fescue	5
				Valley oak	5
Greenfield	Coarse Loamy Bottom	Favorable	---	Soft chess	20
		Normal	---	Wild oats	15
		Unfavorable	---	Redstem filaree	10
				Burclover	5
				Foxtail fescue	5
				Valley oak	5
150*: Hanford	Coarse Loamy Bottom	Favorable	---	Soft chess	20
		Normal	---	Wild oats	15
		Unfavorable	---	Redstem filaree	10
				Burclover	5
				Foxtail fescue	5
				Valley oak	5
Greenfield	Coarse Loamy Bottom	Favorable	2,700	Soft chess	20
		Normal	2,200	Wild oats	15
		Unfavorable	1,700	Redstem filaree	10
				Burclover	5
				Foxtail fescue	5
				Valley oak	5
152*, 153*, 154*: Linne	Gravelly Fine Loamy	Favorable	2,100	Soft chess	15
		Normal	1,700	Blue oak	15
		Unfavorable	1,500	Wild oats	10
				Filaree	10
				Red brome	5
				Burclover	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
152*, 153*, 154*:					
Calodo	Shallow Fine Loamy	Favorable	1,650	Scrub oak	10
		Normal	1,400	Manzanita	10
		Unfavorable	1,150	Soft chess	10
				Filaree	10
				Wild oats	10
				Buckbrush	5
				Lupine	5
				Chamise	5
155*:					
Linne	Gravelly Fine Loamy	Favorable	2,100	Soft chess	15
		Normal	1,700	Blue oak	15
		Unfavorable	1,500	Wild oats	10
				Filaree	10
				Red brome	5
				Burclover	5
155*:					
Diablo	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,900	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Filaree	10
				Barley	5
				Foxtail fescue	5
				Needlegrass	5
156*:					
Linne	Gravelly Fine Loamy	Favorable	2,100	Soft chess	15
		Normal	1,700	Blue oak	15
		Unfavorable	1,500	Wild oats	10
				Filaree	10
				Red brome	5
				Burclover	5
Zakme.					
162*:					
Lompico.					
McMullin	Shallow Gravelly Loamy	Favorable	2,800	Leather oak	20
		Normal	2,100	Manzanita	10
		Unfavorable	1,500	Poison oak	5
				Chamise	5
				Needlegrass	5
163*:					
Los Osos	Fine Loamy	Favorable	4,200	Wild oats	15
		Normal	3,200	Brome	10
		Unfavorable	2,500	Fescue	10
				Needlegrass	10
				Bluegrass	10
				Filaree	10
				Oak	5
				Soft chess	5
Lodo	Shallow Gravelly Fine Loamy	Favorable	2,500	Wild oats	10
		Normal	1,800	Red brome	10
		Unfavorable	1,200	Rattail fescue	10
				Fescue	10
				Redstem filaree	10
				Purple needlegrass	5
				Chamise	5
				Scrub oak	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
164*:					
Los Osos	Fine Loamy	Favorable	4,200	Wild oats	15
		Normal	3,200	Brome	10
		Unfavorable	2,500	Fescue	10
				Needlegrass	10
				Bluegrass	10
				Filaree	10
				Oak	5
				Soft chess	5
Rock outcrop.					
165*:					
McMullin	Shallow Gravelly Loamy	Favorable	2,800	Leather oak	20
		Normal	2,100	Manzanita	10
		Unfavorable	1,500	Poison oak	5
				Chamise	5
				Needlegrass	5
				Brome	5
Rock outcrop.					
166	Sandy Bottom	Favorable	1,500	Redstem filaree	20
Metz		Normal	1,400	Brome	20
		Unfavorable	1,300	Lupine	5
				Clover	5
				Oats	5
				Mouse barley	5
				Oak	5
167*:					
Metz	Sandy Bottom	Favorable	1,500	Redstem filaree	20
		Normal	1,300	Brome	20
		Unfavorable	1,000	Lupine	5
				Clover	5
				Oats	5
				Mouse barley	5
				Oak	5
Tujunga	Sandy Wash	Favorable	1,100	Redstem filaree	10
		Normal	1,000	Brome	10
		Unfavorable	900	Mule fat	10
				Plummer baccharis	5
				California sycamore	5
				Willow	5
168*:					
Millsholm	Shallow Fine Loamy	Favorable	1,350	Soft chess	15
		Normal	1,250	Oats	15
		Unfavorable	1,100	Filaree	15
				Oak	5
				Red brome	5
				Foxtail fescue	5
				Rattail fescue	5
Ayar	Clayey	Favorable	5,000	Wild oats	20
		Normal	2,500	Soft chess	15
		Unfavorable	1,900	Burclover	10
				Brome	10
				Filaree	10
				Barley	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
169*, 170*:					
Millsholm	Shallow Fine Loamy	Favorable	1,500	Soft chess	15
		Normal	1,400	Wild oats	15
		Unfavorable	1,200	Filaree	10
				Burclover	5
				Red brome	5
				Fescue	5
Dibble	Fine Loamy	Favorable	4,000	Blue oak	15
		Normal	2,800	Soft chess	15
		Unfavorable	2,000	Wild oats	10
				Burclover	10
				Clover	5
				Trefoil	5
171*:					
Millsholm	Shallow Fine Loamy	Favorable	1,350	Soft chess	15
		Normal	1,250	Oats	15
		Unfavorable	1,100	Filaree	15
				Red brome	5
				Foxtail fescue	5
				Rattail fescue	5
				California buckwheat	5
				Oak	5
Montara	Shallow Fine Loamy (Serpentine)	Favorable	1,300	Oats	15
		Normal	1,100	Soft chess	10
		Unfavorable	900	Filaree	10
				Sixweeks threeawn	5
				Needlegrass	5
				Red brome	5
				Rattail fescue	5
				Barley	5
172*:					
Millsholm	Shallow Fine Loamy	Favorable	1,500	Soft chess	15
		Normal	1,350	Wild oats	15
		Unfavorable	1,100	Filaree	10
				Red brome	5
				Burclover	5
				Fescue	5
				Needlegrass	5
				Oak	5
Rock outcrop.					
173, 174 Mocho	Fine Loamy Bottom	Favorable	5,200	Wild oats	15
		Normal	3,500	Soft chess	10
		Unfavorable	2,500	Filaree	10
				Burclover	10
				Clover	5
				Oak	5
				Lupine	5
175, 176 Nacimiento	Fine Loamy	Favorable	3,900	Soft chess	15
		Normal	2,900	Wild oats	10
		Unfavorable	2,200	Burclover	10
				Oak	10
				Filaree	10
				Needlegrass	10
				Annual lupine	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
177*, 178*:					
Nacimiento	Fine Loamy	Favorable	3,900	Soft chess	15
		Normal	2,900	Wild oats	10
		Unfavorable	2,200	Burclover	10
				Oak	10
				Filaree	10
				Needlegrass	10
				Lupine	5
Ayar	Clayey	Favorable	5,200	Wild oats	20
		Normal	2,950	Soft chess	15
		Unfavorable	2,200	Burclover	10
				Brome	10
				Filaree	10
				Barley	5
				Foxtail fescue	5
179*, 180*, 181*:					
Nacimiento	Fine Loamy	Favorable	3,900	Soft chess	15
		Normal	2,900	Wild oats	10
		Unfavorable	2,200	Burclover	10
				Oak	10
				Filaree	10
				Needlegrass	10
				Foxtail fiscue	5
Los Osos	Fine Loamy	Favorable	4,200	Wild oats	15
		Normal	3,200	Brome	10
		Unfavorable	2,500	Fescue	10
				Needlegrass	10
				Bluegrass	10
				Filaree	10
				Oak	5
				Soft chess	5
182	Sandy Bottom	Favorable	1,500	Soft chess	10
Oceano		Normal	1,300	Wild oats	10
		Unfavorable	1,000	Oak	5
				Manzanita	5
				Chamise	5
				Ripgut brome	5
				Foxtail fescue	5
				Clover	5
				Red brome	5
				Lupine	5
186	Fine Loamy Bottom (dry)	Favorable	3,400	Soft chess	20
Polonio		Normal	2,700	Wild oats	15
		Unfavorable	2,000	Burclover	15
				Redstem filaree	10
				Ripgut brome	5
				Red brome	5
187, 188, 189	Fine Loamy Bottom	Favorable	5,500	Soft chess	15
Rincon		Normal	3,500	Wild oats	10
		Unfavorable	2,500	Burclover	10
				Filaree	10
				Clover	10
				Oak	5
				Bluegrass	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
191---------- Ryer	Fine Loamy Bottom----------	Favorable Normal Unfavorable	5,250 2,900 2,200	Soft chess---------- Wild oats---------- Burclover---------- Filaree---------- Clover---------- Oak---------- Red brome----------	15 10 10 10 10 5 5
193*: San Andreas.					
Arujo----------	Coarse Loamy----------	Favorable Normal Unfavorable	2,750 2,200 1,700	Soft chess---------- Filaree---------- Wild oats---------- Burclover---------- Needlegrass---------- Ripgut brome---------- Blue oak---------- Coast live oak----------	20 15 10 10 5 5 5 5
196, 197---------- San Ysidro	Loamy Claypan----------	Favorable Normal Unfavorable	2,700 2,000 1,400	Soft chess---------- Clover---------- Filaree---------- Burclover---------- Plantain---------- Nodding needlegrass---------- Brome---------- Wild oats----------	15 10 10 10 5 5 5 5
198*: Santa Lucia--------	Gravelly Fine Loamy----------	Favorable Normal Unfavorable	2,100 1,700 1,500	Soft chess---------- Blue oak---------- Wild oats---------- Filaree---------- Red brome---------- Burclover---------- Oak---------- Trefoil---------- Buckbrush----------	15 15 10 10 5 5 5 5 5
Lopez----------	Shallow Gravelly Fine Loamy	Favorable Normal Unfavorable	1,800 1,300 700	Manzanita---------- Buckbrush---------- Wild oats---------- Annual fescue---------- Chamise---------- Needlegrass---------- Lupine---------- Red brome---------- Redstem filaree----------	20 10 5 5 5 5 5 5 5
199*: Santa Lucia--------	Gravelly Fine Loamy----------	Favorable Normal Unfavorable	2,100 1,700 1,500	Soft chess---------- Blue oak---------- Wild oats---------- Filaree---------- Red brome---------- Burclover---------- Oak---------- Trefoil---------- Buckbrush----------	15 15 10 10 5 5 5 5 5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
199*:					
Gazos	Gravelly Fine Loamy	Favorable	2,100	Soft chess	15
		Normal	1,700	Blue oak	15
		Unfavorable	1,500	Wild oats	10
				Filaree	10
				Red brome	5
				Burclover	5
				Scrub oak	5
200	Coarse Loamy	Favorable	3,000	Soft chess	15
Sesame		Normal	2,250	Oat	10
		Unfavorable	1,700	Filaree	10
				Blue oak	10
				Clover	10
				Ripgut brome	5
				Scrub oak	5
201, 202	Loamy North	Favorable	2,850	Blue oak	20
Shimmon		Normal	2,250	Soft chess	10
		Unfavorable	1,700	Wild oats	10
				Ripgut brome	5
				Longtongue muttongrass	5
				Red brome	5
				Foxtail fescue	5
				Oak	5
203*, 204*:					
Shimmon	Loamy North	Favorable	2,850	Blue oak	20
		Normal	2,250	Soft chess	10
		Unfavorable	1,700	Wild oats	10
				Ripgut brome	5
				Longtongue muttongrass	5
				Red brome	5
				Foxtail fescue	5
				Oak	5
Dibble	Fine Loamy	Favorable	3,700	Blue oak	15
		Normal	2,600	Soft chess	15
		Unfavorable	1,500	Burclover	10
				Clover	5
				Trefoil	5
				Filaree	5
				Wild oats	5
210	Coarse Loamy	Favorable	2,550	Wild oats	15
Vista		Normal	2,050	Soft chess	10
		Unfavorable	1,500	Filaree	10
				Interior live oak	10
				Chamise	5
				Bluegrass	5
				Needlegrass	5
				Foxtail fescue	5
				Rattail fescue	5
211*:					
Vista	Coarse Loamy	Favorable	2,550	Wild oats	15
		Normal	2,000	Soft chess	10
		Unfavorable	1,500	Filaree	10
				Interior live oak	10
				Chamise	5
				Bluegrass	5
				Needlegrass	5
				Rattail fescue	5
				Red brome	5
				Foxtail fescue	5

See footnote at end of table.

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
211*:					
Cieneba	Shallow Coarse Loamy	Favorable	1,900	Chamise	35
		Normal	1,700	Buckbrush	10
		Unfavorable	1,250	Redstem filaree	10
				Red brome	10
				Foothill stipa	5
				Rattail fescue	5

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
100 Arbuckle	Slight	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Severe: low strength.
101 Arbuckle	Slight	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength, slope.	Severe: low strength.
102*: Arbuckle	Moderate: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: shrink-swell, low strength, slope.	Severe: slope.	Severe: low strength.
Positas	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell, low strength.	Severe: low strength, shrink-swell.
103*, 104*, 105*: Arbuckle	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Positas	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, shrink-swell.	Severe: slope, shrink-swell, low strength.	Severe: slope, low strength, shrink-swell.
106*: Arbuckle	Slight	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength, slope.	Severe: low strength.
San Ysidro	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
107 Arnold	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
108*: Arnold	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
109*: Ayar	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
109*: Diablo	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, slope, low strength.	Severe: shrink-swell, low strength.
110*, 111*: Ayar	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
Diablo	Severe: too clayey, slope.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: shrink-swell, slope, low strength.	Severe: shrink-swell, low strength, slope.
112*. Badland.					
113*: Balcom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Calleguas	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
114*, 115*: Balcom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
116--- Botella	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: low strength.
117--- Calleguas	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
118--- Camarillo	Severe: floods, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.
119--- Camarillo	Moderate: wetness.	Severe: floods.	Severe: wetness, floods.	Severe: floods.	Moderate: floods, low strength.
120--- Camatta	Severe: cemented pan.	Moderate: slope, cemented pan.	Severe: cemented pan.	Severe: slope.	Moderate: cemented pan, slope.
121--- Camatta	Severe: cemented pan, slope.	Severe: slope.	Severe: cemented pan, slope.	Severe: slope.	Severe: slope.
122--- Capay	Severe: too clayey.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: shrink-swell, low strength.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
123---------- Capay	Severe: too clayey, floods.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.
124, 125---------- Chanac	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
126---------- Cieneba	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
127*: Cieneba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Andregg----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
128*: Cieneba----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Vista----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
129---------- Clear Lake	Severe: wetness, floods, too clayey.	Severe: wetness, floods, shrink-swell.	Severe: wetness, shrink-swell, floods.	Severe: wetness, floods, shrink-swell.	Severe: wetness, low strength, floods.
130---------- Clear Lake	Severe: too clayey.	Severe: shrink-swell, low strength, floods.	Severe: shrink-swell, low strength, floods.	Severe: shrink-swell, floods, low strength.	Severe: shrink-swell, low strength.
131---------- Concepcion	Moderate: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
132, 133---------- Cropley	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
134---------- Dibble	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.
135, 136, 137----- Dibble	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
138---------- Elder	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: low strength.
139---------- Elder	Slight----------	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
140---------- Elder	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
141*:					
Gaviota	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.					
142*, 143*:					
Gaviota	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
144, 145 Gazos	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, low strength.
146*:					
Gilroy	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Rock outcrop.					
147*:					
Hanford	Slight	Slight	Slight	Slight	Slight.
Greenfield	Slight	Slight	Slight	Slight	Slight.
148*:					
Hanford	Slight	Slight	Slight	Moderate: slope.	Slight.
Greenfield	Slight	Slight	Slight	Moderate: slope.	Slight.
149*:					
Hanford	Slight	Slight	Slight	Slight	Slight.
Greenfield	Slight	Slight	Slight	Slight	Slight.
150*:					
Hanford	Slight	Slight	Slight	Moderate: slope.	Slight.
Greenfield	Slight	Slight	Slight	Moderate: slope.	Slight.
151*:					
Henneke	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.
Rock outcrop.					
152*, 153*, 154*:					
Linne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Calodo	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
155*:					
Linne	Moderate: slope, too clayey, depth to rock.	Moderate: slope, shrink-swell, low strength.	Moderate: slope, depth to rock, shrink-swell.	Severe: slope.	Moderate: low strength, slope, shrink-swell.
Diablo	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, slope, low strength.	Severe: shrink-swell, low strength.
156*:					
Linne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Zakme	Severe: too clayey, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: low strength, slope, shrink-swell.
157--- Lockwood	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: shrink-swell, low strength.	Moderate: low strength, shrink-swell.	Severe: low strength.
158--- Lockwood	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: shrink-swell, low strength.	Moderate: slope, low strength, shrink-swell.	Severe: low strength.
159*:					
Lockwood	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: shrink-swell, low strength.	Moderate: slope, low strength, shrink-swell.	Severe: low strength.
Concepcion	Moderate: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
160*:					
Lockwood	Moderate: slope, too clayey.	Moderate: slope, low strength, shrink-swell.	Moderate: shrink-swell, low strength, slope.	Severe: slope.	Severe: low strength.
Concepcion	Moderate: slope, too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength.
161--- Lompico	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.
162*:					
Lompico	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.
McMullin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
163*:					
Los Osos	Severe: slope, too clayey.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: slope, low strength, shrink-swell.
Lodo	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
164*:					
Los Osos	Severe: slope, too clayey.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: slope, low strength, shrink-swell.
Rock outcrop.					
165*:					
McMullin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Rock outcrop.					
166 Metz	Severe: cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
167*:					
Metz	Severe: floods, cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Tujunga	Severe: cutbanks cave, floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
168*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Ayar	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
169*, 170*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Dibble	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
171*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Montara	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, low strength.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
172*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Rock outcrop.					
173--- Mocho	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell.	Severe: low strength.
174--- Mocho	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, low strength.	Severe: low strength.
175, 176--- Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.
177*, 178*:					
Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.
Ayar	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
179*, 180*, 181*:					
Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.
Los Osos	Severe: slope, too clayey.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: slope, shrink-swell, low strength.	Severe: slope, low strength, shrink-swell.
182--- Oceano	Severe: cutbanks cave.	Slight---	Slight---	Moderate: slope.	Slight.
183--- Pico	Slight---	Slight---	Slight---	Slight---	Slight.
184--- Pico	Slight---	Slight---	Slight---	Moderate: slope.	Slight.
185*. Pits					
186--- Polonio	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: low strength.
187, 188--- Rincon	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
189--- Rincon	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
203*, 204*: Dibble	Severe: slope, too clayey.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.
205 Sorrento	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Severe: low strength.
206 Sorrento	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength.	Severe: low strength.
207 Still	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.
208 Still	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.
209 Still	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Moderate: shrink-swell, low strength.
210 Vista	Moderate: slope, depth to rock.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
211*: Vista	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cieneba	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
212*: Xerofluvents.					
Riverwash.					
213 Zakme	Severe: too clayey, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: low strength, slope, shrink-swell.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
190*: Rock outcrop.					
Gaviota	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
191--- Ryer	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: low strength, shrink-swell.
192--- San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
193*: San Andreas	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.
Arujo	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, slope, shrink-swell.
194--- San Emigdio	Slight	Slight	Slight	Slight	Moderate: low strength.
195--- San Emigdio	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
196, 197--- San Ysidro	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
198*: Santa Lucia	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Lopez	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
199*: Santa Lucia	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Gazos	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, low strength.
200--- Sesame	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
201, 202--- Shimmon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.
203*, 204*: Shimmon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," and "fair." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
100---------- Arbuckle	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight----------	Good.
101---------- Arbuckle	Severe: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Good.
102*: Arbuckle----------	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: slope.
Positas----------	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Poor: too clayey.
103*: Arbuckle----------	Severe: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
Positas----------	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope, too clayey.
104*, 105*: Arbuckle----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Positas----------	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, too clayey.
106*: Arbuckle----------	Severe: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Good.
San Ysidro----------	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
107---------- Arnold	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: too sandy, slope, seepage.
108*: Arnold----------	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope.	Poor: too sandy, slope, seepage.
San Andreas---------	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
109*: Ayar----------	Severe: percs slowly, depth to rock.	Severe: slope.	Severe: too clayey, depth to rock.	Moderate: slope.	Poor: too clayey.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
109*:					
Diablo	Severe: percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey.
110*:					
Ayar	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: too clayey, slope, depth to rock.	Severe: slope.	Poor: slope, too clayey.
Diablo	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock, too clayey.	Severe: slope.	Poor: slope, too clayey.
111*:					
Ayar	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: slope, too clayey.
Diablo	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: slope, too clayey.
112*. Badland					
113*:					
Balcom	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Calleguas	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
114*:					
Balcom	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
115*:					
Balcom	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
116--- Botella	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
117--Calleguas	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
118--Camarillo	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: too clayey, wetness.
119--Camarillo	Severe: wetness.	Severe: floods.	Severe: wetness.	Moderate: floods, wetness.	Fair: too clayey.
120--Camatta	Severe: cemented pan.	Severe: slope.	Moderate: cemented pan.	Moderate: slope.	Poor: thin layer, area reclaim, slope.
121--Camatta	Severe: cemented pan, slope.	Severe: slope.	Moderate: cemented pan.	Severe: slope.	Poor: thin layer, area reclaim, slope.
122--Capay	Severe: percs slowly.	Severe: floods.	Severe: too clayey.	Moderate: floods.	Poor: too clayey.
123--Capay	Severe: percs slowly, floods.	Severe: floods.	Severe: too clayey, floods.	Severe: floods.	Poor: too clayey.
124--Chanac	Severe: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
125--Chanac	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
126--Cieneba	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
127*:					
Cieneba	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Andregg	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
128*:					
Cieneba	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Vista	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
129--Clear Lake	Severe: wetness, floods, percs slowly.	Severe: wetness, floods.	Severe: wetness, floods, too clayey.	Severe: wetness, floods.	Poor: wetness, too clayey.
130--Clear Lake	Severe: percs slowly.	Slight	Severe: too clayey.	Moderate: floods.	Poor: too clayey.
131--Conception	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
132--Cropley	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey.
133--Cropley	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
134--Dibble	Severe: percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey, thin layer, area reclaim.
135--Dibble	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, too clayey.	Severe: slope.	Poor: slope, thin layer, area reclaim.
136, 137--Dibble	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor; slope, thin layer, area reclaim.
138--Elder	Moderate: percs slowly.	Moderate: seepage.	Slight	Slight	Good.
139--Elder	Moderate: percs slowly.	Moderate: slope, seepage.	Slight	Slight	Good.
140--Elder	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Good.
141*:					
Gaviota	Severe: slope, depth to rock.	Severe: seepage, depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
142*:					
Gaviota	Severe: slope, depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
San Andreas	Severe: slope, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
143*:					
Gaviota	Severe: slope, depth to rock.	Severe: seepage, depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
143*: San Andreas	Severe: slope.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
144 Gazos	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
145 Gazos	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
146*: Gilroy	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
147*, 148*: Hanford	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
Greenfield	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
149*: Hanford	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
Greenfield	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
150*: Hanford	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
Greenfield	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
151*: Henneke	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope.	Poor: slope, thin layer, large stones.
Rock outcrop.					
152*: Linne	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Calodo	Severe: percs slowly, slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
153*, 154*:					
Linne	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Calodo	Severe: percs slowly, slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
155*:					
Linne	Severe: depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Poor: area reclaim. thin layer.
Diablo	Severe: percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: too clayey.
156*:					
Linne	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Zakme	Severe: percs slowly, slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, slope.
157 Lockwood	Severe: percs slowly.	Slight	Moderate: too clayey.	Slight	Fair: small stones, too clayey.
158 Lockwood	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: small stones, too clayey.
159*:					
Lockwood	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: small stones, too clayey.
Concepcion	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
160*:					
Lockwood	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: small stones, too clayey, slope.
Concepcion	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: slope, too clayey.
161 Lompico	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
162*:					
Lompico	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
McMullin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
163*:					
Los Osos	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: area reclaim, slope, too clayey.
Lodo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope, thin layer, area reclaim.
164*:					
Los Osos	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: slope, area reclaim, too clayey.
Rock outcrop.					
165*:					
McMullin	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
166 Metz	Moderate: floods.	Severe: seepage, floods.	Severe: seepage, too sandy.	Severe: seepage.	Fair: too sandy.
167*:					
Metz	Severe: floods.	Severe: seepage, floods.	Severe: floods, seepage, too sandy.	Severe: floods, seepage.	Fair: too sandy.
Tujunga	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage, too sandy.	Severe: floods, seepage.	Poor: too sandy, seepage.
168*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Ayar	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: slope, too clayey.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
169*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Dibble	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: depth to rock, too clayey.	Severe: slope.	Poor: thin layer, area reclaim, too clayey.
170*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Dibble	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: thin layer, area reclaim, too clayey.
171*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Montara	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
172*:					
Millsholm	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Rock outcrop.					
173 Mocho	Severe: percs slowly.	Slight	Slight	Slight	Good.
174 Mocho	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
175 Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
176 Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
177*:					
Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Ayar	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: too clayey, depth to rock.	Severe: slope.	Poor: slope, too clayey.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
178*:					
Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Ayar	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: slope, too clayey.
179*:					
Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Los Osos	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Severe: slope.	Poor: area reclaim, slope, too clayey.
180*, 181*:					
Nacimiento	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
Los Osos	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: area reclaim, slope, too clayey.
182 Oceano	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
183, 184 Pico	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
185*. Pits					
186 Polonio	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
187 Rincon	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey.
188 Rincon	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
189 Rincon	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, slope.
190*: Rock outcrop.					
Gaviota	Severe: slope, depth to rock.	Severe: seepage, depth to rock, slope.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
191 Ryer	Severe: percs slowly.	Moderate: slope, seepage.	Severe: too clayey.	Slight	Poor: too clayey.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
192---------- San Andreas	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: seepage, depth to rock.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
193*: San Andreas--------	Severe: depth to rock.	Severe: slope, seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Poor: area reclaim, thin layer.
Arujo----------	Severe: percs slowly, depth to rock.	Severe: seepage, slope.	Severe: depth to rock.	Severe: seepage.	Fair: slope, too clayey, area reclaim.
194, 195---------- San Emigdio	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
196---------- San Ysidro	Severe: percs slowly.	Moderate: slope, seepage.	Severe: too clayey.	Slight----------	Poor: too clayey.
197---------- San Ysidro	Severe: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight----------	Poor: too clayey.
198*: Santa Lucia--------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, area reclaim, small stones.
Lopez----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, area reclaim, thin layer.
199*: Santa Lucia--------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, area reclaim, small stones.
Gazos----------	Severe: slope, percs slowly, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
200---------- Sesame	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
201---------- Shimmon	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
202---------- Shimmon	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.
203*, 204*: Shimmon----------	Severe: slope, depth to rock, percs slowly.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, area reclaim.

See footnote at end of table.

TABLE 7.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
203*, 204*: Dibble	Severe: slope, percs slowly, depth to rock.	Severe: slope.	Severe: slope, depth to rock, too clayey.	Severe: slope.	Poor: slope, thin layer, area reclaim.
205, 206--- Sorrento	Severe: percs slowly.	Slight---	Moderate: too clayey.	Slight---	Fair: too clayey.
207--- Still	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight---	Fair: too clayey, small stones.
208--- Still	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight---	Fair: too clayey.
209--- Still	Severe: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight---	Fair: too clayey.
210--- Vista	Severe: depth to rock.	Severe: slope, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: thin layer, area reclaim.
211*: Vista---	Severe: slope, depth to rock.	Severe: slope, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Cieneba---	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
212*: Xerofluvents. Riverwash.					
213--- Zakme	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
100, 101--Arbuckle	Poor: low strength.	Unsuited	Unsuited	Fair: small stones.
102*:				
Arbuckle	Poor: low strength.	Unsuited	Unsuited	Fair: small stones, slope.
Positas	Poor: low strength, shrink-swell.	Poor: excess fines.	Unsuited	Fair: slope, small stones.
103*:				
Arbuckle	Poor: low strength.	Unsuited	Unsuited	Poor: slope.
Positas	Poor: low strength, shrink-swell.	Poor: excess fines.	Unsuited	Poor: slope.
104*, 105*:				
Arbuckle	Poor: low strength, slope.	Unsuited	Unsuited	Poor: slope.
Positas	Poor: slope, low strength, shrink-swell.	Poor: excess fines.	Unsuited	Poor: slope.
106*:				
Arbuckle	Poor: low strength.	Unsuited	Unsuited	Fair: small stones.
San Ysidro	Poor: low strength.	Unsuited	Unsuited	Good.
107--Arnold	Fair: slope, thin layer, area reclaim.	Fair: excess fines.	Unsuited	Poor: slope.
108*:				
Arnold	Poor: slope.	Fair: excess fines.	Unsuited	Poor: slope.
San Andreas	Poor: slope.	Unsuited: thin layer.	Unsuited	Poor: slope.
109*:				
Ayar	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: too clayey.
Diablo	Poor: shrink-swell, low strength.	Unsuited	Unsuited	Poor: too clayey.
110*:				
Ayar	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
110*:				
Diablo	Poor: shrink-swell, low strength.	Unsuited	Unsuited	Poor: slope, too clayey.
111*:				
Ayar	Poor: slope, low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.
Diablo	Poor: slope, shrink-swell, low strength.	Unsuited	Unsuited	Poor: slope, too clayey.
112*.				
Badland				
113*:				
Balcom	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Calleguas	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope, small stones.
114*:				
Balcom	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Nacimiento	Poor: low strength, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
115*:				
Balcom	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Nacimiento	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
116 Botella	Fair: low strength.	Unsuited	Unsuited	Fair: small stones.
117 Calleguas	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope, small stones, area reclaim.
118 Camarillo	Fair: low strength, wetness.	Unsuited	Unsuited	Good.
119 Camarillo	Fair: wetness, low strength.	Unsuited	Unsuited	Fair: too clayey.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
120--- Camatta	Poor: area reclaim, thin layer.	Poor: excess fines.	Poor: excess fines.	Fair: slope, area reclaim.
121--- Camatta	Poor: thin layer, area reclaim.	Poor: excess fines.	Poor: excess fines.	Poor: slope.
122, 123--- Capay	Poor: shrink-swell, low strength.	Unsuited---	Unsuited---	Poor: too clayey.
124--- Chanac	Fair: slope, low strength, shrink-swell.	Unsuited---	Unsuited---	Poor: slope.
125--- Chanac	Poor: slope.	Unsuited---	Unsuited---	Poor: slope.
126--- Cieneba	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited---	Poor: slope, area reclaim.
127*: Cieneba---	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited---	Poor: slope, area reclaim.
Andregg---	Poor: thin layer, area reclaim, slope.	Unsuited: thin layer.	Unsuited---	Poor: slope.
128*: Cieneba---	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited---	Poor: slope, area reclaim.
Vista---	Poor: area reclaim, slope, thin layer.	Unsuited: thin layer.	Unsuited---	Poor: slope.
129--- Clear Lake	Poor: low strength, shrink-swell.	Unsuited---	Unsuited---	Poor: wetness, too clayey.
130--- Clear Lake	Poor: low strength, shrink-swell.	Unsuited---	Unsuited---	Poor: too clayey.
131--- Concepcion	Poor: low strength, shrink-swell.	Unsuited---	Unsuited---	Good.
132, 133--- Cropley	Poor: shrink-swell, low strength.	Unsuited---	Unsuited---	Poor: too clayey.
134--- Dibble	Poor: low strength, shrink-swell, thin layer.	Unsuited---	Unsuited---	Poor: too clayey.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
135, 136, 137--------- Dibble	Poor: slope, low strength, shrink-swell.	Unsuited----------	Unsuited----------	Poor: slope, too clayey.
138, 139, 140--------- Elder	Fair: low strength.	Poor: excess fines.	Unsuited----------	Good.
141*: Gaviota----------	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited----------	Poor: slope, area reclaim.
Rock outcrop.				
142*: Gaviota----------	Poor: thin layer.	Unsuited: thin layer.	Unsuited----------	Poor: slope, area reclaim.
San Andreas----------	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited----------	Poor: slope.
143*: Gaviota----------	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited----------	Poor: slope.
San Andreas----------	Poor: slope, area reclaim, thin layer.	Unsuited: thin layer.	Unsuited----------	Poor: slope.
144---------- Gazos	Poor: low strength, area reclaim, thin layer.	Unsuited----------	Unsuited----------	Poor: slope, small stones.
145---------- Gazos	Poor: slope, thin layer, low strength.	Unsuited----------	Unsuited----------	Poor: slope, small stones.
146*: Gilroy----------	Poor: thin layer, area reclaim, slope.	Unsuited----------	Unsuited----------	Poor: slope, small stones.
Rock outcrop.				
147*, 148*: Hanford----------	Good----------	Poor: excess fines.	Unsuited----------	Good.
Greenfield----------	Good----------	Poor: excess fines.	Unsuited----------	Good.
149*: Hanford----------	Good----------	Poor: excess fines.	Unsuited----------	Poor: small stones.
Greenfield----------	Good----------	Poor: excess fines.	Unsuited----------	Poor: small stones.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
150*:				
Hanford	Good	Poor: excess fines.	Unsuited	Poor: small stones.
Greenfield	Good	Poor: excess fines.	Unsuited	Poor: small stones.
151*:				
Henneke	Poor: slope, thin layer, large stones.	Unsuited	Unsuited	Poor: slope, large stones, area reclaim.
Rock outcrop.				
152*:				
Linne	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: slope, small stones.
Calodo	Poor: thin layer, low strength, area reclaim.	Unsuited	Unsuited	Poor: slope, area reclaim.
153*, 154*:				
Linne	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: slope, small stones.
Calodo	Poor:, slope, thin layer, low strength.	Unsuited	Unsuited	Poor: slope, area reclaim.
155*:				
Linne	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: small stones.
Diablo	Poor: shrink-swell, low strength.	Unsuited	Unsuited	Poor: too clayey.
156*:				
Linne	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited: thin layer.	Poor: slope, small stones.
Zakme	Poor: low strength, slope, shrink-swell.	Unsuited	Unsuited	Poor: too clayey, slope.
157, 158 Lockwood	Poor: low strength.	Unsuited	Unsuited	Poor: small stones.
159*:				
Lockwood	Poor: low strength.	Unsuited	Unsuited	Poor: small stones.
Concepcion	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Good.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
160*:				
Lockwood	Poor: low strength.	Unsuited	Unsuited	Poor: small stones.
Concepcion	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Fair: slope.
161 Lompico	Poor: low strength, slope, thin layer.	Unsuited	Unsuited	Poor: slope.
162*:				
Lompico	Poor: low strength, slope, thin layer.	Unsuited	Unsuited	Poor: slope.
McMullin	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited	Poor: slope, small stones, area reclaim.
163*:				
Los Osos	Poor: low strength, slope, thin layer.	Unsuited	Unsuited	Poor: slope, too clayey.
Lodo	Poor: slope, area reclaim, thin layer.	Unsuited	Unsuited	Poor: slope, small stones, area reclaim.
164*:				
Los Osos	Poor: low strength, slope, thin layer.	Unsuited	Unsuited	Poor: slope, too clayey.
Rock outcrop.				
165*:				
McMullin	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited	Poor: slope, small stones, area reclaim.
Rock outcrop.				
166 Metz	Good	Poor: excess fines.	Unsuited	Poor: too sandy.
167*:				
Metz	Good	Poor: excess fines.	Unsuited	Poor: too sandy.
Tujunga	Good	Fair: excess fines.	Unsuited	Poor: too sandy.
168*:				
Millsholm	Poor: thin layer, area reclaim, slope.	Unsuited	Unsuited	Poor: slope, area reclaim.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
168*:				
Ayar	Poor: slope, low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.
169*:				
Millsholm	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope, area reclaim.
Dibble	Poor: low strength, shrink-swell, thin layer.	Unsuited	Unsuited	Poor: slope, too clayey.
170*:				
Millsholm	Poor: thin layer, area reclaim, slope.	Unsuited	Unsuited	Poor: slope, area reclaim.
Dibble	Poor: slope, low strength, thin layer.	Unsuited	Unsuited	Poor: slope, too clayey.
171*:				
Millsholm	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope, area reclaim.
Montara	Poor: low strength, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
172*:				
Millsholm	Poor: thin layer, area reclaim, slope.	Unsuited	Unsuited	Poor: slope, area reclaim.
Rock outcrop.				
173, 174--- Mocho	Fair: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey, small stones.
175--- Nacimiento	Poor: thin layer, area reclaimed.	Unsuited	Unsuited	Poor: slope.
176--- Nacimiento	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
177*:				
Nacimiento	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Ayar	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
178*:				
Nacimiento	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Ayar	Poor: slope, low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.
179*:				
Nacimiento	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Los Osos	Poor: low strength, shrink-swell, thin layer.	Unsuited	Unsuited	Poor: slope, too clayey.
180*, 181*:				
Nacimiento	Poor: slope, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
Los Osos	Poor: low strength, slope, thin layer.	Unsuited	Unsuited	Poor: slope, too clayey.
182 Oceano	Good	Poor: excess fines.	Unsuited	Fair: too sandy.
183, 184 Pico	Good	Poor: excess fines.	Unsuited	Good.
185*. Pits				
186 Polonio	Poor: low strength.	Unsuited	Unsuited	Fair: too clayey.
187, 188 Rincon	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey.
189 Rincon	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Fair: too clayey, slope.
190*: Rock outcrop.				
Gaviota	Poor: slope, thin layer, area reclaim.	Unsuited: thin layer.	Unsuited	Poor: slope, area reclaim.
191 Ryer	Poor: low strength, shrink-swell.	Unsuited	Unsuited	Poor: too clayey.
192 San Andreas	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited	Poor: slope.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
193*:				
San Andreas	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited	Fair: slope, small stones, area reclaim.
Arujo	Fair: low strength, shrink-swell, area reclaim.	Unsuited	Unsuited	Fair: slope, too clayey.
194, 195 San Emigdio	Fair: low strength.	Poor: excess fines.	Unsuited	Good.
196, 197 San Ysidro	Poor: low strength.	Unsuited	Unsuited	Good.
198*:				
Santa Lucia	Poor: area reclaim, thin layer.	Unsuited	Unsuited	Poor: slope, small stones.
Lopez	Poor: slope, area reclaim, thin layer.	Unsuited	Unsuited: thin layer.	Poor: slope, small stones, area reclaim.
199*:				
Santa Lucia	Poor: slope, area reclaim, thin layer.	Unsuited	Unsuited	Poor: slope, small stones.
Gazos	Poor: slope, thin layer, low strength.	Unsuited	Unsuited	Poor: slope, small stones.
200 Sesame	Poor: thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
201 Shimmon	Poor: low strength, thin layer, area reclaim.	Unsuited	Unsuited	Poor: slope.
202 Shimmon	Poor: low strength, thin layer, slope.	Unsuited	Unsuited	Poor: slope.
203*, 204*:				
Shimmon	Poor: low strength, thin layer, slope.	Unsuited	Unsuited	Poor: slope.
Dibble	Poor: slope, low strength, shrink-swell.	Unsuited	Unsuited	Poor: slope, too clayey.
205, 206 Sorrento	Poor: low strength.	Unsuited	Unsuited	Fair: too clayey.

See footnote at end of table.

TABLE 8.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
207--- Still	Fair: shrink-swell, low strength.	Unsuited---	Unsuited---	Poor: small stones.
208, 209--- Still	Fair: shrink-swell, low strength.	Unsuited---	Unsuited---	Fair: too clayey, small stones.
210--- Vista	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited---	Fair: slope, area reclaim.
211*: Vista---	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited---	Poor: slope.
Cleneba---	Poor: thin layer, area reclaim.	Unsuited: thin layer.	Unsuited---	Poor: slope, area reclaim.
212*: Xerofluvents. Riverwash.				
213--- Zakme	Poor: low strength, slope, shrink-swell.	Unsuited---	Unsuited---	Poor: too clayey, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
100--- Arbuckle	Favorable---	Low strength--	Favorable---	Favorable---	Favorable---	Favorable.
101--- Arbuckle	Slope---	Low strength--	Slope---	Slope---	Slope---	Slope.
102*, 103*, 104*, 105*:						
Arbuckle---	Slope---	Low strength--	Slope---	Slope---	Slope---	Slope.
Positas---	Slope---	Low strength, hard to pack.	Slope, percs slowly.	Slope, percs slowly, erodes easily.	Slope, percs slowly.	Slope, percs slowly, erodes easily.
106*:						
Arbuckle---	Slope---	low strength--	Slope---	Slope---	Slope---	Slope.
San Ysidro---	Slope---	Low strength, hard to pack.	Percs slowly, slope.	Percs slowly, slope, erodes easily.	Percs slowly, slope, erodes easily.	Percs slowly, slope, erodes easily.
107--- Arnold	Seepage, slope, depth to rock	Seepage, thin layer.	---	---	Slope, too sandy, soil blowing.	Slope, droughty.
108*:						
Arnold---	Seepage, slope, depth to rock	Seepage, thin layer.	---	---	Slope, soil blowing.	Slope, droughty, erodes easily.
San Andreas---	Slope, seepage.	Thin layer, low strength.	---	---	slope, depth to rock.	Slope.
109*, 110*, 111*:						
Ayar---	Slope, depth to rock	Low strength, hard to pack.	Slope, percs slowly.	Slope, slow intake, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
Diablo---	Slope---	Low strength, hard to pack, thin layer.	Slope, percs slowly.	Slope, slow intake, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
112*. Badland						
113*:						
Balcom---	Slope, depth to rock	Low strength, thin layer.	---	---	Slope, depth to rock, erodes easily.	Slope, depth to rock.
Calleguas---	Slope, depth to rock	Thin layer, low strength.	---	---	Slope, depth to rock.	Slope, rooting depth.
114*, 115*:						
Balcom---	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth, erodes easily.	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.
Nacimiento---	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope---	Slope, depth to rock.	Slope, depth to rock.

See footnote at end of table.

TABLE 9.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
116---------- Botella	Favorable-----	Favorable-----	Favorable------	Erodes easily	Favorable------	Erodes easily.
117---------- Calleguas	Slope, depth to rock	Thin layer, low strength.	----------	----------	Slope, depth to rock.	Slope, rooting depth.
118---------- Camarillo	Seepage-------	Low strength, wetness.	Floods---------	Wetness, floods.	Wetness--------	Wetness.
119---------- Camarillo	Seepage-------	Low strength--	Favorable------	Favorable------	Favorable------	Favorable.
120, 121---------- Camatta	Slope, cemented pan.	Thin layer, piping, low strength.	----------	----------	Slope, cemented pan, erodes easily.	Slope, rooting depth.
122---------- Capay	Favorable-----	Low strength, hard to pack.	Percs slowly---	Percs slowly, slow intake.	Percs slowly---	Percs slowly.
123---------- Capay	Favorable-----	Low strength, hard to pack.	Floods, percs slowly.	Floods, percs slowly.	Percs slowly---	Percs slowly.
124, 125---------- Chanac	Slope---------	Low strength--	----------	----------	Slope----------	Slope.
126---------- Cieneba	Slope, depth to rock seepage.	Thin layer----	----------	----------	Slope, depth to rock.	Slope, rooting depth, droughty.
127*: Cieneba----------	Slope, depth to rock seepage.	Thin layer----	----------	----------	Slope, depth to rock.	Slope, rooting depth, droughty.
Andregg----------	Slope, seepage, depth to rock	Thin layer----	----------	----------	Slope, depth to rock.	Droughty, slope, depth to rock.
128*: Cieneba----------	Slope, depth to rock seepage.	Thin layer----	----------	----------	Slope, depth to rock.	Slope, rooting depth, droughty.
Vista----------	Slope, seepage.	Thin layer----	----------	----------	Slope, depth to rock.	Slope, droughty, depth to rock.
129---------- Clear Lake	Favorable-----	Low strength, hard to pack.	Floods, percs slowly.	Wetness, floods, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly, excess salt.
130---------- Clear Lake	Favorable-----	Low strength, hard to pack.	Percs slowly---	Percs slowly, slow intake.	Percs slowly---	Percs slowly.
131---------- Concepcion	Slope---------	Low strength, hard to pack.	Percs slowly, slope.	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
132---------- Cropley	Favorable-----	Low strength, hard to pack.	Percs slowly---	Slow intake, percs slowly.	Percs slowly---	Percs slowly, slope.
133---------- Cropley	Slope---------	Low strength, hard to pack.	Percs slowly, slope.	Slow intake, percs slowly, slope.	Percs slowly---	Percs slowly, slope.

See footnote at end of table.

TABLE 9.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
134, 135, 136, 137--- Dibble	Slope, depth to rock	Low strength, hard to pack, thin layer.	Slope, percs slowly, depth to rock.	Slope, percs slowly, rooting depth.	Slope, percs slowly, depth to rock.	Slope, percs slowly, depth to rock.
138--- Elder	Seepage	Low strength	Favorable	Favorable	Slope	Slope.
139--- Elder	Slope, seepage.	Low strength	Slope	Slope, erodes easily.	Slope	Slope, erodes easily.
140--- Elder	Slope, seepage.	Low strength	Floods	Floods	Slope	Slope.
141*: Gaviota	Slope, depth to rock	Thin layer			Slope, depth to rock.	Slope, rooting depth.
Rock outcrop.						
142*, 143*: Gaviota	Slope, depth to rock	Thin layer			Slope, depth to rock.	Slope, rooting depth.
San Andreas	Slope, seepage, depth to rock	Low strength, thin layer.			Slope, depth to rock.	Slope, depth to rock.
144, 145--- Gazos	Slope, depth to rock	Thin layer, low strength.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
146*: Gilroy	Slope, depth to rock	Low strength, thin layer.			Slope, depth to rock.	Slope, rooting depth.
Rock outcrop.						
147*: Hanford	Seepage	Low strength	Favorable	Favorable	Favorable	Slope.
Greenfield	Seepage	Low strength	Favorable	Favorable	Favorable	Slope.
148*: Hanford	Slope, seepage.	Low strength	Favorable	Slope	Favorable	Slope.
Greenfield	Slope, seepage.	Low strength	Favorable	Slope	Favorable	Slope.
149*: Hanford	Seepage	Low strength	Favorable	Droughty	Favorable	Slope.
Greenfield	Seepage	Low strength	Favorable	Droughty	Favorable	Slope.
150*: Hanford	Slope, seepage.	Low strength	Slope	Droughty, slope.		
Greenfield	Seepage, slope.	Low strength	Slope	Droughty, slope.	Favorable	Slope.
151*: Henneke	Slope, depth to rock	Thin layer, large stones.			Slope, depth to rock, large stones.	Slope, rooting depth, large stones.

See footnote at end of table.

TABLE 9.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
151*: Rock outcrop.						
152*, 153*, 154*: Linne	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
Calodo	Slope, depth to rock	Slope, thin layer, low strength.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, rooting depth.
155*: Linne	Slope, depth to rock	Low strength, thin layer,	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
Diablo	Slope, depth to rock	Low strength, hard to pack.	Slope, percs slowly.	Slope, slow intake, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
156*: Linne	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
Zakme	Slope, depth to rock	Low strength, hard to pack.	----------	----------	Slope, percs slowly.	Slope, percs slowly.
157 Lockwood	Favorable	Low strength	Favorable	Favorable	Erodes easily	Erodes easily.
158 Lockwood	Slope	Low strength	Slope	Erodes easily	Slope, erodes easily.	Slope, erodes easily.
159*, 160*: Lockwood	Slope	Low strength	Slope	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Concepcion	Slope	Low strength, hard to pack.	Percs slowly, slope.	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
161 Lompico	Slope, depth to rock seepage.	Low strength, thin layer.	----------	----------	Slope, depth to rock.	Slope, depth to rock.
162*: Lompico	Slope, depth to rock seepage.	Low strength, thin layer.	----------	----------	Slope, depth to rock.	Slope, depth to rock.
McMullin	Slope, depth to rock	Thin layer, low strength.	----------	----------	Slope, depth to rock.	Slope, rooting depth.
163*: Los Osos	Slope, depth to rock	Hard to pack, thin layer, low strength.	----------	----------	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Lodo	Slope, depth to rock	Thin layer, low strength.	----------	----------	Slope, depth to rock.	Slope, rooting depth.
164*: Los Osos	Slope, depth to rock	Hard to pack, thin layer, low strength.	----------	----------	Slope, depth to rock, percs slowly.	Slope, depth to rock.
Rock outcrop.						

See footnote at end of table.

TABLE 9.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
165*:						
McMullin	Slope, depth to rock	Thin layer	---	---	Slope, depth to rock.	Slope, rooting depth.
Rock outcrop.						
166--- Metz	Slope, seepage.	Piping, low strength.	Slope	Slope, droughty, fast intake.	Slope, too sandy.	Slope, droughty.
167*:						
Metz	Slope, seepage.	Piping, low strength.	Floods	Slope, floods, droughty.	Slope, too sandy.	Slope, droughty.
Tujunga	Seepage	Seepage, low strength.	Floods	Low strength, floods, fast intake.	Slope, too sandy.	Slope, droughty.
168*:						
Millsholm	Slope, depth to rock	Thin layer	---	---	Depth to rock, slope.	Slope, rooting depth, erodes easily.
Ayar	Slope, depth to rock	Low strength, hard to pack.	---	---	Slope, percs slowly.	Slope, percs slowly.
169*, 170*:						
Millsholm	Slope, depth to rock	Thin layer	---	---	Depth to rock, slope.	Slope, rooting depth, erodes easily.
Dibble	Slope, depth to rock	Low strength, hard to pack, thin layer.	---	---	Slope, percs slowly, depth to rock.	Slope, percs slowly, depth to rock.
171*:						
Millsholm	Slope, depth to rock	Thin layer	---	---	Depth to rock, slope, erodes easily.	Slope, rooting depth, erodes easily.
Montara	Slope, depth to rock	Thin layer	---	---	Slope, depth to rock.	Slope, rooting depth.
172*:						
Millsholm	Slope, depth to rock	Thin layer	---	---	Depth to rock, slope, erodes easily.	Slope, rooting depth, erodes easily.
Rock outcrop.						
173--- Mocho	Favorable	Low strength	Favorable	Favorable	Favorable	Erodes easily.
174--- Mocho	Slope	Low strength	Slope	Slope, erodes easily.	Slope	Slope, erodes easily.
175, 176--- Nacimiento	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
177*, 178*:						
Nacimiento	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
Ayar	Slope, depth to rock	Low strength, hard to pack.	Slope, percs slowly.	Slope, slow intake, percs slowly.	Slope, percs slowly, depth to rock.	Slope, percs slowly.

See footnote at end of table.

TABLE 9.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
179*, 180*, 181*: Nacimiento	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
Los Osos	Slope, depth to rock	Hard to pack, thin layer, low strength.	Slope, depth to rock, percs slowly.	Slope, rooting depth, percs slowly.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
182--- Oceano	Slope, seepage.	Seepage, low strength.	Slope---	Slope, droughty, fast intake.	Slope, too sandy.	Slope, droughty.
183--- Pico	Seepage---	Low strength--	Favorable---	Favorable---	Favorable---	Favorable.
184--- Pico	Slope, seepage.	Low strength--	Slope---	Slope---	Slope---	Slope.
185*. Pits						
186--- Polonio	Slope---	Low strength, piping.	Slope---	Slope, erodes easily.	Slope---	Slope, erodes easily.
187--- Rincon	Favorable---	Hard to pack, low strength.	Percs slowly---	Percs slowly---	Percs slowly---	Erodes easily, percs slowly.
188--- Rincon	Slope---	Hard to pack, low strength.	Slope, percs slowly.	Percs slowly, erodes easily.	Percs slowly---	Erodes easily, percs slowly.
189--- Rincon	Slope---	Hard to pack, low strength.	Slope, percs slowly.	Percs slowly, slope, erodes easily.	Percs slowly, slope.	Erodes easily, percs slowly, slope.
190*: Rock outcrop.						
Gaviota	Slope, depth to rock	Thin layer---	---	---	Slope, depth to rock.	Slope, rooting depth.
191--- Ryer	Slope---	Low strength, hard to pack.	Percs slowly---	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
192--- San Andreas	Slope, seepage, depth to rock	Low strength, piping.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
193*: San Andreas	Slope, seepage, depth to rock	Low strength, piping.	Slope, depth to rock.	Slope, rooting depth.	Slope, depth to rock.	Slope, depth to rock.
Arujo	Slope, depth to rock seepage.	Low strength, thin layer.	Slope---	Slope---	Slope---	Slope.
194--- San Emigdio	Seepage---	Piping, low strength.	Favorable---	Favorable---	Favorable---	Favorable.
195--- San Emigdio	Seepage, slope.	Piping, low strength.	Slope---	Slope---	Slope---	Slope.
196--- San Ysidro	Slope---	Low strength, hard to pack.	Percs slowly, slope.	Percs slowly, slope, erodes easily.	Percs slowly, slope, erodes easily.	Percs slowly, slope, erodes easily.

See footnote at end of table.

TABLE 9.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
197---------- San Ysidro	Favorable-----	Low strength, hard to pack.	Percs slowly---	Percs slowly---	Percs slowly, erodes easily.	Percs slowly, erodes easily.
198*: Santa Lucia------	Slope, depth to rock seepage.	Thin layer----	Slope, depth to rock.	Slope, rooting depth.	Complex slope, depth to rock.	Slope, depth to rock.
Lopez----------	Slope, depth to rock	Thin layer----	----------	----------	Slope, depth to rock.	Slope, rooting depth.
199*: Santa Lucia------	Slope, depth to rock seepage.	Thin layer----	Slope, depth to rock.	Slope, rooting depth.	Complex slope, depth to rock.	Slope, depth to rock.
Gazos----------	Slope, depth to rock	Thin layer, low strength.	Slope, depth to rock.	Slope, rooting depth.	Slope----------	Slope, depth to rock.
200---------- Sesame	Depth to rock, slope, seepage.	Thin layer, low strength, piping.	Depth to rock, slope.	Rooting depth, slope.	Depth to rock, slope.	Slope, depth to rock.
201, 202---------- Shimmon	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth, erodes easily.	Slope, depth to rock.	Slope, erodes easily, depth to rock.
203*, 204*: Shimmon----------	Slope, depth to rock	Low strength, thin layer.	Slope, depth to rock.	Slope, rooting depth. erodes easily.	Slope, depth to rock.	Slope, erodes easily, depth to rock.
Dibble----------	Slope, depth to rock	Low strength, hard to pack, thin layer.	Slope, percs slowly, depth to rock.	Slope, percs slowly, rooting depth.	Slope, percs slowly, depth to rock.	Slope, percs slowly, depth to rock.
205, 206---------- Sorrento	Favorable-----	Low strength--	Favorable------	Favorable------	Favorable------	Favorable.
207, 208---------- Still	Favorable-----	Low strength--	Favorable------	Favorable------	Favorable------	Favorable.
209---------- Still	Slope---------	Low strength--	Slope----------	Slope----------	Slope----------	Slope.
210---------- Vista	Slope, seepage, depth to rock	Piping, low strength, thin layer.	Slope, depth to rock.	Slope, droughty, rooting depth.	Slope, depth to rock.	Slope, droughty, depth to rock.
211*: Vista----------	Slope, seepage, depth to rock	Piping, low strength, thin layer.	Slope, depth to rock.	Slope, droughty, rooting depth.	Slope, depth to rock.	Slope, droughty, depth to rock.
Cieneba----------	Slope, depth to rock seepage.	Thin layer----	Slope, depth to rock.	Slope, rooting depth, droughty.	Slope, depth to rock.	Slope, rooting depth, droughty.
212*: Xerofluvents. Riverwash.						
213---------- Zakme	Slope---------	Low strength, hard to pack.	----------	----------	Slope, percs slowly.	Slope, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
100 Arbuckle	Slight	Slight	Moderate: small stones.	Slight.
101 Arbuckle	Slight	Slight	Moderate: small stones, slope.	Slight.
102*: Arbuckle	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Positas	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
103*: Arbuckle	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Positas	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
104*, 105*: Arbuckle	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Positas	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
106*: Arbuckle	Slight	Slight	Moderate: small stones, slope.	Slight.
San Ysidro	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight.
107 Arnold	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, too sandy.
108*: Arnold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
109*: Ayar	Moderate: too clayey, slope.	Moderate: too clayey, slope.	Severe: slope, too clayey.	Moderate: too clayey.
Diablo	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope, too clayey.	Moderate: too clayey.
110*: Ayar	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Moderate: too clayey, slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
110*:				
Diablo	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Moderate: too clayey, slope.
111*:				
Ayar	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.
Diablo	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.
112*.				
Badland				
113*:				
Balcom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Calleguas	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
114*:				
Balcom	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
115*:				
Balcom	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
116--- Botella	Slight	Slight	Moderate: small stones, slope.	Slight.
117--- Calleguas	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.
118--- Camarillo	Severe: floods.	Moderate: wetness, floods.	Severe: floods.	Moderate: floods.
119--- Camarillo	Severe: floods.	Slight	Moderate: too clayey.	Slight.
120, 121--- Camatta	Severe: cemented pan.	Severe: cemented pan.	Severe: slope, cemented pan.	Moderate: dusty.
122--- Capay	Severe: floods.	Moderate: too clayey.	Severe: too clayey.	Moderate: too clayey.
123--- Capay	Severe: floods.	Moderate: too clayey.	Severe: too clayey.	Moderate: too clayey.
124--- Chanac	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
125--Chanac	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
126--Cieneba	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
127*:				
Cieneba	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Andregg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
128*:				
Cieneba	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Vista	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
129--Clear Lake	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.
130--Clear Lake	Severe: floods.	Moderate: too clayey.	Severe: too clayey.	Moderate: too clayey.
131--Concepcion	Moderate: percs slowly.	Slight	Severe: slope.	Slight.
132, 133--Cropley	Moderate: too clayey.	Moderate: too clayey.	Severe: too clayey.	Moderate: too clayey.
134--Dibble	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
135--Dibble	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
136, 137--Dibble	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
138--Elder	Slight	Slight	Slight	Slight.
139--Elder	Slight	Slight	Moderate: slope.	Slight.
140--Elder	Severe: floods.	Slight	Moderate: floods, slope.	Slight.
141*:				
Gaviota	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				
142*:				
Gaviota	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
142*:				
San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
143*:				
Gaviota	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
144 Gazos	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.
145 Gazos	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
146*:				
Gilroy	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Rock outcrop.				
147*:				
Hanford	Slight	Slight	Moderate: small stones.	Slight.
Greenfield	Slight	Slight	Moderate: small stones.	Slight.
148*:				
Hanford	Slight	Slight	Moderate: slope, small stones.	Slight.
Greenfield	Slight	Slight	Moderate: small stones, slope.	Slight.
149*:				
Hanford	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
Greenfield	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
150*:				
Hanford	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
Greenfield	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
151*:				
Henneke	Severe: slope, large stones, depth to rock.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
152*:				
Linne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope, small stones.
Calodo	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.
153*, 154*:				
Linne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Calodo	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
155*:				
Linne	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.
Diablo	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope, too clayey.	Moderate: too clayey.
156*:				
Linne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Zakme	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.
157, 158 Lockwood	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
159*:				
Lockwood	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
Concepcion	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.
160*:				
Lockwood	Moderate: small stones, slope.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.
Concepcion	Moderate: percs slowly, slope.	Moderate: slope, percs slowly.	Severe: slope.	Moderate: percs slowly.
161 Lompico	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
162*:				
Lompico	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
McMullin	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, small stones, depth to rock.	Severe: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
163*:				
Los Osos	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lodo	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
164*:				
Los Osos	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.				
165*:				
McMullin	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, small stones, depth to rock.	Severe: slope.
Rock outcrop.				
166 Metz	Severe: floods.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.
167*:				
Metz	Severe: floods.	Moderate: too sandy.	Moderate: floods, slope, too sandy.	Moderate: too sandy.
Tujunga	Severe: floods, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
168*:				
Millsholm	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Ayar	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.
169*:				
Millsholm	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.
Dibble	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
170*:				
Millsholm	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Dibble	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
171*:				
Millsholm	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
171*: Montara	Severe: slope, depth to rock.	Severe: slope.	Severe: depth to rock, slope.	Moderate: slope.
172*: Millsholm	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				
173--- Mocho	Slight	Slight	Moderate: too clayey.	Slight.
174--- Mocho	Slight	Slight	Moderate: slope, too clayey.	Slight.
175--- Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
176--- Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
177*: Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Ayar	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Moderate: too clayey, slope.
178*: Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ayar	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.
179*: Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Los Osos	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
180*, 181*: Nacimiento	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Los Osos	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
182--- Oceano	Severe: soil blowing.	Severe: soil blowing.	Severe: soil blowing, slope.	Severe: soil blowing.
183--- Pico	Slight	Slight	Moderate: small stones.	Slight.
184--- Pico	Slight	Slight	Moderate: slope, small stones.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
185*. Pits				
186--- Polonio	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Moderate: dusty.
187--- Rincon	Slight---	Slight---	Moderate: too clayey.	Slight.
188--- Rincon	Slight---	Slight---	Moderate: too clayey, slope.	Slight.
189--- Rincon	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
190*: Rock outcrop.				
Gaviota---	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
191--- Ryer	Slight---	Slight---	Moderate: too clayey, slope.	Slight.
192--- San Andreas	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
193*: San Andreas---	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Arujo---	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
194--- San Emigdio	Slight---	Slight---	Slight---	Slight.
195--- San Emigdio	Slight---	Slight---	Moderate: slope.	Slight.
196--- San Ysidro	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight.
197--- San Ysidro	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
198*: Santa Lucia---	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Lopez---	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.
199*: Santa Lucia---	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
199*: Gazos	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
200 Sesame	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
201 Shimmon	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
202 Shimmon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
203*, 204*: Shimmon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Dibble	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
205 Sorrento	Slight	Slight	Moderate: too clayey.	Slight.
206 Sorrento	Slight	Slight	Moderate: slope, too clayey.	Slight.
207 Still	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.
208 Still	Slight	Slight	Moderate: too clayey.	Slight.
209 Still	Slight	Slight	Moderate: slope, too clayey.	Slight.
210 Vista	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
211*: Vista	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Cieneba	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Moderate: slope.
212*: Xerofluvents.				
Riverwash.				
213 Zakme	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
100, 101---------- Arbuckle	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
102*:												
Arbuckle----------	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Positas----------	Fair	Good	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
103*:												
Arbuckle----------	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Positas----------	Poor	Fair	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
104*:												
Arbuckle----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Positas----------	Poor	Poor	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
105*:												
Arbuckle----------	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
Positas----------	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
106*:												
Arbuckle----------	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
San Ysidro--------	Poor	Poor	Poor	Fair	---	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
107---------- Arnold	Poor	Fair	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
108*:												
Arnold----------	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
San Andreas-------	Very poor.	Poor	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
109*:												
Ayar----------	Fair	Good	Poor	---	---	Poor	Very poor.	Very poor.	Fair	---	Very poor.	Poor.
Diablo----------	Fair	Good	Poor	---	---	Poor	Very poor.	Very poor.	Fair	---	Very poor.	Poor.
110*:												
Ayar----------	Fair	Good	Poor	---	---	Poor	Very poor.	Very poor.	Fair	---	Very poor.	Poor.
Diablo----------	Fair	Good	Poor	---	---	Poor	Very poor.	Very poor.	Fair	---	Very poor.	Poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
111*:												
Ayar	Poor	Fair	Poor	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
Diablo	Poor	Fair	Poor	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
112*. Badland												
113*:												
Balcom	Poor	Poor	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Calleguas	Poor	Poor	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
114*:												
Balcom	Fair	Good	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Nacimiento	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
115*:												
Balcom	Poor	Fair	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Nacimiento	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
116 Botella	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
117 Calleguas	Poor	Poor	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
118. Camarillo	Fair	Fair	Good	---	---	Good	Good	Good	Fair	---	Good	Good.
119 Camarillo	Fair	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good.
120, 121 Camatta	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
122 Capay	Good	Good	Good	---	---	Poor	Poor	Poor	Good	---	Poor	Poor.
123 Capay	Good	Good	Good	---	---	Poor	Poor	Poor	Good	---	Poor	Poor.
124, 125 Chanac	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
126 Cieneba	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
127*:												
Cieneba	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Andregg	Very poor.	Poor	Good	Fair	---	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
128*:												
Cieneba	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Vista	Very poor.	Very poor.	Fair	Fair	---	Fair	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Fair.
129, Clear Lake	Poor	Fair	Poor	---	---	Poor	Poor	Good	Poor	---	Fair	Poor.
130, Clear Lake	Fair	Good	Fair	---	---	Poor	Very poor.	Very poor.	Good	---	Very poor.	Fair.
131, Concepcion	Poor	Good	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
132, Cropley	Good	Good	Poor	---	---	Poor	Poor	Fair	Fair	---	Poor	Poor.
133, Cropley	Good	Good	Poor	---	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Poor.
134, Dibble	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
135, Dibble	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
136, Dibble	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
137, Dibble	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
138, Elder	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
139, Elder	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
140, Elder	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
141*:												
Gaviota	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
Rock outcrop.												
142*:												
Gaviota	Poor	Poor	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
San Andreas	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
143*:												
Gaviota	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
San Andreas	Very poor.	Poor	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
144, Gazos	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
145---------- Gazos	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
146*: Gilroy----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Rock outcrop.												
147*, 148*, 149*: Hanford----------	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
Greenfield--------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
150*: Hanford----------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
Greenfield--------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
151*: Henneke----------	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Rock outcrop.												
152*: Linne----------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
Calodo----------	Fair	Good	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
153*: Linne----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Calodo----------	Poor	Fair	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
154*: Linne----------	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Very poor.	---	Very poor.	Good.
Calodo----------	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
155*: Linne----------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
Diablo----------	Fair	Good	Poor	---	---	Poor	Very poor.	Very poor.	Fair	---	Very poor.	Poor.
156*: Linne----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Zakme----------	Poor	Fair	Poor	Good	---	Poor	Very poor.	Very poor.	Poor	Good	Very poor.	Poor.
157---------- Lockwood	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
158---------- Lockwood	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
159*:												
Lockwood----------	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
Concepcion--------	Poor	Good	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
160*:												
Lockwood----------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
Concepcion--------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
161---------- Lompico	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
162*:												
Lompico----------	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
McMullin----------	Very poor.	Very poor.	Fair	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
163*:												
Los Osos----------	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
Lodo----------	Very poor.	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Poor.
164*:												
Los Osos----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Rock outcrop.												
165*:												
McMullin----------	Very poor.	Very poor.	Fair	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
Rock outcrop.												
166---------- Metz	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	Fair	Very poor.	Good.
167*:												
Metz----------	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Tujunga----------	Poor	Fair	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
168*:												
Millsholm----------	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Ayar----------	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
169*:												
Millsholm----------	Very poor.	Poor	Fair	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Dibble	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
170*:												
Millsholm	Very poor.	Poor	Fair	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
Dibble	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
171*:												
Millsholm	Very poor.	Poor	Fair	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
Montara	Very poor.	Very poor.	Poor	---	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
172*:												
Millsholm	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Rock outcrop.												
173 Mocho	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good.
174 Mocho	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
175 Nacimiento	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
176 Nacimiento	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
177*:												
Nacimiento	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Ayar	Fair	Good	Poor	---	---	Poor	Very poor.	Very poor.	Fair	---	Very poor.	Poor.
178*:												
Nacimiento	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Ayar	Poor	Fair	Poor	---	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
179*:												
Nacimiento	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Los Osos	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
180*:												
Nacimiento	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Los Osos	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
181*:												
Nacimiento	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
181*: Los Osos	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
182--- Oceano	Poor	Poor	Good	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
183, 184--- Pico	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
185*. Pits												
186--- Polonio	Fair	Good	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
187--- Rincon	Fair	Good	Fair	---	---	Good	Poor	Poor	Good	---	Poor	Fair.
188--- Rincon	Fair	Good	Fair	---	---	Good	Poor	Very poor.	Good	---	Poor	Fair.
189--- Rincon	Fair	Good	Fair	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
190*: Rock outcrop.												
Gaviota	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Poor.
191--- Ryer	Fair	Good	Good	---	---	Good	Fair	Very poor.	Good	---	Very poor.	Good.
192--- San Andreas	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
193*: San Andreas	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
Arujo	Fair	Good	Good	Good	---	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
194, 195--- San Emigdio	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
196, 197--- San Ysidro	Poor	Poor	Poor	Fair	---	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
198*: Santa Lucia	Poor	Fair	Fair	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Lopez	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
199*: Santa Lucia	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Gazos	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
200---------- Sesame	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
201---------- Shimmon	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
202---------- Shimmon	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
203*:												
Shimmon----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
Dibble----------	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
204*:												
Shimmon----------	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
Dibble----------	Very poor.	Very poor.	Good	---	---	Good	Very poor.	Very poor.	Poor	---	Very poor.	Good.
205---------- Sorrento	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good.
206---------- Sorrento	Good	Good	Good	---	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
207, 208, 209------ Still	Fair	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
210---------- Vista	Fair	Fair	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
211*:												
Vista----------	Poor	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Cieneba----------	Very poor.	Very poor.	Poor	---	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
212*: Xerofluvents. Riverwash.												
213---------- Zakme	Poor	Fair	Poor	Good	---	Poor	Very poor.	Very poor.	Poor	Good	Very poor.	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100, 101---------- Arbuckle	0-29	Fine sandy loam	SM	A-4	0	80-100	75-95	45-75	35-50	15-25	NP-5
	29-53	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	80-100	75-95	60-85	35-75	25-35	10-20
	53-62	Stratified sandy loam to very gravelly sandy clay loam.	SC, SM-SC	A-2	0-5	60-70	50-65	30-45	15-30	15-30	5-15
102*, 103*, 104*, 105*: Arbuckle---------	0-29	Fine sandy loam	SM	A-4	0	80-100	75-95	45-75	35-50	15-25	NP-5
	29-53	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	80-100	75-95	60-85	35-75	25-35	10-20
	53-62	Stratified sandy loam to very gravelly sandy clay loam.	SC, SM-SC,	A-2	0-5	60-70	50-65	30-45	15-30	15-30	5-15
Positas----------	0-10	Coarse sandy loam.	SM	A-4, A-2	0-15	80-100	75-100	45-75	30-50	15-30	NP-5
	10-28	Clay, sandy clay, gravelly clay.	CH, CL	A-7	0-15	80-100	70-100	65-100	50-95	40-65	25-40
	28-40	Sandy clay loam	SM, SC, ML, CL	A-6, A-7	0-15	80-100	75-100	70-90	40-55	35-45	10-20
	41-60	Stratified sandy loam to gravelly clay loam.	SM, SC, CL	A-4, A-6 A-2	0-15	75-100	60-100	30-100	15-80	10-45	NP-20
106*: Arbuckle----------	0-29	Fine sandy loam	SM	A-4	0	80-100	75-95	45-75	35-50	15-25	NP-5
	29-53	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	80-100	75-95	60-85	35-75	25-35	10-20
	53-62	Stratified sandy loam to very gravelly sandy clay loam.	SC, SM-SC	A-2	0-5	60-70	50-65	30-45	15-30	15-30	5-15
San Ysidro--------	0-23	Loam----------	ML, CL-ML	A-4	0	100	100	85-95	60-75	15-30	NP-10
	23-38	Clay, clay loam	CH	A-7	0	100	100	90-100	70-95	50-60	25-35
	38-71	Sandy loam, loam	ML	A-4	0	100	100	90-100	50-70	10-30	NP-5
107---------- Arnold	0-15	Loamy sand------	SP-SM, SM	A-1, A-2, A-3	0	90-100	85-100	40-80	5-30	---	NP
	15-42	Sand, loamy sand	SP-SM, SM	A-1, A-2, A-3	0	90-100	85-100	40-80	5-30	---	NP
	42	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
108*:											
Arnold	0-15	Loamy sand	SP-SM, SM	A-1, A-2, A-3	0	90-100	85-100	40-80	5-30	---	NP
	15-42	Sand, loamy sand	SP-SM, SM	A-1, A-2, A-3	0	90-100	85-100	40-80	5-30	---	NP
	42	Weathered bedrock.	---	---	---	---	---	---	---	---	---
San Andreas	0-11	Sandy loam	SM, ML	A-4	0	90-100	80-100	70-95	35-60	20-40	NP-10
	11-29	Sandy loam, fine sandy loam, loam.	SM, ML	A-4	0	90-100	80-100	70-95	35-60	20-40	NP-10
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
109*, 110*, 111*:											
Ayar	0-9	Silty clay	CH	A-7	0	100	95-100	90-100	85-100	50-60	25-35
	9-61	Clay, silty clay, clay loam.	CH, CL	A-7	0	100	95-100	90-100	75-100	40-70	20-35
	61	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Diablo	0-38	Clay	CL, CH	A-7	0	100	95-100	95-100	85-95	45-70	20-40
	38-50	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	95-100	95-100	85-95	45-70	20-40
	50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
112*. Badland											
113*:											
Balcom	0-12	Loam	ML	A-4	0	90-100	75-100	60-100	50-80	25-35	NP-10
	12-28	Loam, silt loam	ML	A-4	0	90-100	75-100	60-100	50-80	25-35	NP-10
	28	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Calleguas	0-12	Shaly loam	CL-ML, CL, GC, GM-GC	A-4, A-6	0-15	55-90	50-75	40-70	35-65	20-40	5-20
	12	Weathered bedrock.	---	---	---	---	---	---	---	---	---
114*, 115*:											
Balcom	0-12	Loam	ML	A-4	0	100	100	85-100	50-80	30-35	NP-10
	12-28	Loam, silt loam	ML	A-4	0	100	100	85-100	50-80	30-35	NP-10
	28	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Nacimiento	0-18	Silty clay loam	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	18-28	Clay loam, silty clay loam.	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	28	Weathered bedrock.	---	---	---	---	---	---	---	---	---
116 Botella	0-21	Sandy loam	SM	A-4	0	80-100	75-100	50-65	35-50	15-25	NP-5
	21-65	Sandy clay loam, loam.	SC	A-6	0	90-100	85-100	70-90	35-50	30-40	10-15

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
117---------- Calleguas	0-12	Shaly loam------	CL-ML, CL, GC, GM-GC	A-4, A-6	0-15	55-80	50-75	40-70	35-60	25-40	5-15
	12	Weathered bedrock.	---	---	---	---	---	---	---	---	---
118---------- Camarillo	0-10	Sandy loam------	SM	A-4, A-2	0	95-100	95-100	60-70	30-50	15-25	NP-5
	10-62	Stratified, fine sandy loam to silty clay loam	CL-ML, SM-SC, SC, CL	A-4, A-6	0	95-100	95-100	85-95	35-65	15-25	5-15
119---------- Camarillo	0-24	Silty clay loam	CL	A-6	0	95-100	95-100	90-100	70-85	30-40	15-25
	24-62	Stratified, fine sandy loam to silty clay loam	CL-ML, SM-SC, SC, CL	A-4, A-6	0	95-100	95-100	85-95	35-65	15-25	5-15
120, 121---------- Camatta	0-12	Loam----------	ML	A-4	0	100	100	90-100	50-75	20-35	NP-10
	12-20	Indurated-------	---	---	---	---	---	---	---	---	---
	20-60	Gravelly, very fine sandy loam, gravelly loamy sand, very gravelly sandy loam.	SM, GM, SP-SM, GP-GM	A-1, A-2	0-5	25-80	20-75	10-50	5-35	---	NP
122, 123---------- Capay	0-30	Silty clay------	CH	A-7	0	100	100	95-100	85-100	50-70	20-35
	30-60	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-100	40-60	20-35
124, 125---------- Chanac	0-12	Loam----------	CL-ML, CL	A-4, A-6	0	90-100	85-100	70-95	55-65	25-40	5-15
	12-55	Sandy clay loam, loam.	CL, CL-ML, SC, SM-SC	A-4, A-6	0	90-100	85-100	70-100	40-75	25-40	5-15
	55-60	Fine sandy loam, sandy loam, loam.	ML, SM, SM-SC, CL-ML	A-2, A-4	0	90-100	85-100	50-75	30-60	20-35	NP-10
126---------- Cieneba	0-10	Coarse sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-75	20-50	10-20	NP-5
	10	Weathered bedrock.	---	---	---	---	---	---	---	---	---
127*:											
Cieneba----------	0-15	Coarse sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-75	20-50	10-20	NP-5
	15	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Andregg----------	0-9	Coarse sandy loam.	SM	A-2, A-4	0	95-100	85-95	50-60	25-45	---	NP
	9-23	Coarse sandy loam, sandy loam.	SM	A-2, A-4	0	95-100	85-95	50-60	25-45	---	---
	23	Weathered bedrock.	---	---	---	---	---	---	---	---	---
128*:											
Cieneba----------	0-15	Coarse sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-75	20-50	10-20	NP-5
	15	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
128*:											
Vista	0-14	Coarse sandy loam.	SM	A-1, A-2	0	90-100	80-95	45-65	20-35	---	NP
	14-29	Coarse sandy loam, sandy loam.	SM	A-1, A-2	0	90-100	80-95	45-65	20-35	---	NP
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
129	0-25	Clay	CH, CL	A-7	0	100	100	95-100	85-95	40-70	20-40
Clear Lake	25-60	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-70	20-40
130	0-25	Clay	CH, CL	A-7	0	100	100	95-100	85-95	40-70	20-40
Clear Lake	25-60	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-70	20-40
131	0-22	Sandy loam	SM	A-4	0	100	100	65-80	35-50	20-30	NP-5
Concepcion	22-36	Clay	CH, CL	A-7	0	100	100	90-100	50-95	45-60	20-30
	36-51	Clay loam, sandy clay loam.	CL	A-6, A-7	0	100	100	80-100	50-80	30-45	10-20
	51-64	Sandy loam, sandy clay loam	SM	A-4	0	100	100	65-80	35-50	20-30	NP-5
132, 133	0-32	Clay	CL, CH	A-7	0	100	95-100	80-100	70-95	40-60	15-30
Cropley	32-66	Clay, silty clay	CL, CH	A-7	0	100	95-100	80-100	70-95	40-60	15-30
134, 135, 136, 137-	0-12	Clay loam	CL	A-6	0	100	95-100	80-100	70-90	30-40	10-20
Dibble	12-34	Clay loam, clay	CH, CL	A-7	0	100	95-100	85-100	80-95	40-60	20-30
	34	Weathered bedrock.	---	---	---	---	---	---	---	---	---
138, 139, 140	0-12	Loam	ML	A-4	0	80-100	75-100	60-75	50-60	20-30	NP-5
Elder	12-60	Sandy loam, fine sandy loam, loam.	SM	A-2, A-4	0	80-100	75-100	50-70	30-50	10-20	NP-5
141*:											
Gaviota	0-10	Sandy loam	SM	A-4, A-2	0-5	75-100	70-100	55-70	30-50	20-30	NP-5
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
142*, 143*:											
Gaviota	0-15	Sandy loam	SM	A-4, A-2	0-5	80-100	75-100	55-70	30-50	20-30	NP-5
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
San Andreas	0-11	Sandy loam	SM, ML	A-4	0	90-100	80-100	70-90	35-60	10-40	NP-10
	11-29	Sandy loam, fine sandy loam, loam.	SM, ML	A-4	0	90-100	80-100	70-90	35-60	10-40	NP-10
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
144, 145	0-28	Shaly clay loam	CL, GC	A-6	0-5	60-80	50-75	55-70	40-65	30-40	10-20
Gazos	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
146*:											
Gilroy----------	0-9	Gravelly loam---	SM-SC, SC	A-4, A-6	0-5	75-90	50-75	45-70	35-50	20-35	5-15
	9-24	Gravelly clay loam, gravelly loam.	CL, GC	A-6	0-5	60-80	50-75	55-70	40-65	30-40	10-20
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
147*, 148*:											
Hanford----------	0-25	Fine sandy loam	SM	A-2, A-4	0	85-100	75-100	55-75	20-50	10-25	NP-5
	25-60	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	85-100	75-100	50-75	20-50	10-25	NP-5
Greenfield--------	0-8	Fine sandy loam	SM	A-2, A-4	0	95-100	75-100	55-75	20-50	10-25	NP-5
	8-54	Fine sandy loam, sandy loam, coarse sandy loam.	SM	A-2, A-4	0	80-100	75-100	50-75	20-50	10-25	NP-5
	54-60	Stratified, very gravelly sand to sandy loam.	SM	A-2	0	70-100	60-100	50-70	15-35	---	NP
149*, 150*:											
Hanford----------	0-25	Gravelly sandy loam.	SM	A-1, A-2	0	70-85	50-75	40-60	10-35	10-25	NP-5
	25-60	Gravelly fine sandy loam, gravelly sandy loam, gravelly coarse sandy loam.	SM	A-1, A-2	0	70-85	50-75	40-60	10-35	10-25	NP-5
Greenfield--------	0-8	Gravelly sandy loam.	SM	A-1, A-2	0	70-85	50-75	40-60	10-35	10-25	NP-5
	8-54	Gravelly coarse sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SM	A-1, A-2	0	70-85	50-75	40-60	10-35	10-25	NP-5
	54-60	Stratified very gravelly sand to gravelly sandy loam.	SM	A-1, A-2	0	60-85	50-75	30-50	10-30	---	NP
151*:											
Henneke----------	0-8	Very cobbly clay loam.	GC	A-2	30-70	40-50	35-45	30-40	25-35	40-60	15-35
	8-16	Very cobbly clay, very cobbly clay loam.	GC	A-2	30-70	40-50	35-45	30-40	25-35	40-60	15-35
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
152*, 153*, 154*:											
Linne	0-39	Shaly clay loam	ML, GM, SM	A-6, A-7	0	60-90	50-75	40-70	35-65	35-50	10-20
	39	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Calodo	0-16	Clay loam	CL	A-6, A-7	0-5	90-95	80-95	75-95	70-90	30-45	10-20
	16	Weathered bedrock.	---	---	---	---	---	---	---	---	---
155*:											
Linne	0-39	Shaly clay loam	ML, GM, SM	A-6, A-7	0	60-90	50-75	40-70	35-65	35-50	10-20
	39	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Diablo	0-38	Clay	CL, CH	A-7	0	100	95-100	95-100	85-95	45-70	20-40
	38-50	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	95-100	95-100	85-95	45-70	20-40
	50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
156*:											
Linne	0-39	Shaly clay loam	ML, GM, SM	A-6, A-7	0	60-90	50-75	40-70	35-65	35-50	10-20
	39	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Zakme	0-47	Clay	CH	A-7	0	100	100	95-100	90-100	50-70	35-45
	47-55	Clay, silty clay	CH	A-7	0-15	85-100	80-100	70-100	65-100	50-70	30-45
	55	Weathered bedrock.	---	---	---	---	---	---	---	---	---
157, 158 Lockwood	0-26	Shaly loam	GC, SC	A-6, A-2	0	55-80	50-75	45-70	30-50	25-35	10-15
	26-62	Shaly loam, shaly clay loam.	CL, GC, SC	A-6, A-2	0	55-80	50-75	45-70	30-60	25-40	10-25
159*, 160*:											
Lockwood	0-26	Shaly loam	GC, SC	A-6, A-2	0	55-80	50-75	45-70	30-50	25-35	10-15
	26-62	Shaly loam, shaly clay loam.	CL, GC, SC	A-6, A-2	0	55-80	50-75	45-70	30-60	25-40	10-25
Concepcion	0-22	Sandy loam	SM	A-4	0	100	100	65-80	35-50	20-30	NP-5
	22-36	Clay	CH, CL	A-7	0	100	100	90-100	75-95	45-60	20-35
	36-51	Clay loam, sandy clay loam.	CL	A-6, A-7	0	100	100	80-100	50-80	30-45	10-20
	51-64	Sandy loam, sandy clay loam	SM	A-4	0	100	100	65-80	35-50	15-25	NP-5
161 Lompico	0-10	Loam	CL-ML	A-4	0-5	90-100	80-100	70-95	50-75	20-30	5-10
	10-36	Clay loam, sandy clay loam, loam.	CL, SC	A-6	0-5	80-100	75-100	65-95	45-70	20-40	10-20
	36	Weathered bedrock.	---	---	---	---	---	---	---	---	---
162*:											
Lompico	0-10	Loam	CL-ML	A-4	0-5	90-100	80-100	70-95	50-75	20-30	5-10
	10-36	Clay loam, sandy clay loam, loam.	CL, SC	A-6	0-5	80-100	75-100	65-95	45-70	20-40	10-20
	36	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
162*:											
McMullin	0-18	Gravelly loam	SM	A-4, A-2	0-15	70-80	65-75	45-65	25-50	20-30	NP-5
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
163*:											
Los Osos	0-14	Clay loam	CL	A-6, A-7	0	95-100	90-100	80-100	70-95	30-40	10-20
	14-24	Silty clay, clay loam, clay.	CL, CH	A-7	0	95-100	90-100	75-100	55-90	45-60	20-30
	24	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Lodo	0-16	Gravelly clay loam.	SM-SC, SC, CL-ML, CL	A-4, A-6	0-5	90-100	60-75	55-70	40-55	20-30	5-15
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
164*:											
Los Osos	0-14	Clay loam	CL	A-6, A-7	0	95-100	90-100	80-100	70-95	30-50	10-20
	14-24	Silty clay, clay loam, clay.	CL, CH	A-7	0	95-100	90-100	75-100	55-90	45-60	20-30
	24	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
165*:											
McMullin	0-18	Gravelly loam	SM	A-4, A-2	0-15	70-80	65-75	45-65	25-50	20-30	NP-5
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
166	0-9	Loamy sand	SM	A-1, A-2 A-4	0-5	80-100	75-100	35-70	20-40	---	NP
Metz	9-60	Stratified sand to very fine sandy loam.	SM	A-1, A-2	0-5	80-100	75-100	35-70	15-35	---	NP
167*:											
Metz	0-9	Loamy sand	SM	A-1, A-2 A-4	0-5	80-100	75-100	35-70	20-40	---	NP
	9-60	Stratified sand to very fine sandy loam.	SM	A-1, A-2	0-5	80-100	75-100	35-70	15-35	---	NP
Tujunga	0-20	Fine sand	SM, SP-SM	A-1, A-2, A-3	0-5	90-100	75-100	40-70	5-30	---	NP
	20-60	Fine sand, loamy sand, sand.	SM, SP-SM	A-1, A-2, A-3	0-5	90-100	75-100	40-70	5-30	---	NP
168*:											
Millsholm	0-16	Clay loam	CL	A-6	0	80-100	75-100	70-100	60-85	30-40	10-20
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ayar	0-9	Silty clay	CH	A-7	0	100	95-100	90-100	85-100	50-70	25-45
	9-61	Clay, silty clay, clay loam.	CH, CL	A-6, A-7	0	100	95-100	90-100	75-100	35-70	20-45
	61	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
169*, 170*:											
Millsholm	0-16	Clay loam	CL	A-6	0	80-100	75-100	70-100	60-85	30-40	10-20
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Dibble	0-12	Clay loam	CL	A-6, A-7	0	100	95-100	80-100	70-90	35-50	10-25
	12-34	Clay loam, clay	CH, CL	A-7	0	100	95-100	85-100	80-100	40-60	20-30
	34	Weathered bedrock.	---	---	---	---	---	---	---	---	---
171*:											
Millsholm	0-16	Clay loam	CL	A-6	0	80-100	75-100	70-100	60-85	30-40	10-20
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Montara	0-15	Clay loam	CL	A-6, A-7	0-5	90-100	75-100	75-90	70-80	30-50	10-25
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
172*:											
Millsholm	0-16	Clay loam	CL	A-6	0	80-100	75-100	70-100	60-85	30-40	10-20
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
173, 174	0-19	Clay loam	CL	A-6, A-7	0	80-100	75-100	70-100	70-85	30-50	15-25
Mocho	19-64	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-100	65-85	25-40	5-20
175, 176	0-18	Silty clay loam	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	18-28	Silty clay loam, clay loam.	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
Nacimiento	28	Weathered bedrock.	---	---	---	---	---	---	---	---	---
177*, 178*:											
Nacimiento	0-18	Silty clay loam	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	18-28	Silty clay loam, clay loam.	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	28	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Ayar	0-9	Silty clay	CH	A-7	0	100	95-100	90-100	85-100	50-70	25-45
	9-61	Clay, silty clay, clay loam.	CH, CL	A-6, A-7	0	100	95-100	90-100	75-100	35-70	20-45
	61	Weathered bedrock.	---	---	---	---	---	---	---	---	---
179*, 180*, 181*:											
Nacimiento	0-18	Silty clay loam	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	18-28	Silty clay loam, clay loam.	CL, ML	A-6, A-7	0	80-100	75-100	70-95	65-85	35-45	10-20
	28	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Los Osos	0-14	Clay loam	CL	A-6	0	95-100	90-100	80-100	70-95	30-40	10-20
	14-24	Silty clay, clay loam, clay.	CL, CH	A-7	0	95-100	90-100	75-100	55-90	45-60	20-30
	24	Weathered bedrock.	---	---	---	---	---	---	---	---	---
182	0-60	Loamy sand	SP-SM, SM	A-2, A-3	0	100	100	50-65	5-25	---	NP
Oceano											

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
183, 184---------- Pico	0-17	Fine sandy loam	SM	A-4	0	90-100	75-100	70-85	35-50	15-25	NP-5
	17-60	Sandy loam, fine sandy loam.	SM	A-4	0	90-100	75-100	70-85	35-50	15-25	NP-5
185*. Pits											
186---------- Polonio	0-14	Clay loam-------	CL, ML	A-6, A-7	0	100	100	90-100	70-85	35-45	10-20
	14-69	Clay loam, silty clay loam, loam.	CL, ML	A-6, A-7	0	100	100	85-100	65-85	30-45	10-20
187, 188, 189------ Rincon	0-18	Clay loam-------	CL	A-6	0	100	95-100	90-100	80-90	30-40	10-20
	18-64	Sandy clay, clay, clay loam.	CL, CH	A-7	0	100	95-100	90-100	75-90	40-60	25-35
190*: Rock outcrop.											
Gaviota----------	0-10	Sandy loam------	SM	A-4, A-2	0-5	80-100	75-100	55-70	30-50	20-30	NP-5
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
191---------- Ryer	0-12	Clay loam-------	CL	A-6	0	80-100	75-100	70-95	55-90	30-40	10-20
	12-60	Clay, clay loam	CL, CH	A-7	0	80-100	75-100	70-95	60-90	40-55	20-30
192---------- San Andreas	0-29	Sandy loam------	SM, ML	A-4	0	90-100	80-100	70-90	35-60	10-40	NP-10
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
193*: San Andreas-------	0-29	Sandy loam------	SM, ML	A-4	0	90-100	80-100	70-90	35-60	10-40	NP-10
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Arujo----------	0-10	Sandy loam------	SM	A-2, A-4	0	90-100	85-100	50-70	25-40	15-25	NP-5
	10-31	Clay loam, sandy clay loam.	SM-SC, CL-ML, CL, SC	A-4, A-6	0	90-100	85-100	70-95	35-85	25-40	10-20
	31-47	Loam, sandy loam	CL-ML, CL	A-4, A-6	0	90-100	85-100	70-95	50-70	20-35	5-15
	47	Weathered bedrock.	---	---	---	---	---	---	---	---	---
194, 195---------- San Emigdio	0-7	Fine sandy loam	SM-SC, SM, ML, CL-ML	A-4	0	95-100	90-100	75-90	35-60	15-30	NP-10
	7-60	Stratified loam, loamy sand.	SM-SC, SM, ML, CL-ML	A-4	0	80-100	75-100	60-90	35-60	15-30	NP-10
196---------- San Ysidro	0-19	Sandy loam------	SM	A-2, A-4	0	100	100	60-85	30-50	10-20	NP-5
	19-40	Clay, clay loam	CH	A-7	0	100	100	90-100	70-95	50-60	25-35
	40-60	Sandy clay loam, clay loam, sandy loam.	CL	A-6, A-7	0	100	100	90-100	50-70	35-50	15-25
197---------- San Ysidro	0-23	Loam------------	ML, CL-ML	A-4	0	100	100	85-95	60-75	15-30	NP-10
	23-38	Clay, clay loam	CH	A-7	0	100	100	90-100	70-95	50-60	25-35
	38-64	Sandy loam, loam, fine sandy loam.	ML	A-4	0	100	100	90-100	50-70	10-30	NP-5

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
198*:											
Santa Lucia	0-4	Shaly clay loam	GC, CL, CH	A-6, A-7	0-5	55-80	50-75	45-70	35-60	35-55	15-25
	4-21	Very shaly clay loam.	GC	A-2	0-5	30-65	25-50	20-45	10-35	35-55	15-25
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lopez	0-14	Very shaly clay loam.	GM, GC	A-2	0-15	35-65	35-50	30-40	20-35	30-50	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
199*:											
Santa Lucia	0-4	Shaly clay loam	GC, CL, CH	A-6, A-7	0-5	55-80	50-75	45-70	35-60	35-55	15-25
	4-21	Very shaly clay loam.	GC	A-2	0-5	30-65	25-50	20-45	10-35	35-55	15-25
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Gazos	0-28	Shaly clay loam	CL, GC	A-6	0-5	60-80	50-75	55-70	40-65	30-40	10-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
200	0-10	Sandy loam	SM	A-2, A-4	0	95-100	95-100	60-70	30-40	15-25	NP-5
Sesame	10-25	Sandy clay loam	CL	A-6	0	95-100	95-100	85-95	50-60	25-40	10-20
	25	Weathered bedrock.	---	---	---	---	---	---	---	---	---
201, 202	0-10	Loam	ML, CL-ML	A-4	0	100	95-100	90-100	50-70	20-30	NP-10
Shimmon	10-29	Clay loam, sandy clay loam.	CL	A-6	0	100	100	95-100	70-90	25-40	10-20
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
203*, 204*:											
Shimmon	0-10	Loam	ML, CL-ML	A-4	0	100	95-100	90-100	50-70	20-30	NP-10
	10-29	Clay loam, sandy clay loam, silty clay loam.	CL	A-6	0	100	100	95-100	70-90	25-40	10-20
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Dibble	0-12	Clay loam	CL	A-6, A-7	0	100	95-100	80-100	70-90	35-50	10-25
	12-34	Clay loam, clay	CH, CL	A-7	0	100	95-100	85-100	80-100	40-60	20-30
	34	Weathered bedrock.	---	---	---	---	---	---	---	---	---
205, 206	0-19	Clay loam	CL	A-6, A-7	0	100	95-100	95-100	75-85	30-50	10-20
Sorrento	19-60	Silty clay loam, clay loam, loam	CL	A-6, A-7	0	100	95-100	80-95	70-85	25-45	10-20
207	0-28	Gravelly loam	GC, GM-GC, SC, SM-SC	A-4, A-6	0	55-80	50-75	40-65	35-50	20-35	5-15
Still	28-60	Stratified gravelly clay loam to gravelly loam.	GC, CL, GM-GC, CL-ML	A-4, A-6	0	55-80	50-75	40-70	35-55	20-40	5-20
208, 209	0-25	Clay loam	CL	A-6	0	80-100	75-100	70-100	55-80	25-40	10-20
Still	25-60	Stratified clay loam to loam.	CL, CL-ML	A-4, A-6	0	80-100	75-100	70-100	60-80	20-40	5-20

See footnote at end of table.

TABLE 12.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
210---------- Vista	0-14	Coarse sandy loam.	SM	A-1, A-2	0	90-100	80-95	45-65	20-35	---	NP
	14-29	Coarse sandy loam, sandy loam.	SM	A-1, A-2	0	90-100	80-95	45-65	20-35	---	NP
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
211*:											
Vista----------	0-14	Coarse sandy loam.	SM	A-1, A-2	0	90-100	80-95	45-65	20-35	---	NP
	14-29	Coarse sandy loam, sandy loam.	SM	A-1, A-2	0	90-100	80-95	45-65	20-35	---	NP
	29	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Cieneba----------	0-15	Coarse sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-75	20-50	10-20	NP-5
	15	Weathered bedrock.	---	---	---	---	---	---	---	---	---
212*: Xerofluvents.											
Riverwash.											
213---------- Zakme	0-47	Clay----------	CH	A-7	0	100	100	95-100	90-100	50-70	35-45
	47-55	Clay, silty clay	CH	A-7	0-20	85-100	75-100	70-100	65-100	50-70	30-45
	55	Weathered bedrock.	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution									Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve						Percentage smaller than--						
	AASHTO	Unified	3/4 inch	3/8 inch	No. 4	No. 8	No. 30	No. 200	.02 MM	.005 MM	.002 MM			Max. dry density	Optimum moisture
												Pct		Lb/Ft^3	Pct
Arbuckle fine sandy loam:[1] (S73CA-040-050)															
A1------- 0 to 10	A-4 (00)	SM	100	97	94	91	81	50	25	12	--	23	2	121	10
B22t-----29 to 43	A-6 (05)	CL	100	100	99	98	95	61	35	27	22	28	13	124	11
Ayar silty clay:[2] (S57CA-040-051)															
A12------22 to 15	A-7-5(26)	MH	100	100	100	100	99	92	64	46	36	54	24	97	22
A14------27 to 46	A-7-5(29)	MH	100	100	97	96	94	88	70	55	42	61	27	102	20
Concepcion sandy loam:[3] (S74CA-079-052)															
A12------ 4 to 20	A-2-4(00)	SM	100	100	100	99	74	20	14	7	5	--	NP	126	9
B2t------22 to 36	A-7-6(11)	SC	100	100	100	100	89	48	43	36	34	54	33	110	13
C--------51 to 64	A-2-6(01)	SC	100	100	100	100	86	29	26	16	13	35	16	114	14
Nacimiento silty clay loam:[4] (S63CA-040-053)															
A12------ 5 to 18	A-6 (05)	ML	100	98	96	92	76	58	42	25	15	37	11	117	12
C1ca-----18 to 28	A-7-6(09)	ML	100	100	99	96	83	64	44	27	18	42	16	110	16
Ryer clay loam:[5] (S71CA-040-054)															
A12------ 3 to 12	A-4 (00)	ML	100	100	100	98	92	71	45	26	15	19	3	124	9
B22t-----19 to 32	A-6 (11)	CL	100	100	100	98	91	73	54	39	33	34	17	119	11
Cca------47 to 60	A-6 (09)	CL	100	100	100	99	94	72	49	34	26	32	15	119	11

[1]Arbuckle fine sandy loam:
2,000 feet west and 2,300 feet south from the northeast corner of sec. 18, T. 25 S., R. 11 E.

[2]Ayar silty clay:
400 feet east of center of sec. 20, T. 26 S., R. 10 E.

[3]Concepcion sandy loam:
2,200 feet northeast on El Bordo Avenue from El Camino Real, 200 feet southeast into field in Asuncion Land Grant T. 28 S., R. 12 E.

[4]Nacimiento silty clay loam:
East side of road 500 feet south from northwest corner of sec. 24, T. 26 S., R. 13 E.

[5]Ryer clay loam:
3,000 feet west and 4,900 feet south from the northeast corner of sec. 5, T. 26 S., R. 11 E.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
100, 101----------	0-29	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low----------	0.32	5
Arbuckle	29-53	0.2-0.6	0.15-0.17	6.1-7.8	<2	Moderate-----	0.28	
	53-62	0.2-0.6	0.05-0.08	6.1-7.8	---	Low----------	0.10	
102*, 103*, 104*, 105*:								
Arbuckle-------	0-29	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low----------	0.32	5
	29-53	0.2-0.6	0.15-0.17	6.1-7.8	<2	Moderate-----	0.28	
	53-62	0.2-0.6	0.05-0.08	6.1-7.8	---	Low----------	0.10	
Positas--------	0-10	0.6-2.0	0.10-0.13	5.6-6.5	<2	Low----------	0.37	5
	10-28	<0.06	0.03-0.05	6.1-9.4	<2	High---------	0.37	
	28-41	0.2-0.6	0.15-0.17	6.6-8.4	<2	Moderate-----	0.37	
	41-60	0.20-6.0	0.07-0.15	6.6-8.4	<2	Low----------	0.32	
106*:								
Arbuckle--------	0-29	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low----------	0.32	5
	29-53	0.2-0.6	0.15-0.17	6.1-7.8	<2	Moderate-----	0.28	
	53-62	0.2-0.6	0.05-0.08	6.1-7.8	---	Low----------	0.10	
San Ysidro------	0-23	0.6-2.0	0.14-0.16	5.6-7.3	<2	Low----------	0.49	5
	23-38	<0.06	0.04-0.06	7.9-8.4	<2	High---------	0.37	
	38-71	0.2-6.0	0.10-0.16	7.9-8.4	<2	Moderate-----	0.37	
107---------------	0-15	6.0-20.0	0.05-0.09	5.6-7.3	<2	Low----------	0.15	4
Arnold	15-42	6.0-20	0.05-0.09	5.6-7.3	<2	Low----------	0.15	
	42	---	---	---	---	-------------	---	
108*:								
Arnold----------	0-15	6.0-20.0	0.05-0.09	5.6-7.3	<2	Low----------	0.15	4
	15-42	6.0-20	0.05-0.09	5.6-7.3	<2	Low----------	0.15	
	42	---	---	---	---	-------------	---	
San Andreas-----	0-11	2.0-6.0	0.11-0.17	5.6-6.5	<2	Low----------	0.15	2
	11-29	2.0-6.0	0.11-0.17	5.6-6.5	<2	Low----------	0.15	
	29	---	---	---	---	-------------	---	
109*, 110*, 111*:								
Ayar----------	0-9	0.06-0.2	0.14-0.17	7.4-8.4	<2	High---------	0.28	3
	9-61	0.06-0.2	0.14-0.17	7.4-8.4	<2	High---------	0.28	
	61	---	---	---	---	-------------	---	
Diablo----------	0-38	0.06-0.2	0.14-0.19	7.4-8.4	<2	High---------	0.24	3
	38-50	0.06-0.2	0.14-0.19	7.4-8.4	<2	High---------	0.24	
	50	---	---	---	---	-------------	---	
112*. Badland								
113*:								
Balcom----------	0-12	0.6-2.0	0.13-0.17	7.9-8.4	<2	Moderate-----	0.43	2
	12-28	0.6-2.0	0.13-0.17	7.9-8.4	<2	Moderate-----	0.43	
	28	---	---	---	---	-------------	---	
Calleguas-------	0-12	0.6-2.0	0.10-0.12	7.9-8.4	<2	Moderate-----	0.32	1
	12	---	---	---	---	-------------	---	
114*, 115*:								
Balcom----------	0-12	0.6-2.0	0.13-0.17	7.9-8.4	<2	Moderate-----	0.43	2
	12-28	0.6-2.0	0.13-0.17	7.9-8.4	<2	Moderate-----	0.43	
	28	---	---	---	---	-------------	---	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
114*, 115*:								
Nacimiento	0-18	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	2
	18-28	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	
	28	---	---	---	---	---	---	
116	0-21	0.6-2.0	0.10-0.13	5.6-7.3	<2	Moderate	0.37	5
Botella	21-65	0.2-0.6	0.15-0.18	5.6-7.3	<2	Moderate	0.32	
117	0-12	0.6-2.0	0.10-0.12	7.9-8.4	<2	Moderate	0.32	1
Calleguas	12	---	---	---	---	---	---	
118	0-10	2.0-6.0	0.10-0.14	7.9-8.4	<4	Low	0.32	5
Camarillo	10-62	0.6-2.0	0.13-0.17	7.9-8.4	<8	Low	0.32	
119	0-24	0.6-2.0	0.13-0.16	7.9-8.4	<4	Moderate	0.32	5
Camarillo	24-62	0.6-2.0	0.13-0.17	7.9-8.4	<8	Low	0.32	
120, 121	0-12	0.6-2.0	0.13-0.15	7.9-8.4	<2	Low	0.43	1
Camatta	12-20	---	---	---	---	---	---	
	20-60	0.06-0.2	0.03-0.06	7.9-8.4	<4	Low	0.24	
122, 123	0-30	0.06-0.2	0.12-0.16	7.9-8.4	<2	High	0.32	5
Capay	30-60	0.06-0.2	0.12-0.16	7.9-8.4	<2	High	0.37	
124, 125	0-12	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.32	5
Chanac	12-55	0.2-0.6	0.14-0.18	7.9-8.4	<2	Moderate	0.32	
	55-60	0.2-0.6	0.12-0.16	7.9-8.4	<2	Low	0.28	
126	0-10	2.0-6.0	0.09-0.14	5.6-7.3	<2	Low	0.24	1
Cieneba	10	---	---	---	---	---	---	
127*:								
Cieneba	0-15	2.0-6.0	0.09-0.14	5.6-7.3	<2	Low	0.24	1
	15	---	---	---	---	---	---	
Andregg	0-9	2.0-6.0	0.10-0.13	5.6-7.3	<2	Low	0.24	2
	9-23	2.0-6.0	0.10-0.13	5.6-7.3	<2	Low	0.24	
	23	---	---	---	---	---	---	
128*:								
Cieneba	0-15	2.0-6.0	0.09-0.14	5.6-7.3	<2	Low	0.24	1
	15	---	---	---	---	---	---	
Vista	0-14	2.0-6.0	0.07-0.12	6.1-7.3	<2	Low	0.28	2
	14-29	2.0-6.0	0.07-0.12	6.1-7.3	<2	Low	0.28	
	29	---	---	---	---	---	---	
129	0-25	0.06-0.2	0.10-0.16	7.9-8.4	<8	High	0.24	5
Clear Lake	25-60	0.06-0.2	0.10-0.16	7.9-8.4	<16	High	0.24	
130	0-25	0.06-0.2	0.12-0.16	7.9-8.4	<2	---	0.24	5
Clear Lake	25-60	0.06-0.2	0.12-0.16	7.9-8.4	<4	High	0.24	
131	0-22	0.6-2.0	0.11-0.15	5.6-6.5	<2	Low	0.32	1
Concepcion	22-36	<0.06	0.05-0.07	5.1-5.5	<2	High	0.20	
	36-51	0.06-0.2	0.16-0.18	5.1.5.5	<2	Moderate	0.32	
	51-64	0.6-2.0	0.10-0.12	6.1-8.4	<2	Low	0.32	
132, 133	0-32	0.06-0.2	0.13-0.17	6.1-8.4	<2	High	0.24	5
Cropley	32-66	0.06-0.2	0.13-0.17	6.6-8.4	<2	High	0.24	
134, 135, 136, 137	0-12	0.2-0.6	0.16-0.20	5.6-6.5	<2	Moderate	0.43	2
Dibble	12-34	0.06-0.2	0.14-0.18	6.1-7.3	<2	High	0.32	
	34	---	---	---	---	---	---	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
138, 139, 140----	0-12	0.6-2.0	0.15-0.18	5.6-7.3	<2	Low----------	0.37	5
Elder	12-60	0.6-2.0	0.10-0.15	6.6-8.4	<2	Low----------	0.32	
141*:								
Gaviota----------	0-10	2.0-6.0	0.07-0.12	5.6-7.3	<2	Low----------	---	1
	10	---	---	---	---	----------	---	
Rock outcrop.								
142*, 143*:								
Gaviota----------	0-15	2.0-6.0	0.07-0.12	5.6-7.3	<2	Low----------	0.32	1
	15	---	---	---	---	----------	---	
142*, 143*:								
San Andreas-----	0-11	2.0-6.0	0.11-0.17	5.6-6.5	<2	Low----------	0.15	2
	11-29	2.0-6.0	0.11-0.17	5.6-6.5	<2	Low----------	0.15	
	29	---	---	---	---	----------	---	
144, 145---------	0-28	0.2-0.6	0.12-0.15	5.6-7.3	<2	Moderate-----	0.32	2
Gazos	28	---	---	---	---	----------	---	
146*:								
Gilroy----------	0-9	0.6-2.0	0.14-0.15	5.6-7.3	<2	Moderate-----	0.28	2
	9-24	0.2-0.6	0.10-0.15	5.6-7.3	<2	Moderate-----	0.28	
	24	---	---	---	---	----------	---	
Rock outcrop.								
147*, 148*:								
Hanford---------	0-25	2.0-6.0	0.10-0.15	6.1-7.3	<2	Low----------	0.24	5
	25-60	2.0-6.0	0.10-0.15	6.1-8.4	<2	Low----------	0.24	
Greenfield------	0-8	2.0-6.0	0.10-0.15	6.1-7.3	<2	Low----------	0.24	5
	8-54	2.0-6.0	0.11-0.16	6.1-7.8	<2	Low----------	0.24	
	54-60	2.0-6.0	0.07-0.12	6.1-8.4	<2	Low----------	0.24	
149*, 150*:								
Hanford---------	0-25	2.0-6.0	0.08-0.12	6.1-7.3	<2	Low----------	0.17	5
	25-60	2.0-6.0	0.08-0.12	6.1-8.4	<2	Low----------	0.17	
Greenfield------	0-8	2.0-6.0	0.08-0.12	6.1-7.3	<2	Low----------	0.17	5
	8-54	2.0-6.0	0.08-0.12	6.1-7.8	<2	Low----------	0.17	
	54-60	2.0-6.0	0.06-0.11	6.1-8.4	<2	Low----------	0.17	
151*:								
Henneke---------	0-8	0.2-0.6	0.05-0.07	6.1-8.4	<2	Moderate-----	0.24	1
	8-16	0.2-0.6	0.05-0.07	6.6-8.4	<2	Moderate-----	0.24	
	16	---	---	---	---	----------	---	
Rock outcrop.								
152*, 153*, 154*:								
Linne-----------	0-39	0.2-0.6	0.10-0.15	7.9-8.4	<2	Moderate-----	0.24	2
	39	---	---	---	---	----------	---	
Calodo----------	0-16	0.2-0.6	0.16-0.19	7.9-8.4	<2	Moderate-----	0.32	1
	16	---	---	---	---	----------	---	
155*:								
Linne-----------	0-39	0.2-0.6	0.10-0.15	7.9-8.4	<2	Moderate-----	0.24	2
	39	---	---	---	---	----------	---	
Diablo----------	0-38	0.06-0.2	0.14-0.19	7.4-8.4	<2	High---------	0.24	3
	38-50	0.06-0.2	0.14-0.19	7.4-8.4	<2	High---------	0.24	
	50	---	---	---	---	----------	---	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
156*:								
Linne----------	0-39	0.2-0.6	0.10-0.15	7.9-8.4	<2	Moderate-----	0.24	2
	39	---	---	---	---	---	---	
Zakme----------	0-47	0.06-0.2	0.13-0.16	7.4-8.4	<2	High---------	0.15	3
	47-55	0.06-0.2	0.13-0.16	7.4-8.4	<2	High---------	0.15	
	55	---	---	---	---	---	---	
157, 158---------	0-26	0.6-2.0	0.11-0.14	6.1-7.3	<2	Moderate-----	0.49	5
Lockwood	26-62	0.2-0.6	0.11-0.19	6.1-7.8	<2	Moderate-----	0.37	
159*, 160*:								
Lockwood--------	0-26	0.6-2.0	0.11-0.14	6.1-7.3	<2	Moderate-----	0.49	5
	26-62	0.2-0.6	0.11-0.19	6.1-7.8	<2	Moderate-----	0.37	
Concepcion------	0-22	0.6-2.0	0.11-0.15	5.6-6.5	<2	Low----------	0.32	1
	22-36	<0.06	0.05-0.07	5.1-5.5	<2	High---------	0.20	
	36-51	0.06-0.2	0.16-0.18	5.1-5.5	<2	Moderate-----	0.32	
	51-64	0.6-2.0	0.10-0.12	6.1-8.4	<2	Low----------	0.32	
161----------	0-10	2.0-6.0	0.13-0.16	6.1-6.5	<2	Low----------	0.28	2
Lompico	10-36	0.6-2.0	0.15-0.18	5.6-6.0	<2	Moderate-----	0.17	
	36	---	---	---	---	---	---	
162*:								
Lompico---------	0-10	2.0-6.0	0.13-0.16	6.1-6.5	<2	Low----------	0.28	2
	10-36	0.6-2.0	0.15-0.18	5.6-6.0	<2	Moderate-----	0.17	
	36	---	---	---	---	---	---	
McMullin--------	0-18	0.6-2.0	0.10-0.15	5.6-6.5	<2	Low----------	0.17	1
	18	---	---	---	---	---	---	
163*:								
Los Osos--------	0-14	0.2-0.6	0.17-0.19	5.6-7.3	<2	Moderate-----	0.32	2
	14-24	0.06-0.2	0.12-0.16	6.1-7.3	<2	High---------	0.28	
	24	---	---	---	---	---	---	
Lodo----------	0-16	0.2-2.0	0.12-0.16	6.1-7.3	<2	Moderate-----	0.20	1
	16	---	---	---	---	---	---	
164*:								
Los Osos--------	0-14	0.2-0.6	0.17-0.19	5.6-7.3	<2	Moderate-----	0.32	2
	14-24	0.06-0.2	0.12-0.16	6.1-7.3	<2	High---------	0.28	
	24	---	---	---	---	---	---	
Rock outcrop.								
165*:								
McMullin--------	0-18	0.6-2.0	0.10-0.15	5.6-6.5	<2	Low----------	0.17	1
	18	---	---	---	---	---	---	
Rock outcrop.								
166----------	0-9	2.0-6.0	0.06-0.10	6.6-8.4	<2	Low----------	0.17	5
Metz	9-60	2.0-6.0	0.06-0.11	6.6-8.4	<2	Low----------	0.15	
167*:								
Metz----------	0-9	2.0-6.0	0.06-0.10	6.6-8.4	<2	Low----------	0.17	5
	9-60	2.0-6.0	0.06-0.11	7.4-8.4	<2	Low----------	0.15	
Tujunga---------	0-20	6.0-20	0.06-0.08	6.1-7.3	<2	Low----------	0.17	5
	20-60	6.0-20	0.06-0.08	6.1-7.8	<2	Low----------	0.20	
168*:								
Millsholm-------	0-16	0.6-2.0	0.17-0.19	6.1-7.3	<2	Moderate-----	0.37	1
	16	---	---	---	---	---	---	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
168*:								
Ayar	0-9	0.06-0.2	0.14-0.17	7.4-8.4	<2	High	0.28	3
	9-61	0.06-0.2	0.14-0.17	7.4-8.4	<2	High	0.28	
	61	---	---	---	---	---	---	
169*, 170*:								
Millsholm	0-16	0.6-2.0	0.17-0.19	6.1-7.3	<2	Moderate	0.37	1
	16	---	---	---	---	---	---	
Dibble	0-12	0.2-0.6	0.16-0.20	5.6-6.5	<2	High	0.43	2
	12-34	0.06-0.2	0.14-0.18	6.1-7.3	<2	High	0.32	
	34	---	---	---	---	---	---	
171*:								
Millsholm	0-16	0.6-2.0	0.17-0.19	5.1-7.3	<2	Moderate	0.37	1
	16	---	---	---	---	---	---	
Montara	0-15	0.2-0.6	0.17-0.20	6.6-8.4	<2	Moderate	0.32	1
	15	---	---	---	---	---	---	
172*:								
Millsholm	0-16	0.6-2.0	0.17-0.19	5.1-7.3	<2	Moderate	0.37	1
	16	---	---	---	---	---	---	
Rock outcrop.								
173, 174	0-19	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.37	5
Mocho	19-64	0.2-0.6	0.16-0.21	7.9-8.4	<2	Moderate	0.43	
175, 176	0-18	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	2
Nacimiento	18-28	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	
	28	---	---	---	---	---	---	
177*, 178*:								
Nacimiento	0-18	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	2
	18-28	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	
	28	---	---	---	---	---	---	
Ayar	0-9	0.06-0.2	0.14-0.17	7.4-8.4	<2	High	0.28	3
	9-61	0.06-0.2	0.14-0.17	7.4-8.4	<2	High	0.28	
	61	---	---	---	---	---	---	
179*, 180*, 181*:								
Nacimiento	0-18	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	2
	18-28	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.32	
	28	---	---	---	---	---	---	
Los Osos	0-14	0.2-0.6	0.17-0.19	5.6-7.3	<2	Moderate	0.32	2
	14-24	0.06-0.2	0.12-0.16	6.1-7.3	<2	High	0.28	
	24	---	---	---	---	---	---	
182	0-60	6.0-20.0	0.05-0.08	6.1-6.5	<2	Low	0.10	5
Oceano								
183, 184	0-17	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low	0.20	5
Pico	17-60	2.0-6.0	0.10-0.14	7.9-8.4	<2	Low	0.20	
185*.								
Pits								
186	0-14	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.37	5
Polonio	14-69	0.2-0.6	0.14-0.19	7.9-8.4	<2	Moderate	0.37	
187, 188, 189	0-18	0.2-0.6	0.17-0.19	6.1-7.3	<2	Moderate	0.37	4
Rincon	18-64	0.06-0.2	0.12-0.15	6.6-8.4	<2	High	0.43	
	64-75	0.2-0.6	0.13-0.17	7.4-8.4	<2	Moderate	0.37	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
190*:								
Rock outcrop.								
Gaviota	0-10	2.0-6.0	0.07-0.12	5.6-7.3	<2	Low	0.24	1
	10	---	---	---	---	---	---	
191	0-12	0.2-0.6	0.18-0.19	5.6-7.3	<2	Moderate	0.32	5
Ryer	12-60	0.06-0.2	0.13-0.17	6.1-8.4	<2	High	0.24	
192	0-29	2.0-6.0	0.11-0.17	5.6-6.5	<2	Low	0.15	2
San Andreas	29	---	---	---	---	---	---	
193*:								
San Andreas	0-29	2.0-6.0	0.11-0.17	5.6-6.5	<2	Low	0.15	2
	29	---	---	---	---	---	---	
193*:								
Arujo	0-10	2.0-6.0	0.10-0.12	6.1-7.8	<2	Low	0.20	3
	10-31	0.2-0.6	0.15-0.19	6.1-7.8	<2	Moderate	0.20	
	31-47	0.6-2.0	0.14-0.17	6.1-7.8	<2	Moderate	0.32	
	47	---	---	---	---	---	---	
194, 195	0-7	2.0-6.0	0.10-0.16	7.9-8.4	<2	Low	0.32	5
San Emigdio	7-60	2.0-6.0	0.10-0.16	7.9-8.4	<2	Low	0.32	
196	0-19	0.6-2.0	0.07-0.11	5.6-7.3	<2	Low	0.43	5
San Ysidro	19-40	<0.06	0.04-0.06	7.9-8.4	<2	High	0.37	
	40-60	0.06-0.2	0.10-0.16	7.9-8.4	<2	Moderate	0.37	
197	0-23	0.6-2.0	0.14-0.16	5.6-7.3	<2	Low	0.49	5
San Ysidro	23-38	<0.06	0.04-0.06	7.9-8.4	<2	High	0.37	
	38-64	0.06-0.2	0.10-0.16	7.9-8.4	<2	Moderate	0.37	
198*:								
Santa Lucia	0-4	0.6-2.0	0.10-0.14	5.1-6.5	<2	Low	0.15	2
	4-21	0.6-2.0	0.09-0.12	5.1-6.5	<2	Low	0.10	
	21	---	---	---	---	---	---	
Lopez	0-14	0.6-2.0	0.10-0.12	5.6-6.0	<2	Low	0.15	1
	14	---	---	---	---	---	---	
199*:								
Santa Lucia	0-4	0.6-2.0	0.10-0.14	5.1-6.5	<2	Low	0.15	2
	4-21	0.6-2.0	0.09-0.12	5.1-6.5	<2	Low	0.10	
	21	---	---	---	---	---	---	
Gazos	0-28	0.2-0.6	0.12-0.15	5.6-7.3	<2	Moderate	0.32	2
	28	---	---	---	---	---	---	
200	0-10	2.0-6.0	0.10-0.13	5.6-6.5	<2	Low	0.28	2
Sesame	10-25	0.6-2.0	0.15-0.18	6.1-7.3	<2	Moderate	0.17	
	25	---	---	---	---	---	---	
201, 202	0-10	0.6-2.0	0.11-0.16	6.1-7.3	<2	Low	0.37	2
Shimmon	10-29	0.2-0.6	0.16-0.19	6.1-8.4	<2	Moderate	0.64	
	29	---	---	---	---	---	---	
203*, 204*:								
Shimmon	0-10	0.6-2.0	0.11-0.16	6.1-7.3	<2	Low	0.37	2
	10-29	0.2-0.6	0.16-0.19	6.1-8.4	<2	Moderate	0.64	
	29	---	---	---	---	---	---	
Dibble	0-12	0.2-0.6	0.16-0.20	5.6-6.5	<2	High	0.43	2
	12-34	0.06-0.2	0.14-0.18	6.1-7.3	<2	High	0.32	
	34	---	---	---	---	---	---	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
205, 206--------- Sorrento	0-19 19-60	0.2-0.6 0.2-0.6	0.18-0.21 0.16-0.21	6.6-8.4 7.4-8.4	<2 <2	Moderate----- Moderate-----	0.32 0.37	5
207-------------- Still	0-28 28-60	0.6-2.0 0.2-0.6	0.10-0.13 0.10-0.13	6.1-7.3 6.6-8.4	<2 <2	Low---------- Moderate-----	0.24 0.28	5
208, 209--------- Still	0-25 25-60	0.2-0.6 0.2-0.6	0.16-0.18 0.14-0.18	6.1-7.3 6.6-8.4	<2 ---	Moderate----- Moderate-----	0.28 0.28	5
210-------------- Vista	0-14 14-29 29	2.0-6.0 2.0-6.0 ---	0.07-0.12 0.07-0.12 ---	6.1-7.3 6.1-7.3 ---	<2 <2 ---	Low---------- Low---------- ---	0.28 0.28 ---	2
211*: Vista-----------	0-14 14-29 29	2.0-6.0 2.0-6.0 ---	0.07-0.12 0.07-0.12 ---	6.1-7.3 6.1-7.3 ---	<2 <2 ---	Low---------- Low---------- ---	0.28 0.28 ---	2
Cieneba--------- 	0-15 15	2.0-6.0 ---	0.09-0.14 ---	5.6-7.3 ---	<2 ---	Low---------- ---	0.24 ---	1
212*: Xerofluvents. Riverwash.								
213-------------- Zakme	0-47 47-55 55	0.06-0.2 0.06-0.2 ---	0.13-0.16 0.13-0.16 ---	7.4-8.4 7.4-8.4 ---	<2 <2 ---	High--------- High--------- ---	0.15 0.15 ---	3

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," apparent," and "perched." The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
100, 101---------- Arbuckle	B	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
102*, 103*, 104*, 105*:													
Arbuckle---------	B	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Positas----------	D	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Moderate.
106*:													
Arbuckle----------	B	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
San Ysidro--------	B	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Moderate.
107--------------- Arnold	B	None--------	---	---	>6.0	---	---	40-60	Ripable	---	---	Moderate	Moderate.
108*:													
Arnold------------	B	None--------	---	---	>6.0	---	---	40-60	Ripable	---	---	Moderate	Moderate.
San Andreas-------	B	None--------	---	---	>6.0	---	---	20-40	Ripable	---	---	Moderate	Moderate.
109*, 110*, 111*:													
Ayar---------------	D	None--------	---	---	>6.0	---	---	40-70	Ripable	---	---	High-----	Low.
Diablo------------	D	None--------	---	---	>6.0	---	---	40-60	Ripable	---	---	High-----	Low.
112*. Badland													
113*:													
Balcom------------	B	None--------	---	---	>6.0	---	---	20-40	Ripable	---	---	High-----	Low.
Calleguas---------	D	None--------	---	---	>6.0	---	---	10-20	Ripable	---	---	High-----	Low.
114*, 115*:													
Balcom------------	B	None--------	---	---	>6.0	---	---	20-40	Ripable	---	---	High-----	Low.
Nacimiento--------	C	None--------	---	---	>6.0	---	---	20-40	Ripable	---	---	High-----	Low.
116--------------- Botella	B	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
117--------------- Calleguas	D	None--------	---	---	>6.0	---	---	10-20	Ripable	---	---	High-----	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
118---------- Camarillo	C	Frequent----	Brief-----	Nov-Mar	2.0-2.5	Apparent	Jan-May	>60	---	---	---	High-----	Moderate.
119---------- Camarillo	C	Rare--------	---	---	4.0-5.0	Apparent	Jan-May	>60	---	---	---	High-----	Moderate.
120, 121---------- Camatta	D	None--------	---	---	>6.0	---	---	>60	---	10-20	Rippable	High-----	Low.
122---------- Capay	D	Rare--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Moderate.
123---------- Capay	D	Occasional	Brief-----	Jan-Feb	>6.0	---	---	>60	---	---	---	High-----	Moderate.
124, 125---------- Chanac	B	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
126---------- Cieneba	C	None--------	---	---	>6.0	---	---	6-12	Rippable	---	---	Low------	Low.
127*: Cieneba----------	C	None--------	---	---	>6.0	---	---	12-20	Rippable	---	---	Low------	Low.
Andregg----------	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Moderate.
128*: Cieneba----------	C	None--------	---	---	>6.0	---	---	12-20	Rippable	---	---	Low------	Low.
Vista----------	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Moderate.
129---------- Clear Lake	D	Occasional	Brief-----	Dec-Feb	1.0-3.0	Apparent	Oct-Mar	>60	---	---	---	High-----	High.
130---------- Clear Lake	D	Rare--------	---	---	>6.0	---	---	>60	---	---	---	High-----	High.
131---------- Concepcion	D	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
132, 133---------- Cropley	D	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
134, 135, 136, 137---------- Dibble	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	High-----	Moderate.
138, 139---------- Elder	B	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
140---------- Elder	B	Occasional	Brief-----	Nov-Mar	>6.0	---	---	>60	---	---	---	Moderate	Moderate.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
141*: Gaviota	D	None	---	---	>6.0	---	---	6-12	Hard	---	---	Low	Low.
Rock outcrop.													
142*, 143*: Gaviota	D	None	---	---	>6.0	---	---	12-20	Hard	---	---	Low	Low.
San Andreas	B	None	---	---	>6.0	---	---	20-40	Ripable	---	---	Moderate	Moderate.
144, 145 Gazos	C	None	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Low.
146*: Gilroy	C	None	---	---	>6.0	---	---	20-40	Hard	---	---	High	Low.
Rock outcrop.													
147*, 148*, 149*: Hanford	B	None	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
Greenfield	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
150*: Hanford	B	None	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
Greenfield	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
151*: Henneke	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	High	Moderate.
Rock outcrop.													
152*, 153*, 154*: Linne	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Low.
Calodo	C	None	---	---	>6.0	---	---	10-20	Ripable	---	---	Moderate	Low.
155*: Linne	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Low.
Diablo	D	None	---	---	>6.0	---	---	40-60	Ripable	---	---	High	Low.
156*: Linne	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Low.
Zakme	D	None	---	---	>6.0	---	---	40-60	Ripable	---	---	High	Low.
157, 158 Lockwood	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
159*, 160*:													
Lockwood	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
Concepcion	D	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
161--Lompico	B	None	---	---	>6.0	---	---	20-40	Rippable	---	---	High	High.
162*:													
Lompico	B	None	---	---	>6.0	---	---	20-40	Rippable	---	---	High	High.
McMullin	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
163*:													
Los Osos	C	None	---	---	>6.0	---	---	20-40	Rippable	---	---	High	Moderate.
Lodo	D	None	---	---	>6.0	---	---	10-20	Rippable	---	---	Low	Low.
164*:													
Los Osos	C	None	---	---	>6.0	---	---	20-40	Rippable	---	---	High	Moderate.
Rock outcrop.													
165*:													
McMullin	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Rock outcrop.													
166--Metz	A	Rare	---	---	>6.0	---	---	>60	---	---	---	High	Low.
167*:													
Metz	A	Occasional	Brief	Nov-Mar	>6.0	---	---	>60	---	---	---	High	Low.
Tujunga	A	Occasional	Brief	Dec-Mar	>6.0	---	---	>60	---	---	---	Low	Low.
168*:													
Millsholm	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Ayar	D	None	---	---	>6.0	---	---	40-70	Rippable	---	---	High	Low.
169*, 170*:													
Millsholm	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Dibble	C	None	---	---	>6.0	---	---	20-40	Rippable	---	---	High	Moderate.
171*:													
Millsholm	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Montara	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	High	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
172*:													
Millsholm	D	None	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
Rock outcrop.													
173, 174 Mocho	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
175, 176 Nacimiento	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Low.
177*, 178*:													
Nacimiento	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Low.
Ayar	D	None	---	---	>6.0	---	---	40-70	Ripable	---	---	High	Low.
179*, 180*, 181*:													
Nacimiento	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Low.
Los Osos	C	None	---	---	>6.0	---	---	20-40	Ripable	---	---	High	Moderate.
182 Oceano	A	None	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
183, 184 Pico	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
185*. Pits													
186 Polonio	B	None	---	---	>6.0	---	---	>60	---	---	---	High	Low.
187, 188, 189 Rincon	C	None	---	---	>6.0	---	---	>60	---	---	---	High	Moderate.
190*:													
Rock outcrop.													
Gaviota	D	None	---	---	>6.0	---	---	6-12	Hard	---	---	Low	Low.
191 Ryer	C	None	---	---	>6.0	---	---	>60	---	---	---	High	Moderate.
192 San Andreas	B	None	---	---	>6.0	---	---	20-40	Ripable	---	---	Moderate	Moderate.
193*:													
San Andreas	B	None	---	---	>6.0	---	---	20-40	Ripable	---	---	Moderate	Moderate.
Arujo	B	None	---	---	>6.0	---	---	40-60	Ripable	---	---	Moderate	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
194, 195---------- San Emigdio	B	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
196, 197---------- San Ysidro	B	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Moderate.
198*: Santa Lucia------	C	None--------	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	High.
Lopez------------	D	None--------	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Moderate.
199*: Santa Lucia------	C	None--------	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	High.
Gazos------------	C	None--------	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Low.
200---------- Sesame	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Low.
201, 202---------- Shimmon	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Moderate.
203*, 204*: Shimmon----------	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Moderate.
Dibble----------	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	High-----	Moderate.
205, 206---------- Sorrento	B	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
207---------- Still	B	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
208, 209---------- Still	B	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
210---------- Vista	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Moderate.
211*: Vista------------	C	None--------	---	---	>6.0	---	---	20-40	Rippable	---	---	Moderate	Moderate.
Cieneba----------	C	None--------	---	---	>6.0	---	---	12-20	Rippable	---	---	Low------	Low.
212*: Xerofluvents. Riverwash.													
213---------- Zakme	D	None--------	---	---	>6.0	---	---	40-60	Rippable	---	---	High-----	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Andregg	Coarse-loamy, mixed, thermic Typic Haploxerolls
Arbuckle	Fine-loamy, mixed, thermic Typic Haploxeralfs
Arnold	Mixed, thermic Typic Xeropsamments
*Arujo	Fine-loamy, mixed, thermic Pachic Argixerolls
Ayar	Fine, montmorillonitic, thermic Typic Chromoxererts
Balcom	Fine-loamy, mixed, thermic Calcixerollic Xerochrepts
Botella	Fine-loamy, mixed, thermic Pachic Argixerolls
Calleguas	Loamy, mixed (calcareous), thermic, shallow Typic Xerorthents
Calodo	Loamy, mixed, thermic, shallow Calcic Haploxerolls
Camarillo	Fine-loamy, mixed (calcareous), thermic Aquic Xerofluvents
Camatta	Loamy, mixed, thermic, shallow Xerollic Paleorthids
Capay	Fine, montmorillonitic, thermic Typic Chromoxererts
Chanac	Fine-loamy, mixed, thermic Calcixerollic Xerochrepts
Cieneba	Loamy, mixed, nonacid, thermic, shallow Typic Xerorthents
Clear Lake	Fine, montmorillonitic, thermic Typic Pelloxererts
Concepcion	Fine, montmorillonitic, thermic Xeric Argialbolls
Cropley	Fine, montmorillonitic, thermic Chromic Pelloxererts
Diablo	Fine, montmorillonitic, thermic Chromic Pelloxererts
Dibble	Fine, montmorillonitic, thermic Typic Haploxeralfs
Elder	Coarse-loamy, mixed, thermic Cumulic Haploxerolls
Gaviota	Loamy, mixed, nonacid, thermic Lithic Xerorthents
Gazos	Fine-loamy, mixed, thermic Pachic Haploxerolls
Gilroy	Fine-loamy, mixed, thermic Typic Argixerolls
Greenfield	Coarse-loamy, mixed, thermic Typic Haploxeralfs
Hanford	Coarse-loamy, mixed, nonacid, thermic Typic Xerorthents
Henneke	Clayey-skeletal, serpentinitic, thermic Lithic Argixerolls
Linne	Fine-loamy, mixed, thermic Calcic Pachic Haploxerolls
Lockwood	Fine-loamy, mixed, thermic Pachic Argixerolls
Lodo	Loamy, mixed, thermic Lithic Haploxerolls
Lompico	Fine-loamy, mixed, mesic Ultic Argixerolls
Lopez	Loamy-skeletal, mixed, thermic Lithic Ultic Haploxerolls
Los Osos	Fine, montmorillonitic, thermic Typic Argixerolls
McMullin	Loamy, mixed, mesic Lithic Ultic Haploxerolls
Metz	Sandy, mixed, thermic Typic Xerofluvents
Millsholm	Loamy, mixed, thermic Lithic Xerochrepts
Mocho	Fine-loamy, mixed, thermic Fluventic Haploxerolls
Montara	Loamy, serpentinitic, thermic Lithic Haploxerolls
Nacimiento	Fine-loamy, mixed, thermic Calcic Haploxerolls
Oceano	Mixed, thermic Alfic Xeropsamments
Pico	Coarse-loamy, mixed, thermic Fluventic Haploxerolls
Polonio	Fine-loamy, mixed (calcareous), thermic Xeric Torriorthents
Positas	Fine, montmorillonitic, thermic Mollic Palexeralfs
Rincon	Fine, montmorillonitic, thermic Mollic Haploxeralfs
Ryer	Fine, montmorillonitic, thermic Typic Haploxeralfs
San Andreas	Coarse-loamy, mixed, thermic Typic Haploxerolls
San Emigdio	Coarse-loamy, mixed (calcareous), thermic Typic Xerofluvents
*San Ysidro	Fine, montmorillonitic, thermic Typic Palexeralfs
Santa Lucia	Clayey-skeletal, mixed, thermic Pachic Ultic Haploxerolls
Sesame	Fine-loamy, mixed, thermic Typic Haploxeralfs
Shimmon	Fine-loamy, mixed, thermic Typic Argixerolls
Sorrento	Fine-loamy, mixed, thermic Calcic Haploxerolls
Still	Fine-loamy, mixed, thermic Cumulic Haploxerolls
Tujunga	Mixed, thermic Typic Xeropsamments
Vista	Coarse-loamy, mixed, thermic Typic Xerochrepts
Zakme	Very fine, montmorillonitic, mesic Vertic Haploxerolls

* U. S. GOVERNMENT PRINTING OFFICE : 1983 O - 302-136

Accessibility Statement

This document is not accessible by screen-reader software. The U.S. Department of Agriculture is committed to making its electronic and information technologies accessible to individuals with disabilities by meeting or exceeding the requirements of Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended in 1998. Section 508 is a federal law that requires agencies to provide individuals with disabilities equal access to electronic information and data comparable to those who do not have disabilities, unless an undue burden would be imposed on the agency. The Section 508 standards are the technical requirements and criteria that are used to measure conformance within this law. More information on Section 508 and the technical standards can be found at www.section508.gov.

If you require assistance or wish to report an issue related to the accessibility of any content on this website, please email Section508@oc.usda.gov. If applicable, please include the web address or URL and the specific problems you have encountered. You may also contact a representative from the USDA Section 508 Coordination Team.

Nondiscrimination Statement

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by:

(1) mail: U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;

(2) fax: (202) 690-7442; or

(3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.