SOIL SURVEY

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SOIL SURVEY OF WESTERN RIVERSIDE AREA, CALIFORNIA

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, AND UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF INDIAN AFFAIRS IN COOPERATION WITH UNIVERSITY OF CALIFORNIA AGRICULTURAL EXPERIMENT STATION

THE WESTERN RIVERSIDE AREA is east of the Los Angeles Basin (fig. 1). It is made up of the western one-third of Riverside County. Two national forests are adjacent to the Area. The San Jacinto Ranger District of the San Bernardino National Forest is to the east in the San Jacinto Mountains, and the Trabuco Ranger District of the Cleveland National Forest is on the western edge in the Santa Ana Mountains. These forests are excluded from this survey. Also excluded is the March Air Force Base. The total extent of the survey area is approximately 1,105,940 acres, or about 1,728 square miles.

Riverside County is south of the San Bernardino Mountains, east of the Santa Ana Mountains, and north of the Aqua Tibia and Palomar Mountains. It includes the San Jacinto Mountains and the northern part of the Santa Rosa Mountains and extends across the Coachella Valley to the Colorado River. The county is roughly 190 miles from east to west, and 42 miles from north to south. About one third of the county is mapped in the survey area.

Figure 1.—Location of Western Riverside Area in California

The soils in the survey area are nearly level to very steep and are suitable for many kinds of crops. Many areas are irrigated, but large areas are used for dryfarmed crops. A large area of rocky soils has a cover of brush and is pastured. Irrigation water was brought to the Area as early as the 1870's, and much citrus was planted near the city of Riverside. The Washington navel orange was first planted in the Area in 1920. Since then the Area has produced large amounts of this popular orange for the market. The irrigated areas are also used for truck crops, alfalfa, grapes, and permanent pasture. In the dryfarmed areas, barley and wheat are the major crops.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in the Western Riverside Area, where they are located, and how they can be used. They went into the Area knowing they likely would find many soils they had already seen and perhaps some they had not. As they traveled over the Area, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of plants or crops; 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 that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in areas nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. For successful use of this survey, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or

neir behavior under present methods of ment.

Map

oil map at the back of this survey shows, l associations in the Western Riverside ociation is a landscape that has a distinc- l pattern of soils. It normally consists of jor soils and at least one minor soil, and the major soils. The soils in one associa- in another, but in a different pattern.

ng associations is useful to people who idea of the soils in the Area, who want erent parts of an Area, or who want to on of large tracts that are suitable for a land use. Such a map is a useful general ng a watershed, or a wildlife area, or in ering works, recreational facilities, and elopments. It is not a suitable map for anagement of a farm or field, or for ct location of a road, building, or similar e the soils in any one association ordinar- pe, depth, stoniness, drainage, and other hat affect their management.

Riverside Area consists of two physio- s. These are the Southern California nd the Southern California Mountains. hrough 8 are on the plain, and the other are on the mountains.

uthern California Coastal Plain

aphic section is made up of soils in inter- or in intermountain valleys at a low of the areas consist of deep alluvial fills uplands that surround valleys. Elevation to 3,500 feet, and annual rainfall from The average annual temperature is 59° to frost-free season is about 200 to 300 days. ain is traversed by several large fault s that have contributed greatly to the l separation of valley soils and upland ern California Coastal Plain is in Land 9. It contains eight soil associations.

scal-Las Posas association

ndulating to steep, moderately deep to t have a surface layer of fine sandy loam bbro and latite-porphyry

ation is in the western part of the survey re well drained. Slopes range from 2 to areas that are hilly to steep generally places are cobbly or stony. Other areas in an intermediate valley. Elevation to 3,500 feet. Average rainfall is 9 to rage annual temperature is 59° to 65° F., e season ranges from 230 to 300 days.

on makes up about 10 percent of the jalco soils make up about 40 percent; 15 percent; Las Posas soils, 15 percent; and Lake Mathews, the remaining 30

loam. Below is fine-grained metamorphosed sandstone and schist.

Minor soils of this association are the Honcut and Vallecitos soils and the thick surface variant of the Vallecitos soils. Other small areas consist of the land types Rock land and Wet alluvial land. Honcut soils and Wet alluvial land occur in the larger drainageways. The hilly to steep, rocky Vallecitos soils are on uplands. Rock land generally occurs on the upland crests.

The soils of this association are used chiefly for grain and pasture. If irrigation water is available, citrus is grown on soils where the climate is suited. The soils are also used for recreation areas and as wildlife habitat.

3. *Cieneba-Rock Land-Fallbrook association*

Well-drained and somewhat excessively drained, undulating to steep, very shallow to moderately deep soils that have a surface layer of sandy loam and fine sandy loam; on granitic rock

The soils of this association are on uplands. They are mainly on granitic rock islands in the intermediate valleys and on the foothills of the San Jacinto Mountains. Many alluvial fans emanate from these islands. Slopes range from 2 to 50 percent. Elevation ranges from 700 to 3,500 feet, and the average annual rainfall ranges from 9 to 16 inches. The average annual temperature is 59° to 65° F., and the frost-free season is 200 to 300 days.

This association makes up about 16 percent of the survey area. Cieneba soils make up 55 percent of this association; the land type Rock land, 15 percent; Fallbrook soils, 15 percent; and minor soils, the remaining 15 percent.

Cieneba soils are steeper and more rocky than the other soils of the association. They generally are shallow, hilly to steep, somewhat excessively drained soils. Their surface layer is brown, medium acid sandy loam. The underlying material is light yellowish-brown, slightly acid gravelly coarse sand that rests on weathered granitic rock. Rocks crop out and cover 2 to 10 percent of the surface.

Rock land is steep and very shallow. Rocks crop out and cover 35 to 60 percent of the surface.

Fallbrook soils, which are well drained and moderately deep, occupy the smoother, less rocky areas. The surface layer is brown, slightly acid and neutral sandy loam. The subsoil is reddish-brown, neutral sandy clay loam underlain by weathered granite. In some places the Fallbrook soils are severely eroded and their subsoil is exposed. Rocks crop out and cover 2 to 10 percent of the surface in other areas.

Minor soils of this association are Arlington, Bonsall, Bosanko, Buren, Vista, and Visalia. Bonsall soils occur in small spots in the more nearly level areas where favorable moisture conditions exist. Bosanko soils occur in areas where the parent rock was rich in weatherable minerals.

The soils of this association are used chiefly for pasture and dryfarmed grain. If irrigation water is available, citrus generally is grown on moderately deep, undulating to rolling soils where the climate is suited. The soils are also used for homesites, for related community purposes, for recreation, and as wildlife habitat.

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mewhat excessively drained and ace layer is dark grayish-brown sandy loam and loam. The sub-wn, slightly acid gravelly coarse y decomposing mica-schist that In some areas rock crops out and the surface.

ll drained and are moderately er is brown to dark-brown and edium acid sandy loam and stony ain by light yellowish-brown, de-ed, acid, igneous rock. In some cover 2 to 10 percent of the sur-

sociation are Bull Trail, Crouch, n, and areas of the miscellaneous Rock land, Rough broken land, Mottsville and Oak Glen soils the Bull Trail soils on terraces, uplands. Rock land occurs on the d slopes.

ciation are used for range. Im-re grown where the soils are not lly areas. The soils are also used as wildlife habitat.

k Glen association

well-drained, gently sloping to at have a surface layer of loamy on alluvial fans and valley fill

ciation are on alluvial fans and ed predominantly in material c uplands in the Southern Cali-s range from 2 to 25 percent. 500 to 6,000 feet, and the average om 10 to 25 inches. The average 0° to 57° F., and the frost-free 5 days.

up about 4 percent of the survey ke up 50 percent of the associa-ercent; Oak Glen soils, 15 per-e remaining 10 percent.

cessively drained. Their surface own, slightly acid loamy sand or al underlying is grayish-brown, se sand. In places many cobble-

drained. Their surface layer is edium acid sandy loam or loam. wish-brown, medium acid sandy in by yellowish-brown, medium

ll drained. They have a surface acid fine sandy loam or gravelly ying material is reddish-brown, loam.

sociation are Anza and Bishop, and areas of the miscellaneous land types Riverwash and Wet alluvial land.

The soils of this association are used chiefly for pasture (domestic rye) and grain. If irrigation water is available, apples, pears, peaches, alfalfa seed, and potatoes are grown. The soils are also used for recreation and as wildlife habitat.

Descriptions of the Soils

This section provides detailed information about the soils in the Area. It describes each soil series, and then each soil, or mapping unit. The soils are described in alphabetical order.

The description of a soil series mentions features that apply to all of the soils of that series. Differences among the soils of one series are pointed out in the descriptions of the individual soils, or are apparent in the name.

A profile typical of each series is described in detail in the first mapping unit. This typifying profile is for scientists, engineers, and others who need to make highly technical soil interpretations. The layers, or horizons, are designated by symbols such as A1, B21t, and C1. These symbols have special meaning for soil scientists. Many readers, however, need only remember that symbols beginning with "A" are for surface layer; those with "B" are for subsoil; those with "C" are for substratum, or parent material; and those with "R" are for bedrock. All measurements refer to depth from the surface.

The color of each horizon is described in words, such as yellowish brown, and is also indicated by symbols for hue, value, and chroma, such as 10YR 5/4. These symbols, which are called Munsell color notation, are used by soil scientists to evaluate the color of the soil precisely (*11*)[1]. Unless otherwise stated, all color terms in the survey are for dry soil.

The texture of the soil refers to the content of sand, silt, and clay. It is determined by the way the soil feels when rubbed between the fingers, and it is checked by laboratory analyses. Each mapping unit is identified by a textural class name, such as "fine sandy loam." This name refers to the texture of the surface layer or A horizon.

The structure is indicated by the way the individual soil particles are arranged in larger grains, or aggregates, and the amount of pore space between grains. The structure of the soil is described by terms that denote strength or grade, size, and shape of soil materials, such as "weak, fine, angular blocky structure."

Boundaries between the horizons are described so as to indicate their thickness and shape. The terms for thickness are *abrupt*, *clear*, *gradual*, and *diffuse*. The shape of the boundary is described as *smooth*, *wavy*, *irregular*, or *broken*.

Other terms used for describing the soils are defined in the Glossary. For more general information about the soils, the reader can refer to the section "General Soil Map," in which the broad patterns of soils are described. The approximate acreage and proportionate extent of the soils are given in table 1, and their location and

[1] Italic numbers in parentheses refer to Literature Cited, p. 155.

nate extent of the soils

Soil	Acreage	Percent
5 to 15 percent slopes, ded	140	(1)
deep, 2 to 8 percent slopes,	970	0.1
sandy loam, 8 to 15 percent ded	7,150	.6
sandy loam, 2 to 8 percent ded	2,660	.2
sandy loam, 15 to 35 percent ded	2,250	.2
y fine sandy loam, 5 to 15 pes, eroded	1,330	.1
y fine sandy loam, 15 to 50 pes, eroded	25,000	2.3
y loam, 2 to 8 percent slopes,	4,400	.4
y loam, 8 to 15 percent slopes,	880	.1
, 2 to 8 percent slopes,	480	(1)
um, drained	2,640	.2
um, drained, saline-alkali	2,830	.3
um, strongly saline-alkali	1,240	.1
y sandy loam, 15 to 50 percent ded	117,800	10.6
y sandy loam, 8 to 15 percent ded	6,520	.6
ly loam, 5 to 8 percent	1,650	.1
ly loam, 8 to 15 percent ded	4,900	.4
ly loam, 15 to 50 percent ded	6,700	.6
elly coarse sandy loam, 2 to lopes	1,420	.1
elly loamy sand, 2 to 8 pes	890	.1
ly loamy sand, 2 to 8 percent	800	.1
y loam, 0 to 2 percent	320	(1)
elly sandy loam, 0 to 2 pes	750	.1
ly sandy loam, 2 to 12 pes	700	.1
y sandy loam, 25 to 50 pes, eroded	19,500	1.8
sandy loam, 15 to 35 percent ded	300	(1)
y fine sandy loam, 15 to 25 pes	580	.1
y sandy loam, 25 to 50 percent ded	1,900	.2
y sandy loam, 8 to 25 percent ded	3,460	.3
y sand, 8 to 15 percent slopes,	1,010	.1
y loam, 8 to 15 percent slopes,	2,500	.2
y loam, 15 to 25 percent ded	1,460	.1
nd, 2 to 15 percent slopes, ed	3,180	.3
fine sand, 0 to 2 percent	1,930	.1
fine sand, 0 to 2 percent	790	.1
sand, 0 to 5 percent	630	.1
sand, poorly drained, 0 to 2 pes	2,010	.2
sand, gravelly substratum, cent slopes	540	.1
fine sand, saline-alkali, cent slopes	640	.1
fine sand, gravelly sub- to 2 percent slopes	1,800	.1

acreage and proportionate extent of the soils—Continued

Acreage	Percent	Soil	Acreage	Percent
6,710	0.6	Gorgonio cobbly loamy fine sand, 2 to 15 percent slopes	2,160	0.2
570	.1	Grangeville loamy fine sand, drained, 0 to 5 percent slopes	3,270	.3
1,320	.1	Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes	800	.1
1,320	.1	Grangeville sandy loam, sandy substratum, drained, 0 to 5 percent slopes	770	.1
1,570	.1	Grangeville sandy loam, sandy substratum, drained, saline-alkali, 0 to 5 percent slopes	830	.1
3,930	.4	Grangeville fine sandy loam, drained, 0 to 2 percent slopes	4,500	.4
1,740	.1	Grangeville fine sandy loam, drained, 5 to 15 percent slopes	150	(1)
890	.1	Grangeville fine sandy loam, poorly drained, saline-alkali, 0 to 5 percent slopes	2,380	.2
590	.1	Grangeville fine sandy loam, saline-alkali, 0 to 5 percent slopes	2,760	.2
3,470	.3	Grangeville fine sandy loam, loamy substratum, drained, 0 to 2 percent slopes	730	.1
2,000	.2	Grangeville fine sandy loam, loamy substratum, drained, saline-alkali, 0 to 2 percent slopes	760	.1
730	.1	Greenfield sandy loam, 2 to 8 percent slopes, eroded	24,000	2.2
3,350	.3	Greenfield sandy loam, 0 to 2 percent slopes	10,200	.9
1,320	.1	Greenfield sandy loam, 8 to 15 percent slopes, eroded	4,200	.4
590	.1	Greenfield sandy loam, 15 to 25 percent slopes, eroded	900	.1
470	(1)	Gullied land	20,700	1.9
7,000	.6	Hanford coarse sandy loam, 2 to 8 percent slopes	39,500	3.6
1,300	.1	Hanford loamy fine sand, 0 to 8 percent slopes	770	.1
1,210	.1	Hanford coarse sandy loam, 0 to 2 percent slopes	2,970	.3
2,250	.2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	10,200	.9
1,360	.1	Hanford cobbly coarse sandy loam, 2 to 15 percent slopes, eroded	2,230	.2
12,700	1.4	Hanford coarse sandy loam, deep, 2 to 8 percent slopes, eroded	450	(1)
3,950	.4	Hanford sandy loam, 2 to 15 percent slopes	1,040	.1
4,030	.4	Hanford fine sandy loam, 0 to 2 percent slopes	4,500	.4
27,800	2.5	Hilmar loamy sand, 0 to 2 percent slopes, eroded	1,920	.2
6,640	.6	Hilmar loamy very fine sand, 0 to 2 percent slopes	1,800	.2
2,720	.2	Hilmar loamy very fine sand, 2 to 8 percent slopes	230	(1)
6,950	.6	Honcut sandy loam, 2 to 8 percent slopes	1,520	.1
410	(1)	Honcut sandy loam, 8 to 15 percent slopes, eroded	450	(1)
4,010	.4	Honcut loam, 2 to 8 percent slopes, eroded	1,200	.1
190	(1)	Honcut cobbly sandy loam, 2 to 25 percent slopes	200	(1)
260	(1)	Las Posas loam, 8 to 15 percent slopes, eroded	3,700	.3
440	(1)	Las Posas loam, 2 to 8 percent slopes	3,210	.3
610	.1	Las Posas loam, 5 to 8 percent slopes, eroded	420	(1)
160	(1)	Las Posas loam, 8 to 25 percent slopes, severely eroded	700	.1
310	(1)	Las Posas stony loam, 8 to 15 percent slopes, eroded	260	(1)
8,340	.8	Las Posas rocky loam, 8 to 15 percent slopes, eroded	550	(1)
3,250	.3	Las Posas rocky loam, 15 to 50 percent slopes, severely eroded	8,320	.8
1,540	.1			
590	.1			
3,020	.3			

he soils—Continued

	Acreage	Percent
ercent slopes	1,040	0.1
tely deep, 2 to	1,090	.1
tely deep, to 5	1,850	.2
moderately slopes,	230	(1)
to 5 percent slopes,	15,160	1.4
to 2 percent	4,610	.4
to 5 percent slopes,	4,440	.4
to 8 percent slopes,	2,820	.3
to 8 percent slopes,	1,270	.1
to 15 percent	2,320	.2
to 15 percent d	2,620	.2
5 to 25 percent d	1,620	.1
oderately deep, 8 to ded	670	.1
oderately deep, es, severely	300	(1)
y loam, 0 to 8 d	3,070	.3
y loam, moderately lopes, eroded	300	(1)
ms, 5 to 15 percent	480	(1)
ms, 5 to 25 percent d	2,970	.3
dy loams, 15 to 25 ly eroded	3,560	.3
	8,380	.8
	49,500	4.5
	17,710	1.6
loam, 2 to 8 per-	6,760	.6
loam, 0 to 2 per-	7,660	.7
loam, 8 to 15 d	1,670	.1
loam, deep, 0 to	3,400	.3
2 percent	3,710	.3
8 percent	4,670	.4
15 percent slopes,	840	.1
m, channeled, 2 to	770	.1
o 25 percent slopes,	4,010	.4
to 50 percent	6,800	.6
sandy loam, 15 to oded	22,000	1.2
loam, 8 to 15 percent	950	.1
and, 2 to 15 percent	2,600	.2
sand, 2 to 25 percent	1,470	.1
percent slopes,	260	(1)
to 50 percent	370	(1)
15 to 50 percent	15,800	1.4

of the soils—Continued

Soil	Acreage	Percent
loam, 15 to 35 percent	3,470	0.3
sandy loam, 2 to 35 oded	5,070	.5
y loam, saline-alkali	770	.1
y loam, strongly	670	.1
ne-alkali	810	.1
e sand, saline-alkali	1,770	.1
	770	.1
aline-alkali	3,130	.3
	2,080	.2
trongly saline-	1,310	.1
leep, saline-alkali	840	.1
leep, strongly	1,270	.1
8 percent slopes,	2,340	.2
loam, 8 to 15 percent	230	(1)
8 percent slopes	1,840	.2
15 percent slopes,	550	(1)
25 percent slopes,	300	(1)
n, 2 to 25 percent	330	(1)
y fine sandy loam, pes, eroded	390	(1)
y fine sandy loam, opes, eroded	950	.1
y fine sandy loam, opes, severely	400	(1)
ndy loam, 2 to 15 oded	390	(1)
rrow areas	1,460	.1
s and dams)	5,240	.5
	1,105,940	100.0

typical profile on a south-facing slope 00 feet west and 500 feet south of the of section 18, T. 3 S., R. 7 W.):

s, grayish-brown (10YR 5/2) clay, very dark ish brown (10YR 3/2) when moist; strong, se, blocky structure; extremely hard, ex- ely firm, very sticky and very plastic; dant very fine and few fine roots; common, fine, tubular pores; slightly acid (pH 6.1); ary blocks are 12 to 21 inches in diameter; , wavy boundary. Horizon is 3 to 6 inches

hes, grayish-brown (10YR 5/2) clay, dark ish brown (10YR 4/2) when moist; strong, se and medium, blocky structure; extremely very sticky and very plastic; plentiful very roots; common, fine, tubular pores; many ensides; neutral (pH 7.0); clear, wavy dary. Horizon is 5 to 8 inches thick.

ches, grayish-brown (10YR 5/2) clay, dark ish brown (10YR 4/2) when moist; strong, se, blocky structure; extremely hard, ex- ely firm, very sticky and very plastic; plenti- ery fine roots; common, fine, simple, tubular s; many slickensides about 45 degrees to the cal; neutral (pH 7.2); clear, irregular dary. Horizon is 7 to 10 inches thick.

hes, light brownish-gray (10YR 6/2) heavy loam, dark grayish brown (10YR 4/2) when

sandy loam
s. The sub-
dy loam.
d Oak Glen

in, pasture,
and alfalfa.
pes (AcC).—
s on alluvial

facing slope
and 250 feet
, T. 7 S., R.

2) fine sandy
when moist;
m, subangular
le, nonsticky
nd very fine
slightly acid
y. Horizon is

YR 4/2) fine
R 2/2) when
ky structure;
and slightly
plentiful fine
ores; slightly
dary. Horizon

YR 4/2) fine
R 2/2) when
blocky struc-
y and slightly
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abrupt, wavy
thick.
2) fine sandy
YR 3/2) when
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3/2) when
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s thick.
) sandy loam,
R 3/2) when
nonsticky and
ms; few, fine,
(10YR 5/4);
pores; moder-
effervescence;

d has a sandy
horizon is 17
reaction, and
C horizon is
my sand and
a depth below

areas of Motts-
Calpine sandy
d are areas of
and make up

rapid, and the
inches. Runoff

ssive; slightly hard, friable, slightly sticky
slightly plastic; plentiful very fine roots;
mon, very fine, irregular pores; neutral (pH
; gradual, smooth boundary. Horizon is 4 to
nches thick.

hes, brown (10YR 5/3) gravelly loam, brown
R 4/3) when moist; massive; slightly hard,
ble, slightly sticky and slightly plastic;
tiful very fine roots; common, very fine,
ular pores; mildly alkaline (pH 7.8); clear,
oth boundary. Horizon is 3 to 18 inches thick.

nches, brown (10YR 5/3) gravelly clay loam,
wn (10YR 4/3) when moist; moderate, med-
, subangular blocky structure; slightly hard,
, sticky and plastic; plentiful very fine roots;
mon, very fine, tubular pores; weak thin
y films on ped faces; mildly alkaline (pH 7.5);
r, smooth boundary. Horizon is 6 to 15 inches
k.

nches, brown (10YR 5/3) gravelly clay loam,
wn (10YR 4/3) when moist; massive; slightly
d, firm, sticky and plastic; plentiful very fine
ts; common, very fine, tubular pores; weak
n clay films in tubular pores; mildly alkaline
H 7.5); clear, smooth boundary. Horizon is 4
20 inches thick.

es, yellowish-brown (10YR 5/4) very gravelly
dy loam, brown (10YR 4/3) when moist;
ssive; soft, very friable, nonsticky and non-
stic; few very fine roots; many, very fine,
ular pores; neutral (pH 7.0).

n is slightly acid to neutral. The Bt horizon
eutral to mildly alkaline gravelly loam to
am. The C horizon is gravelly to very gravelly

this soil in mapping are small areas of Gar-
very fine sandy loam and Perkins gravelly

moderately slow permeability, and its avail-
ding capacity is 6.0 to 8.0 inches. Runoff is
, and the hazard of erosion is slight to moder-
one is more than 60 inches deep, and natural
rate.

le soil is used for irrigated citrus, alfalfa,
in and for dryland grain and pasture. (Capa-
1 (19) irrigated; Loamy range site)

elly loam, 8 to 15 percent slopes (AlD).
this soil in mapping are very small
a gravelly very fine sandy loam surface
elly loam subsoil. Runoff is medium on
hazard of erosion is moderate.

d for irrigated citrus and grain and for
pasture, and range. (Capability unit
ated; Loamy range site)

elly loam, 15 to 25 percent slopes (AlE).
this soil in mapping is a small area that
ne sandy loam surface layer. Runoff is
, and the hazard of erosion is high.

d for irrigated grain and citrus and for
and range. (Capability unit IVe-1 (19)
y range site)

, 2 to 8 percent slopes (AkC).—The pro-
is similar to that described for the Ar-
it does not contain gravel in the surface
l, and it has a subsoil of loam or clay
ith this soil in mapping are some nearly
small area with a fine sandy loam sur-

water holding capacity of this soil is 9.0

sed for irrigated citrus, alfalfa, melons,
for dryland grain, pasture, and range.
IIe-1 (19) irrigated; Loamy range site)

fine roots; many, fine and
s; neutral (pH 7.3); clear,
on is 4 to 9 inches thick.
5/4) loam, reddish brown
it; massive; hard, friable,
onplastic; abundant very
nd very fine, tubular pores;
7.5); gradual, smooth
4 to 8 inches thick.
wn (5YR 5/4) loam, dark
/4) when moist; moderate,
y structure; hard, friable,
htly plastic; abundant fine
mmon, fine and medium,
in clay films on ped faces
lkaline (pH 7.8); gradual,
izon is 6 to 13 inches thick.
n (5YR 5/3) loam, reddish
en moist; strong, fine, sub-
ure; hard, friable, slightly
lastic; plentiful very fine
nmon, fine and very fine,
in clay films on ped faces
lkaline (pH 7.8); slightly
egated in fine soft masses;
y. Horizon is 4 to 10 inches

vn (5YR 5/4) loam, dark
3/4) when moist; massive;
sticky and slightly plastic;
roots; common, very fine,
n clay films in bridges and
(pH 7.5); slightly effer-
ated in fine soft masses;
y. Horizon is 3 to 14 inches

YR 5/3) weakly cemented
(10YR 4/3) when moist;
structure; very hard, firm,
stic; common, microtubular
(pH 7.5); strongly effer-
between structural units;
) siliceous coatings on the
which resist decomposition
r, wavy to irregular bound-
2 inches thick.
5/3) loamy coarse sand,
en moist; massive; neutral

o mildly alkaline. The Bt
e, brown to reddish-brown
th to the weakly cemented
36 inches.
g are small areas of Han-
loam, Ramona sandy loam,
included are some eroded

, and the available water
nches. Runoff is slow to
is slight to moderate. The

ryland grain and pasture,
ps, and for nonfarm pur-
) irrigated; Loamy range

8 percent slopes (AnC).

r to that described for
ine sandy loam surface

Arlington fine sandy
mapping.
itrus, grain, and truck
nd range, and for non-
IIIe-8 (19) irrigated;

loam, 8 to 15 percent slopes
his soil is similar to that described
but it has a fine sandy loam sur-

curring on slopes of 15 to 25 per-
ncluded are severely eroded areas,
percent of the total acreage.
d the hazard of erosion is mod-

irrigated citrus and truck crops,
pasture, and for nonfarm pur-
IVe-8 (19) irrigated; Loamy

loam, deep, 0 to 2 percent slopes
his soil is similar to that described
s, but it is deep over the weakly
a fine sandy loam surface layer
cluded in this mapping unit are
ore clay in the subsoil than nor-

olding capacity of this soil is 6.0
slow, and the hazard of erosion is
36 to 54 inches deep.
irrigated citrus, truck crops, and
n and pasture, and for nonfarm
nit IIs-8 (19) irrigated; Loamy

loam, deep, 2 to 8 percent slopes
his soil is similar to that described
s, but it is deep over the weakly
a fine sandy loam surface layer

ercent of the acreage mapped as
luded small areas where the sub-
nore clay than normal. Also in-
areas that have a water table at a
s.
olding capacity of this soil is 6.0
medium, and the hazard of ero-
ot zone is 36 to 54 inches deep.
irrigated citrus, truck crops, and
in, pasture, and range, and for
apability unit IIIe-1 (19) irri-
te)

loam, deep, 8 to 15 percent slopes
his soil is similar to that described
s, but it is deep over the weakly
a fine sandy loam surface layer
few small areas with a slight in-
bsoil are included in mapping.
holding capacity of this soil is
ff is medium, and the hazard of
root zone is 36 to 54 inches deep.
irrigated citrus and grain, for
and range, and for nonfarm pur-
t IVe-1 (19) irrigated; Loamy

p, 0 to 5 percent slopes (ArB).—
is similar to that described for
but it is deep over the weakly

holding capacity is 7 to 9 inches.
54 inches deep.
irrigated citrus, truck crops, and
sture, grain, and range, and for nonfarm purposes. (Capability unit IIe-1 (19) irrigated; Loamy range site)

Arlington loam, deep, 5 to 15 percent slopes (ArD).—The profile of this soil is similar to that described for the Arlington series, but it is deep over the weakly cemented layer. Included with this soil in mapping are a few small areas of moderately deep soils and a small area having slopes of 15 to 25 percent.

The available water holding capacity of this soil is 7 to 9 inches. Runoff is medium, and the hazard of erosion is moderate. The root zone is 36 to 54 inches deep.

This soil is used for irrigated citrus and grain, for dryland grain, pasture, and range, and for nonfarm purposes. (Capability unit IIIe-1 (19) irrigated; Loamy range site)

Arlington and Greenfield fine sandy loams, 2 to 8 percent slopes, eroded (AtC2).—This mapping unit consists of an undifferentiated group of soils on top of convex terraces, on ridges, and in concave areas where dissected terraces and alluvial fans merge. About 45 percent of the acreage is Arlington fine sandy loam; about 40 percent, Greenfield fine sandy loam; 10 percent, included areas of Greenfield cobbly and gravelly fine sandy loams; and 5 percent, included areas of severely eroded Arlington and Greenfield soils.

The Arlington soil of this mapping unit has a profile similar to that described for the Arlington series, but its surface layer is fine sandy loam. In areas of Arlington soil, there are rills and a few shallow gullies. The Greenfield soil of this mapping unit has a profile similar to that described for the Greenfield series, but its surface layer is fine sandy loam.

The soils in this group are used for dryland grain in the area east of Temesula and Murrieta. (Both soils, capability unit IIIe–8 (19) irrigated; Loamy range site)

Arlington and Greenfield fine sandy loams, 8 to 15 percent slopes, eroded (AtD2).—This mapping unit consists of an undifferentiated group of soils on top of convex terraces, on ridges, and in concave areas where dissected terraces and alluvial fans meet. About 35 percent of the acreage is Arlington fine sandy loam; 35 percent, Greenfield fine sandy loam; 10 percent, included areas of Greenfield cobbly and gravelly fine sandy loams; and 20 percent, included areas of severely eroded Arlington and Greenfield soils.

The Arlington soil of this mapping unit has a profile similar to that described for the Arlington series, but its surface layer is fine sandy loam and is eroded. The Greenfield soil of this mapping unit has a profile similar to that described for the Greenfield series, but its surface layer is fine sandy loam.

Runoff is medium on these soils, and the hazard of erosion is moderate.

The soils in this group are used for dryfarmed grain. (Both soils, capability unit IVe-8 (19) irrigated; Loamy range site)

Arlington and Greenfield fine sandy loams, 15 to 35 percent slopes, severely eroded (AtF3).—This mapping unit consists of an undifferentiated group of soils on top of convex terraces, on ridges, and in concave areas where dissected terraces and alluvial fans meet. Shallow to deep gullies occur, and in places the subsoil is exposed. About 55 percent of the acreage is Arlington fine sandy loam, and 45 percent, Greenfield fine sandy loam.

ish-brown (5YR 3/4) clay,
(2.5YR 3/4) when moist;
ery firm, sticky and plastic;
oots; many, very fine, tubu-
ninent slickensides; moder-
3.0); strongly effervescent;
ny fine rounded soft masses;
ıdary. Horizon is 6 to 24

vn (5YR 5/3) heavy loam,
4/3) when moist; massive;
sticky and slightly plastic;
.ar pores; moderately alka-
ly effervescent; lime segreg-
oft masses; clear, irregular
s 4 to 12 inches thick.
own (5YR 5/3) and light
6/3) loam; massive; slightly
slightly sticky and slightly
alkaline (pH 8.2); strongly
n many medium irregular
wavy boundary. Horizon is

lish-brown (5YR 6/3) and
reathered, basic igneous rock
kets of lime in soft masses;
t; moderately alkaline (pH

derately alkaline heavy clay
noderately to strongly effer-
h to the decomposing gabbro
e than 60 inches.
ıapping are small areas of
as loam, and Temescal rocky

is moderately slow, and the
is 5.0 to 8.0 inches. Runoff
zard of erosion is slight to
5 more than 60 inches deep,

nd pasture, grain, and range.
gated; Clayey range site)

slopes (AuD).—Included
few small areas that have
e areas of Auld gravelly
p Auld gravelly clay.
l, and the hazard of ero-

pasture, grain, and range.
irrigated; Clayey range

rcent slopes (AyF).—The
o that described for the
are on the surface and
d with this soil in map-
es of 2 to 8 percent. Also
of Auld clay or gravelly

ınd the hazard of erosion
ıble water holding capac-
l fertility is low to mod-

pasture and range. (Capa-
; Clayey range site)
cid igneous alluvium that
inland sea. The area was
eformed by geologic proc-
eroded and dissected by
dform has been destroyed.
cent.
onsists of soft sandstone,

arkose, siltstone, and beds of gravel. This material is semiconsolidated and ranges from light gray through grayish brown to brown. It ranges from moderately alkaline to strongly alkaline and is moderately or strongly effervescent.

Vegetation consists mainly of forbs and brush in extremely sparse stands. Where this land is near areas of cropland, it provides a habitat for small game, particularly rabbits, doves, and quail. The main uses of this land are for wildlife habitat and as a source of water. (Capability unit VIIIe-1 (19, 20) dryland; range site not assigned)

Bishop Series

The Bishop series consists of poorly drained soils on flood plains and alluvial fans. These soils developed in alluvium from granitic rock. Slopes are 0 to 2 percent. Elevations range from 3,500 to 4,200 feet. The average annual rainfall ranges from 13 to 17 inches, the average annual temperature from 52° to 56° F., and the average frost-free season from 120 to 160 days.

In a typical profile, the surface layer is gray silt loam about 14 inches thick. The substratum is gray, olive-gray, and grayish-brown stratified fine sandy loam, sandy clay loam, and silty clay loam. The soil is generally moderately to strongly saline-alkali.

The Bishop soils are near the Bull Trail, Oak Glen, and Mottsville soils.

The Bishop soils are used for dryland pasture and range and for irrigated potatoes.

Bishop silt loam (0 to 2 percent slopes) (Bb).—This soil occurs on flood plains and alluvial fans. It is moderately to strongly saline-alkali.

Following is a typical profile on a southwest-facing slope of 2 percent (1,050 feet east and 100 feet north of the southwest corner of section 29, T. 7 S., R. 2 E.):

A11—0 to 7 inches, gray (10YR 5/1) silt loam, black (10YR 2/1) when moist; moderate, fine, granular structure; slightly hard, very friable, nonsticky and slightly plastic; plentiful fine roots and abundant very fine roots; many, very fine and fine, irregular pores; moderately alkaline (pH 8.0); strongly effervescent; clear, smooth boundary. Horizon is 2 to 8 inches thick.

A12—7 to 14 inches, gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) when moist; weak, fine and medium, subangular blocky structure that parts to moderate, fine, granular structure; hard, friable, slightly sticky and slightly plastic; plentiful fine roots and abundant very fine roots; common, fine, tubular and irregular pores; moderately alkaline (pH 8.0); strongly effervescent; clear, smooth boundary. Horizon is 5 to 12 inches thick.

C1—14 to 26 inches, gray (5Y 5/1) fine sandy loam; few, faint, olive (5Y 5/3) mottles, very dark gray (5Y 3/1) when moist; moderate, medium, subangular blocky structure; very hard, friable, slightly sticky and slightly plastic; plentiful very fine roots and few fine roots; few, fine, and common, very fine, tubular pores; few thin clay films line tubular pores; moderately alkaline (pH 8.2); strongly effervescent; gradual, smooth boundary. Horizon is 8 to 14 inches thick.

C2g—26 to 32 inches, olive-gray (5Y 5/2) fine sandy loam, olive gray (5Y 4/2) when moist; weak, medium, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few, fine and very fine roots; few, very fine, tubular pores; moderately alkaline (pH 8.2); strongly effervescent; abrupt, smooth boundary. Horizon is 6 to 12 inches thick.

C3ca—32 to 52 inches, gray (5Y 6/1) silty clay loam, dark gray (5Y 4/1) when moist; massive; hard, firm, sticky and plastic; moderately alkaline (pH 8.2); violently effervescent; clear, smooth boundary. Horizon is 12 to 20 inches thick.

C4—52 to 64 inches, grayish-brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) when moist; massive; hard, firm, sticky and plastic; moderately alkaline (pH 8.2); very slightly effervescent.

The A horizon is slightly to strongly effervescent. It ranges from very dark gray to light gray in color and from silty clay loam to silt loam in texture. The C horizon ranges from fine sandy loam to silty clay loam in texture. In about 40 percent of the areas mapped, the water table is within 20 inches of the surface soil. Irrigation wells are lowering the water table.

Included with this soil in mapping are small areas of Calpine sandy loam, Oak Glen fine sandy loam, Mottsville sandy loam, and Mottsville loamy sand. Also included are small areas of erosion and deposition and areas that are somewhat poorly drained and only slightly saline-alkali.

Permeability of this soil is moderate to moderately slow, and available water holding capacity is 9.0 to 10.0 inches. Runoff is ponded, and there is no erosion hazard. The root zone is more than 60 inches deep, except where it is limited by the water table. Natural fertility is moderate.

This soil is used for dryland pasture and range and for irrigated potatoes. (Capability unit VIw-1 (20) dryland; Cienega range site)

Bonsall Series

Soils of the Bonsall series have developed in material deeply weathered from granodiorite or tonalite. These moderately well drained soils occur on uplands and have slopes of 2 to 15 percent. Elevations range from 1,000 to 1,800 feet. The average annual rainfall ranges from 10 to 14 inches, the average annual temperature from 62° to 65° F., and the average frost-free season from 240 to 300 days. The vegetation is chiefly annual grasses, forbs, and chamise.

Typically, the surface layer is brown fine sandy loam and loam about 9 inches thick. The subsoil is reddish-brown and dark reddish-brown clay loam and clay and yellowish-brown sandy clay. At a depth of about 30 inches is decomposing tonalite.

The Bonsall soils are near the Cieneba, Fallbrook, Vista, and Monserate soils.

The Bonsall soils are used for dryland hay, grain, pasture, and range, for irrigated citrus, and for nonfarm purposes.

Bonsall fine sandy loam, 2 to 8 percent slopes (BdC).—This undulating to gently rolling soil occurs on uplands.

Following is a typical profile on an east-facing slope of 4 percent (900 feet east and 700 feet south of the north quarter corner of section 19, T. 3 S., R. 4 W.):

Ap—0 to 5 inches, brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) when moist; weak, fine, granular structure; soft, very friable, slightly sticky and slightly plastic; abundant, very fine, random roots; many, very fine and few, fine, irregular pores; medium acid (pH 6.0); abrupt, wavy boundary. Horizon is 5 to 6 inches thick.

A1—5 to 9 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) when moist; weak, medium, granular structure; soft, very friable, slightly sticky and slightly plastic; plentiful, very fine, random roots; many, very fine and fine, tubular pores;

This soil is used for dryland pasture, hay, and grain, for irrigated citrus, and for homesites. (Capability unit IVe-3 (19) irrigated; Claypan range site)

Bosanko Series

In the Bosanko series are well-drained soils that have slopes of 2 to 15 percent. These upland soils developed in light-colored, acid igneous rocks. Elevations range from 1,500 to 2,600 feet. The average annual rainfall ranges from 10 to 16 inches, the average annual temperature from 59° to 64° F., and the average frost-free season from 220 to 270 days. Vegetation is chiefly annual grasses and chamise.

In a typical profile, the surface layer is grayish-brown clay about 23 inches thick. Underlying this is grayish-brown and pale-olive sandy clay. At a depth of about 32 inches is decomposing igneous rock.

The Bosanko soils are near the Buren, Las Posas, Cajalco, and Temescal soils.

Bosanko soils are commonly used for dryland pasture, range, and grain. Where the climate is favorable, citrus is grown.

Bosanko clay, 2 to 8 percent slopes (BfC).—This undulating to gently rolling soil occurs on uplands.

Following is a typical profile on a west-facing slope of 5 percent (500 feet north of Simpson Road and 250 feet east of the west side of section 26, T. 4 S., R. 5 W.):

Ap1—0 to 2 inches, grayish-brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) when moist; strong, medium, subangular blocky structure; extremely hard, extremely firm, very sticky and very plastic; abundant very fine roots; many, very fine, tubular pores; medium acid (pH 6.0); clear, smooth boundary. Horizon is 2 to 9 inches thick.

Ap2—2 to 9 inches, grayish-brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) when moist; strong, medium, subangular blocky structure; extremely hard, extremely firm, very sticky and very plastic; plentiful very fine roots; common, very fine, tubular pores; neutral (pH 6.8); clear, irregular boundary. Horizon is 4 to 12 inches thick.

A11—9 to 17 inches, grayish-brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) when moist; strong, medium, subangular blocky structure; extremely hard, extremely firm, very sticky and very plastic; few very fine roots; few, very fine, tubular pores; few slickensides; neutral (pH 7.0); gradual, wavy boundary. Horizon is 4 to 10 inches thick.

A12—17 to 23 inches, grayish-brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) when moist; strong, coarse, subangular blocky structure; extremely hard, extremely firm, very sticky and very plastic; few very fine roots; few, very fine, tubular pores; few slickensides; neutral (pH 7.0); gradual, wavy boundary. Horizon is 4 to 11 inches thick.

AC—23 to 27 inches, grayish-brown (10YR 5/2) sandy clay, dark grayish brown (10YR 4/2) when moist; massive, very hard, very firm, very sticky and plastic; few very fine roots; few, very fine, tubular pores; prominent slickensides; mildly alkaline (pH 7.8); slightly effervescent; gradual, wavy boundary. Horizon is 4 to 11 inches thick.,

C1—27 to 32 inches, pale-olive (5Y 6/3) sandy clay, light olive brown (2.5Y 5/4) when moist; massive; very hard, very firm, sticky and plastic; few slickensides; mildly alkaline (pH 7.8); strongly effervescent; gradual, wavy boundary. Horizon is 5 to 10 inches thick.

C2—32 to 36 inches, weathered acid igneous rock; massive; neutral (pH 7.2).

The A horizon is medium acid to neutral. Depth to weathered acid igneous rock commonly ranges from 23 to 36 inches.

Included with this soil in mapping are small areas of Cajalco fine sandy loam, Buren loam, Auld clay, and Porterville clay. Also included are small areas of gravelly or stony Bosanko clay and areas that are only 10 to 20 inches deep to the weathered igneous rock.

This soil has moderately slow permeability. The available water holding capacity is 4.0 to 5.0 inches. Runoff is medium, and the hazard of erosion is moderate. The root zone is 23 to 36 inches deep. Natural fertility is moderate.

This soil is used for dryland pasture, range, and grain and for irrigated citrus. (Capability unit IIIe-5 (19) irrigated; Clayey range site)

Bosanko clay, 8 to 15 percent slopes (BfD).—Included with this soil in mapping are small areas of gravelly or stony Bosanko clay. Also included in mapping are a few small areas of Bosanko clay that are 10 to 20 inches deep to weathered rock. Some small areas that are slightly effervescent in the surface layer are also included.

This soil is used for dryland pasture, range, and grain and for irrigated citrus. (Capability unit IIIe-5 (19) irrigated; Clayey range site)

Buchenau Series

The Buchenau series consists of moderately well drained soils on alluvial fans. Slopes range from 0 to 8 percent. These soils developed in mixed alluvium and are underlain by a platy, calcareous hardpan. Elevations range from 700 to 1,500 feet. The average annual rainfall ranges from 10 to 14 inches, the average annual temperature from 62° to 64° F., and the average frost-free season from 220 to 260 days. Vegetation is chiefly annual grasses, saltgrass, and forbs.

In a typical profile, the surface layer is brown loam about 10 inches thick. The subsoil is yellowish-brown, brown, and pale-brown clay loam and loam about 29 inches thick. The substratum is light brownish-gray loam, which overlies a cemented, platy hardpan at a depth of about 52 inches.

The Buchenau soils are near the Arlington, Buren, Greenfield, and Porterville soils.

The Buchenau soils are used for irrigated truck crops, alfalfa, permanent pasture, and grain. They are also used for dryland pasture and range and for nonfarm purposes.

Buchenau loam, slightly saline-alkali, 0 to 2 percent slopes (BhA).—This nearly level soil occurs in basins.

Following is a typical profile on a south-facing slope of 1 percent (900 feet south and 400 feet east of the north quarter corner of section 32, T. 2 S., R. 5 W.):

Ap—0 to 7 inches, brown (10YR 5/3) loam, dark brown (10YR 3/3) when moist; moderate, medium, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; abundant very fine and few fine roots; common, very fine and few, fine, irregular and tubular pores; moderately alkaline (pH 8.0); very slightly effervescent; gradual, smooth boundary. Horizon is 7 to 15 inches thick.

A1—7 to 10 inches, brown (10YR 5/3) loam, brown to dark brown (10YR 4/3) when moist; moderate, medium, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; abundant very fine and few fine roots; common, very fine and few, fine, irregular and tubular pores; moderately alkaline (pH 8.0); very slightly effervescent; clear, wavy boundary. Horizon is 3 to 8 inches thick.

B21t—10 to 16 inches, yellowish-brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) when moist; strong, medium, subangular blocky structure; hard, firm, sticky and slightly plastic; abundant very fine roots; common, very fine, tubular pores; few thin clay films in bridges and pores; moderately alkaline (pH 8.0); slightly effervescent; gradual, wavy boundary. Horizon is 5 to 9 inches thick.

B22t—16 to 24 inches, brown (10YR 5/3) loam, brown to dark brown (10YR 4/3) when moist; strong, coarse, subangular blocky structure; hard, firm, sticky and plastic; abundant very fine and few fine roots; common, very fine, tubular pores; few thin clay films as bridges and in pores; moderately alkaline (pH 8.0); slightly effervescent; clear, wavy boundary. Horizon is 5 to 8 inches thick.

B3t—24 to 39 inches, pale-brown (10YR 6/3) loam, brown to dark brown (10YR 4/3) when moist; massive; slightly hard, friable, slightly sticky and nonplastic; abundant very fine roots; common, very fine and few, fine, tubular pores; few thin clay films as bridges and in pores; few, fine, distinct mottles of yellowish brown; moderately alkaline (pH 8.0); slightly effervescent; clear, wavy boundary. Horizon is 4 to 15 inches thick.

C1—39 to 52 inches, light brownish-gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) when moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; common, very fine and few, fine, tubular pores; few, fine, distinct mottles of yellowish brown; moderately alkaline (pH 8.0); strongly effervescent; clear, smooth boundary. Horizon is 11 to 24 inches thick.

C2cam—52 to 61 inches. white (10YR 8/2) strongly lime-cemented hardpan, light brownish gray (2.5Y 6/2) when moist; massive, breaking to medium, platy structure; few very fine roots; common, fine and few, medium, tubular pores; strongly alkaline (pH 8.6); violently effervescent; fine and medium, generally rounded, soft masses of lime.

The A horizon is slightly to very slightly effervescent, pale-brown to dark-brown very fine sandy loam to loam. The Bt horizon is grayish-brown to yellowish-brown loam to heavy clay loam. The C horizon is light brownish-gray to white, strongly to violently effervescent loam to clay loam. Depth to the platy, calcareous pan ranges from 35 to 54 inches.

Included with this soil in mapping are small areas of Arlington fine sandy loam, Buren loam, Greenfield sandy loam, and Porterville clay. Also included are some areas that have a fine sandy loam, silt loam, or light clay loam surface layer.

Permeability of this soil is moderately slow, and the available water holding capacity is 5.0 to 8.0 inches. Runoff is very slow, and the hazard of erosion is slight. The root zone is 35 to 54 inches deep, and natural fertility is moderately high.

This Buchenau soil is used for irrigated truck crops, alfalfa, grain, and permanent pasture. It is also used for dryland pasture and range and for homesites. (Capability unit IIs-8 (19) irrigated; Loamy range site)

Buchenau loam, slightly saline-alkali, 2 to 8 percent slopes (BhC).—The profile of this soil is similar to that described for the Buchenau series, but the depth to the platy pan is 24 to 36 inches. Included with this soil in mapping are small areas having slopes of 8 to 25 percent. Also included are areas that are 36 to 54 inches deep to the pan.

Runoff on this soil is medium, and the hazard of erosion is moderate. The available water holding capacity is 3.75 to 5.0 inches.

This soil is used for dryland grain and pasture, for irrigated pasture and alfalfa, and for nonfarm purposes.

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nches.
ion is
l fer-

roots; common, fine, tubular
y alkaline (pH 8.0); clear,
Horizon is 4 to 7 inches thick.
or dark-brown (7.5YR 4/4)
own (7.5YR 4/4) when moist;
gular blocky structure; very
very sticky and very plastic;
dom roots; common, fine, tubu-
noderately thick clay films on
ately alkaline (pH 8.0); grad-
ary. Horizon is 5 to 10 inches

brown (10YR 6/3) clay loam,
own (10YR 4/3) when moist;
gular blocky structure; very
sticky and plastic; few, fine,
mon, fine, tubular pores; com-
hick clay films on ped faces;
ne (pH 8.4); strongly effer-
filaments and threads and
soft masses of calcium car-
, 10YR 7/2 dry); clear, smooth
is 7 to 12 inches thick.
olive-brown (2.5Y 5/4) loam,
Y 4/4) when moist; massive;
lightly sticky and plastic; very
roots; many, fine, tubular pores;
lms line tubular pores; moder-
H 8.4); slightly effervescent;
threads of lime; clear, smooth
is 6 to 10 inches thick.
sh-brown (10YR 5/4), weakly
dark yellowish brown (10YR
very coarse polygons, sides of
with thin lime and silica coat-
ish brown (10YR 6/4) when
rm, slightly sticky and plastic;
ar pores; moderately alkaline
effervescent; fine threads and
m carbonate; gradual, smooth
is 8 to 14 inches thick.
owish-brown (10YR 6/4) loam,
own (10YR 4/3) when moist;
percent of mass appears to be
hard, firm, slightly sticky and
fine, tubular pores; moderately
); slightly effervescent; fine
ents of calcium carbonate.

cid to moderately alkaline fine
Bt horizon is generally neutral
effervescent to strongly effer-
n. The color of the Bt horizon
to dark brown and light olive
horizon is light brownish gray
h brown in color. It is a weakly
that occurs at a depth com-
nches.
mapping are small areas of
jalco fine sandy loam, Wyman
coarse sandy loam. Some small
have a sandy loam or gravelly
r. Some inclusions are eroded

noderately slow, and the avail-
is 5.0 to 7.0 inches. Runoff is
sion is moderate. The root zone
al fertility is moderately high.
l pasture, grain, and range, for
and alfalfa, and for nonfarm
–8 (19) irrigated; Loamy range

15 percent slopes, eroded
soil in mapping are a few
sandy loam surface layer.
n soils that have slopes of

Runoff is medium on this soil, and the hazard of erosion is high. Natural fertility is moderately high.

This soil is used for dryland grain, pasture, and range, for irrigated citrus and alfalfa, and for nonfarm purposes. (Capability unit IVe-8 (19) irrigated; Loamy range site)

Buren loam, 5 to 15 percent slopes, severely eroded (BvD3).—The profile of this soil is similar to that described for the Buren series, but it has a loam surface layer and is severely eroded. Included in mapping are some small areas of gently sloping Buren soils.

The available water holding capacity of this soil is 3.0 to 5.0 inches. Runoff is rapid, and the hazard of erosion is high. The root zone is 20 to 27 inches deep. Natural fertility is low.

This soil is used for dryland grain, pasture, and range, for irrigated citrus and alfalfa, and for nonfarm purposes. (Capability unit IVe-8 (19) irrigated; Loamy range site)

Buren loam, deep, 2 to 8 percent slopes, eroded (BxC2).—The profile of this soil is similar to that described for the Buren series, but it has a loam surface layer and is 40 to 50 inches deep to the pan.

Included with this soil in mapping are some small areas of Buren soils that are 24 to 40 inches deep to the pan. Also included are some areas of Buren soils with a sandy loam surface layer.

Runoff is slow to medium on this soil, and the hazard of erosion is slight to moderate. The available water holding capacity is 6.0 to 8.0 inches. Natural fertility is high.

This soil is used for dryland grain, pasture, and range, for irrigated citrus, alfalfa, and truck crops, and for nonfarm purposes. (Capability unit IIe-1 (19) irrigated; Loamy range site)

Cajalco Series

The Cajalco series consists of well-drained soils developed in decomposing gabbro and other basic igneous rocks. Rock outcrops occur in some areas. These soils are on uplands and have slopes of 2 to 50 percent. Elevations range from 900 to 2,700 feet. The average annual rainfall ranges from 10 to 16 inches, the average annual temperature from 61° to 65° F., and the average frost-free season from 230 to 300 days. Vegetation is chiefly annual grasses, forbs, and chamise.

In a typical profile, the surface layer is yellowish-brown fine sandy loam about 10 inches thick. The subsoil is brown fine sandy loam and loam. It grades to light yellowish-brown loam at a depth of about 18 inches. At a depth of about 22 inches is weathered gabbro.

The Cajalco soils are near the Temescal, Las Posas, Honcut, and Wyman soils.

Cajalco soils are used for dryland pasture, grain, and range, for irrigated citrus, and for nonfarm purposes.

Cajalco fine sandy loam, 8 to 15 percent slopes, eroded (CaD2).—This rolling soil occurs on uplands.

Following is a typical profile on a west-facing slope of 8 percent (1,350 feet north and 800 feet west of the southeast corner of section 22, T. 4 S., R. 5 W.):

Ap1—0 to 3 inches, yellowish-brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) when moist; weak, coarse, granular structure; soft, very friable, nonsticky and nonplastic; abundant very fine roots; many, very fine, irregular pores; slightly acid (pH 6.5); clear, smooth boundary. Horizon is 2 to 5 inches thick.

Ap2—3 to 10 inches, yellowish-brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) when moist; weak, coarse, granular structure; slightly hard, very friable, slightly sticky and nonplastic; abundant very fine and few medium roots; many, very fine, irregular and tubular pores; slightly acid (pH 6.5); gradual, wavy boundary. Horizon is 4 to 8 inches thick.

B1—10 to 13 inches, brown (7.5YR 5/4) fine sandy loam, dark reddish brown (5YR 3/4) when moist; weak, coarse, subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; abundant very fine roots; many, very fine, tubular pores; few thin clay films line tubular pores; neutral (pH 7.0); gradual, wavy boundary. Horizon is 3 to 7 inches thick.

B2—13 to 18 inches, brown (7.5YR 5/4) loam, dark reddish brown (5YR 3/4) when moist; moderate, medium, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; plentiful very fine roots; many, very fine, tubular pores; few thin clay films line tubular pores; neutral (pH 7.0); clear, wavy boundary. Horizon is 4 to 15 inches thick.

B3—18 to 22 inches, light yellowish-brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) when moist; massive; hard, friable, slightly sticky and nonplastic; plentiful very fine roots; many, very fine, tubular pores; neutral (pH 7.0); gradual, wavy boundary. Horizon is 3 to 11 inches thick.

C1—22 to 30 inches, light yellowish-brown (10YR 6/4), well-weathered gabbro, yellowish brown (10YR 5/4) when moist; massive; hard, friable, nonsticky and nonplastic; mildly alkaline (pH 7.5); gradual, wavy boundary. Horizon is 4 to 22 inches thick.

C2—30 to 62 inches, light-gray (10YR 6/1) decomposing gabbro, gray (10YR 5/1) when moist; massive; very hard, very friable, nonsticky and nonplastic; slightly acid (pH 6.5).

The A horizon is yellowish-brown to dark-brown fine sandy loam to loam. The B horizon is brown to reddish-brown or yellowish-brown fine sandy loam or loam to clay loam. The C horizon is mildly alkaline to slightly acid, light-gray to dark-brown, weathered gabbro. Seams and pockets of calcium carbonate are present. The depth to the weathered gabbro ranges from 18 to 46 inches.

Included with this soil in mapping are small areas of Honcut sandy loam, Wyman fine sandy loam, Las Posas loam, and Temescal rocky loam. Some Cajalco soils having slopes of 2 to 5 percent and a very fine sandy loam or gravelly very fine sandy loam surface layer are also included.

Permeability of this soil is moderate. The available water holding capacity is 2.0 to 6.0 inches. Runoff is medium, and the hazard of erosion is moderate. The root zone is 20 to 46 inches deep. Natural fertility is moderate.

This Cajalco soil is used for dryland pasture, grain, and range, for irrigated citrus, and for nonfarm purposes. (Capability unit IVe-1 (19) irrigated; Loamy range site)

Cajalco fine sandy loam, 2 to 8 percent slopes, eroded (CaC2).—Depth of this soil to partly weathered rock is 30 to 36 inches. Included in mapping are some small areas that are 36 to 46 inches deep to weathered rock.

The available water holding capacity of this soil is 4.0 to 5.0 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for dryland grain, pasture, and range, for irrigated citrus, and for nonfarm purposes. (Capability unit IIIe-1(19) irrigated; Loamy range site)

Cajalco fine sandy loam, 15 to 35 percent slopes, eroded (CaF2).—Depth of this soil to partly weathered rock is 20 to 34 inches. Cajalco soils that have a very fine

rofile on a northeast-facing
south and 50 feet east of the
14, T. 8 S., R. 3 E.):

dark-brown (10 R 4/3) sandy
grayish brown (10YR 3/2) when
ne, crumb structure; soft, very
y and nonplastic; abundant fine
ots; medium acid (pH 6.0); clear,
y. Horizon is 6 to 16 inches thick.
llowish-brown (10YR 4/4) sandy
n (10YR 3/3) when moist; weak,
ular blocky structure; slightly
le, nonsticky and slightly plastic;
nedium roots; common, medium,
few thin clay films in pores;
pH 5.7); clear, smooth boundary.
8 inches thick.
ellowish-brown (10YR 4/4) sandy
own (10YR 3/3) when moist;
e, subangular blocky structure;
lightly sticky and slightly plastic;
oots; common, medium, tubular
thin clay films in pores; medium
gradual, smooth boundary. Hori-
inches thick.
ellowish-brown (10YR 4/4) sandy
lowish brown (10YR 3/4) when
, coarse, subangular blocky struc-
iable, slightly sticky and slightly
nedium roots; common, medium,
common thin clay films in pores;
pH 5.6); gradual, smooth bound-
6 to 15 inches thick.
ellowish-brown (10YR 4/4) sandy
llowish brown (10YR 3/4) when
medium, subangular blocky struc-
hard, friable, slightly sticky and
; common, medium, tubular pores;
films in pores; medium acid (pH
ooth boundary. Horizon is 8 to 14

h-brown (10YR 5/4) loamy coarse
llowish brown (10YR 4/4) when
; slightly hard, friable, nonsticky
; medium acid (pH 6.0).

m medium acid to slightly acid in
brown to dark yellowish brown in
sand to very fine sandy loam in
generally slightly acid to medium
to grayish-brown sandy loam to
hly acid to medium acid, brown to
rse sand to fine sandy loam.
mapping are small areas of Motts-
n fine sandy loam, and Bull Trail
eas with a gravelly sandy loam or
ace layer and a coarse sandy sub-

is moderately rapid. The available
.0 to 7.5 inches. Runoff is slow to
erosion is slight to moderate. The
inches deep, and natural fertility

land pasture (domestic rye) and
irrigated alfalfa, peaches, pears,
ability unit IIe-1 (20) irrigated,
ny Uplands range site)

to 15 percent slopes, eroded

is soil in mapping are some
gravelly fine sandy loam or
ace layer. Also included are
m substratum. Slopes of some
5 to 35 percent.

soil, and the hazard of erosion
ty is moderate.

gated peaches and for dryland

60 inches, gray to light-gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) when moist; weak, coarse, angular blocky structure; hard, firm, sticky and plastic; few very fine to fine roots; many, fine to coarse, tubular pores; a few slickensides; moderately alkaline (pH 8.2); strongly effervescent.

orizon is gray to dark gray in color.

with this soil in mapping are small areas of sandy loam, Domino silt loam, and Willows silty small areas that have a water table at a depth of nches during part of the year are included. About f the acreage mapped as this soil is included small ng slopes of 2 to 5 percent.

s a somewhat poorly drained soil that is now is slightly saline-alkali. Its permeability is moder- and the available water holding capacity is 9.0 to . Runoff is slow, and the hazard of erosion is slight. one is more than 60 inches deep. Natural fertility ely high.

l is used for irrigated truck crops, alfalfa, and pasture, for dryland grain, and for homesites. y unit I-1 (19) irrigated; Silty Basin range site)

loam, drained, saline-alkali (0 to 2 percent —The profile of this soil is similar to that r the Chino series, but it is moderately to ne-alkali and has a loam or silt loam sub-

with this soil in mapping are small areas of that have a sandy loam or very fine sandy tum, and a few small areas of deposition and included are areas having slopes of 2 to 5 small areas with a water table at a depth of es during part of the year.

al fertility of this soil is moderately low.

s used for dryland grain, pasture, and range. sed for irrigated truck crops, alfalfa, and for homesites. (Capability unit IVs-6 (19) ilty Basin range site)

loam, strongly saline-alkali (0 to 2 percent —The profile of this soil is similar to that typical for the Chino series, but it is strongly and has a water table at a depth of 18 to 36 nage is poor, and natural fertility is moder-

s used for dryland pasture and range. (Capa- Vw-6 (19) irrigated; Silty Basin range site)

ries

eba series consists of somewhat excessively ls on uplands. Slopes range from 5 to 50 ese soils formed in coarse-grained igneous ions range from 900 to 3,500 feet. The average fall ranges from 9 to 16 inches, the average erature from 59° to 65° F., and the average ason from 220 to 300 days. The vegetation is al grasses, chamise, and flat-top buckwheat.

cal profile, the surface layer is brown sandy 14 inches thick. Underlying this is light own gravelly coarse sand. At a depth of about slightly acid, weathered granodiorite.

ba soils are near the Vista, Fallbrook, Friant, ido soils.

ba soils are used for dryland grain, pasture, or irrigated citrus, and for homesites.

ocky sandy loam, 15 to 50 percent slopes, 2).—This hilly to very steep soil occurs on

ny coarse sand or gravelly fine sandy loam
Also included are some areas where slopes
cent.
his soil is slow, and the hazard of erosion
root zone is 16 to 22 inches deep.
s used for dryland grain, pasture, and
rigated citrus, and for nonfarm purposes.
nit IVe-1 (19) irrigated; Shallow Loamy

ndy loam, 8 to 15 percent slopes, eroded
profile of this soil is similar to that de-
Cieneba series, but it has a sandy loam sur-
ss than 2 percent of the surface is occupied
ps.
th this soil in mapping is a small area, south
that is underlain by weakly consolidated,
l, granitic alluvium. Also included are small
a gravelly sandy loam or a fine sandy loam

le water holding capacity of this soil is 2.0
Runoff is medium, and the hazard of erosion
he root zone is 16 to 22 inches deep. Natural
w.
used for dryland grain, pasture, and range,
citrus, and for homesites. (Capability unit
ryland; Shallow Loamy range site)
ndy loam, 15 to 50 percent slopes, eroded
profile of this soil is similar to that de-
Cieneba series, but it has a sandy loam sur-
ss than 2 percent of the surface is occupied
ops.
mapping are a few small areas having a
fine sandy loam surface layer.
used chiefly for range. Small areas that
used for citrus are used like the surround-
pability unit VIIe-1 (19) dryland; Shallow
site)

s

ina series are somewhat excessively drained
ly drained soils on alluvial fans and in
pes are 0 to 12 percent. These soils formed
from metasedimentary rocks. Elevations
0 to 2,000 feet. The average annual rainfall
0 to 15 inches, the average annual tempera-
to 65° F., and the average frost-free season
00 days. The vegetation is chiefly annual
p buckwheat, sumac, and chamise.
profile, the surface layer is grayish-brown
e sandy loam about 10 inches thick. Below
sh-brown gravelly sandy loam and very
e sandy loam. At a depth of about 38 inches
ish-gray very gravelly coarse sand.
a soils are near the Garretson, Arbuckle,
ils.
soils are used for dryland pasture, grain,
irrigated citrus, and for homesites.
velly coarse sandy loam, 2 to 8 percent
—This gently to moderately sloping soil
vial fans and in valley fills.
a typical profile on a north-facing slope of
) feet east and 660 feet south of the north
of section 3, T. 4 S., R. 7 W.):

A1—0 to 10 inches, grayish-brown (10YR 5/2) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) when moist; massive; slightly hard, friable, nonsticky and nonplastic; abundant, very fine pores and many, irregular, micro pores; neutral (pH 7.0); approximately 30 percent angular to subangular pebbles 3 to 5 millimeters in size; clear, smooth boundary. Horizon is 3 to 10 inches thick.

C1—10 to 23 inches, grayish-brown (10YR 5/2) gravelly sandy loam, dark grayish brown (10YR 4/2) when moist; massive; slightly hard, friable, nonsticky and slightly plastic; plentiful fine roots; few, fine, tubular pores; mildly alkaline (pH 7.5); approximately 20 percent gravel; clear, smooth boundary. Horizon is 5 to 13 inches thick.

C2—23 to 38 inches, grayish-brown (10YR 5/2) very gravelly coarse sandy loam, dark grayish brown (10YR 4/2) when moist; massive; slightly hard, friable, nonsticky and nonplastic; plentiful fine roots; mildly alkaline (pH 7.5); approximately 40 percent gravel; clear, smooth boundary. Horizon is 15 to 30 inches thick.

C3—38 to 60 inches+, light brownish-gray (10YR 6/2) very gravelly coarse sand, dark grayish brown (10YR 4/2) when moist; single grain; loose when dry or moist, nonsticky and nonplastic; mildly alkaline (pH 7.5); approximately 50 percent gravel.

The A horizon is gravelly to very gravelly. The C horizon is light gray to grayish brown to light brownish gray in color. It is very gravelly or very cobbly sandy loam to sand.

Included with this soil in mapping are small areas of Garretson gravelly very fine sandy loam and Arbuckle gravelly loam. Also included are some areas having a gravelly sandy loam surface layer. Some inclusions are affected by streambank erosion and deposition.

Permeability is rapid on this soil, and the available water holding capacity is 3.75 to 5.0 inches. Drainage is somewhat excessive. Runoff is slow to medium, and the erosion hazard is slight to moderate. The root zone is more than 60 inches deep. Natural fertility is low.

This soil is used for dryland pasture, grain, and range, for irrigated citrus, and for homesites. (Capability unit IIIs-4 (19) irrigated; Sandy range site)

Cortina gravelly loamy sand, 2 to 8 percent slopes (ClC).—The profile of this soil is similar to that described for the Cortina series, but it has a gravelly loamy sand surface layer. The soil is crossed by braided stream channels and is subject to overflow.

This soil is excessively drained and has rapid permeability. The available water holding capacity is 3.0 to 4.5 inches. Runoff is slow to medium, and the hazard of erosion is high. Natural fertility is low.

This soil is used for range. (Capability unit VIIw-4 (19) dryland; Sandy Alluvial range site)

Cortina cobbly loamy sand, 2 to 8 percent slopes (CmC).—The profile of this soil is similar to that described for the Cortina series, but it has a cobbly loamy sand surface layer and is lighter in color. This soil is affected by stream channel erosion and deposition.

A few small areas mapped as this soil have a cobbly sandy loam surface layer and are slightly to moderately eroded.

This excessively drained soil has rapid permeability and rapid runoff. The available water holding capacity is 2.5 to 4.0 inches. The hazard of erosion is high because of overflow from the shallow stream channels. Natural fertility is low.

This soil is used for range. (Capability unit VIIw-4 (19) dryland; Sandy Alluvial range site)

Cortina sandy loam, 0 to 2 percent slopes (CoA).—The profile of this soil is similar to that described for the Cortina series, but it has a light-gray or gray gravelly coarse sand layer at a depth of 20 to 36 inches. There is no significant gravel content in the surface layer, although some areas with a gravelly surface layer are included with this soil in mapping.

Runoff on this soil is slow, and the hazard of erosion is slight. The substratum is very rapidly permeable. Natural fertility is low.

This soil is used for dryland pasture, grain, and range and for homesites. In climatically favorable locations, the soil areas are used for irrigated citrus. (Capability unit IIIs-0 (19) irrigated; Sandy range site)

Cortina gravelly sandy loam, 0 to 2 percent slopes (CpA).—The profile of this soil is similar to that described for the Cortina series, but it has very rapidly permeable gravelly coarse sand at a depth of 10 to 20 inches. A few areas of shallow loamy sand are included.

The available water holding capacity of this soil is 2.0 to 3.0 inches. This excessively drained soil has low natural fertility. Runoff is slow, and the hazard of erosion is slight.

This soil is used for dryland pasture, grain, and range and for homesites. (Capability unit IVs-0 (19) irrigated; Sandy range site)

Cortina cobbly sandy loam, 2 to 12 percent slopes (CrD).—The profile of this soil is similar to that described for the Cortina series, but it has a cobbly sandy loam surface layer and shows less stratification throughout its profile.

Included in mapping are a few small areas having slopes of 12 to 25 percent. Also included are areas having a cobbly loam surface layer and areas that are slightly calcareous in the lower layers.

The available water holding capacity of this soil is 4.5 to 6.0 inches. Permeability is rapid. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for irrigated citrus, for dryland pasture and range, and for homesites. (Capability unit IVs-4 (19) irrigated; Sandy range site)

Crafton Series

Soils of the Crafton series are well drained, are on uplands, and have slopes of 15 to 50 percent. These soils formed in material from metamorphic rock—gneiss and schist. Elevations range from 3,500 to 6,000 feet. The average annual rainfall ranges from 17 to 30 inches, the average annual temperature from 52° to 57° F., and the average frost-free season from 150 to 250 days. The vegetation is chiefly annual grasses, shrubs, and scrub oaks.

In a typical profile, the surface layer is brown to dark yellowish-brown sandy loam about 26 inches thick. The underlying material is light yellowish-brown, weathered rock with fractures and cleavage planes.

Crafton soils are near the Mottsville, Oak Glen, Calpine, and Bull Trail soils and near Rough broken land.

Crafton soils are used for dryland pasture and range and for nonfarm purposes.

Crafton rocky sandy loam, 25 to 50 percent slopes, eroded (CsF2).—This steep soil occurs on uplands. Rock outcrops occupy 2 to 10 percent of the surface.

Following is a typical profile on a northeast-facing slope of 35 percent (300 feet north and 1,400 feet west of the east quarter corner of section 27, T. 2 S., R. 1 E.):

These soils are on uplands, where they developed on te and granodiorite. Elevations range from 3,500 to feet. The average annual rainfall ranges from 16 to ches, the average annual temperature from 50° to ., and the average frost-free season from 150 to 225 The vegetation is chiefly annual grasses, ceanothus, gebrush, and Jeffrey and sugar pines.

a typical profile, the surface layer is dark grayish- sandy loam about 11 inches thick. The subsoil is sandy loam about 7 inches thick. At a depth of 18 inches is pale-brown sandy loam. This is under- y very pale-brown weathered granite at about 28 s.

Crouch soils are near the Sheephead, Crafton, Toll- and Mottsville soils.

uch soils are used for dryland grain, pasture, and for recreation, and as a source of water.

uch rocky sandy loam, 25 to 50 percent slopes, d (CyF2).—This steep soil is on uplands. Rock out- occupy 2 to 10 percent of the surface.

lowing is a typical profile on a northwest-facing of 35 percent (250 feet east and 200 feet south of the west corner of section 26, T. 3 S., R. 1 E.):

—¼ inch to 0, dark-gray to very dark gray plant litter.

1—0 to 5 inches, dark grayish-brown (10YR 4/2) sandy loam, very dark gray (10YR 3/1) when moist; weak, coarse, crumb structure; soft, very friable, nonsticky and nonplastic; abundant very fine roots; many, very fine, irregular pores; slightly acid (pH 6.5); clear, smooth boundary. Horizon is 5 to 11 inches thick.

2—5 to 11 inches, dark grayish-brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) when moist; weak, medium, subangular blocky structure; soft, very friable, nonsticky and nonplastic; abundant, very fine and few fine roots; many, very fine, irregular and few, fine, tubular pores; medium acid (pH 6.0); clear, smooth boundary. Horizon is 5 to 11 inches thick.

t—11 to 18 inches, brown (10YR 5/3) sandy loam, brown (10YR 4/3) when moist; weak, medium, subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; plentiful very fine and few fine roots; many, very fine, irregular pores and few, fine, tubular pores; colloid stains and occasional thin bands of colloid clay; medium acid (pH 6.0); gradual, wavy boundary. Horizon is 7 to 12 inches thick.

—18 to 28 inches, pale-brown (10YR 6/3) sandy loam, brown (10YR 5/3) when moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and common fine roots; plentiful, very fine, irregular pores and plentiful, fine, tubular pores; strongly acid (pH 5.5); gradual, irregular boundary. Horizon is 5 to 12 inches thick.

—28 inches, very pale brown (10YR 7/3), weathered granite, pale brown (10YR 6/3) when moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine and few medium roots; many, very fine, irregular pores and few, medium, tubular pores; strongly acid (pH 5.5).

The A horizon is slightly acid to medium acid in reaction d dark grayish brown to brown in color. The B horizon is le brown, brown, or yellowish brown in color. It is coarse ndy loam to sandy loam. The C2 horizon is very pale-brown yellowish-brown, weathered granite or granodiorite. Depth weathered granite commonly ranges from 22 to 46 inches. Included with this soil in mapping are small areas of Toll- use sandy loam, Crafton fine sandy loam, Sheephead fine ndy loam, Mottsville loamy sand, and Oak Glen fine sandy m.

This soil is well drained. Its permeability is moderately pid, and the available water holding capacity is 2.0 to 3.5

ght brownish-gray and light olive-brown, sand, loamy fine sand, and fine sandy loam. re near the Tujunga, Hanford, and Hilmar

soils are used for irrigated truck crops, s, and pasture and for homesites.

and, 2 to 15 percent slopes, wind-eroded gently sloping to rolling soil occurs on

s a typical profile on an east-facing slope of feet north and 800 feet west of the center . 2 S., R. 6 W.):

inches, light brownish-gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) when moist; single grain; loose when dry or moist, nonsticky and nonplastic; medium acid (pH 5.6); gradual, smooth boundary. Horizon is 7 to 10 inches thick.

24 inches, light brownish-gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) when moist; single grain; loose when dry or moist, nonsticky and nonplastic; medium acid (pH 5.6); few very fine roots; clear, smooth boundary. Horizon is 3 to 40 inches thick.

8 inches, light olive-brown (2.5Y 5/4) loamy fine sand, olive brown (2.5Y 4/4) when moist; massive; slightly hard, very friable, nonsticky and nonplastic; plentiful very fine and few fine roots; neutral (pH 6.6); gradual, smooth boundary. Horizon is 15 to 40 inches thick.

64 inches, light olive-brown (2.5Y 5/4) fine sandy loam, olive brown (2.5Y 4/4) when moist; massive; slightly hard, very friable, slightly sticky and nonplastic; plentiful very fine and few fine roots; neutral (pH 6.8).

ind-modified soil material. It is mostly sand or sand to fine sandy loam, but there are very thin s lenses of silt. The color is light brownish gray e brown and pale brown. The reaction is neutral cid.

with this soil in mapping are small areas of my sand and Hilmar loamy sand. Also included reas with a sandy loam substratum.

ity of this soil is rapid. The available water hold- is 4.5 to 6.5 inches. Runoff is very slow. The ater erosion is slight, but wind erosion is a high root zone is more than 60 inches deep. Natural w.

is used for irrigated truck crops, alfalfa, and for homesites. (Capability unit IIIe-4 (19) ir- dy range site)

y fine sand, 0 to 2 percent slopes (DbA).— this soil is similar to that described for the ut it has a pale-brown loamy fine sand sur-

ery slow on this soil. The hazard of water ht. The available water holding capacity is es. Wind erosion is a moderate hazard.

s used for irrigated truck crops, alfalfa, asture and for homesites. (Capability unit igated; Sandy range site)

lo series are somewhat poorly drained to d soils on alluvial fans and flood plains. from 0 to 5 percent. These soils developed in isting mainly of granitic material. Eleva- om 600 to 1,800 feet. The average annual s from 11 to 14 inches, the average annual rom 61° to 64° F., and the average frost- m 200 to 270 days. The vegetation is chiefly

2 inches thick over gravelly coarse
re areas of gravelly loamy sand that
-alkali. Some included areas consist
nnels.
r holding capacity of this soil is 4.5
is slow, and the hazard of erosion

for irrigated grain, pasture, and
sites. (Capability unit IIIw-4 (19)
ge site)

poorly drained, 0 to 2 percent slopes

f this soil is similar to that described
but it is loamy sand 15 to 42 inches
oarse sand. The water table is at a
es, and the soil is subject to overflow

soil in mapping are small areas of a
t is very deep and has higher avail-
pacity than this soil; some areas of
is only 10 to 15 inches deep over
l; and small areas of moderately

ailable water holding capacity of 1.5
bility is rapid to very rapid. Runoff
hazard of erosion is slight. Natural
y low.
or range and for nonfarm purposes.
Iw-4 (19) dryland; Sandy Alluvial

gravelly substratum, 0 to 5 percent

profile of this soil is similar to that
llo series, but it consists of 15 to 24
over gravelly coarse sand. Included
as of eroded stream channels. Also
tely saline-alkali areas.
r holding capacity of this soil is 2.0
is very slow, and the hazard of ero-
l fertility is very low.
r irrigated grain, pasture, and alfalfa
apability unit IVw-0 (19) irrigated;

sand, saline-alkali, 0 to 5 percent

profile of this soil is similar to that
llo series, but it is saline-alkali and
um. Included with this soil in map-
a water table at a depth of 36 to 48
l are strongly saline-alkali areas.
of this soil is moderately rapid. The
n 60 inches deep.
or irrigated alfalfa and pasture and
ability unit IIIw-6 (19) irrigated;

sand, gravelly substratum, 0 to 2

.—The profile of this soil is similar
r the Dello series, but it is 24 to 42
velly coarse sand.
soil in mapping are some areas with
pth of 36 to 48 inches. Also included
to 54 inches deep over gravelly coarse
f stream channel erosion and deposi-
as are some small areas of moderately
ils.
r holding capacity of this soil is 3.75
is very slow, and the hazard of ero-
l fertility is low.

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dark brown (10YR 3/3) when moist; moderate, coarse, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; abundant very fine exped roots; few, very fine, tubular pores; slightly acid (pH 6.5); clear, smooth boundary. Horizon is 8 to 16 inches thick.

34 inches, brown (10YR 5/3) very fine sandy loam, dark brown (10YR 3/3) when moist; massive; slightly hard, friable, slightly sticky and slightly plastic; abundant very fine roots; many, very fine, tubular pores; slightly acid (pH 6.5); abrupt, irregular boundary. Horizon is 4 to 6 inches thick.

es, metamorphosed, fine-grained sandstone; abundant very fine roots in fracture planes; slightly acid (pH 6.5).

orizon is slightly acid to medium acid in reaction, yellowish brown in color, and fine sandy loam to xture. The B horizon is generally slightly acid to id, brown to yellowish-brown fine sandy loam to th to the weathered, fine-grained, metamorphosed and schist commonly ranges from 24 to 50 inches. with this soil in mapping are small areas of Friant loam, Lodo gravelly loam, Vallecitos loam, Vista ly loam, Fallbrook sandy loam, and Fallbrook rocky .

has moderate permeability. Runoff is medium, and of erosion is moderate. The available water holdty is 3.75 to 8.0 inches. The root zone is 24 to 50 . Natural fertility is moderate.

l is used for dryland grain, pasture, and range. unit IVe-8 (19) irrigated; Loamy range site)

fine sandy loam, 2 to 8 percent slopes, 2).—Included with this soil in mapping are areas of Fallbrook fine sandy loam.

low on this soil, and the hazard of erosion is

is used mainly for dryland grain, pasture, A few small areas are used for irrigated itrus. (Capability unit IIIe-8 (19) irrigated; site)

fine sandy loam, 15 to 25 percent slopes, 2).—The profile of this soil is similar to that the Escondido series, but it has a yellowishe layer. This soil is crossed by actively cutes and gullies that generally are entrenched Included in mapping are a few small areas fine sandy loam.

rapid on this soil, and the hazard of erosion

used for dryland pasture and range. (Capa-Ie-8 (19) dryland; Loamy range site)

rocky fine sandy loam, 8 to 50 percent d (EfF2).—The profile of this soil is similar ibed for the Escondido series, but it is 24 to ep to weathered metamorphosed sandstone. ps cover 2 to 10 percent of the surface. Inapping are a few small areas in which less t of the surface is occupied by rock outcrops. ble water holding capacity of this soil is 3.75 . Runoff is medium to rapid, and the hazard moderate to high. Natural fertility is mod-

is used for range and as a source of water. unit VIe-8 (19) dryland; Loamy range site)

s

Exeter series have slopes of 0 to 8 percent, in basins and on alluvial fans. These well-

from moderately
nge from 600 to
ranges from 10 to
ture from 61° to
1 from 230 to 280
rasses and forbs.
r is brown sandy
l is brown heavy
n indurated silica
an decreases with

eld, Ramona, and

rain and pasture,
ck crops, and for

pes (EnA).—This

st-facing slope of
outh of the north
3 W.):

sandy loam, dark
moist; weak, fine,
iable, nonsticky and
nany pores; medium
h boundary. Horizon

sandy loam, dark
moist; moderate,
weak, fine, granular
nsticky and slightly
any pores; slightly
oth boundary. Hori-
id may be a tillage

) heavy loam, dark
ist; strong, medium,
very hard, firm,
lentiful roots; many
; a few manganese
; gradual, smooth
inches thick.
) heavy loam, dark
ist; strong, medium,
ry hard, firm, sticky
; many pores; few
nese stains; neutral
undary. Horizon is

) heavy loam, dark
noist; massive; ex-
, slightly sticky and
nany pores; moder-
ctures; a few man-
alkaline (pH 8.1);
occurs in seams;
lower boundary;
izon is 4 to 12 inches

'4) indurated hard-
lark brown (7.5YR
moderately alkaline
ent; lime occurs in
undary. Horizon is

coarse sandy loam,
ien moist; massive;
sticky and slightly
alkaline (pH 7.8);

im acid in reaction,
sandy loam to fine
s neutral to moder-
ish brown in color,

and very fine sandy loam to clay loam in texture. The Cm horizon is mildly to strongly alkaline and slightly to strongly effervescent. The cementation of the Cm horizon decreases with depth. Depth to the silica-cemented hardpan commonly ranges from 20 to 37 inches, but may be as great as 54 inches in some Exeter soils.

Included with this soil in mapping are small areas of Greenfield sandy loam, Ramona sandy loam, and Monserate sandy loam. Also included are some areas where erosion and deposition have occurred along streambanks.

The permeability of this soil is moderate, and the available water holding capacity is 3.75 to 5.0 inches. Runoff is slow, and the hazard of erosion is slight. The root zone is 20 to 36 inches deep. Natural fertility is moderate.

This soil is used for irrigated alfalfa, potatoes, and truck crops, for dryland pasture, and for homesites. (Capability unit IIIs-8 (19) irrigated; Loamy range site)

Exeter sandy loam, 2 to 8 percent slopes, eroded (EnC2).—Erosion on this soil is indicated by a 12- to 15-inch drop of irrigation pipelines across fields, by washing or deposition in dead furrows, by short gullies cut through the edges of fields, and by rills formed in summer-fallow fields after a rain. Deposition occurs in natural drains where the slope decreases.

Included with this soil in mapping are a few areas with light clay loam subsoil. Also included is a very small acreage where slopes are 8 to 15 percent.

Runoff on this soil is slow to medium, and the hazard of erosion is slight to moderate.

This soil is used for irrigated alfalfa, potatoes, and truck crops, for dryland pasture and grain, and for homesites. (Capability unit IIIe-8 (19) irrigated; Loamy range site)

Exeter sandy loam, slightly saline-alkali, 0 to 5 percent slopes (EoB).—The profile of this soil is similar to that described for the Exeter series, but it has slight concentrations of sodium salts. Included with this soil in mapping are a few small areas that are 36 to 54 inches deep to the hardpan. Also included are eroded areas and areas with a light clay loam subsoil.

The available water holding capacity of this soil is 5.0 to 6.5 inches. Runoff is slow, and the hazard of erosion is slight.

This soil is used for irrigated truck crops, alfalfa, and potatoes, for dryland grain, and for homesites. (Capability unit IIIs-6 (19) irrigated; Loamy range site)

Exeter sandy loam, deep, 0 to 2 percent slopes (EpA).—The profile of this soil is similar to that described for the Exeter series, but it is 36 to 54 inches deep to the hardpan.

Included with this soil in mapping are a few small areas with a heavy sandy loam or a light clay loam subsoil. Also included are a few small areas of slightly saline-alkali Exeter soils near the basin rim. Some included areas have slopes of 2 to 5 percent.

The available water holding capacity of this soil is 5.0 to 7.5 inches. Runoff is slow, and the hazard of erosion is slight. The root zone is 36 to 54 inches deep. Natural fertility is high.

This soil is used for irrigated alfalfa, potatoes, and truck crops, for dryland grain, and for homesites. (Capability unit IIs-8 (19) irrigated; Loamy range site)

Exeter sandy loam, deep, 2 to 8 percent slopes, eroded (EpC2).—The profile of this soil is similar to that described for the Exeter series, but it is 36 to 54 inches deep to the hardpan. Erosion on this soil is indicated by washing or deposition in dead furrows and by the elevation

a typical profile on a southeast-facing
nt (1,600 feet north and 650 feet east of
r corner of section 20, T. 3 S., R. 4 W.) :

hes, brown (10YR 5/3) sandy loam, dark brown
10YR 3/3) when moist; weak, medium and fine,
ranular structure; soft, very friable, nonsticky
nd nonplastic; abundant fine and very fine roots;
any, fine, irregular pores; slightly acid (pH
.5); clear, smooth boundary. Horizon is 3 to 16
aches thick.

inches, brown (10YR 5/3) sandy loam, dark
rown (10YR 3/3) when moist; massive; slightly
ard, very friable, nonsticky and nonplastic;
lentiful fine and very fine roots; many, fine,
rregular pores; neutral (pH 7.0); clear, smooth
oundary. Horizon is 3 to 7 inches thick.

) inches, reddish-brown (5YR 4/4) sandy clay
oam, dark reddish brown (5YR 3/4) when moist;
trong, coarse, subangular blocky structure; very
ard, very firm, very sticky and plastic; plentiful
ine and very fine exped roots; common, fine,
rregular pores; common moderately thick clay
lms on ped faces; neutral (pH 7.0); gradual,
mooth boundary. Horizon is 5 to 14 inches thick.

4 inches, reddish-brown (5YR 4/4) sandy clay
oam, dark reddish brown (5YR 3/4) when
noist; strong, coarse, subangular blocky struc-
ure; very hard, very firm, very sticky and
lastic; plentiful fine roots; common, fine, ir-
egular pores; common thin clay films on ped
aces and in pores; many angular quartz and
eldspar fragments that range from white to
eddish yellow (5YR 6/6) in color, range up to
one-quarter inch in diameter, and become more
umerous with depth; neutral (pH 7.0); gradual,
rregular boundary. Horizon is 4 to 18 inches
hick.

weathered granitic rock (Woodson Mt. tonalite);
becomes slightly harder with depth.

izon is slightly acid to neutral in reaction and
brown, or yellowish brown in color. The Bt hori-
n brown to dark brown or yellowish red in color
clay loam or sandy clay loam in texture. The C
ightly acid to neutral, light brownish-yellow to
eathered granodiorite or tonalite. Depth to the
ck commonly ranges from 20 to 36 inches but
hallow as 10 inches in some Fallbrook soils.

vith this soil in mapping are small areas of
ly loam, Vista coarse sandy loam, Bonsall fine
Monserate sandy loam, and Buren fine sandy

ty of this soil is moderate. Runoff is medium, and
f erosion is moderate. The available water hold-
is 4.0 to 7.0 inches. The root zone is 20 to 36
Natural fertility is moderate.

rook soil is used for dryland grain and pasture,
citrus, and for homesites. (Capability unit IVe-1
d; Loamy range site)

ndy loam, 15 to 25 percent slopes, eroded
ded with this soil in mapping are small
more than 36 inches deep to weathered
as with a fine sandy loam surface layer are

pid on this soil, and the hazard of erosion

used for dryland grain and pasture, for
s, and for homesites. (Capability unit VIe-1
Loamy range site)

ndy loam, shallow, 5 to 8 percent slopes,
—The profile of this soil is similar to that
he Fallbrook series, but it is 10 to 20 inches
ered rock. Included with this soil in map-
w small areas that have slopes of 2 to 5

ith this soil in mapping are a
gravelly fine sandy loam or a
e layer.
ing capacity of this soil is 2.0
ium, and the hazard of erosion
ty is moderately low.
yland grain and pasture, for
nesites. (Capability unit IVe-1
amy range site)

well-drained soils that de-
ed mica-schist. These soils are
of 5 to 50 percent. Elevations
t. The average annual rainfall
, the average annual tempera-
l the average frost-free season
vegetation is chiefly annual
and chaparral. In some areas
geways.
rface layer is very dark gray-
sandy loam about 13 inches
veakly weathered mica-schist.
the Cieneba, Vista, Escondido,

range and pasture and as a

loam, 25 to 50 percent slopes,
soil occurs on uplands. Rock
ent of the surface.
profile on a northeast-facing
et east and 200 feet north of
ion 7, T. 7 S., R. 1 E.):

sed organic matter.
rk grayish-brown (10YR 3/2) fine
ry dark brown (10YR 2/2) when
ne, crumb structure; slightly hard,
onsticky and nonplastic; abundant
; many, very fine, irregular pores;
pH 6.2); abrupt, smooth boundary.
3 inches thick.
(10YR 4/3) fine sandy loam, dark
3/3) when moist; moderate,
ngular blocky structure; slightly
iable, nonsticky and nonplastic;
and plentiful, fine and very fine
dium and common, fine and very
pores; neutral (pH 6.7); abrupt,
ry. Horizon is 5 to 10 inches thick.
(10YR 4/3) fine sandy loam, dark
3/3) when moist; moderate,
ngular blocky structure; slightly
ble, nonsticky and nonplastic; few,
lentiful, fine and very fine roots;
nd many, fine and very fine, tubu-
itral (pH 6.6); abrupt, irregular
izon is 4 to 7 inches thick.

to medium acid in reaction, very
own to yellowish brown in color,
ndy loam in texture. The R layer
slightly weathered mica schist that
acture planes. The depth to mica
m 10 to 20 inches.
in mapping are small areas of
coarse sandy loam, Escondido fine
loam, and Hanford sandy loam.
l is moderately rapid. Runoff is
osion is high. The available water

(pH 6.5); gradual, smooth bound-
is 4 to 36 inches thick.
n (10YR 5/3) gravelly loam, brown
n (10YR 4/3) when moist; massive;
l, very friable, slightly sticky and
ıbundant very fine roots; few, very
pores; 30 to 40 percent angular
ɔbblestones; slightly acid (pH 6.5);
ıoth boundary. Horizon is 11 to 23

yish-brown (10YR 5/2) loam, dark
vn (10YR 4/2) when moist; mas-
r hard, very friable, slightly sticky
plastic; few very fine roots; com-
ıe, tubular and irregular pores; 5 to
angular gravel and cobblestones;
6.8).

r acid to neutral in reaction, grayish
wish brown in color, and gravelly
sandy loam in texture. The C hori-
brown or yellowish brown in color
loam to silt loam in texture. In
; very fine sandy loam throughout.
l in mapping are small areas of
ındy loam, Arbuckle gravelly loam,
ım. Also included are some areas
ı and deposition have occurred.
ɔil is moderate. Runoff is slow to
ıf erosion is slight to moderate. The
ıpacity is 5.0 to 7.5 inches. The root
ıes deep. Natural fertility is high.
sed for irrigated citrus, truck crops,
ı and for dryland pasture and grain.
: homesites. (Capability unit IIe–1
nge site)

ıdy loam, 0 to 2 percent slopes

; soil is similar to that described
but it is grayish brown and is
throughout. Small areas having
ɔe layer are included in areas
included are some eroded areas
ıus subsoil.
.ding capacity of this soil is 7.5
ɜlow, and the hazard of erosion

·igated truck crops, alfalfa, and
and pasture, and for homesites.
irrigated; Loamy range site)

ndy loam, 2 to 8 percent slopes

s soil is similar to that described
, but it is essentially free of
led with this soil in mapping is
low a depth of 40 inches.
ıolding capacity is 7.5 to 10.0
medium, and the hazard of ero-
ɔ.
irrigated citrus, alfalfa, truck
land grain and pasture, and for
ıit IIe-1 (19) irrigated; Loamy

sandy loam, 8 to 15 percent

The profile of this soil is similar
Garretson series, but it is essen-
oughout. Shallow gullies occur,
furrows. Included with this soil
ı a fine sandy loam surface layer.
ıaving a sandy loam substratum.
ıldıng capacity of this soil is 7.5
medium, and the hazard of ero-

·igated citrus and grain, for dry-

The A horizon is slightly acid to neutral in reaction and grayish brown to brown in color. In some places the A horizon is fine sandy loam. The thin weathered crust of the R layer is slightly acid to neutral in reaction and pale brown and brownish yellow in color. Depth to sandstone commonly ranges from 10 to 20 inches but may be as shallow as 6 inches in some areas. Rock crops out in some places.

Included with this soil in mapping are small areas of Altamont clay and Vallecitos loam.

This well-drained soil has moderate permeability. The available water holding capacity is 1.5 to 3.0 inches. Runoff is medium to rapid, and the hazard of erosion is high. The root zone is 10 to 20 inches deep. Natural fertility is low.

This Gaviota soil is used for range, for recreation, and as a source of water. (Capability unit VIIe-1 (19) dryland; Shallow Loamy range site)

aviota rocky fine sandy loam, 25 to 75 percent slopes, erely eroded (GeG3).—The profile of this soil is simito that described for the Gaviota series, but the texture he surface layer is fine sandy loam. Sandstone is genlly at a depth of 6 to 15 inches. Exposed sandstone ges and rock outcrops cover 2 to 10 percent of the face. Numerous small gullies occur.

ncluded in mapping are a few small areas with a ky very fine sandy loam surface layer.

'his soil is somewhat excessively drained. The availe water holding capacity is 0.5 to 1.0 inch. Runoff is id to very rapid, and the hazard of erosion is high to y high. The root zone is 6 to 15 inches deep. Natural ility is very low.

'he soil is used as a source of water. (Capability unit IIs-1 (19, 20) dryland; range site not assigned)

aviota rocky very fine sandy loam, 25 to 50 percent es, eroded (GgF2).—From 2 to 10 percent of the sure of this soil is covered with rock outcrops and long dstone ledges. A few small areas of Gaviota rocky sandy loam are included.

unoff is rapid on this soil, and the hazard of erosion igh.

'his soil is used for range, for recreation, and as a rce of water. (Capability unit VIIe-1 (19) dryland; llow Loamy range site)

rgonio Series

n the Gorgonio series are somewhat excessively drained xcessively drained soils on alluvial fans. These soils eloped in alluvium consisting mainly of granitic erials. Slopes are 0 to 15 percent. Elevations range m 1,200 to 2,500 feet. The average annual rainfall ges from 10 to 18 inches, the average annual tempera- from 61° to 65° F., and the average frost-free season n 220 to 250 days. The vegetation is chiefly annual sses, forbs, and shrubs.

n a typical profile, the surface layer is dark grayishwn to brown gravelly loamy fine sand about 15 inches k. The underlying material is brown, stratified grav- loamy sand and gravelly loamy fine sand, and it exds to a depth of more than 60 inches.

'he Gorgonio soils are near the Hanford, Tujunga, Soboba soils.

orgonio soils are used for dryland pasture and range, irrigated alfalfa and apricots, and for homesites.

orgonio gravelly loamy fine sand, 2 to 15 percent es (GmD).—This gently sloping to strongly sloping occurs on alluvial fans.

'ollowing is a typical profile on a southeast-facing

Gorgonio loamy sand, 8 to 15 percent slopes (GhD).—The profile of this soil is similar to that described for the Gorgonio series, but it has a loamy sand surface layer. Included with this soil in mapping is a small area having slopes of 15 to 25 percent.

This soil is excessively drained and has very rapid permeability. Runoff is slow, and the hazard of erosion is slight. The available water holding capacity is 3.5 to 4.5 inches.

This soil is used for dryland pasture and for homesites. (Capability unit IVs-4 (19) irrigated; Sandy range site)

Gorgonio loamy sand, channeled, 2 to 15 percent slopes (GkD).—The profile of this soil is similar to that described for the Gorgonio series, but it is relatively free of gravel in the surface layer. Braided stream channels have been cut across areas of this soil.

Included in mapping are a few small areas that are underlain at depths of 20 to 36 inches by gravelly coarse sand. Also included are some areas where slopes are 0 to 2 percent.

Runoff is slow to rapid on this soil, and the hazard of erosion is moderate to high.

This soil is used for range, as a source of water, and for recreation. (Capability unit VIIw-4 (19) dryland; Sandy Alluvial range site)

Gorgonio loamy sand, deep, 2 to 8 percent slopes (GlC).—The profile of this soil is similar to that described for the Gorgonio series, but it has a loamy sand surface layer and is free of gravel. Sandy loam occurs at a depth of 36 to 60 inches.

Included with this soil in mapping is a small area of Gorgonio loamy sand that is 60 inches deep. Also included are small areas of Gorgonio soils that are underlain by gravelly coarse sand at depths of 36 to 60 inches. Some small included areas have slopes of 0 to 2 percent.

The available water holding capacity of this soil is 5.0 to 6.0 inches. Runoff is slow, and the hazard of erosion is slight.

This soil is used for irrigated pasture and for nonfarm purposes. (Capability unit IIs-4 (19) irrigated; Sandy range site)

Gorgonio cobbly loamy fine sand, 2 to 15 percent slopes (GnD).—The profile of this soil is similar to that described for the Gorgonio series, but it is cobbly loamy fine sand throughout.

Included with this soil in mapping are a few small areas in which the underlying material is sandy loam. Also included are Gorgonio soils that have slopes of 15 to 25 percent.

Runoff is slow on this soil, and the hazard of erosion is slight.

This soil is used for dryland pasture and range and for homesites. (Capability unit VIe-7 (19) dryland; Sandy range site)

Grangeville Series

The Grangeville series consists of moderately well drained to poorly drained soils on alluvial fans and flood plains. These soils developed in alluvium from granitic materials. Slopes are 0 to 15 percent. Elevations range from 600 to 1,800 feet. The average annual rainfall ranges from 11 to 14 inches, the average annual temperature from 61° to 64° F., and the average frost-free season from 200 to 270 days. The vegetation is chiefly annual

grasses, saltgrass, and forbs but includes some cottonwoods.

In a typical profile, the surface layer is grayish-brown loamy fine sand and loamy very fine sand about 17 inches thick. The underlying layers are stratified and range from grayish brown to light brownish gray in color and from loamy fine sand to very fine sandy loam in texture. Depth to the water table in the Grangeville soils is from 20 to more than 48 inches.

The Grangeville soils are near the Dello and Traver soils.

Grangeville soils are used for dryland grain, for irrigated alfalfa, truck crops, and pasture, and for homesites.

Grangeville loamy fine sand, drained, 0 to 5 percent slopes (GoB).—This nearly level to gently sloping soil occurs on alluvial fans and flood plains.

Following is a typical profile on an east-facing slope of 1 percent (1,680 feet north and 20 feet east of the southwest corner of section 25, T. 4 S., R. 1 W.):

Ap—0 to 10 inches, grayish-brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) when moist; weak, fine, subangular blocky structure; soft, very friable, nonsticky and nonplastic; few, very fine, random roots; common, very fine, irregular pores; moderately alkaline (pH 8.0); slightly effervescent; abrupt, wavy boundary. Horizon is 3 to 10 inches thick.

A1—10 to 17 inches, grayish-brown (2.5Y 5/2) loamy very fine sand, very dark grayish brown (2.5Y 3/2) when moist; massive; soft, very friable, nonsticky and nonplastic; plentiful, very fine, random roots; few, very fine, irregular pores; moderately alkaline (pH 8.2); slightly effervescent; abrupt, wavy boundary. Horizon is 4 to 7 inches thick.

C1—17 to 19 inches, grayish-brown (2.5Y 5/2) very fine sandy loam, dark grayish brown (2.5Y 4/2) when moist; massive; soft, very friable, slightly sticky and slightly plastic; plentiful, very fine, random roots; few, very fine, tubular pores and common, very fine, irregular pores; moderately alkaline (pH 8.4); strongly effervescent; variable silt lenses 1 to 5 inches thick; few, fine, faint mottles; abrupt, irregular boundary. Horizon is 2 to 11 inches thick.

C2—19 to 39 inches, light brownish-gray (2.5Y 6/2) loamy very fine sand, dark grayish brown (2.5Y 4/2) when moist; massive; soft, very friable, nonsticky and nonplastic; few, very fine, random roots; few, very fine, tubular pores and many, very fine, irregular pores; moderately alkaline (pH 8.4); strongly effervescent; few, fine, faint mottles; gradual, wavy boundary. Horizon is 5 to 20 inches thick.

C3—39 to 45 inches, grayish-brown (2.5Y 5/2) loamy very fine sand, very dark grayish brown (2.5Y 3/2) when moist; massive; soft, very friable, nonsticky and nonplastic; few, very fine, tubular pores and many, very fine, irregular pores; moderately alkaline (pH 8.4); strongly effervescent; highly micaceous; gradual, irregular boundary. Horizon is 5 to 16 inches thick.

C4—45 to 60 inches, grayish-brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) when moist; massive; soft, very friable, nonsticky and nonplastic; few, very fine, random pores; strongly alkaline (pH 8.6); strongly effervescent.

The A horizon is gray, brownish gray, light brownish gray, or grayish brown in color. The C horizon is grayish brown to light brownish gray in color and loamy sand to very fine sandy loam in texture. In places the lower C horizon is stratified with loamy sand to silty clay loam.

Included with this soil in mapping are small areas of Dello loamy fine sand and Traver fine sandy loam. Some included areas have a loamy sand or very fine sandy loam surface layer. Also included are areas of streambank erosion and deposition.

This moderately well drained soil has moderately rapid permeability. Runoff is slow, and the hazard of erosion is slight. The available water holding capacity is 5.0 to 7.5 inches. The root zone is more than 60 inches deep. Natural fertility is moderate.

This Grangeville soil is used for irrigated alfalfa, for dryland pasture and grain, and for homesites. (Capability unit IIs-4 (19) irrigated; Sandy Basin range site)

Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes (GpB).—The profile of this soil is similar to that described for the Grangeville series, but it is gray sandy loam throughout and is slightly to moderately saline-alkali. Included with this soil in mapping are small areas having a loamy sand surface layer. Also included are small areas of sandy loam that are 36 to 48 inches deep over coarse gravelly sand.

The available water holding capacity of this soil is 6.0 to 7.5 inches. Runoff is slow, and the hazard of erosion is slight. Natural fertility is moderately low.

This soil is used for dryland pasture and grain, for irrigated alfalfa and permanent pasture, and for homesites. (Capability unit IIIs-6 (19) irrigated; Sandy Basin range site)

Grangeville sandy loam, sandy substratum, drained, 0 to 5 percent slopes (GrB).—The profile of this soil is similar to that described for the Grangeville series, but it has a gray sandy loam surface layer and is 30 to 42 inches deep over very coarse sand. Included in mapping are small areas where the underlying material is coarse loamy sand, and small areas that have a gravelly loam surface layer.

The available water holding capacity of this soil is 3.75 to 6.5 inches. Runoff is slow, and the hazard of erosion is slight. The root zone is 30 to 42 inches thick.

This soil is used for dryland pasture and grain, for irrigated alfalfa and permanent pasture, and for homesites. (Capability unit IIIs-0 (19) irrigated; Sandy Basin range site)

Grangeville sandy loam, sandy substratum, drained, saline-alkali, 0 to 5 percent slopes (GsB).—The profile of this soil is similar to that described for the Grangeville series, but it has a surface layer of light brownish-gray sandy loam. Loamy coarse sand is at a depth of 30 to 40 inches. This soil is moderately saline-alkali.

Included with this soil in mapping are small areas having a loamy sand surface layer. These inclusions are not saline-alkali and have a water table at a depth of 36 to 60 inches.

The available water holding capacity of this soil is 4.5 to 6.0 inches. Runoff is slow, and the hazard of erosion is slight. The root zone is 30 to 40 inches deep. Natural fertility is low.

This soil is used for dryland grain and pasture, for irrigated alfalfa, and for homesites. (Capability unit IIIs-6 (19) irrigated; Sandy Basin range site)

Grangeville fine sandy loam, drained, 0 to 2 percent slopes (GtA).—The profile of this soil is similar to that described for the Grangeville series, but it has a fine sandy loam surface layer. Loam is at a depth of 36 to 54 inches.

Included with this soil in mapping are some small eroded areas and areas having slopes of 2 to 5 percent. Also included are areas that have a water table at a

eep fine sandy loam over

capacity of this soil is 7.5
d the hazard of erosion is

grain and pasture, for ir-
, and for homesites. (Cap-
; Sandy Basin range site)

am, loamy substratum,
ercent slopes (GxA).—The
to that described for the
ı light brownish-gray fine
s 26 to 40 inches deep over
o strongly saline-alkali.
apping are areas having a
loam surface layer. Also
ich fine sandy loam is 24
sand. Some included areas

capacity of this soil is 7.0
and the hazard of erosion
w.
ed alfalfa and permanent
d pasture, and for home-
19) irrigated; Sandy Basin

s are on alluvial fans and
ercent. These well-drained
sisting mainly of granitic
om 600 to 3,500 feet. The
from 10 to 18 inches, the
om 59° to 64° F., and the
200 to 280 days. The vege-
forbs, sumac, and chamise
k trees.
face layer is brown sandy
he subsoil is brown sandy
d extends to a depth of

r the Hanford, Pachappa,

dryland grain and pasture,
alfa, potatoes, citrus, and

8 percent slopes, eroded
ately sloping soil occurs on

file on a southeast-facing
north and 380 feet west of
tion 18, T. 3 S., R. 2 W.):

10YR 5/3) sandy loam, dark
) when moist; weak, medium,
d weak, fine, granular struc-
d, very friable, slightly sticky
c; abundant fine and very fine
e and very fine pores; slightly
adual, smooth boundary. Hori-
es thick.
YR 5/3) sandy loam, very dark
0YR 3/2) when moist; weak,
locky structure; slightly hard,
tly sticky and slightly plastic;

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8.5

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derlying material. This soil is braided with shal-
m channels.
small areas that have a cobbly fine sandy loam
sandy loam surface layer are included.
ge is somewhat excessive on this soil. The avail-
er holding capacity is 3.0 to 4.5 inches. Runoff
medium, and the hazard of erosion is slight to

oil is used for pasture and range and for non-
poses. (Capability unit VIe-7 (19, 20) dryland;
nge site)

rd coarse sandy loam, deep, 2 to 8 percent roded (HeC2).—The profile of this soil is similar escribed for the Hanford series, but it is under- ravelly coarse sand at a depth of 30 to 40 inches. llow gullies, and small areas of deposition occur. ed with this soil in mapping are a few small t have a gravelly loamy sand surface layer.
oil is somewhat excessively drained. It has rapid lity. The available water holding capacity is .0 inches. Runoff is slow to medium, and the f erosion is slight to moderate. The root zone is inches deep. Natural fertility is low.
oil is used for irrigated alfalfa, truck crops, and us, for dryland grain and pasture, and for home- pability unit IIIs-0 (19) irrigated; Sandy range

rd sandy loam, 2 to 15 percent slopes (HfD).— ile of this soil is similar to that described for the series, but it has a sandy loam surface layer. is subject to stream channel erosion and deposi- it is generally laced with braided stream chan- some entrenched channels.
l areas that have a gravelly coarse sandy loam or ndy loam surface layer are included in areas as this soil. Some small areas having slopes of percent are also included.
is rapid, and the hazard of erosion is high. The water holding capacity is 5.0 to 7.5 inches.
oil is used for dryland grain, pasture, and range recreation. (Capability unit VIIw-4 (19) dry- ndy Alluvial range site)

rd fine sandy loam, 0 to 2 percent slopes (HgA). rofile of this soil is similar to that described for ford series, but it has a fine sandy loam surface cluded with this soil in mapping are small areas tratified underlying material of sand and loam. nall eroded areas are also included.
is slow on this soil, and the hazard of erosion The available water holding capacity is 7.5 to s.
oil is used for irrigated alfalfa and truck crops, nd grain and pasture, and for homesites. (Capa- it I-1 (19) irrigated; Loamy range site)

Series

ilmar series consists of moderately well drained alluvial fans. Slopes range from 0 to 8 percent. ils developed in alluvium that was washed from ned in granitic material and reworked by wind. ns range from 600 to 1,000 feet. The average an- nfall ranges from 11 to 13 inches, the average an- nperature from 61° to 65° F., and the average

rate, and its
inches. Run-
s slight. Soil
is rapid.
rapes, alfal-
asture. It is
-4 (19) irri-

rcent slopes
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y fine sand
soil in map-
15 percent.
rate, and its
inches. Run-
s slight. Soil
is rapid.
alfalfa, and
It is suited
) irrigated;

s on alluvial
dominantly
25 percent.
The average
the average
the average
Vegetation is
lso, there are

dark-brown
lerlying ma-
y loam and

Wyman soils.
nd grain and

pes (HnC).—
s on alluvial

-facing slope
t of the west
V.):

ndy loam, very
moist; weak,
ture; slightly
d nonplastic;
few, fine, tubu-
regular pores;
smooth bound-
k.
ndy loam, very
moist; weak,
ocky structure;
icky and non-
ne roots; few,
e and fine, ir-
H 6.5); clear,
20 inches thick.
e sandy loam,
oist; massive;
icky and non-
e roots; many,
ntly acid (pH

6.5); clear, wavy boundary. Horizon is 16 to 24 inches thick.

C2—44 to 60 inches, brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/2) when moist; massive; soft, very friable, nonsticky and nonplastic; few roots; many, very fine, irregular pores; slightly acid (pH 6.5).

The A horizon is slightly acid to neutral in reaction, grayish brown, brown, or dark brown in color, and gravelly sandy loam to fine sandy loam in texture. The C horizon is grayish brown, brown, or dark brown and is sandy loam to very fine sandy loam.

Included with this soil in mapping are small areas of Buren loam and Wyman loam. A few small included areas have slopes of 0 to 2 percent.

This Honcut soil has moderately rapid permeability. Runoff is slow to medium, and the hazard of erosion is slight to moderate. The available water holding capacity is 5.5 to 7.5 inches. The root zone is more than 60 inches deep. Natural fertility is moderate.

This soil is used for irrigated citrus and dryland grain. (Capability unit IIe-1 (19) irrigated; Loamy range site)

Honcut sandy loam, 8 to 15 percent slopes, eroded (HnD2).—Small areas of deposition occur in drainageways where the slope of this soil decreases. Rills have been formed in grainfields. A few small areas with a gravelly sandy loam surface layer are included with this soil in mapping.

Runoff is medium, and the hazard of erosion is moderate.

This soil is used for irrigated citrus and for dryland grain and pasture. (Capability unit IIIe-1 (19) irrigated; Loamy range site)

Honcut loam, 2 to 8 percent slopes, eroded (HuC2).—The profile of this soil is similar to that described for the Honcut series, but it is grayish-brown light loam throughout the profile. Rills, shallow gullies, and small areas of deposition occur.

A few areas with a gravelly very fine sandy loam surface layer are included in areas mapped as this soil. Also included are areas with a sandy loam or loamy sand substratum and areas with a calcareous substratum. Some inclusions have slopes of 0 to 2 percent, and there are included small areas of stream channel erosion.

The available water holding capacity of this soil is 7.5 to 10.0 inches. Permeability is moderate. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Natural fertility is high.

This soil is used for irrigated citrus and truck crops and for dryland grain and pasture. (Capability unit IIe-1 (19) irrigated; Loamy range site)

Honcut cobbly sandy loam, 2 to 25 percent slopes (HoE).—The profile of this soil is similar to that described for the Honcut series, but it has a cobbly sandy loam surface layer. This soil is subject to stream channel erosion and deposition.

Included in mapping are some areas that have no stream channel erosion. A few areas with a gravelly or cobbly loamy sand surface layer are also included.

The available water holding capacity of this soil is 3.0 to 4.5 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Natural fertility is low.

This soil is used for range and for nonfarm purposes. (Capability unit VIIw-4 (19) irrigated; Sandy Alluvial range site)

Las Posas Series

Soils of the Las Posas series are on uplands. Slopes range from 2 to 50 percent. These well-drained soils developed on gabbro and other intrusive basic igneous rocks. Elevations range from 1,000 to 3,000 feet. The average annual rainfall ranges from 9 to 14 inches, the average annual temperature from 59° to 65° F., and the average frost-free season from 240 to 300 days. Vegetation is chiefly annual grasses, forbs, chamise, flat-top buckwheat, and black sage.

Typically, the surface layer is reddish-brown loam and clay loam about 12 inches thick. The subsoil is dark-red clay and red heavy clay loam. At a depth of about 32 inches is yellowish-red weathered gabbro.

The Las Posas soils are near the Temescal, Cajalco, and Murrieta soils.

Las Posas soils are used for dryland pasture and grain and for irrigated citrus and truck crops.

Las Posas loam, 8 to 15 percent slopes, eroded (LaD2).—This rolling soil occurs on uplands.

Following is a typical profile on a north-facing slope of 8 percent (500 feet east and 1,000 feet north of the west quarter corner of section 18, T. 7 S., R. 1 W.):

Ap—0 to 7 inches, reddish-brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) when moist; weak, medium, granular structure; hard, friable, slightly sticky and slightly plastic; abundant very fine roots; many, very fine, irregular pores; slightly acid (pH 6.2); clear, smooth boundary. Horizon is 2 to 6 inches thick.

A3—7 to 12 inches, reddish-brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) when moist; moderate, medium, angular blocky structure; hard, firm, sticky and plastic; abundant very fine roots; common, very fine, tubular pores; slightly acid (pH 6.2); clear, wavy boundary. Horizon is 4 to 8 inches thick.

B21t—12 to 17 inches, dark-red (2.5YR 3/6) clay, dark red (2.5YR 3/6) when moist; strong, coarse, angular blocky structure; very hard, very firm, very sticky and very plastic; plentiful, very fine, exped roots; common, very fine, tubular pores; continuous thick clay films on ped faces and in pores; neutral (pH 7.0); gradual, smooth boundary. Horizon is 4 to 8 inches thick.

B22t—17 to 27 inches, dark-red (2.5YR 3/6) clay, dark red (2.5YR 3/6) when moist; strong, medium, angular blocky structure; very hard, very firm, very sticky and very plastic; plentiful very fine roots (mostly in cracks along ped faces); few, very fine, tubular pores; continuous thick clay films on ped faces and in pores; neutral (pH 7.3); clear, wavy boundary. Horizon is 4 to 8 inches thick.

B3t—27 to 32 inches, red (2.5YR 4/6) heavy clay loam, dark red (2.5YR 3/6) when moist; strong, medium, angular blocky structure; very hard, firm, sticky and plastic; few very fine roots; few, very fine, tubular pores; many moderately thick clay films on ped faces and in pores; neutral (pH 7.3); clear, wavy boundary. Horizon is 6 to 12 inches thick.

C1—32 to 40 inches, yellowish-red (5YR 5/6) weathered fine-grained gabbro, yellowish red (5YR 4/6) when moist; neutral (pH 7.3); clear, smooth boundary. Horizon is 8 to 10 inches thick.

C2—40 to 54 inches, pale-brown (10YR 6/3) weathered gabbro; neutral (pH 7.0).

The A horizon is slightly acid to neutral in reaction and reddish brown to brown or dark brown in color. The Bt horizon is generally neutral to mildly alkaline in reaction, dark red to red in color, and heavy clay loam to clay in

ish-red to pale-brown
mposing gabbro ranges

ng are small areas of
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slopes (LaC).—A few
s deep to weathered
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o 30 inches deep to

pacity is 3.0 to 5.0
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ity of this soil is 2.0
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it is 20 to 26 inches
a yellowish-brown
10 percent of the

A few small areas that have a fine sandy loam surface layer and rock outcrops are included with this soil in mapping. Also included are some areas having a stony loam surface layer.

The available water holding capacity of this soil is 3.0 to 4.0 inches. Runoff is rapid, and the hazard of erosion is high. The root zone is 20 to 26 inches deep. Natural fertility is low.

This soil is used for range and dryland pasture. (Capability unit VIe-7 (19) dryland; Loamy range site)

Las Posas rocky loam, 15 to 50 percent slopes, severely eroded (LkF3).—The profile of this soil is similar to that described for the Las Posas series, but it is 15 to 20 inches deep to weathered gabbro and has a yellowish-red subsoil. Rock outcrops are on 2 to 10 percent of the surface.

A few small areas with a fine sandy loam or stony loam surface layer and rock outcrops are included with this soil in mapping.

The available water holding capacity of this soil is 2.0 to 3.0 inches. Runoff is rapid, and the hazard of erosion is high. The root zone is 15 to 20 inches deep. Natural fertility is low.

This soil is used for range. (Capability unit VIIe-1 (19) dryland; Shallow Loamy range stie)

Lodo Series

The Lodo series consists of somewhat excessively drained upland soils on slopes of 8 to 50 percent. These soils developed on metamorphosed fine-grained sandstone. Elevations range from 700 to 2,500 feet. The average annual rainfall ranges from 10 to 14 inches, the average annual temperature from 62° to 65° F., and the average frost-free season from 230 to 250 days. Vegetation is chiefly annual grasses, forbs, and chaparral.

In a typical profile, the surface layer is brown gravelly loam about 8 inches thick. Underlying this is brown shattered and weathered fine-grained metamorphosed sandstone. Depth to the sandstone varies from 8 to 15 inches.

Lodo soils are near the Vallecitos, Escondido, Temescal, and Cajalco soils.

The Lodo soils are used for range and dryland pasture.

Lodo rocky loam, 8 to 25 percent slopes, eroded (LpE2).—This rolling to hilly soil occurs on uplands. Rock outcrops occupy 2 to 10 percent of the surface.

Following is a typical profile on an east-facing slope of 14 percent (150 feet east of the west quarter corner of section 27, T. 5 S., R. 4 W.):

A11—0 to 3 inches, brown (10YR 5/3–4/3) gravelly loam, dark brown (10YR 3/3) when moist; moderate, medium, angular blocky structure; slightly hard, friable, nonsticky and slightly plastic; abundant fine and very fine roots; many, fine and very fine tubular pores; slightly acid (pH 6.4); clear, smooth boundary. Horizon is 3 to 6 inches thick.

A12—3 to 8 inches, brown (7.5YR 5/4) gravelly loam, dark yellowish brown (10YR 3/4) when moist; moderate, medium, angular blocky structure; hard, friable, nonsticky and slightly plastic; abundant very fine roots; many very fine pores; slightly acid (pH 6.2); diffuse, irregular boundary. Horizon is 5 to 9 inches thick.

C—8 to 19 inches, shattered and decomposed, fine-grained, metamorphosed sandstone; slightly acid (pH 6.2).

R—19 inches, metamorphosed, fine-grained sandstone.

10YR 4/3) when moist;
friable, nonsticky and
y fine and few fine roots;
pores; slightly acid (pH
ndary. Horizon is 1 to 7

n (10YR 5/4) clay, dark
3/4) when moist; moder-
ructure; tops of columns
ear coated with a pale-
sh-brown dust; common,
of brown to dark brown
rown (5YR 4/4) when
ery hard, very firm, very
ic; plentiful very fine
very fine, tubular pores;
ick clay film, brown to
3), brown (10YR 3/3)
ly alkaline (pH 8.2);
edium, irregular-shaped,
abrupt, wavy boundary.
s thick.
n (10YR 5/4) indurated
brown (10YR 4/4) when
ts; few very fine pores;
icture planes; moderately
ongly effervescent; fine
wavy boundary. Horizon

(10YR 5/4) clay loam,
10YR 4/4) when moist;
, firm, sticky and plastic;
fine pores; few thin clay
; strongly alkaline (pH
ent; fine seams of lime;
ry. Horizon is 12 to 18

(10YR 5/4) loam, dark
4/4) when moist; mas-
ightly sticky and plastic;
pores; strongly alkaline
rvescent; fine seams of

lark yellowish brown in
own to dark brown. The
ly to strongly alkaline,
llowish brown to reddish
s from 18 to 36 inches.
agent, with lime in the

ing are small areas of
o silt loam, Monserate
ome small included areas
e layer or a clay loam
ear the edges of basins

ow. The available water
Runoff is slow, and the
ertility is moderate. The

d grain and pasture, for
d for homesites. (Capa-
aypan range site)

ercent slopes, eroded

s similar to that de-
the surface layer is
hick.
g are small areas that
ded are a few small
am surface layer and
clay loam subsoil.
s soil. The hazard of

and pasture and for
(19) irrigated; Clay-

oam, 5 to 15 percent slopes, eroded
of this soil is similar to that de-
a series, but it has a brown surface

soil in mapping are areas with a
ım surface layer. A few small areas
ly loam surface layer are also in-

ɔn this soil, and the hazard of ero-

ɔr dryland grain and pasture and
bility unit IVe–3 (19) irrigated;

loam, shallow, 2 to 8 percent slopes,
uded with this soil in mapping are
a loam surface layer. Also included
s of 8 to 15 percent.
holding capacity of this soil is 2.0
is slow to medium, and the hazard
moderate. The root zone is 10 to 20
fertility is moderately low.
dryland grain and pasture and for
y unit IVe-3 (19) irrigated; Clay-

series are somewhat excessively
ı alluvial fans. Slopes range from
e soils developed in alluvium from
ıdstone and shale. Elevations range
. The average annual rainfall ranges
he average annual temperature from
average frost-free season from 220 to
is chiefly annual grasses, forbs, wil-
s.
the upper 28 inches is light brown-
and. Below this is light brownish-
d and light-gray sand.
near the San Emigdio soils and

for dryland grain and pasture and
ops, citrus, olives, apricots, and al-
sed for homesites.
ınd, 0 to 2 percent slopes (MfA).—
occurs on alluvial fans.
ɔical profile on a southwest-facing
0 feet north and 100 feet west of the
5 S., R. 1 E.):

light brownish-gray (10YR 6/2) loamy
d, very dark grayish brown (10YR 3/2)
ıoist; single grain; loose when dry or
ıonsticky and nonplastic; abundant very
ɔts; very porous; mildly alkaline (pH
ightly effervescent; clear, wavy boundary.
is 6 to 28 inches thick.
, light brownish-gray (10YR 6/2) loamy
sand, very dark grayish brown (10YR
hen moist; single grain; loose when dry
st, nonsticky and nonplastic; plentiful
e roots; very porous; mildly alkaline (pH
ightly effervescent; gradual, wavy bound-
rizon is 8 to 22 inches thick.
light-gray (2.5Y 7/2) sand, light brown-
y (2.5Y 6/2) when moist; single grain;
hen dry or moist, nonsticky and non-
few very fine roots; very porous; mildly
(pH 7.8); slightly effervescent.

The C1 horizon is neutral to mildly alkaline in reaction and light grayish brown to grayish brown. The C2 and C3 horizons are mildly to moderately alkaline, grayish brown to light gray loamy fine sand to sand.

Included with this soil in mapping are small areas of San Emigdio fine sandy loam or loam. Some small areas with a sandy loam substratum and a gravelly loamy fine sand surface layer are also included.

Permeability of this soil in rapid. Runoff is slow, and the hazard of erosion is slight. The available water holding capacity is 3.75 to 5.0 inches. The root zone is more than 60 inches deep. Natural fertility is low.

This Metz soil is used for irrigated olives, alfalfa, and truck crops, for dryland grain and pasture, and for homesites. (Capability unit IIIs–4 (19) irrigated; Sandy range site)

Metz loamy fine sand, gravelly sand substratum, 0 to 5 percent slopes (MgB).—The profile of this soil is similar to that described for the Metz series, but it is 30 to 42 inches deep over gravelly coarse sand.

A few small areas having a loamy sand surface layer are included with this soil in mapping. Also included are areas, comprising about one-tenth of the mapping unit, where the gravelly coarse sand substratum is at a depth of 10 to 30 inches.

Runoff is slow on this soil, and the hazard of erosion is slight. The available water holding capacity is 2.5 to 4.0 inches. The root zone is 30 to 42 inches thick. Natural fertility is moderate.

This soil is used for irrigated alfalfa, truck crops, apricots, and olives, for dryland grain and pasture, and for nonfarm purposes. (Capability unit IVs–0 (19) irrigated; Sandy range site)

Metz loamy fine sand, sandy loam substratum, 0 to 5 percent slopes (MhB).—The profile of this soil is similar to that described for the Metz series, but it is 20 to 36 inches deep over sandy loam.

A few areas with a loamy sand surface layer and a loam substratum are included with this soil in mapping. Also included are areas on slopes of 5 to 15 percent.

The available water holding capacity of this soil is 5.5 to 7.0 inches. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Natural fertility is moderate.

This soil is used for irrigated alfalfa, truck crops, citrus, olives, and apricots. It is also used for dryland grain and pasture and for nonfarm purposes. (Capability unit IIs—4 (19) irrigated; Sandy range site)

Metz loamy sand, 2 to 8 percent slopes (MdC).—The profile of this soil is similar to that described for the Metz series, but it has a loamy sand surface layer.

Included with this soil in mapping are a few small areas of loamy fine sand, some of which are 36 to 60 inches deep over gravelly coarse sand. Also included are areas on slopes of 8 to 15 percent.

The available water holding capactiy of this soil is 3.75 to 5.0 inches. Runoff is slow, and the hazard of erosion is slight.

This soil is used for irrigated citrus, olives, apricots, alfalfa, and truck crops. It is also used for dryland grain and pasture and for nonfarm purposes (Capability unit IIIs–4 (19) irrigated; Sandy range site)

Metz loamy sand, channeled, 0 to 15 percent slopes (MeD).—The profile of this soil is similar to that described for the Metz series, but it has a loamy sand texture throughout and is channeled.

Included with this soil in mapping are a few areas

ar, smooth boundary. Horizon is 2
ck.

sh-red (5YR 4/6) sandy loam, dark
1 (2.5YR 3/4) when moist; moder-
subangular blocky structure; hard,
sticky and slightly plastic; common
any, fine, tubular pores; slightly
); abrupt, smooth boundary. Hori-
inches thick.

ldish-brown (5YR 4/4) sandy clay
eddish brown (2.5YR 3/4) when
, medium, prismatic structure; ex-
, very firm, very sticky and very
fine, mostly exped roots; few, fine,
; many moderately thick clay films
on ped faces; neutral (pH 6.7);
oth boundary. Horizon is 5 to 10

ldish-brown (5YR 5/4) sandy clay
reddish brown (5YR 3/4) when
medium, angular blocky structure;
rd, very sticky and very plastic;
tly exped roots; few, fine, tubular
moderately thick clay films in pores
faces; neutral (pH 7.2); abrupt,
ry. Horizon is 8 to 12 inches thick.

ark-brown (10YR 4/3) indurated
k reddish brown (5YR 3/4) when
ve; very few roots in seams and
etimes lime and/or purplish-black
ains in seams; mildly alkaline (pH
, smooth boundary. Horizon is 5 to
k.

llowish-brown (10YR 5/4) loamy
ark reddish brown (5YR 3/4) when
ve; weakly cemented; very hard,
y and nonplastic; mildly alkaline
ear, wavy boundary. Horizon is 3
hick.

llowish-brown (10YR 5/4) loamy
ark reddish brown (5YR 3/4) when
e; weakly cemented in lenses; soft,
nonsticky and nonplastic; mildly
7.5).

ly acid to neutral in reaction and
reddish brown to yellowish red in
grayish brown to reddish brown in
to clay loam in texture. The Cm
emented hardpan, which sometimes
a dendritic pattern in seams and
ellowish-brown coarse sandy loam
th to the hardpan commonly ranges

l in mapping are small areas of
ford coarse sandy loam, Greenfield
sandy loam. Also included are some
lly sandy loam surface layer, and
ches deep to the hardpan.

l above the nearly impervious pan
ff is medium, and the hazard of
vailable water holding capacity is
one is 20 to 36 inches deep. Natural

sed for irrigated citrus, for dryland
or nonfarm purposes. (Capability
; Loamy range site)

0 to 5 percent slopes (MmB).
s similar to that described for
has a sandy clay subsoil.

in mapping are a few small
ay in the subsoil than is typi-
that are 36 to 54 inches deep to
ome inclusions have slopes of

slight on this soil, and runoff is

l ceanothus. In addition, there
pines.
layer is dark grayish-brown
es thick. The underlying mate-
ıy coarse sand.
near the Oak Glen and Calpine

for range, for dryland pasture
d apples, peaches, potatoes, and
o used for nonfarm purposes.
2 to 8 percent slopes (MoC).—
sloping soil is on alluvial fans

profile on a west-facing slope of
ınd 1,760 feet west of the south-
T. 7 S., R. 5 E.) :
: grayish-brown (10YR 4/2) loamy
ırk grayish brown (10YR 3/2) when
e grain; loose when dry or moist,
d nonplastic; abundant fine and very
ightly acid (pH 6.2) ; clear, smooth
orizon is 4 to 10 inches thick.
k grayish-brown (10YR 4/2) loamy
ırk grayish brown (10YR 3/2) when
e grain; loose when dry or moist,
d nonplastic; plentiful fine and very
ightly acid (pH 6.2) ; clear, smooth
orizon is 14 to 24 inches thick.
ish-brown (10YR 5/2) loamy coarse
ırk grayish brown (10YR 3/2) when
e grain; loose when dry or moist,
d nonplastic; plentiful very fine and
roots; slightly acid (pH 6.2).
ly acid to medium acid in reaction,
ay in color, and sand to loamy sand
is generally slightly acid to neutral,
own loamy sand to gravelly loamy

in mapping are small areas of Oak
d Calpine sandy loam. Some areas
gravelly loamy sand or loamy fine
s braided with stream channels are

oil is rapid. Runoff is medium, and
moderate. The available water hold-
inches. The root zone is more than
fertility is moderate.
used for irrigated apples, peaches,
dryland grain and pasture, and for
ability unit IIIs–4 (20) irrigated,
arse Sandy range site)

, **8 to 15 percent slopes** (MoD).
ıtains some fine gravel. Other-
to that described for the Motts-

in mapping are small areas that
ınd surface layer, areas with a
ınd areas that are braided with
luded are areas having slopes of

his soil, and the hazard of ero-

rland pasture and grain and for
oility unit IVs–4 (20) irrigated,
arse Sandy range site)
y sand, 8 to 25 percent slopes
s soil is similar to that described
but it has a cobbly loamy sand
ing unit is channeled by inter-

g are areas that are
2 to 8 percent.
ty of this soil is 2.5
pid, and the hazard
lity is low.
e and range and for
VIIw–4 (20) dry-

ent slopes (MsC).—
at described for the
loam surface layer.
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city of this soil is
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d, IVsc–4 (20) dry-

ent slopes (MsD).—
that described for
loam surface layer.
are some small areas
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with braided stream

city of this soil is
n is moderate. Nat-

pples, peaches, and
re, and for nonfarm
) irrigated, IVsc–4
ite)

25 percent slopes,
il is similar to that
ut it has a cobbly
gullies occur. There
cutting and deposi-

ing are some areas
areas are included

the hazard of ero-
holding capacity is

e and range. (Capa-
e Sandy range site)

ed on olivine basalt.
flows. Slopes are 2
1,700 to 2,500 feet.
rom 14 to 20 inches,
59° to 62° F., and
to 300 days. Vege-
ed, and forbs.
er is dark-red stony
subsoil is dark-red
am and clay. At a
e basalt.
as Posas soils, and

Murrieta stony clay loam, 2 to 25 percent slopes (MuE).—This undulating to hilly soil occurs on lava flows.

Following is a typical profile on a south-facing slope of 2 percent (1,150 feet north and 1,300 feet east of the west quarter corner of section 2, T. 8 S., R. 4 W.):

A—0 to 5 inches, dark-red (2.5YR 3/6) stony clay loam, dark reddish brown (2.5YR 3/4) when moist; moderate, fine, angular blocky structure; hard, firm, slightly sticky and plastic; abundant very fine roots; common, very fine, irregular and tubular pores; medium acid (pH 5.6); clear, wavy boundary. Horizon is 3 to 8 inches thick.

B1—5 to 9 inches, dark-red (2.5YR 3/6) heavy clay loam, dark reddish brown (2.5YR 3/4) when moist; moderate, medium, angular blocky structure; hard, firm, sticky and plastic; abundant very fine roots; common, very fine, irregular and tubular pores; common thin clay films on peds and in pores; medium acid (pH 5.6); abrupt, wavy boundary. Horizon is 3 to 4 inches thick.

B21t—9 to 13 inches, dark-red (2.5YR 3/6) clay, dark reddish brown (2.5YR 3/4) when moist; strong, coarse, prismatic structure, the prisms being irregular and high in apparent volume weight; extremely hard, extremely firm, very sticky and very plastic; plentiful very fine roots; common, very fine, tubular pores; continuous thick clay films on ped faces; medium acid (pH 5.6); clear, wavy boundary. Horizon is 2 to 5 inches thick.

B22t—13 to 17 inches, dark reddish-gray (5YR 4/2) clay, dark reddish gray (5YR 4/2) when moist; strong, coarse, prismatic structure; extremely hard, extremely firm, very sticky and very plastic; plentiful very fine roots; common, very fine, tubular pores; continuous thick clay films on ped faces; medium acid (pH 6.0); abrupt, wavy boundary. Horizon is 4 to 11 inches thick.

R—17 inches, gray olivine basalt, mottled with red and yellow; many cavities from gas bubbles; plentiful very fine roots on surface of rock fragments. Many feet thick.

The A horizon is slightly acid to medium acid in reaction and reddish brown to dark red in color. The Bt horizon is dark-red to dark reddish-gray heavy clay loam to clay. Depth to hard basalt commonly ranges from 12 to 20 inches.

Included with this soil in mapping are small areas of Las Posas loam. Some small depressional areas and some unnamed moderately deep soils with a clay loam subsoil are also included.

Permeability of this soil is slow. Runoff is slow to rapid, and the hazard of erosion is slight to high. The available water holding capacity is 2.0 to 3.0 inches. The root zone is 12 to 20 inches deep. Natural fertility is moderate.

This Murrieta soil is used for pasture and range. (Capability unit VIe–7 (19) dryland; Shallow Clayey range site)

Oak Glen Series

The Oak Glen series consists of well-drained soils on alluvial fans and in valley fills. Slopes range from 5 to 25 percent. These soils developed in alluvium predominantly from granitic and metamorphosed granitic rock. Elevations range from 3,500 to 6,000 feet. The average annual rainfall ranges from 10 to 25 inches, the average annual temperature from 50° to 57° F., and the average frost-free season from 150 to 225 days. Vegetation is chiefly annual grasses, forbs, big sagebrush, ceanothus, and scrub oaks, and there are a few sugar pines.

Typically, the surface layer is brown fine sandy loam about 29 inches thick. The substratum is reddish-brown fine sandy loam and extends to a depth of 60 inches or more.

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Perkins soils are used for dryland grain and pasture, for irrigated citrus, and for nonfarm purposes. Areas of Perkins soils are near the city of Corona.

Perkins gravelly loam, 5 to 8 percent slopes (PgC).—This moderately sloping soil occurs on alluvial fans and terraces.

Following is a typical profile on a northeast-facing slope of 8 percent (1,000 feet north and 700 feet east of the southwest corner of section 18, T. 4 S., R. 6 W.):

A11—0 to 7 inches, brown (7.5YR 5/4) gravelly loam, dark reddish brown (5YR 3/4) when moist; weak, coarse, angular blocky structure parting to moderate, medium, granular structure; slightly hard, firm, slightly sticky and slightly plastic; abundant very fine and few fine roots; common, very fine pores; surface one-half inch tends to be soft, very fine, and granular and contains a considerable amount of organic matter; slightly acid (pH 6.1); clear, wavy boundary. Horizon is 3 to 8 inches thick.

A12—7 to 12 inches, brown (7.5YR 5/4) gravelly loam, dark reddish brown (5YR 3/4) when moist; moderate, medium, angular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; abundant very fine and few fine roots; common fine pores; slightly acid (pH 6.1); clear, wavy boundary. Horizon is 5 to 8 inches thick.

B1—12 to 15 inches, reddish-brown (2.5YR 4/4) gravelly clay loam, dark reddish brown (2.5YR 3/4) when moist; moderate, medium, angular blocky structure; hard, very firm, sticky and plastic; plentiful very fine roots; many medium pores; thin discontinuous clay films in pores; soil particles appear platy when magnified; slightly acid (pH 6.5); gradual, smooth boundary. Horizon is 3 to 11 inches thick.

B21t—15 to 23 inches, dark reddish-brown (2.5YR 3/4, dry or moist) gravelly heavy clay loam; moderate, fine, subangular blocky structure; very hard, very firm, very sticky and plastic; plentiful very fine roots; few, medium, tubular pores; continuous moderately thick clay films in pores and on ped faces; slightly acid (pH 6.5); gradual, wavy boundary. Horizon is 6 to 10 inches thick.

B22t—23 to 30 inches, dark reddish-brown (2.5YR 3/4, dry or moist) gravelly heavy clay loam; moderate, fine, subangular blocky structure; very hard, very firm, very sticky and plastic; few very fine roots; few, fine, tubular pores; continuous moderately thick clay films in pores and on ped faces; neutral (pH 7.0); gradual, wavy boundary. Horizon is 4 to 16 inches thick.

B23t—30 to 36 inches, similar to horizon above but reddish brown (2.5YR 4/4) when moist; many rock fragments. Horizon is 6 to 10 inches thick.

B3—36 to 44 inches, dark reddish-brown (2.5YR 3/4) gravelly heavy clay loam, reddish brown (2.5YR 4/4) when moist; moderate, fine, subangular blocky structure; very hard, very firm, very sticky and plastic; few very fine roots; few, fine, tubular pores; continuous moderately thick clay films in pores and on ped faces; neutral (pH 6.8); many rock fragments; clear, wavy boundary. Horizon is 8 to 14 inches thick.

C1—44 to 50 inches, brown (7.5YR 5/4) very gravelly sandy clay loam, reddish brown (5YR 4/4) when moist; massive; slightly hard, firm, sticky and plastic; continuous moderately thick clay films in pores; neutral (pH 6.8); gradual, wavy boundary. Horizon is 6 to 8 inches thick.

C2—50 to 60 inches, similar to horizon above but with many moderately thick clay films in pores. Many feet thick.

The A horizon is slightly acid to neutral in reaction, light yellowish brown to brown in color, and gravelly fine sandy loam to gravelly loam in texture. The Bt horizon is neutral

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about 18 inches thick. The substratum is stratified sandy, gravelly, or cobbly alluvium of granitic origin.

The Placentia soils are near the Hanford, Greenfield, and Ramona soils.

Placentia soils are used for dryland pasture and grain, for irrigated permanent pasture, and for nonfarm purposes.

Placentia fine sandy loam, 0 to 5 percent slopes (PlB).—This nearly level to gently sloping soil occurs on terraces and alluvial fans.

Following is a typical profile on a west-facing slope of 4 percent (about 1,200 feet north-northwest of the intersection of State Highway 71 and U.S. Highway 395, on the west side of right-of-way, near the northeast corner of section 13, T. 8 S., R. 3 W.):

A11—0 to 8 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) when moist; weak, medium, granular structure; slightly hard, very friable, nonsticky and nonplastic; abundant very fine roots; many, very fine, tubular pores; medium acid (pH 6.0); clear, smooth boundary. Horizon is 5 to 10 inches thick.

A12—8 to 13 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) when moist; weak, medium, subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; plentiful, fine, tubular pores; medium acid (pH 6.0); clear, smooth boundary. Horizon is 5 to 18 inches thick.

A13—13 to 18 inches, pale-brown (10YR 6/3) loam, dark brown (10YR 4/3) when moist; weak, medium, subangular blocky structure; hard, friable, slightly sticky and nonplastic; plentiful fine roots; many, fine and very fine, tubular pores; slightly acid (pH 6.2); abrupt, smooth boundary. Horizon is 2 to 5 inches thick.

B21t—18 to 31 inches, brown (7.5YR 4/4) heavy clay loam, dark brown (7.5YR 3/2) when moist; strong, coarse, prismatic structure; extremely hard, very firm, sticky and very plastic; few fine roots, mostly in interfaces between peds; very few, fine, tubular pores; continuous thick clay films on ped faces; mildly alkaline (pH 7.5); clear, smooth boundary. Horizon is 6 to 14 inches thick.

B22t—31 to 39 inches, brown (7.5YR 5/4) heavy clay loam, dark brown (7.5YR 3/2) when moist; strong, coarse, prismatic structure; very hard, very firm, sticky and plastic; very few fine roots; very few, fine, tubular pores; many moderately thick clay films on ped faces; strongly effervescent; moderately alkaline (pH 8.0), with both disseminated and segregated lime in soft masses; clear, smooth boundary. Horizon is 7 to 14 inches thick.

B3—39 to 57 inches, brown (10YR 5/3) sandy clay loam, dark reddish brown (5YR 3/2) when moist; massive; hard, firm, sticky and plastic; strongly effervescent; moderately alkaline (pH 8.0); clear, smooth boundary. Horizon is 5 to 15 inches thick.

C—57 inches, stratified sandy, gravelly, or cobbly granitic alluvium.

The A horizon is medium acid to slightly acid in reaction, brown to grayish brown or pale brown in color, and sandy loam to loam in texture. The Bt horizon is neutral to moderately alkaline and contains lime splotches in the lower part. It is brown to reddish brown to dark red or yellowish brown in color and heavy clay loam to sandy clay in texture. The C horizon is stratified sandy, gravelly, or cobbly granitic alluvium. Depth to the dense, very slowly permeable clay commonly ranges from 12 to 20 inches.

Included with this soil in mapping are small areas of Hanford coarse sandy loam, Greenfield sandy loam, and Ramona sandy loam. Some small areas with a noncalcareous lower Bt horizon and substratum are also included. Some inclusions are 20 to 36 inches deep to clay. Included also are small areas having slopes of 5 to 25 percent.

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ne hazard of erosion is moderate. The root zone is more 0 inches deep, and natural fertility is high.

s Ramona soil is used for irrigated peaches, apricots, and grain and for dryland grain and pasture. It is to many nonfarm uses. (Capability unit IIe–1 (19) ed; Loamy range site)

ıa sandy loam, 0 to 2 percent slopes (RaA).— with this soil in mapping are a few small areas e a loamy sand surface layer. Runoff is slow on and the hazard of erosion is slight.

oil is used for irrigated citrus, truck crops, and or dryland grain and pasture, and for homesites. ity unit I–1 (19) irrigated; Loamy range site)

ıa sandy loam, 0 to 5 percent slopes, severely RaB3).—The profile of this soil is similar to that for the Ramona series, but its surface layer is nches thick. Included with this soil in mapping small areas that have a loamy sand surface layer. is medium on this soil, and the hazard of erosion ate. Natural fertility is moderate.

oil is used for irrigated citrus, alfalfa, and truck r dryland grain and pasture, and for homesites. ity unit IIIe–1 (19) irrigated; Loamy range

ıa sandy loam, 5 to 8 percent slopes, eroded -Included with this soil in mapping are a few as that have a loamy sand surface layer. Runoff is on this soil, and the hazard of erosion is moderate.

oil is used for irrigated citrus, peaches, truck falfa, and grain, for dryland grain and pasture, omesites. (Capability unit IIIe–1 (19) irrigated; ange site)

ıa sandy loam, 5 to 8 percent slopes, severely RaC3).—This soil has a thinner surface layer, but e is otherwise similar to that described for the series. The surface layer is 6 to 10 inches thick.

ed with this soil in mapping are small areas that ravelly sandy loam surface layer. Also included areas that have a substratum of loamy sand.

ıtural fertility of this soil is moderate. Runoff is to rapid, and the hazard of erosion is high.

oil is used for irrigated citrus, peaches, truck lfalfa, and grain and for dryland grain and It is suited to homesites. (Capability unit IIIe–1 gated; Loamy range site)

ıa sandy loam, 8 to 15 percent slopes, eroded -Included with this soil in mapping are a few as that have a loamy sand surface layer.

ıtural fertility of this soil is moderate. Runoff is ıd the hazard of erosion is high.

oil is used for irrigated citrus and peaches, for grain and pasture, and for homesites. (Capability –1 (19) irrigated; Loamy range site)

a sandy loam, 8 to 15 percent slopes, severely RaD3).—The profile of this soil is similar to that for the Ramona series, but it has a surface layer to 10 inches thick.

ed with this soil in mapping are small areas that ine sandy loam, gravelly fine sandy loam, or sandy loam surface layer.

is rapid on this soil, and the hazard of erosion Natural fertility is moderate.

oil is used for irrigated citrus and peaches, dryland grain and pasture, and for homesites. (Capability unit IVe–1 (19) irrigated; Loamy range site)

Ramona sandy loam, 15 to 25 percent slopes, severely eroded (RaE3).—The profile of this soil is similar to that described for the Ramona series, but its surface layer is only 6 to 10 inches thick.

Included with this soil in mapping are small areas that have a gravelly fine sandy loam or fine sandy loam surface layer. Also included are a few areas that are only moderately eroded.

The natural fertility of this soil is moderate. Runoff is rapid, and the hazard of erosion is high.

This soil is used for dryland grain and pasture, for irrigated peaches and citrus, and for homesites. (Capability unit VIe–1 (19) dryland; Loamy range site)

Ramona sandy loam, moderately deep, 8 to 15 percent slopes, eroded (RdD2).—The profile of this soil is similar to that described for the Ramona series, but it has a dark-brown to brown surface layer and is underlain at a depth of 24 to 40 inches by unrelated calcareous sediment.

Included with this soil in mapping are small areas that have a gravelly sandy loam or fine sandy surface layer.

The available water holding capacity of this soil is 4.0 to 6.0 inches. Runoff is medium, and the hazard of erosion is moderate.

This soil is used for dryland grain and pasture. (Capability unit IVe–1 (19) irrigated; Loamy range site)

Ramona sandy loam, moderately deep, 15 to 25 percent slopes, severely eroded (RdE3).—The profile of this soil is similar to that described for the Ramona series, but it has a dark-brown to brown surface layer. At a depth of 15 to 36 inches is unrelated calcareous sediment.

Included with this soil in mapping are small areas that are less than 15 inches deep to unrelated sediment. Also included are some areas with a fine sandy loam surface layer.

The water holding capacity of this soil is 3.0 to 5.0 inches. Natural fertility is moderate. Runoff is rapid, and the hazard of erosion is high.

This soil is used for range, limited dryland grain and pasture, and for homesites. (Capability unit VIe–1 (19) dryland; Loamy range site)

Ramona very fine sandy loam, 0 to 8 percent slopes, eroded (ReC2).—The profile of this soil is similar to that described for the Ramona series, but it has a dark-brown very fine sandy loam surface layer.

Included with this soil in mapping are a few small severely eroded areas.

The available water holding capactiy of this soil is 9.5 to 10.5 inches. Runoff is medium, and the hazard of erosion is moderate.

This soil is used for irrigated citrus, peaches, truck crops, alfalfa, and grain, for dryland grain and pasture, and for homesites. (Capability unit IIIe–1 (19) irrigated; Loamy range site)

Ramona very fine sandy loam, moderately deep, 0 to 8 percent slopes, eroded (RfC2).—The profile of this soil is similar to that described for the Ramona series, but it has a dark-brown very fine sandy loam surface layer. At a depth of 24 to 42 inches is unrelated calcareous sediment of the San Timoteo formation.

Included with this soil in mapping are small areas of

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Ie–1 (19) dryland;
ility unit VIe–8 (19)

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l the hazard of erosion

itrus and alfalfa, for
for homesites. (Capa-
Loamy range site)
deep, 0 to 2 percent
soil is similar to that
s, but it is loamy sand
ll eroded areas are in-

and the hazard of ero-
holding capacity is 5.0

alfalfa, apricots, and
pasture, and for home-
rigated; Loamy range

nt slopes (SgA).—The
described for the San
surface layer and a

g is an area having a
of 20 to 36 inches. A
am substratum. Some
on basin rims are also

ate, and the available
0.0 inches. Runoff is
ight. Natural fertility

alfa and truck crops,
for homesites. (Capa-
y range site)
nt slopes (SgC).—The
described for the San
xture throughout.
ubstratum at a depth

-brown, partly decomposed litter from
s.
pale-brown (10YR 6/3) loam, brown
3) when moist; weak, fine, granular
soft, friable, nonsticky and slightly
abundant fine and medium roots;
y alkaline (pH 8.2); violently effer-
lear, smooth boundary. Horizon is 6 to
nick.
ght-gray (10YR 7/2) loam, pale brown
3) when moist; massive; soft, friable,
and slightly plastic; few medium and
ots; moderately alkaline (pH 8.2);
effervescent; gradual, smooth boundary.
s 5 to 11 inches thick.
light-gray (10YR 7/2) loam, grayish
0YR 5/2) when moist; massive; soft,
nonsticky and slightly plastic; few
and coarse roots; moderately alkaline
; violently effervescent; clear, irregular
. Horizon is 8 to 10 inches thick.
ght-gray (10YR 7/2) decomposing soft
breaking down to sandy loam, pale
0YR 6/3) when moist; massive; hard,
sticky and nonplastic; few, medium and
andom roots; moderately alkaline (pH
ently effervescent.
derately alkaline to neutral and slightly
nt. It is light yellowish brown and pale
nd light brownish gray in color and fine
m in texture. The AC horizon is light-
dy loam to silt loam.
soil in mapping are small areas of Metz
igdio sandy loam, and Rough broken
ving a gravelly fine sandy loam or very
ace layer are also included. Other in-
ned soil that is 10 to 20 inches deep to
Timoteo soils having slopes of 2 to 8
5 percent.
is soil is moderate, and the available
y is 3.0 to 5.0 inches. Runoff is medium,
osion is moderate. The root zone is 20
tural fertility is moderate.
soil is used for dryland pasture and
it IVe-1 (19) irrigated; Loamy range

25 to 50 percent slopes, eroded
th this soil in mapping are some
Runoff is rapid on this soil, and the
igh. Natural fertility is very low.
r range and as a source of water.
-1 (19) dryland; Loamy range site)

es consists of somewhat excessively
veloped on mica-schist and gneiss.
lands, where slopes range from 8
ons range from 3,500 to 7,500 feet.
infall ranges from 10 to 25 inches,
mperature from 50° to 56° F., and
season from 150 to 225 days. Vege-
l grasses, pine bluegrass, sage buck-
haparral. Some cutleaf ceanothus,
rees also occur.
, the surface layer is dark grayish-
sandy loam about 12 inches thick.
owish-brown gravelly coarse sandy
f about 17 inches is pale-yellow,
ica-schist. Rock outcrops cover 2 to
ace.
ls are near the Crafton, Tollhouse,

2,500 feet. The
o 12 inches, the
67° F., and the
lays. Vegetation
and chamise.
s grayish-brown
The substratum
and cobbly sand

a and Hanford

range and for

nt slopes (SsD).
g soil occurs on
channels, which
are across the
the gently to
rse the uplands
l cones.
outhwest-facing
00 feet north of
S., R. 1 W.):

5/2) stony loamy
4/2) when moist;
st), nonsticky and
and fine roots;
eutral (pH 7.0);
n is 8 to 14 inches

2), stratified, very
loamy sand, dark
when moist; this
color than the A1
ry or moist), non-
medium and fine
res; neutral (pH

kaline in reaction
sh brown in color.
velly, very cobbly,
d. The C horizon
t is very gravelly,
arse sand.
small areas of
andy loam. Small
to 25 percent are

unoff is slow, and
ble water holding
is more than 60

for nonfarm pur-
l; Sandy Alluvial

percent slopes
that described
arse fragments
t channeled.
osion is moder-

d for nonfarm
lryland; Sandy

ils on uplands.
soils developed

Included with this soil in mapping are small areas of Gaviota very fine sandy loam and Altamont clay. Also included is a soil that is 15 to 26 inches deep to weathered conglomerate.

Permeability of this soil is moderately slow. The available water holding capacity is 3.0 to 5.0 inches. Runoff is medium, and the hazard of erosion is moderate. The root zone is 26 to 36 inches deep. Natural fertility is moderate.

This Soper soil is used for dryland pasture and range. (Capability unit VIe–1 (19) dryland; Loamy range site)

Soper cobbly loam, 25 to 50 percent slopes, eroded (SuF2).—The profile of this soil is similar to that described for the Soper series, but it has a cobbly loam surface layer and is 20 to 36 inches deep to weathered conglomerate.

Included with this soil in mapping are some areas that are 10 to 20 inches deep to weathered sandstone and marine conglomerate. Also included are very small areas having sandstone rock outcrops.

Runoff is rapid on this soil, and the hazard of erosion is high. The available water holding capacity is 1.5 to 5.0 inches. The root zone is 20 to 36 inches deep.

This soil is used for range. (Capability unit VIIe–1 (19) dryland; Loamy range site)

Temescal Series

The Temescal series consists of well-drained soils on uplands. Slopes range from 15 to 50 percent. These soils developed on predominantly latite-porphyry or gabbro. Elevations range from 1,000 to 3,500 feet. The average annual rainfall ranges from 10 to 18 inches, the average annual temperature from 59° to 63° F., and the average frost-free season from 240 to 280 days. Vegetation is chiefly annual grasses, forbs, and chamise.

In a typical profile, the surface layer is grayish-brown and brown loam about 17 inches deep. It is underlain by light yellowish-brown, partly weathered and fractured latite-porphyry. Rock outcrops cover 2 to 10 percent of the surface. The Temescal soils are near the Cajalco and Las Posas soils.

Temescal soils are used for dryland pasture and range. Where they occur in fields of more suitable soils, small isolated areas are irrigated and planted to citrus.

Temescal rocky loam, 15 to 50 percent slopes, eroded (TbF2).—This hilly to steep soil occurs on uplands. Rock outcrops cover 2 to 10 percent of the surface.

Following is a typical profile on a northeast-facing slope of 30 percent (1,050 feet north and 200 feet east of the south quarter corner of section 3, T. 4 S., R 6 W.):

A11—0 to 6 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) when moist; moderate, medium, granular structure; soft, very friable, slightly sticky and nonplastic; abundant very fine and fine roots; abundant, very fine, irregular and tubular pores; slightly acid (pH 6.2); clear, smooth boundary. Horizon is 2 to 6 inches thick.

A12—6 to 13 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) when moist; moderate, medium, granular structure; slightly hard, very friable, slightly sticky and nonplastic; abundant very fine roots; abundant, very fine, tubular pores; common angular rock fragments; neutral (pH 6.8); gradual, wavy bounday. Horizon is 4 to 10 inches thick.

A13—13 to 17 inches, brown (10YR 5/3) loam, dark brown (10YR 3/3) when moist; massive; slightly hard, friable, slightly sticky and slightly plastic;

Rock outcrops cover

ville, Crouch, Craf-

l pasture and range.
in.

m, 8 to 50 percent
to steep soil occurs
o 10 percent of the

a northeast-facing
he east quarter cor-

3) coarse sandy loam,
when moist; weak,
soft, very friable, non-
ndant very fine roots;
r pores; medium acid
oundary. Horizon is 1

3) sandy loam, dark
en moist; moderate,
y structure; soft, very
plastic; abundant very
ny, very fine, irregular
I 6.0); abrupt, wavy
8 inches thick.
YR 7/3) coarse sand,
when moist; massive;
icky and nonplastic;
nedium acid (pH 6.0);
Horizon is 6 to 12 inches

2) granodiorite, light
when moist; massive;
eavage planes have in-

brown to dark grayish
wn to yellowish-brown
to partly weathered
hes.
g are small areas of
am, Crafton fine sandy
Also included are some
y sand or cobbly sandy

e available water hold-
noff is rapid, and the
one is 10 to 20 inches

nd pasture and range.
; Shallow Loamy Up-

cent slopes, eroded
similar to that de-
has a dark grayish-
urface is essentially

ng are small areas

erately rapid. The
) to 2.5 inches. Run-
on is moderate. Nat-

re, some grain, and
dryland; Shallow

cent slopes, eroded
similar to that de-
has a dark grayish-

y and nonplastic;
derately alkaline
small pockets of
boundary. Hori-

(10YR 6/2) fine
wn (10YR 4/2)
rd, firm, slightly
; few fine pores;
; strongly effer-
adual, irregular
ches thick.
10YR 6/2) loam,
2) when moist;
, slightly sticky
few pores; very
ntly effervescent;
, most of them
irregular bound-
thick.
10YR 6/2) loam,
2) when moist;
ightly sticky and
few pores; very
ongly to violently

y effervescent and
ght brownish-gray
sandy loam. The
alkaline, slightly
aline-alkali. This
to dark grayish-
orizon is strongly
ently effervescent.
rayish-brown fine

all areas of Dello
nd, and Waukena
ll severely eroded
r, and areas with

e available water
f is slow, and the
is more than 60

falfa, for dryland
ability unit IIIs-6

percent slopes)
o that described
ly saline-alkali.
oamy sand sub-
nd or fine sandy

ght to moderate.

ops and alfalfa,
mesites. (Capa-
asin range site)

(0 to 2 percent
ilar to that de-
fine sandy loam
is soil. Included
n is sandy loam.
ately low.

and alfalfa, for
esites. (Capabil-
in range site)

ne-alkali, eroded
le of this soil is
series, but it has

ostratum of gravelly coarse
nes. Included with this soil
hat have a gravelly loamy
led are small areas having

nd the hazard of erosion is
inches deep, and the avail-
2 to 3 inches.
nd pasture and grain, for
omesites. (Capability unit
ange site)

nd, 0 to 8 percent slopes

soil differs from that de-
junga series because it is
ut. A few small areas that
and one area having slopes
l with this soil in mapping.
g capacity of this soil is
, and the hazard of erosion

ted grapes, dryland grain
s. (Capability unit IVs–4
site)

well-drained soils on up-
) percent. These soils devel-
hosed sandstone and shale.
2,500 feet. The average an-
to 18 inches, the average
to 64° F., and the average
) 300 days. Vegetation is
namise, and scrub oaks. Al-
ve oaks.
-face layer is brown loam
soil is reddish-brown loam
2 inches thick. The parent
phosed, fine-grained sand-
ructure faces.
r the Lodo, Friant, Fall-

dryland grain, range, and
citrus if they are irrigated
gely of more suitable soils.

percent slopes, severely

to hilly soil occurs on up-
ed by washing and deposi-
and small gullies in dry-
eas of deposition in places
l by head cutting shallow

ile on a northwest-facing
est of the east quarter cor-
W.):

5/3) loam, dark brown (10YR
; weak, medium, subangular
slightly hard, friable, slightly
y plastic; abundant very fine
fine, irregular and common,
; strongly acid (pH 5.5); clear,
Horizon is 2 to 10 inches thick.
own (5YR 5/4) heavy loam,
wn (5YR 3/4) when moist;
subangular blocky structure;
tly sticky and slightly plastic;

nick solum variant, 2 to 8 percent
).—This undulating to gently roll-
plands. Erosion is indicated by the
vashing in dead furrows, rills and
armed fields, and the larger head-
grazed pasture areas. In most places
ges from gently rolling to undulat-
deposition in the drains.

pical profile on a southeast-facing
00 feet east and 50 feet south of the
f section 7, T. 5 S., R. 3 W.):

yellowish-brown (10YR 5/4) loam, dark
(10YR 3/3) when moist; moderate,
, subangular blocky structure; very hard,
slightly sticky and slightly plastic; few
e roots; many, very fine, and few, fine,
pores; slightly acid (pH 6.2); clear,
boundary. Horizon is 3 to 8 inches thick.
brown (7.5YR 5/4) loam, dark brown
3/3) when moist; moderate, medium, sub-
blocky structure; very hard, friable,
sticky and slightly plastic; few very fine
e roots; many, very fine, and few, fine,
pores; slightly acid (pH 6.2); clear,
oundary. Horizon is 2 to 6 inches thick.
, reddish-brown (5YR 4/4) clay loam,
eddish brown (5YR 3/4) when moist;
e, medium, subangular blocky structure;
ly hard, firm, sticky and plastic; plenti-
fine and fine roots; common, very fine,
, fine, tubular pores; few thin clay films
faces, few bridges, and few thin clay
ing pores; moderately alkaline (pH 8.0);
avy boundary. Horizon is 4 to 6 inches

es, reddish-brown (5YR 5/4) clay loam,
eddish brown (5YR 3/4) when moist;
e, very coarse, angular blocky structure
to strong, coarse, angular blocky struc-
xtremely hard, firm, sticky and plastic;
l very fine and few fine inped roots and
t very fine and fine exped roots; many,
e, and common, fine, tubular pores; com-
n clay films on ped faces and lining tubu-
s; moderately alkaline (pH 8.0); gradual,
oundary. Horizon is 8 to 12 inches thick.
es, yellowish-red (5YR 4/6) sandy clay,
h red (5YR 4/6) when moist; strong,
, angular blocky structure; extremely
ery firm, very sticky and very plastic;
l micro and very fine roots; many, very
l common, fine, tubular pores; few moder-
ick and common thin clay films on ped
hin clay films line tubular pores; moder-
kaline (pH 8.0); clear, irregular bound-
rizon is 5 to 9 inches thick.
reddish-yellow (5YR 6/6) loam, yellowish
R 4/6) when moist; massive; very hard,
ghtly sticky and slightly plastic; few very
s in cleavage planes; few thin clay films
vage planes; moderately alkaline (pH
ear, irregular boundary. Horizon is 9 to
s thick.
reddish-yellow (5YR 6/6) loam, yellowish
R 5/6) when moist; massive; very hard,
ghtly sticky and slightly plastic; no roots;
al manganese stains; moderately alka-
8.0); clear, irregular boundary. Horizon
5 inches thick.
pale brown (10YR 7/3) to light-gray
6/1) slightly weathered metamorphosed
e.

ightly acid to neutral in reaction, yellow-
in color, and fine sandy loam to loam in
on is slightly acid to moderately alkaline
wn to reddish brown or yellowish red in

st of the

loam, very
st; weak,
, nonsticky
ts; slightly
lary. Hori-

10YR 3/2)
3/1) when
, nonsticky
ots; plenti-
ightly acid
y. Horizon

andy loam,
oist; mas-
' and non-
; plentiful,
(pH 7.0);
is 8 to 16

andy loam,
oist; mas-
' and non-
y fine, dis-
(pH 7.5);
is 8 to 12

andy loam,
3/2) when
, nonsticky
tiful, very
y alkaline

n reaction,
rk gray in
xture. The
rk-gray to
am.
l areas of
d Hanford
that has a
atum at a
have slopes
nes have a
inclusions
ntly saline-

o longer a
the hazard
rapid. The
s. The root
ity is high.
nd pasture.
ge site)

s (VmA).—
ed for the
e through-

unnamed
sand sub-

erosion is
9.0 to 10.0
oved.
r dryland
irrigated;

s (VmC).—
ed for the
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2

ndy clay loam, olive
massive; very hard,
tic; few, fine, tubular
(pH 8.4); violently
ted and in irregular,
ns.

to strongly alkaline
brown in color, and
re. The B horizon is
line and strongly to
ayish-brown to dark-
horizon is moderately
strongly to violently
w to dark yellowish
am to clay in texture.
are small areas of
my fine sand, Chino
o included are some
eas having slopes of

noff is slow, and the
ilable water holding
zone is greater than
erately low.
ted alfalfa and per-
asture, and for home-
igated; Sandy Basin

saline-alkali (0 to
h this soil in map-
saline-alkali soils.
s of 2 to 5 percent.

nanent pasture, for
nonfarm purposes.
ted; Sandy Basin

2 percent slopes)
r to that described
loam surface layer
moderately saline-
lkali parts of the
ainly in the Ryan
as. Prior to pump-
ls for flood control,
s under water part

are small areas of
a depth of 30 to 54
carbonate with a
his included soil is
color, and it lacks
surface horizon is
ixed by cultivation
he Bt horizon, has
. Also included are
areas having slopes
here the texture of

y of this soil is 5.0

nanent pasture, al-
d pasture; and for
IIIs–6 (19) irri-

alkali (0 to 2 per-
s soil is similar to
akena series, but it

strongly effervescent; clear, smooth bound-
lorizon is 3 to 12 inches thick.
gray (5Y 5/1) silty clay, dark olive gray
3/2) when moist; strong, medium, sub-
ar blocky structure; very hard, very firm,
and very plastic; abundant very fine and
roots; few very fine pores; moderately
he (pH 8.2); strongly effervescent; gradual,
h boundary. Horizon is 4 to 14 inches thick.
s, gray (5Y 5/1) clay, olive gray (5Y 4/2)
moist; strong, medium, subangular blocky
ure; extremely hard, very firm, very sticky
ery plastic; few very fine roots; few very
ores; many slickensides; moderately alka-
pH 8.4); strongly effervescent; gradual,
h boundary. Horizon is 5 to 14 inches thick.
s, olive-gray (5Y 5/2) silty clay, olive gray
4/2) when moist; strong, medium, sub-
ar blocky structure; extremely hard, very
very sticky and very plastic; few very fine
few fine pores; many slickensides; moder-
alkaline (pH 8.4); strongly effervescent;
ams of calcium carbonate and calcium sul-
gradual, smooth boundary. Horizon is 4
nches thick.
inches, light-gray to gray (5Y 6/1) silty
lark gray (5Y 4/1) when moist; moderate,
, angular blocky structure; very hard, very
sticky and plastic; moderately alkaline (pH
strongly effervescent; many calcium sulfate
and some lime concretions; abrupt, wavy
ary. Horizon is 12 to 21 inches thick.
nches, olive-gray (5Y 5/2) silty clay, olive
5Y 4/2) when moist; weak, coarse, angular
structure; very hard, very firm, sticky
plastic; moderately alkaline (pH 8.4);
ly effervescent; many seams of gypsum and
ime concretions.

s moderately alkaline to strongly alkaline
light gray to olive gray to dark grayish
d heavy silty clay loam to silty clay in
and C1 horizons are generally moderately
strongly alkaline, light-gray to olive-gray
The C2 and C3 horizons are moderately
alkaline. These horizons are gray to olive-
silty clay that contains seams of gypsum
concretions.
is soil in mapping are small areas of Chino
silt loam, Madera fine sandy loam, and
. Also included are some small areas cut
s, some areas having a silt loam surface
mall areas with a loam or fine sandy loam

this soil is slow. Runoff is slow, and the
is slight. The available water holding
0.0 inches. The root zone is more than 60
ater table occurs at a depth of 36 to 60
tility is moderately low.
il is used for dryland grain and pasture,
lfa, and for homesites. (Capability unit
ted; Silty Basin range site)

y (0 to 2 percent slopes) **(Wf)**.—This
e-alkali. Included with it in mapping
ing slopes of 2 to 5 percent. Also in-
h a silt loam surface layer, and a few
water table is at a depth of 36 to 60

ow on this soil. Natural fertility is

for irrigated alfalfa and permanent
grain and pasture, and for homesites.
IIw–5 (19) irrigated; Silty Basin

y, strongly saline-alkali (0 to 2 per-
-The profile of this soil is similar to

that described for the Willows series, but it has a light brownish-gray substratum. Included in mapping are small areas of moderately saline-alkali soils. Also included are soils having a silty clay loam surface layer.

Runoff is very slow on this soil. Natural fertility is low.

This soil is used for dryland grain and pasture and for nonfarm purposes. (Capability unit IVw-6 (19) irrigated; Silty Basin range site)

Willows silty clay, deep, saline-alkali (0 to 2 percent slopes) (Wm).—The profile of this soil is similar to that described for the Willows series, but it is 36 to 48 inches deep over thin, light-gray lenses that are cemented by lime and silica. Included in mapping are small areas having slopes of 2 to 5 percent. Also included are areas that are only 24 to 36 inches deep to the thin, cemented lenses.

Runoff is very slow on this soil. The available water holding capacity is 5.0 to 8.0 inches. The root zone is 36 to 48 inches deep.

This soil is used for irrigated alfalfa, for dryland grain and pasture, and for homesites. (Capability unit IIIw-6 (19) irrigated; Silty Basin range site)

Willows silty clay, deep, strongly saline-alkali (0 to 2 percent slopes) (Wn).—The profile of this soil is similar to that described for the Willows series, but it is 36 to 48 inches deep over thin, light-gray lenses that are cemented by silica and lime. Included with this soil in mapping are small areas having slopes of 2 to 5 percent. Also included are areas that are only 24 to 36 inches deep to the cemented lenses.

Runoff is very slow on this soil. The available water holding capacity is 5.0 to 8.0 inches. The root zone is 36 to 48 inches deep.

This soil is used for dryland grain and pasture and for nonfarm uses. (Capability unit IVw-6 (19) irrigated; Silty Basin range site)

Wyman Series

Soils of the Wyman series are well drained and lie on alluvial fans. Slopes range from 2 to 15 percent. These soils developed in alluvium from predominantly basic igneous materials. Elevations range from 1,000 to 2,500 feet. The average annual rainfall ranges from 9 to 14 inches, the average annual temperature from 61° to 64° F., and the average frost-free season from 220 to 280 days. Vegetation is chiefly annual grasses, forbs, chamise, and black sage.

Typically, the surface layer is brown loam about 10 inches thick. The subsoil is reddish-brown loam and clay loam about 40 inches thick. The substratum is yellowish-red coarse sandy loam.

The Wyman soils are associated with the Honcut and Buren soils.

Wyman soils are used for dryland pasture and grain and, if irrigated, for citrus, alfalfa, and truck crops.

Wyman loam, 2 to 8 percent slopes, eroded (WyC2).—This gently sloping to moderately sloping soil occurs on alluvial fans.

Following is a typical profile on an east-southeast-facing slope of 5 percent (450 feet west and 200 feet north of the southeast corner of section 14, T. 5 S., R. 2 W.):

A11—0 to 6 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) when moist; weak, medium, granular structure; slightly hard, friable, slightly sticky and slightly plastic; abundant very fine roots; very fine irregular pores; slightly acid (pH 6.5); gradual, smooth boundary. Horizon is 4 to 10 inches thick.

A12—6 to 10 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) when moist; moderate, fine, granular structure; slightly hard, friable, slightly sticky and slightly plastic; abundant very fine roots; many, very fine, tubular pores; neutral (pH 6.8); clear, smooth boundary. Horizon is 4 to 17 inches thick.

B1t—10 to 14 inches, reddish-brown (5YR 4/4) heavy loam, dark reddish brown (5YR 3/3) when moist; weak, medium, subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common, very fine, tubular pores; patchy thin clay films on ped faces and in pores; neutral (pH 7.0); gradual, wavy boundary. Horizon is 4 to 12 inches thick.

B21t—14 to 25 inches, reddish-brown (5YR 4/4) clay loam; dark reddish brown (5YR 3/3) when moist; weak, medium, subangular blocky structure; slightly hard, firm, sticky and plastic; few very fine and fine roots; common, very fine, tubular pores; patchy clay films on ped faces and in pores; mildly alkaline (pH 7.5); gradual, smooth boundary. Horizon is 6 to 12 inches thick.

B22t—25 to 36 inches, reddish-brown (5YR 4/4) heavy loam, dark reddish brown (5YR 3/3) when moist; weak, medium, subangular blocky structure; slightly hard, firm, slightly sticky and plastic; few very fine roots; many, very fine, tubular pores; mildly alkaline (pH 7.5); gradual, smooth boundary. Horizon is 5 to 12 inches thick.

B3—36 to 50 inches, reddish-brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) when moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; mildly alkaline (pH 7.5); gradual, smooth boundary. Horizon is 6 to 14 inches thick.

C—50 to 60 inches, yellowish-red (5YR 5/6) coarse sandy loam, dark reddish brown (5YR 3/4) when moist; massive; soft, very friable, nonsticky and nonplastic; mildly alkaline (pH 7.5).

The A horizon is neutral to slightly acid in reaction and brown to grayish brown in color. The Bt horizon is generally neutral to moderately alkaline, brown to reddish brown, and fine sandy loam to clay loam. The C horizon is mildly to moderately alkaline, yellowish-red to dark-brown coarse sandy loam to loam.

Included with this soil in mapping are small areas of Honcut sandy loam, Honcut loam, and Buren loam. Also included are some areas of severely eroded Wyman fine sandy loam, areas that have a gravelly loam or gravelly fine sandy loam surface layer, and areas with a slightly calcareous substratum. Some inclusions have slopes of 0 to 2 percent.

Permeability is moderately slow on this soil. Runoff is medium, and the hazard of erosion is moderate. The available water holding capacity is 7.5 to 10 inches. The root zone is more than 60 inches deep, and natural fertility is high.

This Wyman soil is used for irrigated citrus, truck crops, and alfalfa and for dryland grain and pasture. (Capability unit IIe-1 (19) irrigated; Loamy range site)

Wyman fine sandy loam, 8 to 15 percent slopes, eroded (WxD2).—The profile of this soil is similar to that described for the Wyman series, but it has a fine sandy loam surface layer and a brown loam subsoil.

Small areas having a gravelly fine sandy loam or a very fine sandy loam surface layer are included with this soil in mapping. Also included are areas that have slopes of 15 to 25 percent.

Runoff is medium on this soil, and the hazard of erosion is moderate.

This soil is used for irrigated citrus and for dryland

es. (Capability unit IIIe–8

dy loam, 8 to 25 per-
all areas that have a
ndy loam, or fine sandy
h this soil in mapping.
are 36 to 42 inches deep

is soil, and the hazard

olives and for dryland
t IVe–8 (19) irrigated;

dy loam, 8 to 25 per-
3).—The profile of this
the Ysidora series, but
hardpan. Areas of ex-

m or cobbly fine sandy
th this soil in mapping.
erely eroded unnamed
arelated granite.
apacity of this soil is
d, and the hazard of
10 to 20 inches deep.

ture and range. (Capa-
Shallow Loamy range

2 to 15 percent slopes,
s soil is similar to that
out the surface layer is
content is less than 15

ng are small areas that
akly to strongly silica-
e small areas having a

pacity of this soil is 4.5

trus, for dryland grain
Capability unit IVe–8

e *Soils*

pability grouping used
s discussed, the soils in
bed, and management
s suggested. Following
rincipal crops are listed
sed for crops and the
given. Then uses of the
gineering purposes, and
discussed.

general way, the suit-
field crops. The groups
tions of the soils when
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wildlife, or recrea-

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ed by slow or very
soil.
sed by coarse soil

ed by fine soil tex-

d by salt or alkali.
ed by cobblestones,
crops.
root penetration
over hard bedrock

ed by low fertility
Area).

bility classification
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nd resource area is
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cropping systems.
Nation have been
arts of two of these
nd are outlined on
their numbers are
19), and Southern
ber of the resource
class, subclass, and

that affect manage-
e to be placed con-
ragraphs that fol-
parts within the
so that local farm-
eas. Following the
list of those condi-
cement of the soils

rce area makes up
he soils formed in

small to large intermediate valleys, in interior valleys, and on mountains. The topography, relief, and geology vary considerably in this resource area.

Elevations in the resource area range from 500 to 3,500 feet. Summers generally are hot, and winters are cool and moist. Rainfall ranges from about 9 to 18 inches and varies in amount from year to year. Supplemental irrigation is necessary for best growth of most crops, though dryland grain and hay are grown in some places.

The soils in Land Resource Area 19 are placed in capability units on the assumption that these conditions exist:

1. The temperature generally is mild, and the frost-free period ranges from 200 to 310 days. Frost occurs locally, but protection is provided for crops that have a high cash value.
2. Irrigation water is available for most irrigable soils. Much of the acreage intensively cropped is under irrigation. Irrigation is being expanded as quickly as water becomes economically available. All reasonable means are taken to conserve water. If the water supply is salty, drainage and leaching are needed to minimize damage to crops that are sensitive to salt.
3. The soils adjacent to unprotected stream channels are subject to occasional flooding. They are classified according to their capability for crops on basis of this flooding hazard. The somewhat poorly drained and poorly drained soils of the basins have a seasonal high water table. If suitable outlets are available and it is economically feasible, these soils are drained. If certain soil characteristics or qualities of the basin soils make drainage difficult and suitable drainage outlets are lacking, the soils are not drained. The drained basin soils are classified on basis of the recurrence or nonrecurrence of the water table, and the undrained ones, on basis of their continual drainage problem.
4. Saline and alkali soils are present in some basins and on the rims of some basins. If drainage is feasible, the basin soils are classified on the basis that maximum leaching and reduction of salts and alkali are possible. If drainage is not feasible, those basin soils are classified on the basis that leaching and reduction of salts and alkali cannot be accomplished.
5. A wide variety of the common field, truck, fruit, citrus, and nut crops are grown.
6. A high level of management is used.

Land Resource Area 20.—This resource area includes the northeastern and southeastern corners of the survey area. It is made up of nearly level to very steep soils on uplands and terraces and in small valleys. The soils formed in material weathered from granite, mica-schist, or gneiss or in alluvium derived from these rocks.

Elevations in the resource area range from 3,500 to 8,500 feet. Precipitation ranges from 9 to 30 inches. Most of the rainfall comes in winter and in spring. Rainfall is marginal for dryland crops at lower elevations. The growing season ranges from 80 to 180 days.

The soils in Land Resource Area 20 are placed in capability units on the assumption that these conditions exist:

1. Freezing temperatures are common throughout the resource area in winter and spring. Field and orchard crops that are winter hardy are the only suitable crops. Normally protection from frost is provided for orchard crops when the trees are in blossom and at the time the fruit is set. Occasional summer thunder showers may adversely affect growth of crops. During the growing season the temperature is warm enough for all the common field and orchard crops to mature.
2. Irrigation water generally is not available, because the supply of water in the resource area is limited and the cost of bringing water into the area is high. Use of local water supplies may be improved for limited use in the area. The soils of this resource area are classified on the basis of their capability for dryland crops as well as for irrigated crops.
3. A few partly drained mountain meadows are in the Area. The soils in these areas are classified on the basis that the areas remain in meadows or in pasture.
4. Areas of soils in this resource area that are affected by salts and alkali are not important enough to affect the capability classification.
5. The major crops in this resource area are hay and grain. Selected row crops and tree crops are grown where the climate is suited and where irrigation water is available.
6. The level of management is moderately high.

Management by Capability Units

In the pages that follow, the capability units in the Western Riverside Area are described and suggestions for the use and management for all the soils of each unit are given. Estimates for available water capacity given in each capability unit are to a depth of 60 inches or to a limiting layer if such a layer is at a depth of less than 60 inches.

The names of soil series represented are mentioned in the description of each capability unit. This does not mean, however, that all soils of a given series appear in the unit. The names of all soils in any given capability unit can be found by referring to the "Guide to Mapping Units" at the back of this survey. The capability units are not numbered consecutively, because not all units used in California occur in each capability class.

Capability unit I–1 (19) irrigated

In this unit are very deep, moderately well drained to well drained loamy very fine sands to silt loams. These soils are in the Chino, Garretson, Grangeville, Greenfield, Hanford, Pachappa, Ramona, San Emigdio, and Visalia series. Some of the soils are slightly affected by salts and alkali. Stratification exists in alluvial soils of the Chino, Garretson, Grangeville, Hanford, San Emigdio, and Visalia series. The Chino and Grangeville soils formed under somewhat poor drainage but are now drained. Slopes range from 0 to 2 percent.

Roots and water penetrate these soils readily. In places there is a slight increase in amount of clay in the subsoil that slightly reduces permeability. Available water capacity is more than 7.5 inches.

Soils in this unit are suited to citrus, avocados, walnuts, truck crops, specialty crops, field crops, and all other

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ll drained soils
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lco, Fallbrook,
Honcut, Las
Wyman series.
fine sand and
lerally are 0 to
ercent. Some of
oils are eroded

om 3.5 to 11.0
in this unit is
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k is at a depth
zard of erosion
f farm machin-

a can be grown
gated are used
s. Air drainage
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Farming across
low runoff and
races that have
to catch runoff
s can be grown

d sandy loams
Oak Glen series.
e sandy loam is

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nd water pene-
in areas where
or where water

, forage crops,
growing season,
ility unit IIIe-
l, supplemental
ntour or across
over crops help

loams to loams
se soils have a
gravelly heavy
nial plants and
he upper clayey
penetrate to a
2 to 8 percent.

ll of these soils,

e. Returning crop residues or
atter to the soil improves the
intake. Cultivating across the
f erosion.

irrigated

ghtly saline-alkali and moder-
are moderately well drained,
ep fine sandy loams and loams
geville series. These Buchenau
deep to a hardpan, and the
than 60 inches deep. Slopes

ely rapid to moderately slow
of the Buchenau soils is very
e water capacity is 3.75 to 10.0
on is slight to moderate.
suited to those crops that can
s of salts and alkali. Small
are the only suitable crops for

ope or on the contour helps to
he hazard of erosion. Growing
ble on the areas as a mulch also
amendments may be beneficial,
cause of the slopes. Only shal-
these soils to keep from expos-
subsoil.

irrigated

oderately deep and deep, and
d well drained. They are in the
Escondido, Exeter, Greenfield,
iant, and Ysidora series. The
to loam, and it is gravelly in
nges from sandy loam to heavy
19 to 50 inches deep to bedrock
le hardpan. Some of these soils
om 0 to 8 percent.
e to slow in these soils. These
, and the available water capac-
he depth that roots can pene-
or by the hardpan. No mois-
from the bedrock or from the

erraces and ridge crests on low
rge valley fills that are high
ge is good. Consequently, the
-free growing conditions. The
l to tree crops. Their location
s and avocados, but these crops
rops are not commonly grown.
l tender specialty crops are
es are seldom grown. Small
med crops.
pan in some of the soils can be
g. Drainage then is improved
able to penetrate to a greater
hing is limited, especially on
to bedrock. In some irrigated
led for draining small draws
are likely to develop. Careful
water is needed to keep a
forming.

Capability unit IIIw–0 (19) irrigated

Dello loamy fine sand, gravelly substratum, 0 to 2 percent slopes, is the only soil in this unit. It is moderately deep to deep and is somewhat poorly drained. Gravelly coarse sand is at a depth of 24 to 42 inches. The water table generally is at a depth of more than 36 inches.

Permeability is rapid in this soil. The available water capacity is 3.75 to 5.0 inches.

This soil is suited to irrigated pasture, alfalfa, small grains, and truck crops. When land leveling is done, only shallow cuts should be made to avoid exposing the unfavorable gravelly coarse sand. Where suitable outlets are available, tile drains or ditches are required to lower the water table and keep it below the root zone. Growing a protective cover of plants provides protection from wind erosion. Irrigation water needs to be applied fairly frequently and in small amounts.

Capability unit IIIw–4 (19) irrigated

Soils in this unit are nearly level to gently sloping and are somewhat poorly drained. They are in the Dello series. Their surface layer is loamy sand or loamy fine sand. These soils are on flood plains. Slopes range from 0 to 5 percent.

Permeability is moderately rapid in these soils. Available water capacity is 4.5 to 7.0 inches. The water table is at a depth below 36 inches.

These soils are suited to irrigated truck crops and field crops. Tree crops are not well suited because of the high water table. Tile drains or ditches are needed to lower the water table. Applying irrigation water in small amounts and fairly frequently avoids building up the water table. Returning all crop residues to the soils increases the content of organic matter and improves soil structure and tilth.

Capability unit IIIw–5 (19) irrigated

Willows silty clay is the only soil in this unit. It is a very deep, poorly drained, slowly permeable soil. This soil is in basins at fairly low elevations. Slopes range from 0 to 2 percent.

Permeability is slow in the subsoil. Drainage is poor, but the water table can be maintained at a depth below 3 feet fairly easily. The soil is over 5 feet deep, but root penetration is reduced by the high water table and clay texture. The available water capacity is 8 to 10 inches. Erosion is not a hazard. In places this soil is stratified, and permeability of the major strata is slow. Salts are present in places, but sufficient amounts can be removed so that crops that are moderately salt tolerant to very tolerant can be grown.

This soil is not suitable for tree crops. Alfalfa is fairly well suited, but it is generally not planted other than in a cropping system for soil conditioning purposes. Land leveling can be done on these soils without exposing unfavorable subsoil material. A tillage pan is not likely to form. Drainage ditches, supplemented in places by sump-lift outlets, are needed to make satisfactory use of these soils. Returning all crop residues and other organic matter to the soil increases the infiltration rate and improves structure and tilth.

Capability unit IIIw–6 (19) irrigated

Soils in this unit are very deep, somewhat poorly drained and poorly drained loamy fine sands, fine sandy loams, and silty clays. They are in the Dello, Grangeville, and Willows series. These soils are moderately affected by salts and alkali. They are more than 60 inches deep or have thin lenses cemented by lime and silica at a depth of 36 to 48 inches. Slopes range from less than 2 to 5 percent.

In places a water table is at a depth of 3 to 5 feet. The available water capacity is 5.0 to 10.0 inches. Erosion is not a hazard.

These soils are suited to forage crops, to row crops, and to field crops that can tolerate moderate amounts of salts and alkali. Tile drains or ditches are needed to lower the water table. Where drains are installed, the soil should be leached of salts by applying excess irrigation water. Such soil amendments as gypsum help to reduce the amount of sodium salts. If these soils are cultivated when moist, a tillage pan is likely to form.

Capability unit IIIs–0 (19) irrigated

Soils in this unit are moderately deep to deep, moderately well drained to excessively drained sandy loams and coarse sandy loams. They are underlain by coarse sand and gravel and are in the Cortina, Grangeville, and Hanford series. These soils formed in recent alluvium and lack clay accumulations. Some of these soils are eroded. Slopes range from 0 to 8 percent.

Roots penetrate to a depth of 20 to 42 inches. Permeability is rapid to very rapid. The available water capacity is 3.75 to 6.5 inches. Some moisture is available to plants from the underlying coarse material, but it is not sufficient for much plant growth.

These soils occur on flood plains. They are subject to stream cutting and detrimental deposition in places.

Walnuts and alfalfa are not suited to these soils. Under special management, these soils are suited to row crops and truck crops. Air drainage is adequate in most valleys for citrus to be grown if some protection from frost is provided.

When land leveling is done on these soils, only shallow cuts should be made to avoid exposing the coarse-textured substratum. A tillage pan is likely to develop in orchards. Because of the low available water capacity, irrigation water should be applied frequently and in small amounts to avoid loss of water and leaching of plant nutrients.

Capability unit IIIs–3 (19) irrigated

Madera fine sandy loam, 0 to 2 percent slopes, is the only soil in this unit. It is moderately deep and is moderately well drained. It has a clay subsoil and hardpan that severely restrict penetration of roots and water, though perennial plants obtain moisture from the subsoil in some places. Depth to clay subsoil ranges from 18 to 36 inches.

Permeability is very slow in this soil. Available water capacity is 4.0 to 5.0 inches. Erosion is not a hazard.

This soil generally is on low terraces where air drainage is good. In places where frost is not a hazard, citrus and off-season truck crops and specialty crops that are sensitive to frost can be grown. Avocados are poorly suited because of the very slowly permeable subsoil. In dry-farmed areas cropping is largely limited to small grains.

e than 60 inches. The shallower soils are under-
hardpan. Slopes range from 0 to 5 percent.
bility is moderate to slow in the subsoil and
in the hardpan, where present. The available
pacity is about 3.75 to 10 inches. In places salt
bly reduces actual available water. The hazard
is slight. Wind, however, causes some damage to
d slight erosion and deposition.
es the use of soil amendments, land leveling, and
are needed. After initial land improvement is
l, irrigation must be controlled so that salts
vnward through the soils. If crops are overirri-
perched water table is likely to occur. Tile drain-
is required in places to keep a high water table
eloping. Returning all cover crops, crop resi-
other sources of organic matter to the soil im-
rtility, structure, and tilth.

unit IIIs–8 (19) irrigated

s unit are moderately deep, moderately well
and well drained sandy loams and silt loams.
ls are in the Domino and Exeter series. They are
nches deep to a hardpan. These soils are in basins
lluvial fans. Slopes range from 0 to 2 percent.
bility above the hardpan is moderate to slow.
h that roots can penetrate is limited by the hard-
no moisture is available to plants in the hardpan.
noderate amount of clay occurs in the subsoil.
water capacity is 3.75 to 7.0 inches. Fertility is
ly high. The hazard of erosion is slight.
and truck crops are grown on these soils, but
l nut crops are not commonly grown. In dry-
reas, the only suitable crops are small grains and
asture plants. Alfalfa, other forage crops, row
d field crops that can tolerate moderate amounts
nd alkali are suited.
ps are overirrigated, a perched water table is
occur. Returning all cover crops, crop residues,
r sources of organic matter to the soil improves
structure, and tilth.

y unit IVe–1 (19) irrigated

n this unit are shallow to very deep, well-drained
ewhat excessively drained sandy loams to loams.
in the Arbuckle, Arlington, Cajalco, Cieneba,
k, Greenfield, Las Posas, Ramona, San Timoteo,
a series. These soils are 10 to 54 inches deep to
d permeable bedrock, or to a weakly cemented
and on sloping terraces they are more than 60
eep. Some of these soils are gravelly, and many
are eroded or severely eroded. Slopes range from
ercent.
ability is rapid to slow in the subsoil. Available
pacity is 2.0 to 10.0 inches. Most of the soils are
ly fertile. Roots penetrate these soils readily, and
moisture and a few roots enter the underlying
aterial.
soils generally occur in the foothills where air
is favorable. They are suited to all crops adapted
imate. In areas where irrigation water is avail-
ge areas are planted to citrus and to avocados. In
ed areas small grains are the only crops that can
n.
ating across the slope or on the contour are ways

Some of these soils are gravelly, and some are
th to sandstone or calcareous marl is 20 to 42
substratum is calcareous. Slopes range from
ent, and many of the soils are eroded.
lity is slow in these soils. The hazard of ero-
rate to high, especially in areas used for dry-
n.
ls are used for dryfarmed grain and annual
for citrus and irrigated alfalfa. Air drainage
. Permeability is adequate under nearly all
f precipitation and irrigation except for the
ve crops such as avocados.
should be planted on the contour to slow run-
ce erosion, or cover crops should be grown in
s. Turning under green-manure crops or cover
to improve tilth, soil structure, and water
Sprinklers are the most efficient method of
use on these soils.

nit IVe–8 (19) irrigated

this unit are moderately deep to deep, well
moderately well drained sandy loam to loam.
are in the Arlington, Buren, Escondido,
Monserate, Ramona, and Ysidora series. Also
is a variant from the Vallecitos series. Some
s are gravelly. These soils are 19 to 50 inches
y slowly permeable bedrock or a hardpan.
e from 2 to 25 percent, but they are domi-
15 percent. Most of these soils are eroded.
lity is moderate to very slow in the subsoil.
or hardpan limits root penetration and may
p of excess moisture for short periods after
a heavy rain. The hazard of erosion is high.
ls generally are in the foothills where air
favorable. In areas where irrigation water is
all areas are planted to citrus. In dryfarmed
grain is grown. Avocados and other crops sen-
paired drainage are not suited. Cultivating
ope or on the contour helps to slow runoff and
osion. The use of stubble mulch helps reduce
also increases infiltration. Sprinklers are the
or irrigation.

nit IVec–1 (20) dryland

nit are moderately deep to very deep, well-
somewhat excessively drained loamy sands to
e soils are in the Anza, Bull Trail, Calpine,
nford, and Oak Glen series. They occur in
effective rainfall. Slopes range from 0 to 25
ost places, but they range from 0 to 2 percent
s of Anza loam. Most areas are eroded.
ls have only slight restrictions that affect
of roots and water. In places there is a slight
increase in amount of clay in the subsoil. Ex-
Bull Trail and Crouch soils, which are, re-
0 to more than 60 inches deep to a hardpan
6 inches deep to weathered granite, the effec-
pth is more than 60 inches. Permeability is
rapid to moderately slow. Annual precipita-
from 7 to 10 inches. Available water capacity
2.0 to 10.0 inches.
of this unit are used for rye grown for grain,
used for forage crops. Water is not available
n, and growth of crops is erratic because of

y to apply irrigation water frequently and in mounts. Overirrigation should be avoided because es plant nutrients from the soils. When land level- done on these soils, only shallow cuts should be o avoid exposing unfavorable material. Returning sidues to the soils improves soil structure and y.

ity unit IVs–4 (19) irrigated

in this unit are very deep, somewhat excessively and excessively drained loamy sands to sandy They are in the Cortina, Gorgonio, and Tujunga In places these soils are cobbly. Slopes range from percent.

eability is rapid to very rapid in these soils. The le water capacity is 3.0 to 5.0 inches. Fertility is

e soils are on fans, and air drainage is favorable in Where irrigation water is available, apricots, ls, and citrus are grown. Walnuts also are grown w places. Dryfarmed areas are used largely for rains, pasture, and range.

ese soils are clean cultivated, erosion is a hazard. t places the stones are removed from the surface e leveling or smoothing easier, but the soil is not ise disturbed. Cover crops are grown continuously gated orchards to protect the soils from erosion, or er crops are left to provide cover. Cultivating the slope helps to slow runoff and reduce erosion. ing crop residues to the soils improves fertility ucture. Sprinklers generally are better to use for ng these soils than other methods, though in places re gently sloping soils can be furrow irrigated.

ity unit IVs–4 (20) irrigated

sville loamy sand, 8 to 15 percent slopes, is the il in this unit. It is a very deep, excessively drained t formed on alluvium and is stratified in places. nd water readily penetrate this soil.

eability is rapid in this soil. Available water capac- 3.75 to 5.0 inches. This soil occurs in areas where tation provides 10 to 16 inches of water for irri-

soil is moderately well suited to small grains, crops, and deciduous orchards. If water supplies developed, supplemental irrigation is used. Return- crop residues to the soil improves soil structure tility. Cultivating across the slope helps to control and reduce erosion. Sprinklers are well suited to irrigating this soil.

lity unit IVs–6 (19) irrigated

in this unit are very deep, somewhat poorly d to moderately well drained fine sandy loams and ms. They are in the Chino, Traver, and Waukena These soils are saline-alkali to strongly saline- Slopes range from 0 to 2 percent. Some areas are

neability is moderately slow to slow in these soils. ailable water capacity is 7.0 to 11.0 inches. Erosion a hazard.

se soils have a high percentage of adsorbed sodium excess of soluble salts. In places a perched water ccurs for short periods because of the unfavorable

They are in
from 8 to 35

apid to mod-
athered bed-
h of 20 to 46
nches. Avail-

e. The slope
iting factors
ertilizer, and
must be left
on.

deep, well-
ries that are
) inches deep
rocks. Slopes

lity is high,
inches. The

pasture than
ertilizing, by
drainage on
us is grown
grain is also
mingled with
) and IVe-5
helps to con-

ned to exces-
oams. They
gonio, Han-
and Yokohl
obly, and in
en the rock
few stony or
Some of the
or to a layer
o 3.0 percent
Slopes range
oded.
s except the
slowly per-
is 1.5 to 6.5
s sufficiently
few roots to

dryland pas-
e soils make
citrus and
ive manage-
d areas and
would be left

very deep,
sandy loams
Trail, Craf-

.tely slow. Available water capacity
content of organic matter is high.
mapping units are drained by using
. Productivity generally is greater,
are kept in native meadow grasses.
ı entrenchment and gullying, which
and greatly reduce growth of forage
ıazards to continued use. Protection
efore is needed.

(20) dryland

andy loam, 8 to 25 percent slopes,
l in this unit. It is very deep and is
ermeability is rapid, and the avail-
s 3.0 to 4.5 inches. The hazard of

to pasture, range, wildlife, and rec-
ding and fertilizing improve the
f forage in years of favorable rain-

1 (19) dryland

e shallow to moderately deep, some-
ained to moderately well drained
. They are in the Cieneba, Fallbrook,
s Posas, Lodo, Monserate, Soper,
and Ysidora series. The land type,
also is in this unit. These soils are 8
n places they are gravelly and are
ble to slowly permeable bedrock or
crops cover 2 to 10 percent of the
s. Slopes range from 8 to 50 percent,
ıtly 15 to 50 percent. These soils are
oded.
s have an increase in clay in the sub-
vever, limit penetration of roots or
s rapid to moderately slow in all the
idora, which have a very slowly per-
The hazard of erosion is moderate to
natural fertility is relatively low.
ıcity is 1.0 to 5.0 inches.
suited to cultivation because of the
, and high hazard of erosion. They
range, for watershed, and as wildlife
hese soils from overgrazing and fire
on. Seeding or fertilizing is not eco-
ı these soils.

1 (20) dryland

allow, excessively drained soils of the
ouse series. These soils have a surface
ı and are 10 to 20 inches deep to
bility is moderately rapid. Available
to 5.0 inches. Slopes range from 8 to

ed to wildlife, recreation, watershed,
g the soils from fire and overgrazing
on.

4 (20) dryland

are shallow, somewhat excessively
ely drained sandy loams. These soils
l and Tollhouse series. They have a
f fine sandy loam and coarse sandy

to fairly soft underlying material. Slopes are steep to very steep.

Some areas of these land types are barren of vegetation. A plant cover is needed on the areas to keep large quantities of sand, silt, and debris from washing onto more productive areas.

These land types have little value for farming. They are used only for watershed, for recreation, and for wildlife. Protection from fire is needed to reduce the hazard of erosion.

Capability unit VIIIw–4 (19, 20) dryland

Only Riverwash is in this unit. It consists of very deep, very coarse, sandy, gravelly, or stony areas in stream channels. Frequent flooding by streams and deposition of soil material is likely. Riverwash is essentially barren. Slopes range from 0 to 8 percent.

This land type is not suitable for farming. It provides suitable sites for recreation and for wildlife. Some areas are also a source of sand and gravel for construction purposes.

Capability unit VIIIs–1 (19, 20) dryland

This unit consists of Gaviota rocky fine sandy loam, 25 to 75 percent slopes, severely eroded, and of the land type, Rock land. These mapping units are on rough mountainous areas that have a cover of brush. The soil material between the rocks is extremely rocky and is less than 15 inches deep to bedrock. The Gaviota soil is somewhat excessively drained and is moderately permeable. Available water capacity is less than 1.0 inch.

Areas of this capability unit are not suited to farming. They are used for watershed, for recreation, and as wildlife habitat. Providing protection from fire helps to reduce the erosion hazard.

Estimated Yields

This subsection gives estimated yields of the principal crops grown in the Western Riverside Area, explains the vegetative soil groups, and discusses some of the management practices used to obtain the yields given in tables 2 and 3. In table 2 are estimated yields for crops grown in the Southern California Coastal Plains, and in table 3 are estimated yields for crops grown in the Southern California Mountains. These estimates are based on observations made by soil scientists who surveyed the Area, on comparisons with similar soils, and on information furnished by farmers. They also are based on suggestions furnished by crop specialists in the Soil Conservation Service, the California Agricultural Experiment Station, and by the Federal Extension Service. Federal and county census records and crop data also were reviewed and considered.

Vegetative soil groups.—A vegetative soil group is a grouping of soils that have similar properties and qualities from the standpoint of plant adaptation and use. The grouping is used chiefly for determining the plants most suitable for conservation practices and production of forage when the major limiting soil feature or problem is known. The possibility of irrigation and such climatic factors as precipitation, maximum and minimum temperatures, and length of growing season are separate factors and are not covered here. The system is statewide,

ied or not, that experience,
arch findings up to the pres-
give the highest returns.

ons should be kept in mind
tes in tables 2 and 3. First,
predictions. Second, the fig-
e expected over a period of
e yield may be considerably
rage. The yield given in the
an approximate average of
grape varieties. Yields vary
cial wine varieties to 12 tons
e varieties. Third, there is
n some soils. For example,
tali in the soils varies from
t was considered in making
for frost hazard in relation
s made for variations in cli-
rea, for example, the climate
wine grapes, but yields of
suitability of the soil and
variations in climate.
rainfall affects the yields of
n soils of the same or similar
Gorgonio Pass area and south
of 2,000 to 4,000 feet, the bar-
er than that in the rest of the
y amount to more than 800
ford and Greenfield soils.
ls and management practices
e survey will be most useful
of the survey. New develop-
of fertilizer, tillage, and con-
will change some information
l better practices can always
e and Federal farm advisory
est information available.
nly practiced for most crops
cludes proper preparation of
weeds, diseases, insects, and
d most desirable varieties of
ation of the seedbed, planting,
, irrigation, and other man-
oper time and in the proper
be more intense and exacting
ment than under the A level.
f most use when the manage-
such yields are produced are
ement for a particular yield
g the mapping unit and the
le 2 or table 3, and its vegeta-
Mapping Units" at the end
le, Arbuckle gravelly loam, 2
produces an estimated yield
er acre under the B level of
capability unit IIe-1 (19) and
The combination of practices
d is covered in the following

level of management, apricots
ble vegetative soil groups re-
. These trees require 5.0 to 8.0
ter applied on a fixed schedule

der two levels of

of a figure indicates

apes	Alfalfa
B	A
Tons	*Tons*[3]
.....	.....
.....	.....
.....	11
.....	.....
.....	.....
.....	11
.....	.....
.....	.....
.....	11
.....	7
.....	6
.....	.....
5.0	7
5.0	7
.....	.....
5.0	7
5.0	.....
.....	7
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	6
.....	6
.....	6
.....	8
.....	7
.....	7
4.0	9
.....	.....
.....	.....
.....	.....
.....	8
.....	7
.....	.....
.....	.....
.....	.....
4.0	5

management for the Southern California Coastal Plains, Land Resource Area 19

a crop is not commonly grown on the soil or is not economically suited to that soil]

Irrigated crops—Continued											Dryland crop	
Alfalfa	Barley		Oranges		Potatoes				Pasture		Barley	
					Spring		Fall					
B	A	B	A	B	A	B	A	B	A	B	A	B
Tons[3]	*Cwt.*	*Cwt.*	*Boxes*[4]	*Boxes*[4]	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*	*A.U.M.*[5]	*A.U.M.*[5]	*Cwt.*	*Cwt.*
.....	18	25	.....	.....	.....	.....	.....	.....	6	11	7	11
.....	.....	.....	.....	.....	.....	.....	.....	.....	6	11	5	10
14	20	30	200	380	.....	.....	.....	.....	7	14	6	10
.....	15	25	200	380	.....	.....	.....	.....	7	14	5	10
.....	15	25	180	300	.....	.....	.....	.....	7	12	5	8
14	20	30	200	380	.....	.....	.....	.....	9	15	6	10
.....	15	25	200	380	.....	.....	.....	.....	7	14	5	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	7	12	.....	.....
14	20	30	180	300	.....	.....	.....	.....	9	15	6	10
9	15	25	310	410	300	350	275	300	8	15	8	10
8	15	25	310	410	300	350	275	300	8	15	8	11
.....	.....	.....	300	380	300	350	275	300	7	12	6	10
9	20	30	350	450	300	350	275	300	9	18	8	12
9	15	25	350	450	300	350	275	300	9	15	8	11
.....	15	20	350	450	300	350	275	300	8	13	6	10
9	20	30	350	450	300	350	275	300	9	18	8	12
.....	15	20	350	450	.....	.....	.....	.....	9	15	8	11
9	15	25	310	410	.....	.....	.....	.....	8	15	8	10
.....	.....	.....	300	380	.....	.....	.....	.....	7	12	6	10
.....	.....	.....	180	350	.....	.....	.....	.....	6	11	.....	.....
.....	20	30	.....	.....	.....	.....	.....	.....	8	15	10	15
.....	15	25	.....	.....	.....	.....	.....	.....	8	12	8	14
.....	15	25	150	300	.....	.....	.....	.....	6	10	5	10
.....	.....	.....	150	300	.....	.....	.....	.....	6	10	4	8
.....	20	30	150	300	.....	.....	.....	.....	6	11	7	15
.....	15	25	150	300	.....	.....	.....	.....	6	11	5	15
8	15	30	.....	.....	275	300	225	250	6	12	.....	.....
8	15	30	.....	.....	.....	.....	.....	.....	6	11	4	8
8	15	30	.....	.....	.....	.....	.....	.....	6	11	5	10
10	15	20	200	300	300	350	275	300	8	14	6	8
9	20	30	150	300	.....	.....	.....	.....	7	12	10	12
9	10	15	150	300	.....	.....	.....	.....	.....	.....	6	8
11	20	35	200	400	300	350	275	300	9	18	12	14
.....	15	25	300	400	300	350	275	300	6	11	5	8
.....	15	25	300	400	.....	.....	.....	.....	6	11	5	10
.....	.....	.....	150	300	.....	.....	.....	.....	.....	.....	.....	.....
10	20	35	.....	.....	300	350	275	300	5	9	8	14
9	15	25	.....	.....	275	300	225	250	4	8	4	8
.....	.....	.....	.....	.....	.....	.....	.....	.....	4	8	.....	.....
.....	.....	.....	100	280	.....	.....	.....	.....	6	10	4	8
.....	.....	.....	100	280	.....	.....	.....	.....	6	10	4	8
7	.....	.....	180	370	.....	.....	.....	.....	5	10	4	8

TABLE 2.—Estimated average acre yields of principal crops under two levels of

Soil	Irrigated crops						
	Apricots		Peaches		Wine grapes		Alfalfa
	A	B	A	B	A	B	A
	Tons[1]	*Tons*[1]	*Lugs*[2]	*Lugs*[2]	*Tons*	*Tons*	*Tons*[3]
Cortina sandy loam, 0 to 2 percent slopes							3
Cortina gravelly sandy loam, 0 to 2 percent slopes							
Cortina cobbly sandy loam, 2 to 12 percent slopes							
Delhi fine sand, 2 to 15 percent slopes, wind-eroded	4	7			2.5	4.5	6
Delhi loamy fine sand, 0 to 2 percent slopes	4	7			2.5	4.0	6
Dello loamy fine sand, 0 to 2 percent slopes					3.0	5.0	6
Dello loamy sand, 0 to 5 percent slopes					2.5	4.0	6
Dello loamy sand, gravelly substratum, 0 to 5 percent slopes							4
Dello loamy fine sand, saline-alkali, 0 to 5 percent slopes							4
Dello loamy fine sand, gravelly substratum, 0 to 2 percent slopes							4
Domino silt loam, saline-alkali							6
Domino fine sandy loam, eroded							6
Domino fine sandy loam, saline-alkali							4
Domino silt loam							6
Domino silt loam, strongly saline-alkali							
Escondido fine sandy loam, 8 to 15 percent slopes, eroded							
Escondido fine sandy loam, 2 to 8 percent slopes, eroded							4
Exeter sandy loam, 0 to 2 percent slopes							6
Exeter sandy loam, 2 to 8 percent slopes, eroded							6
Exeter sandy loam, slightly saline-alkali, 0 to 5 percent slopes							6
Exeter sandy loam, deep, 0 to 2 percent slopes							7
Exeter sandy loam, deep, 2 to 8 percent slopes, eroded					2.5	4.0	7
Exeter very fine sandy loam, 0 to 5 percent slopes							6
Exeter very fine sandy loam, deep, 0 to 5 percent slopes					3.0	5.0	7
Fallbrook sandy loam, 8 to 15 percent slopes, eroded					3.0	5.0	
Fallbrook sandy loam, 15 to 25 percent slopes, eroded							
Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded							6
Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded					3.0	5.0	6
Fallbrook fine sandy loam, shallow, 8 to 15 percent slopes, eroded							
Garretson gravelly very fine sandy loam, 2 to 8 percent slopes	6	8	800	1,000	6.0	8.0	8
Garretson very fine sandy loam, 0 to 2 percent slopes	6	8	800	1,000	8.0	10.0	9
Garretson very fine sandy loam, 2 to 8 percent slopes	6	8	800	1,000	8.0	10.0	9
Garretson very fine sandy loam, 8 to 15 percent slopes, eroded	6	8			8.0	10.0	
Garretson gravelly very fine sandy loam, 0 to 2 percent slopes	6	8	800	1,000	6.0	8.0	8
Garretson gravelly very fine sandy loam, 8 to 15 percent slopes, eroded	6	8	750	950	6.0	8.0	
Gorgonio gravelly loamy fine sand, 2 to 15 percent slopes	6	8	600	730	1.5	2.7	5
Gorgonio loamy sand, 0 to 8 percent slopes	5	7	550	700	2.5	3.5	6
Gorgonio loamy sand, 8 to 15 percent slopes	5	7	550	700	2.5	3.5	
Gorgonio loamy sand, deep, 2 to 8 percent slopes	6	8	600	730	1.5	5.0	6
Gorgonio cobbly loamy fine sand, 2 to 15 percent slopes	6	8	550	700			

p

B

wt.

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10
15
.....

TABLE 2.—Estimated average acre yields of principal crops under two levels of

Soil	Irrigated crops						
	Apricots		Peaches		Wine grapes		Alfalfa
	A	B	A	B	A	B	A
	Tons[1]	*Tons*[1]	*Lugs*[2]	*Lugs*[2]	*Tons*	*Tons*	*Tons*[3]
Grangeville loamy fine sand, drained, 0 to 5 percent slopes					3.0	5.0	6
Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes							5
Grangeville sandy loam, sandy substratum, drained, 0 to 5 percent slopes							5
Grangeville sandy loam, sandy substratum, drained, saline-alkali, 0 to 5 percent slopes							4
Grangeville fine sandy loam, drained, 0 to 2 percent slopes					3.0	5.0	6
Grangeville fine sandy loam, drained, 5 to 15 percent slopes							
Grangeville fine sandy loam, poorly drained, saline-alkali, 0 to 5 percent slopes							
Grangeville fine sandy loam, saline-alkali, 0 to 5 percent slopes							
Grangeville fine sandy loam, loamy substratum, drained, 0 to 2 percent slopes					5.0	8.0	6
Grangeville fine sandy loam, loamy substratum, drained, saline-alkali, 0 to 2 percent slopes							4
Greenfield sandy loam, 2 to 8 percent slopes, eroded	6	8	750	1,000	4.0	7.0	7
Greenfield sandy loam, 0 to 2 percent slopes	6	8	750	1,000	5.0	8.0	7
Greenfield sandy loam, 8 to 15 percent slopes, eroded	6	8	750	950	4.0	7.0	
Greenfield sandy loam, 15 to 25 percent slopes. eroded	6	8	750	950			
Hanford coarse sandy loam, 2 to 8 percent slopes	6	8	750	1,000	3.0	5.0	7
Hanford loamy fine sand, 0 to 8 percent slopes	6	8	750	950	3.0	5.0	7
Hanford coarse sandy loam, 0 to 2 percent slopes	6	8	750	950	3.0	5.0	6
Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	6	8	700	900	2.5	4.0	
Hanford coarse sandy loam, deep, 2 to 8 percent slopes, eroded							4
Hanford fine sandy loam, 0 to 2 percent slopes	6	8	900	1,000	5.0	8.0	8
Hilmar loamy sand, 0 to 2 percent slopes, eroded	5	7	450	600	4.0	8.0	6
Hilmar loamy very fine sand, 0 to 2 percent slopes					5.0	8.0	8
Hilmar loamy very fine sand, 2 to 8 percent slopes					5.0	8.0	6
Honcut sandy loam, 2 to 8 percent slopes	6	8	750	950	5.0	7.0	5
Honcut sandy loam, 8 to 15 percent slopes, eroded	6	8	750	950	5.0	7.0	
Honcut loam, 2 to 8 percent slopes, eroded	5	8	750	950	3.0	5.0	8
Las Posas loam, 8 to 15 percent slopes, eroded							
Las Posas loam, 2 to 8 percent slopes					5.0	7.0	
Las Posas loam, 5 to 8 percent slopes, eroded							
Las Posas loam, 8 to 25 percent slopes, severely eroded							
Madera fine sandy loam, 0 to 2 percent slopes							4
Madera fine sandy loam, 2 to 5 percent slopes, eroded							4
Madera fine sandy loam, 5 to 15 percent slopes, eroded							
Madera fine sandy loam, shallow, 2 to 8 percent slopes, eroded							
Metz loamy fine sand, 0 to 2 percent slopes	5	7			2.0	3.0	4
Metz loamy fine sand, gravelly sand substratum, 0 to 5 percent slopes	5	7					4
Metz loamy fine sand, sandy loam substratum, 0 to 5 percent slopes	6	8	450	600	3.0	5.0	6
Metz loamy sand, 2 to 8 percent slopes	5	7			2.0	3.0	4

Resource Area 19—Continued

					Dryland crop	
	Potatoes		Pasture		Barley	
	Fall					
	A	B	A	B	A	B
	Cwt.	*Cwt.*	*A.U.M.*[5]	*A.U.M.*[5]	*Cwt.*	*Cwt.*
)	.....	.....	5	9	8	12
.....	.....	.....	6	12	6	12
.....	.....	.....	4	8	6	12
.....	.....	.....	4	8	6	10
.....	.....	.....	9	13	12	18
.....	.....	.....	6	12	8	15
.....	.....	.....	4	8	4	8
.....	.....	.....	4	12	6	12
)	.....	.....	9	18	8	12
.....	.....	.....	4	8	6	10
0	375	425	9	15	10	17
0	375	425	9	18	10	17
0	375	425	8	12	10	15
0	300	425	5	12	8	12
0	375	425	7	13	9	17
0	375	425	5	10	9	17
0	375	405	5	9	9	17
0	375	425	7	12	8	15
0	325	375	5	9	6	10
0	375	425	10	18	9	17
0	150	250	6	10	9	16
.....	.....	.....	7	15	9	17
.....	.....	.....	6	12	9	15
0	375	425	6	12	8	12
0	375	425	6	16	6	12
.....	.....	.....	9	16	8	12
.....	.....	.....	6	12	6	16
.....	.....	.....	7	12	12	16
.....	.....	.....	7	12	10	14
0	150	175	7	12	8	12
0	150	175	7	12	8	12
.....	.....	.....	6	11	6	10
.....	.....	.....	5	10	4	8
0	350	375	5	9	4	8
0	350	375	5	9	4	8
0	350	375	6	12	4	8
0	350	375	4	8	1	8

E 2.—Estimated average acre yields of principal crops under two levels of

	Irrigated crops						
	Apricots		Peaches		Wine grape		Alfalfa
	A	B	A	B	A	B	A
	Tons[1]	*Tons*[1]	*Lugs*[2]	*Lugs*[2]	*Tons*	*Tons*	*Tons*[3]
.....	6	8	.....	.....	2.5	4.0	4
.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	.....	.....	.....
.....	6	8	800	1,000	6.0	10.0	7
.....	6	8	800	1,000	6.0	10.0	8
.....	.....	.....	.....	.....	.....	.....	4
.....	.....	.....	.....	.....	.....	.....	4
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	.....	.....	5
.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	.....	.....	6
.....	5	8	750	950	8.0	10.0	6
.....	6	8	750	950	8.0	10.0	6
.....	.....	.....	.....	.....	7.0	9.0	6
.....	5	8	750	950	7.0	9.0	6
.....	.....	.....	700	900	5.0	8.0	6
.....	5	8	700	950	5.0	8.0	.....
.....	.....	.....	700	900	.....	.....	.....
.....	.....	.....	400	600	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....	5	8	750	950	7.0	9.0	7
.....	.....	.....	.....	.....	.....	.....	6
.....	6	8	.....	.....	6.0	8.0	7
.....	6	8	.....	.....	8.0	10.0	7
.....	6	8	.....	.....	.....	.....	6
.....	6	8	.....	.....	6.0	8.0	7
.....	6	8	800	1,000	6.0	10.0	8
.....	6	8	800	1,000	6.0	10.0	8
.....	6	8	750	950	5.0	8.0	8
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	5
.....	.....	.....	.....	.....	5.0	7.0	6
.....	.....	.....	.....	.....	.....	.....	5

management for the Southern California Coastal Plains, Land Resource Area 19—Continued

Irrigated crops—Continued											Dryland crop	
Alfalfa	Barley		Oranges		Potatoes				Pasture		Barley	
					Spring		Fall					
B	A	B	A	B	A	B	A	B	A	B	A	B
Tons[3]	*Cwt.*	*Cwt.*	*Boxes*[4]	*Boxes*[4]	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*	*A.U.M.*[5]	*A.U.M.*[5]	*Cwt.*	*Cwt.*
7	15	25	200	350	400	450	350	375	5	10	4	8
8	10	20	150	300	350	400	250	275	7	12	6	10
8	10	20	150	300	350	400	250	275	7	12	6	10
.....	6	12	100	200	.....	.....	.....	.....	6	12	4	8
12	20	30	300	400	400	500	350	375	9	18	9	17
13	20	30	.....	.....	400	500	350	375	10	18	9	17
6	15	25	250	350	350	400	300	325	6	12	8	12
6	15	25	250	350	350	400	300	325	7	12	8	12
.....	15	25	250	350	350	400	300	325	6	12	8	12
.....	6	12	250	350	350	400	300	325	5	11	6	10
.....	13	18	.....	.....	.....	.....	.....	.....	6	12	6	10
.....	6	12	.....	.....	.....	.....	.....	.....	6	12	4	8
.....	.....	.....	150	300	.....	.....	.....	.....	7	12	8	12
10	20	30	150	300	.....	.....	.....	.....	7	12	8	12
8	18	25	150	300	.....	.....	.....	.....	6	11	8	12
8	15	25	.....	.....	.....	.....	.....	.....	5	9	8	12
8	10	20	.....	.....	.....	.....	.....	.....	6	10	6	10
8	20	30	200	350	400	450	350	375	9	18	13	16
8	20	30	200	350	400	450	350	375	10	18	13	16
8	6	12	180	300	.....	.....	.....	.....	8	13	8	14
8	15	25	200	350	400	450	350	375	8	13	8	14
8	4	10	180	300	.....	.....	.....	.....	7	12	8	12
.....	15	25	180	300	.....	.....	.....	.....	7	12	8	12
.....	.....	.....	180	300	.....	.....	.....	.....	7	12	8	14
.....	.....	.....	150	250	.....	.....	.....	.....	.....	.....	.....	.....
.....	6	12	150	300	.....	.....	.....	.....	7	12	.....	.....
.....	.....	.....	150	300	.....	.....	.....	.....	.....	.....	.....	.....
9	15	25	200	350	400	450	350	375	8	13	9	16
8	.....	.....	200	350	.....	.....	.....	.....	8	13	9	14
11	20	30	300	400	400	500	350	375	8	14	8	12
11	20	30	300	400	400	450	275	300	8	13	8	12
10	15	25	300	400	400	500	350	375	8	13	6	10
11	20	30	300	400	400	450	275	300	.....	.....	8	12
13	20	30	.....	.....	350	400	300	325	10	18	9	17
13	20	30	300	400	350	400	300	325	9	18	9	17
12	15	25	300	400	350	400	300	325	9	18	9	17
.....	.....	.....	.....	.....	.....	.....	.....	.....	7	14	8	18
10	20	35	.....	.....	.....	.....	.....	.....	5	9	4	8
10	20	35	.....	.....	.....	.....	.....	.....	5	10	4	8
10	20	35	.....	.....	.....	.....	.....	.....	5	9	5	10

der two levels of

pes	Alfalfa
B	A
Tons	*Tons*[3]
.....	.....
.....	4
4.0	4
.....	4
.....	.....
8.0	8
8.0	8
8.0	8
.....	.....
5.0	7
.....	4
.....	.....
.....	4
.....	4
.....	5
.....	4
.....	.....
.....	4
.....	.....
0.0	7
0.0	.....
.....	4
.....	.....
.....	.....
.....	4
.....	.....
.....	6

Plains, Land Resource Area 19—Continued

ps—Continued						Dryland crop	
Potatoes				Pasture		Barley	
Spring		Fall					
A	B	A	B	A	B	A	B
Cwt.	*Cwt.*	*Cwt.*	*Cwt.*	*A.U.M.*[5]	*A.U.M.*[5]	*Cwt.*	*Cwt.*
.....	.....	.....	.....	4	8	4	8
.....	.....	.....	.....	5	9	4	7
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	6	10	8	12
.....	.....	.....	.....	5	9	6	10
400	450	375	425	9	15	8	14
.....	.....	.....	.....	10	18	8	14
.....	.....	.....	.....	9	15	8	14
.....	.....	.....	.....	7	12	8	12
.....	.....	.....	.....	7	14	8	12
.....	.....	.....	.....	5	9	6	8
.....	.....	.....	.....	5	9	.....	.....
.....	.....	.....	.....	5	10	4	6
.....	.....	.....	.....	4	8	4	6
.....	.....	.....	.....	5	14	8	12
.....	.....	.....	.....	5	11	9	14
.....	.....	.....	.....	4	8	6	10
.....	.....	.....	.....	5	9	8	12
.....	.....	.....	.....	4	8	6	10
300	350	250	275	9	18	8	12
300	350	250	275	9	15	6	10
.....	.....	.....	.....	8	15	6	11
.....	.....	.....	.....	7	13	6	8
.....	.....	.....	.....	6	12	5	8
.....	.....	.....	.....	8	15	8	12
.....	.....	.....	.....	8	15	6	10
.....	.....	.....	.....	7	12	6	10

ıs one animal unit (1 cow, 1 horse, 5 sheep, or 5 goats) can be grazed per acre
.

under two levels of management for the Resource Area 20

ence of a figure indicates crop is not commonly suited to that soil]

rrigated crops					Dryland crop	
alfa	Potatoes		Pasture		Barley	
B	A	B	A	B	A	B
Tons[2]	*Acres*	*Acres*	*A.U.M.*[3]	*A.U.M.*[3]	*Cwt.*	*Cwt.*
6	250	350	9	18	4	8
6	300	400	10	18	4	8
6	300	400	10	18	4	8
.....	.....	.....	10	18	4	8
.....	.....	.....	6	11	4	8
.....	.....	.....	7	12	4	8
6	300	400	7	14	8	12
.....	300	400	7	12	8	12
6	300	400	9	18	8	12
.....	.....	.....	6	11	4	8
.....	.....	.....	6	11	4	8
6	250	350	7	12	6	10
.....	.....	.....	6	10	5	9
6	300	400	7	13	8	12
.....	300	400	7	12	8	12
.....	.....	.....	.....	.....	.....	.....
5	250	350	7	12	8	12
.....	.....	.....	7	12	8	12
.....	.....	.....	7	12	8	12

mal-unit-months per acre. The number of months one unit (1 cow, 1 horse, 5 sheep, or 5 goats) can be grazed re during the grazing season without damage to the e.

er row crop. Apply fer-
ndicated by soil tests, or
8 pounds of phosphorus,
otassium as sidedressing
After the last irrigation,
d. About 1.0 inch of irri-
nkler, is required every
20 to 24 irrigations are
n.

r the A level of manage-
tative soil groups, a typi-
ach of potatoes and silage
ar each of potatoes and
potatoes that have been
re planted between July
require about 80 pounds
horus, and 165 pounds of
idedressing of 80 pounds
pplied when 60 to 75 per-
potato vines. These pota-
rrigation water per acre
s applied by sprinkler at
every 4 days.

ment for the soils in all
a typical cropping sequ-
4 to 6 years of alfalfa.
have been treated with
tween July 5 and August
the results indicated by
of nitrogen, 55 pounds of
ounds of potassium. Irri-
ne as for the A level of

e A level of management,
rate of 2 pounds of alfal-
pound of narrowleaf tre-
4 pounds of tall fescue, 2
d 2 pounds of perennial
ter is applied by borders
tive soil group A, 4.0 to
acre is required every 15
May to October. On the
4.0 to 6.0 inches of irri-
d every 12 to 20 days. On
ps D and G, 2.0 to 4.0
plied every 15 days. Pas-
soil groups requires 60
owing establishment, and
in October. The fertilizer
getative soil group F also
er acre.

nent, a mixture of locally
umes are seeded. On soils
pounds of nitrogen and
cre are applied in March
nitrogen is applied just
f May to October. About
ounds of phosphorus per
rrigation is by borders or
ls in vegetative soil group
es of irrigation water per
e requires from 4.0 to 6.0
re every 10 to 20 days on
o 6.0 inches of irrigation

water every 10 days on soils in groups D and G. A perched water table is likely to develop if the pasture is overirrigated. Except that only the border method of irrigation is used, the soils in vegetative soil groups E and F have the same requirements as those in group A. The soils in groups E and F also require gypsum. The gypsum should be applied according to the results indicated by soil tests. Tile drains or open ditch drains also may be needed.

DRYLAND BARLEY. Under the A level of management, a suitable cropping sequence on all of the soils is 1 year of barley and 1 year of fallow. After treatment with a fungicide, the barley seed is drilled but not fertilized.

Under the B level of management, a typical cropping sequence on all of the soils is 1 year each of barley, volunteer pasture, and fallow. About 20 to 30 pounds of nitrogen is required and is applied in the mulch. After treatment with a fungicide, the barley seed is drilled.

Storie Index Rating[2]

The soils of the Area are rated according to the Storie index (*9*). This index expresses numerically the relative degree of suitability, or value of a soil for general intensive farming. The rating is based on soil characteristics only and is obtained by evaluating such factors as depth, texture of the surface soil, density of subsoil, 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 cannot be considered as an index of land value. The index rating is given in the "Guide to mapping units".

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) slope; and (X) other factors, such as drainage, salts and alkali, and erosion. Each of these four general factors is evaluated on the basis of 100 percent. A rating of 100 percent expresses the most favorable, or ideal, condition, and lower percentage ratings are given for conditions that are less favorable for crop production.

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 may have an excellent profile justifying a rating of 100 percent for factor A, excellent texture of the surface soil justifying 100 percent for factor B, a smooth, nearly level surface justifying 100 percent for factor C, but a high accumulation of salts or alkali that would give a rating of 10 percent for factor X. Multiplying these four ratings gives an index rating of 10 for this soil. The high accumulation of salts or alkali would dominate the quality of the soil, render it unproductive for crops, and justify the low index rating of 10.

Soils are placed in grades according to their suitability for farming as shown by their Storie index ratings. The six grades and their range in index ratings are:

[2] Prepared by EUGENE L. BEGG, soils specialist, University of California, Davis.

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parts of the survey area in Land Re-

this soil is slow. Available water capa-
ches and fertility is moderate.
on this site is open brush that has an
w open grassy areas of soft chess, wild
tgrass, wild barley, cutleaf filaree, and
forbs. In places needlegrasses and other
also are present. Flattop buckwheat,
ge, and ceanothus are the predominant

has been depleted through heavy graz-
esirable plants, such as soft chess and
and are replaced by less desirable and
, such as red brome and brush. Because
, its potential productivity is low. Only
e gained through range seeding and

ilized and where management otherwise
estimated annual production of air-dry
k on this site is 600 pounds per acre in
moisture and 100 pounds in years of
ture. Total annual yields can be in-
mes by adding fertilizer and improving

CLAYPAN SITE

te are nearly level to moderately steep
re in the central and western parts of
Land Resource Area 19. They are in the
Perkins, Placentia, and Yokohl series.
e layer of loam or fine sandy loam that
ly in places. These shallow to very deep
pan or a hardpan, or have a fine-tex-
ne of the soils are eroded or severely

these soils is slow to very slow. Avail-
y is 2.0 to 10.5 inches, and fertility is

on this site consists predominantly of
d less desirable annuals as soft chess,
pgut brome. In a few places needle-
vildrye, and other perennial grasses are
any places cutleaf filaree is abundant.
on this site, but it is not so common as
y site. Plant composition is similar to
y site, but productivity is lower.
has been depleted through heavy graz-
grasses decrease and are replaced by
grasses as ripgut brome, poverty fes-
nuals. In some years tarweed is common
range and pasture, though it generally is
n heavily grazed and depleted areas.
is likely to infest well-managed range
e years.
s site are suitable for seeding and brush
nse is not so good, however, as on the
and Loamy sites.
rtilized and where management other-
ed, estimated annual production of air-
s site is 1,300 pounds per acre in years
ure and 800 pounds in years of unfavor-
al annual yields can be increased two to

chaparral. The understory is made up of soft
d oats, ryegrass, cutleaf filaree, and other an-
of needlegrasses and other perennial grasses.
iceous understory is sparse.
he range has been depleted through heavy graz-
ire, the desirable plants in the understory de-
l are replaced by such less desirable and undesir-
ts as red brome, nitgrass, poverty fescue, pop-
r, and annual lupine. In places on severely
eas that have been depleted by fire, the plant
sists of almost pure stands of chamise that have
eous understory. Brush control and seeding are
ly for control of erosion and to provide protec-
fire.
s not fertilized and where management other-
t improved, estimated annual production of air-
e on this site is 400 pounds per acre in years of
moisture and 100 pounds in years of unfavor-
ure. Total annual yields can be increased two to
es on soils in units AlE3, CaF2, CbD2, CbF2, ChC,
C2, FcD2, FkD2, FwE2, LaE3, MnD2, and MnE3
e Buren part of units RmE3 and RnE3 by adding
and improving management.

SANDY SITE

f this range site are at elevations of less than
in Land Resource Area 19. Some of the soils are
el to strongly sloping or rolling and others are
y steep. These soils are in the Cortina, Delhi,
rgonio, Hanford, Hilmar, Metz, and Tujunga
ey consist mainly of very deep, coarse-textured
in places are stony or gravelly. Also in this site,
are some coarse-textured and medium-textured
have a sandy or gravelly substratum.
bility is moderately rapid to very rapid. Avail-
r capacity is 2.0 to 5.5 inches. Fertility is low to

ant cover on this site consists of such desirable
s soft chess, wild oats, and cutleaf filaree and of
scattered to moderately dense stands that have
ory of goldenbush, California sagebrush, flat-
wheat, and other shrubs. A few cottonwoods and
es are also in the overstory. In places needle-
unegrass, and other perennial grasses grow.
he range has been depleted through heavy graz-
y other disturbance, desirable grasses decrease
eplaced by such less desirable and undesirable
red brome, nitgrass, and annual weeds. The
lants, particularly goldenbush and flattop buck-
so increase.
ls of this site are suitable for brush control and
ng adapted annual grasses and legumes. The
is not so good, however, as on soils of the Clayey
ny sites.
as not fertilized, and where management is not
improved, estimated annual production of air-
ge is 1,000 pounds per acre in years of favorable
and 200 pounds in years of unfavorable mois-
al annual yields can be increased two to three
adding fertilizer and improving management.

SANDY ALLUVIAL SITE

f this range site are on river bottoms and along
nannels in Land Resource Area 19. They are

e in the Cor-
tz, San Emig-
hese soils are
p of finer tex-
the soils are

stratum. The
and fertility

tered to dense
s, goldenbush,
ws, and syca-
Less desirable
annual weeds
f this site and
rows in small
ntrol is useful
ol of phreato-

on this site is
moisture and
e.

stern, western,
and Resource
ville, Traver,
e nearly level
vel to sloping
e soils of this
ave a surface
my fine sand.
li soils or of
ls are eroded.
e soils. Avail-
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stern, western,
and Resource
to very deep
Villows series.
am, loam, or

silty clay. Some of the soils are saline-alkali and others are strongly saline-alkali.

Permeability of these soils is moderate to slow. Available water capacity is 5.0 to 11.0 inches and fertility is low to high. Most of this site is now in crops or irrigated pasture. Much of the acreage has been drained by ground water pumping.

The predominant plant cover on this site is similar to that on the Sandy Basin site. Annual grasses and forbs, however, seldom are abundant on this site, even in years of above-average rainfall. Soils of this site respond to seeding or other range management, especially if saline-alkali reclamation and drainage have been accomplished.

In areas not fertilized and where management is otherwise not improved, estimated annual production of air-dry forage on this site is 200 pounds per acre in years of favorable moisture and 50 pounds in years of unfavorable moisture. Total annual yields can be increased two to four times by adding fertilizer and improving management.

CIENEGA SITE

This range site consists of soils in valleys in the southeastern part of the survey area in Land Resource Area 20. Only Bishop silt loam and the land type Wet alluvial land are in this site. They are nearly level to strongly sloping and occupy meadowland, where the water table is seasonally high. These soils are somewhat poorly drained to poorly drained and are slightly saline-alkali to strongly saline-alkali. Potential productivity is high because of the high water table.

Permeability is moderate to moderately slow. Available water capacity is 9.0 to 10.0 inches and fertility is low.

When the range has been depleted under heavy grazing or any other disturbance, the perennial grasses decrease and sedges and wire rush increase. The wire rush finally dominates. Annual grasses and forbs, particularly cutleaf filaree, are abundant. Thistle and other undesirable weeds also infest depleted areas.

The plant composition and its productivity are dependent upon the water table. When the water table is lowered by gullying, by drought, or by pumping from wells, the cienega vegetation disappears and is replaced by plants similar to those of the Loamy Uplands site. Big sagebrush commonly invades when the water table has been lowered.

The soils of this site respond to seeding of adapted perennial grasses. Competition from wiregrass is severe, however, and careful preparation of the seedbed is necessary. In many places gully control is needed for control of erosion and to help maintain or restore the water table.

In areas not fertilized and where management otherwise is not improved, estimated annual production of air-dry forage is 4,000 pounds per acre in years of favorable moisture and 1,200 pounds in years of unfavorable moisture. Total annual yields can be increased two to four times by adding fertilizer and improving management.

COARSE SANDY SITE

Soils of this range site are in the eastern part of the survey area on valley bottoms or on alluvial fans and uplands in Land Resource Area 20. Elevations range from 3,500 to 7,000 feet, and rainfall ranges from 13 to 25 inches. These soils are in the Crouch and Mottsville series. They are moderately deep to very deep, nearly level to

ANDS SITE

the northeastern, east-
of the survey area in
ons are more than 3,500
4 to 25 inches. This site
ndy loams of the Sheep-
soils are shallow to mod-
steep to very steep. They
y in places.
apid to moderate. Avail-
aches and fertility is low

open to dense stands of
oak, manzanita, sugar
ral. Predominant in the
able grasses as wild oats
s abundant in years of
rennial grasses, such as
redominant.
ted through heavy graz-
esirable grasses decrease
esirable and undesirable
verty fescue, and annual
eases, in particular those
reas burned have almost
or no herbaceous under-
range are not suited to
eding are useful only for
tion from fire.
r-dry forage on this site
f favorable moisture and
ble moisture.

n the Western Riverside
onal opportunities they
heavily populated areas.
range from fine-textured
rse-textured soils of the
ng that such soils as the
Cajalco and Fallbrook
campsites for tents and
n the soils are used for
ife inhabiting the areas

d in this survey area are
ng doves, pheasant, rab-
d bass are among the fish
ponds of the Area.
os are in the Area, chiefly
aver, Willows, and Wau-
life habitat, or for water
for these soils unless the
ds generally can be built
and by constructing con-
nts that are salt tolerant,
nese millet, can be grown
the fields can be flooded
duck hunting.

vationist, Soil Conservation

'acific Flyway that
oirs in the Area are
ards, green-winged

mary game bird in
hes, brushland, and
e soils in these areas
ured to coarse tex-
Tujunga, and Vista.
sh cover, as well as
e cover generally is
rt annual forbs and
. Additional food is
nt cultivated fields.
provides more area
rally improves the
ices, such as "guzz-
and Vista soils also
e dryfarmed grain-
erted to citrus, the
trus groves provide
l as sufficient water.
love is a fairly im-
verside Area. It in-
weed and wasted
and brushland. The
r to those suited to

f the most sought
ts are stocked on a
erally do not repro-
ay eggs. The eggs,
he humidity in the
t hatching success
elds. A considerable
, and many of the
ne. Some increase in
ly as more private
and they maintain

wildlife species in
nt the riverwashes,
to irrigated land.
the Dello, Grange-
and Vista series.
s where rabbits are
farmer.
Fallbrook, Friant,
damage crops and
ks and browseways
nprove the habitat

ghout the Area are
n 1963, seven com-
a furnished fishing
ocked their ponds
urce of cool water
ew lining methods
t the most porous

d in the Western
er skiing only; no

Engineering Uses of the Soils[5]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, and pipelines, the foundations of buildings, facilities for storing water, structures for controlling erosion, drainage systems, and systems for disposing of sewage. The properties most important to the engineer are permeability, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, particle size, plasticity, and reaction. Also important are depth to water table, flooding hazard, depth to bedrock, to a hardpan, or to sand and gravel, and relief. Such information is made available in this section. Engineers can use this information to—

1. Make soil and land use studies that will aid in selecting and developing sites for industries, businesses, residences, and recreational areas.
2. Make preliminary estimates of the engineering properties of soils in the planning of agricultural drainage systems, farm ponds, irrigation systems, land leveling, and diversion terraces.
3. Make preliminary evaluations of soil conditions that will aid in selecting locations for highways, airports, pipelines, and cables, and in planning more detailed surveys for the selected locations.
4. Locate probable sources of sand, gravel, and other materials suitable for construction needs.
5. Correlate performance of engineering structures with mapping units to develop information for general planning that will be useful in designing and maintaining certain engineering practices and structures.
6. Determine the suitability of the soils for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and aerial photographs.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

It should be emphasized that the interpretations made in this soil survey may not eliminate the need for sampling and testing needed at a site chosen for a specific engineering work that involves heavy loads or at a site where excavations are to be deeper than the depths of the layers here reported. Also, engineers should not apply specific values to the estimates for bearing capacity given in this survey. Nevertheless, by using this survey, an engineer can select and concentrate on those kinds of units most important for his proposed kind of construction, and in this manner, reduce the number of samples taken for laboratory testing and complete an adequate soil investigation at minimum cost.

The soil mapping units shown on the maps in this survey may include small areas of a different soil material. These included soils are too small to be mapped separately and generally are not significant to the agriculture in the Area but may be important in engineering planning.

[5] By WARREN D. BENNETT, civil engineer, Soil Conservation Service.

ent at which the soil
to a plastic state. The
at which the soil mate-
id state. The *plasticity*
between liquid limit
range in moisture con-
in a plastic condition.

e survey area, lists the
it, and gives estimates
ne engineering work.
to weathered or hard
sonal high water table,
, and AASHO classifi-
he percentages of mate-
sieves are given. Also
g values, permeability,
, salinity, and shrink-
based partly on exam-
rtly on results of test
estimates are only for
ion from these values
mation on the range of
ained in other parts of
ection "Descriptions of

pan, expressed in feet,
nge of depth from the
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able, expressed in feet,
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The range of estimated
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classification groups.
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TABLE 4.—

Soil name and location	Parent material	Report No.[1]	Depth	Maximum dry density	Optimum moisture	Mechanical Percentage 3-in.	¾-in.	No. 4 (4.7 mm.)
			Inches	*Lb. per. cu. ft.*	*Percent*			
Arbuckle gravelly loam: 800 feet W. and 200 feet S. of E¼ corner, sec. 31, T. 3 S., R. 6 W.	Pleistocene alluvial deposits.	62—163	0—12	129	9	100	99	91
		62—165	12—26	132	11	100	95	89
		62—166	26—45	140	8	100	87	61
		62—164	45—68	140	8	100	93	58
Arlington loam: 50 feet E. and 220 feet S. of Mary St. and Victoria Ave., SE¼, sec. 3, T. 3 S., R. 5 W.	Pleistocene alluvial deposits.	62—175	0—9	130	9	—	—	100
		62—176	13—23	134	10	—	100	99
		62—177	28—37	139	7	—	100	95
Cajalco fine sandy loam: 700 feet E. and 400 feet N. of SW corner, sec. 36, T. 4 S., R. 5 W.	San Marcos gabbro.	62—178	0—8	128	11	—	—	100
		62—179	23—31	127	12	—	—	100
Hanford coarse sandy loam: 1,000 feet S. and 1,200 feet W. of E¼ corner, sec. 30, T. 3 S., R. 2 W.	Recent granitic alluvium.	62—174	17—37	133	8	—	100	98
Placentia fine sandy loam: 1,000 feet N. of Calif. Hwy. 71 on W. side of U.S. Hwy. 395.	Pleistocene alluvial deposits.	62—167	0—18	124	10	—	—	100
		62—168	18—31	124	13	—	—	—
		62—170	39—57	127	12	—	—	—
Ramona sandy loam: 1,100 feet N. and 500 feet W. of SW¼ corner, sec. 31, T. 2 S., R. 1 W.	Alluvium.	62—171	14—23	131	8	—	100	99
		62—172	37—46	132	11	—	100	99
		62—173	68—74	129	12	—	100	98
San Emigdio fine sandy loam: 800 feet E. and 50 feet S. of NW corner, sec. 16, T. 3 S., R. 2 W.	Alluvium from San Timoteo Badlands.	62—169	22—42	131	9	—	100	96
Vista coarse sandy loam: On E. side of Hwy. R3 in NW¼, sec. 18, T. 7 S., R. 1 E.	Granodiorite.	S 31058	1—9	120	11	—	—	100
		S 31059	15—24	126	10	—	—	100
		S 31060	24—30	125	11	—	100	98
Willows silty clay: 200 feet N. of S¼ corner, sec. 33, T. 4 S., R. 3 W. On Rynsberger Ranch in the triangle between Ellis Road, U.S. Highway 395 and San Jacinto River.	Mixed alluvium.	S 32473	0—6	95	25	—	—	—
		S 32474	10—24	97	25	—	—	—
		S 32475	42—60	96	25	—	—	—

[1] Tests for all except Willows and Vista soils performed by District VIII, California Division of Highways in accordance with procedures given in "California Materials Manual for Testing and Control Procedure;" tests for Willows and Vista soils performed by Bureau of Public Roads (BPR), reports dated April 22, 1957 and June 9, 1958.

[2] Based on California Division of Highways: Method No. 216 E.

[3] Mechanical analyses by the California Division of Highways (*3*), Methods No. 202 and 203. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the California procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine

quid mit	Plasticity index	Classification	
		AASHO[4]	Unified[5]
[6])	([6])	A—4(4)	ML
25	11	A—6(6)	CL
24	12	A—2—6(0)	GC
23	8	A—2—4(0)	SW—SC
24	5	A—4(7)	ML—CL
26	10	A—4(4)	CL
[6])	([6])	A—2—4(0)	SM
[6])	([6])	A—2—4(0)	SM
29	13	A—6(4)	SC
[6])	([6])	A—1—b(0)	SM
[6])	([6])	A—4(5)	ML
35	23	A—6(13)	CL
29	15	A—6(9)	CL
[6])	([6])	A—4(3)	SM
24	10	A—4(3)	CL
29	13	A—6(2)	SC
[6])	([6])	A—4(1)	SM
[6])	([6])	A—4(0)	SM
25	3	A—2—4(0)	SM
[6])	([6])	A—1—6(0)	SW—SM
52	23	A—7—6(16)	MH—CH
56	35	A—7—5(20)	MH—CH
56	35	A—7—5(20)	MH—CH

diameter is excluded from calculations of ning textural classes for soil.

d BPR have agreed to consider that all soils ation. Examples of borderline classification

TABLE 5.—

or that it would not be applicable. Not included in this table, (RsC), Rock land (RtF), Rough broken land (RuF), Terrace

Classification			Percentage	
texture	Unified	AASHO	Larger than 3 inches	No. 4 (4.7 mm.)
bbly in s. dstone.	CH, MH	A—7	100	90—100
sandy	SM, ML	A—4	100	100
.....	ML, CL	A—4	100	95—100
am	CL	A—6	100	95—100
gravelly loam.	GM, SM	A—2	80—95	50—60
y loam .	GM, SM	A—2	95—100	65—85
y clay	GM, SM	A—4	90—100	70—90
gravelly loam.	GM, SM	A—2	80—95	50—60
.....	ML, CL	A—4, A—6	100	100
ly cen ted loam.	SM	A—2	95—100	90—100
coarse	SP, SM	A—1	100	100
.....	CH, MH	A—7	100	100
.....	CL	A—6	100	100
red ba- igneous				
clay	CH, MH	A—7	65—85	65—85
loam ...	CL	A—4	65—85	50—65
red ba- igneous				
n	ML	A—4, A—6	100	100
ed fine loam ty clay	ML, CL	A—4, A—6	100	100
.....	ML	A—4	100	100
..... e.	CL, CH	A—7	100	100
..... red acid us rock.	CL, MH	A—7	100	100
..... d pan gly ce- ed with	CL, ML	A—4, A—6	100	100

too variable for engineering use, are the land types Badland (BaG), Gullied land (GzG), Riverwash uvial land (WeD), < = more than]

	Atterberg values						
o. 200 74 mm.)	Liquid limit	Plastic index	Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
			Inches per hour	*Inches per inch of soil*	*pH value*	*Mmhos/cm at 25° C.*	
5—85	55—70	35—45	0.06—0.2	[2]0.14—0.16	6.1—8.4	< 1	High.
15—60	.....	([3])	2.0—6.3	0.13—0.15	6.1—8.4	< 1	Low.
0—65	15—35	5—10	0.63—2.0	0.16—0.18	6.1—7.3	< 1	Moderate.
0—80	20—30	10—20	0.2—0.63	0.17—0.19	6.6—7.8	< 1	Moderate.
5—15	15—25	5—10	0.63—2.0	0.06—0.08	6.6—7.3	< 1	Low.
5—35	15—35	5—10	0.63—2.0	0.11—0.13	6.1—7.3	< 1	Low.
5—50	20—30	10—20	0.2—0.63	0.12—0.14	6.6—7.8	< 1	Moderate.
5—15	15—25	5—10	0.63—2.0	0.06—0.08	6.6—7.3	< 1	Low.
5—75	20—30	5—15	0.63—2.0	0.15—0.17	6.1—7.8	< 1	Moderate.
5—35	.....	.....	0.06—0.2	.....	.....	< 1	Low.
0—20	.....	([3])	> 20	0.06—0.08	6.6—7.3	< 1	Low.
0—90	50—75	20—45	0.06—0.20	0.14—0.16	6.6—8.4	< 1	High.
0—75	25—35	10—20	0.63—2.0	0.16—0.18	7.9—8.4	< 1	Moderate.
0—65	50—75	20—45	01.06—0.20	0.08—0.10	6.6—8.4	< 1	Moderate.
0—40	20—30	5—10	01.63—2.0	0.09—0.11	7.9—8.4	< 1	Low.
0—90	35—45	10—15	0.63—2.0	0.18—0.20	7.9—8.4	1—8	Moderate.
5—95	30—40	5—25	0.2—2.0	0.16—0.20	7.9—8.4	4—15+	Moderate.
0—75	10—20	0—10	2.0—6.3	0.16—0.18	5.6—6.0	< 1	Low.
0—90	40—60	25—35	< 0.06	0.04—0.06	6.6—8.4	1—4	High.
5—75	35—60	15—35	01.06—2.0	0.14—0.16	5.6—7.8	< 1	High.
5—85	15—35	5—20	0.2—0.63	0.16—0.18	7.9—8.4	0—8	Moderate.
.....	.....	.....	< 0.06	.....	8.5—9.0	.....	

TABLE 5.—*Estimated*

series and symbols	Depth to— Bedrock or hardpan	Depth to— Seasonal high water table	Depth from surface (typical profile)	Classification: USDA texture	Classification: Unified	Classification: AASHO	Percentage: Larger than 3 inches	Percentage: No. 4 (4.7 mm.)
	Feet	*Feet*	*Inches*					
Trail: BsC2, , BsE3, BtD2,	>5	(1)	0—22	Coarse sandy clay loam; stones on surface in places.	SC	A—4	100	100
			22—55	Coarse sandy loam.	SM	A—2	95—100	70—90
			55—60	Weakly cemented fine sandy loam.	SM	A—2	100	100
BuC2, BuD2, , BxC2.	>5	(1)	0—37	Clay loam	CL	A—6	100	100
			37—52	Weakly cemented loam.	ML	A—4	100	100
co: CaC2, , CaF2, CbD2, .	1½—4	(1)	0—13	Fine sandy loam.	SM	A—2	100	100
			13—22	Loam	SC	A—6	100	100
			22	Weathered gabbro.				
ne: CcC2, , CdC2.	>5	(1)	0—33	Sandy loam and loam.	SM	A—2, A—4	95—100	90—100
			33—60	Loamy coarse sand.	SM	A—1	95—100	90—100
Ce, Cf, Cg	>5	1½—5	0—60	Silty clay loam	CL	A—6	100	100
eba: ChC, , ChF2, CkD2, .	1—2	(1)	0—22	Gravelly coarse sandy loam.	SM, GM	A—1, A—2	90—100	70—90
			22	Weathered granodiorite.				
: CIC, CmC, CoA, CpA,	>5	(1)	0—60	Cobbly and gravelly loamy sand and sandy loam.	GM	A—1	50—60	40—50
on: CsF2, , CuE.	2—3	(1)	0—26	Sandy loam	SM	A—2	95—100	90—100
			26	Mica-schist.				
ch: CvD2, D2, CwE2, , CyF2.	2—4	(1)	0—28	Sandy loam	SM	A—2	95—100	90—100
			28	Weathered granite.				
DaD2, DbA ...	>5	(1)	0—64	Fine sand and loamy fine sand.	SM	A—2	100	100
3, DmA, DoA, B.	>5	1—4	0—62	Loamy fine sand, loamy sand, and sand.	SM	A—2	100	100
B, DrA	>5	3—4	0—24	Loamy fine sand and loamy sand.	SM	A—2	100	100
			24—60	Gravelly sand ..	SW, GW	A—1	90—100	70—80
o: Ds2, Dt, Dv, Dw.	1½—3½	2½—5	0—27	Silt loam	ML, CL	A—4	100	100
			27—36	Loam, weakly to strongly cemented with lime.	ML, CL	A—4	100	100
			36—63	Loam	ML, CL	A—4	100	100

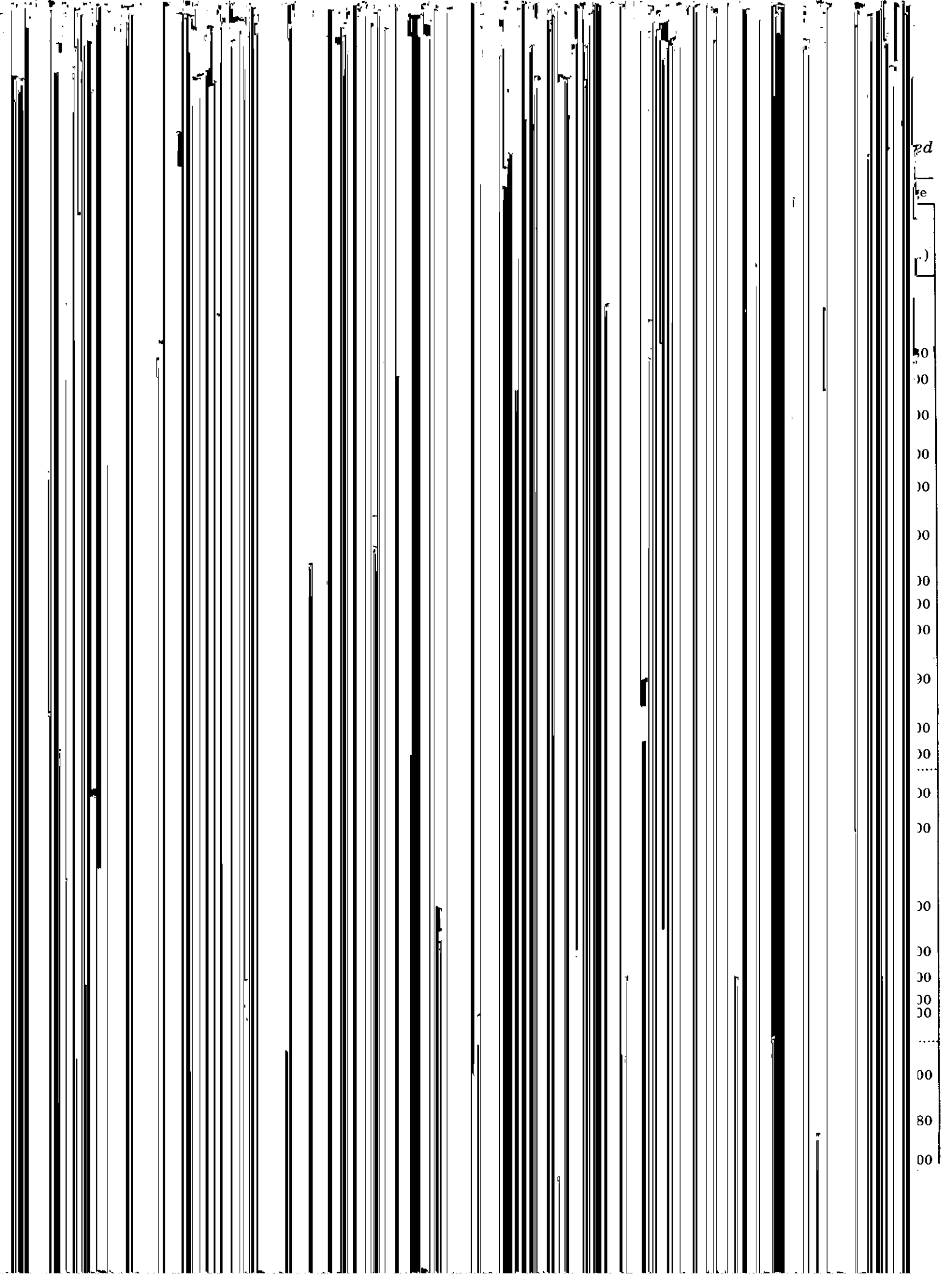
properties—Continued

passing sieve—			Atterberg values		Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Liquid limit	Plastic index					
					Inches per hour	*Inches per inch of soil*	*pH value*	*Mmhos/cm at 25° C.*	
85—100	55—60	40—50	15—40	5—10	0.2—0.63	0.14—0.16	5.1—6.0	< 1	Moderate.
55—70	40—60	25—35	.....	(3)	2.0—6.3	0.10—0.12	6.1—7.3	< 1	Low.
85—100	45—55	25—35	.....	.....	0.06	0.10—0.12	6.6—7.3	.....	Low.
95—100	90—100	70—80	20—35	15—25	0.2—0.63	0.17—0.19	6.1—8.4	< 1	Moderate.
95—100	80—95	50—65	10—25	5—10	< 0.06	.....	7.9—8.4	.....	Low.
95—100	60—75	25—35	.....	(3)	2.0—6.3	0.13—0.15	6.1—7.3	< 1	Low.
95—100	80—90	40—50	25—35	10—20	0.63—2.0	0.16—0.18	6.6—7.3	< 1	Moderate.
85—95	60—70	25—45	.....	(3)	2.0—6.3	0.11—0.13	5.6—6.5	< 1	Low.
90—100	40—50	10—20	.....	(3)	> 20.0	0.06—0.08	5.6—6.5	< 1	Low.
100	90—100	85—95	30—40	20—35	0.20—0.63	0.19—0.21	7.9—8.4	1—15+	Moderate.
65—85	35—50	15—30	.....	(3)	6.3—20.0	0.06—0.08	5.6—6.5	< 1	Low.
30—45	25—35	5—10	.....	(3)	6.3—20.0	0.05—0.07	6.6—7.8	< 1	Low.
85—95	55—65	20—30	.....	(3)	2.0—6.3	0.10—0.12	5.6—6.5	< 1	Low.
85—95	55—65	20—30	.....	(3)	2.0—6.3	0.11—0.13	5.1—6.5	< 1	Low.
95—100	65—80	15—35	.....	(3)	6.3—20.0	0.08—0.11	5.6—7.3	< 1	Low.
90—100	50—75	15—30	.....	(3)	2.0—20.0	0.08—0.11	7.4—8.4	0—15	Low.
90—100	50—75	15—30	.....	(3)	2.0—6.3	0.08—0.11	7.4—8.4	0—8	Low.
60—80	40—50	0—5	.....	(3)	> 20.0	0.05—0.07	7.4—8.4	0—8	Low.
100	90—100	70—90	20—35	5—10	0.63—2.0	0.19—0.21	7.9—9.0	4—15+	Moderate.
100	80—95	60—75	15—25	5—10	< 0.06	.....	7.9—9.0	8—15+	Low.
100	80—90	60—70	15—25	5—10	0.63—2.0	0.16—0.18	7.9—9.0	8—15+	Low.

TABLE 5.—*Estimated*

h h ce cal e)	Classification			Percentage	
	USDA texture	Unified	AASHO	Larger than 3 inches	No. 4 (4.7 mm.)
s					
4	Very fine sandy loam.	ML	A—4	100	100
4	Sandstone.				
6	Sandy loam and very fine sandy loam.	SM, ML	A—4	100	100
7	Loam	ML, CL	A—4	100	100
0	Indurated hardpan.	.....	.....	.....	.....
0	Coarse sandy loam.	SM	A—2	100	100
4	Sandy loam	SM	A—2	100	95—100
4	Sandy clay loam	SC	A—6	100	95—100
4	Weathered granite.				
3	Fine sandy loam.	SM	A—4	100	95—100
3	Mica-schist.				
)	Very fine sandy loam.	ML	A—4	100	95—100
)	Gravelly very fine sandy loam and loam.	ML, SC	A—4	95—100	75—85
5	Very fine sandy loam or fine sandy loam.	ML, SM	A—4	100	100
5	Weathered sandstone.				
)	Loamy sand	SM	A—2	100	95—100
)	Gravelly loamy sand.	GM	A—1	80—100	60—80
)	Gravelly or cobbly loamy sand.	GM	A—1	75—90	55—70
)	Loamy fine sand and fine sandy loam.	SM	A—4	100	100
3	Sandy loam	SM	A—4	100	100
)	Loamy coarse sand and coarse sand.	SP, SM	A—2	100	90—100
3	Fine sandy loam.	SM, ML	A—4	100	100
4	Loam	ML, CL	A—4	100	100
3	Sandy loam	SM	A—2	100	100
)	Loam	ML, CL	A—4	100	100
)	Coarse sandy loam.	SM	A—2	100	90—100
)	Loamy sand and gravelly coarse sand.	SP, SM	A—1	90—100	70—100

	Atterberg values		Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
200 mm.)	Liquid limit	Plastic index					
			Inches per hour	*Inches per inch of soil*	*pH value*	*Mmhos/cm at 25° C.*	
—65	15—35	5—10	0.63—2.0	0.15—0.17	5.6—6.5	< 1	Low.
—60	.....	(3)	2.0—6.3	0.11—0.13	5.6—6.5	1—5	Low.
—70	15—30	5—10	0.63—2.0	0.16—0.18	6.6—8.4	1—8	Moderate.
.....	.....	.....	< 0.06	.....	7.4—9.0	.....	
—35	.....	.....	2.0—6.3	0.11—0.13	7.4—8.4	1—4	Low.
—35	.....	(3)	2.0—6.3	0.11—0.13	6.1—7.3	< 1	Low.
—50	20—30	10—20	0.63—2.0	0.14—0.16	6.6—7.3	< 1	Moderate.
—50	.....	(3)	2.0—6.3	0.13—0.15	5.6—7.3	< 1	Low.
—65	15—35	5—10	0.63—2.0	0.15—0.17	6.1—7.3	< 1	Low.
—60	15—30	5—10	0.63—2.0	0.10—0.12	6.1—7.3	< 1	Low.
—60	.....	(3)	0.63—2.0	0.11—0.15	6.1—7.3	< 1	Low.
—20	.....	.....	6.3—20.0	0.06—0.08	5.6—6.5	< 1	Low.
—10	.....	(3)	6.3—20.0+	0.05—0.07	5.6—6.0	< 1	Low.
—10	.....	(3)	6.3—20.0+	0.05—0.07	5.6—6.5	<1	Low.
—50	.....	(3)	2.0—6.3	0.10—0.12	7.9—9.0	1—15+	Low.
—45	.....	(3)	2.0—6.3	0.11—0.13	7.9—9.0	1—15	Low.
—15	.....	(3)	20.0+	0.06—0.08	7.9—9.0	4—15	Low.
—55	.....	(3)	2.0—6.3	0.13—0.15	7.9—9.0	1—15+	Low.
—75	15—35	5—10	0.63—2.0	0.16—0.18	7.9—9.0	1—15+	Low.
—35	.....	(3)	2.0—6.3	0.11—0.13	6.1—7.3	< 1	Low.
—60	10—25	5—10	0.63—2.0	0.16—0.18	6.6—7.8	< 1	Low.
—25	.....	(3)	2.0—6.3	0.10—0.12	6.1—7.8	< 1	Low.
—15	.....	(3)	6.3—20.0	0.06—0.08	6.1—7.8	< 1	Low.



perties—Continued

sing sieve—			Atterberg values		Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
Io. 10 0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	Liquid limit	Plastic index					
					Inches per hour	*Inches per inch of soil*	*pH value*	*Mmhos/cm at 25° C.*	
5—60	30—40	10—15	.....	(3)	2.0—6.3	0.08—0.10	6.1—7.8	<1	Low.
5—75	50—60	5—15	.....	(3)	6.3—20.0	0.06—0.08	6.1—7.8	<1	Low.
0—95	60—80	25—45	.....	(3)	2.0—6.3	0.10—0.12	7.9—8.4	0—4	Low.
100	90—100	75—85	30—40	10—30	0.2—0.63	0.18—0.20	7.9—8.4	0—4	Moderate.
100	90—95	35—45	.....	(3)	6.3—20.0	0.10—0.12	7.9—8.4	4—8	Low.
)—100	60—70	25—35	.....	(3)	2.0—6.3	0.11—0.13	6.1—7.3	<1	Low.
5—100	65—90	50—70	10—35	5—10	0.63—2.0	0.16—0.18	6.1—7.3	<1	Low.
5—100	85—95	60—75	25—35	15—20	0.2—0.63	0.15—0.19	6.1—7.3	<1	Moderate.
100	90—100	75—95	50—60	20—30	0.2—0.63	0.14—0.16	6.6—7.8	<1	High.
50—70	40—60	35—50	0—10	0—5	0.63—2.0	0.10—0.12	5.6—6.5	<1	Low.
100	70—85	35—50	.....	(3)	2.0—6.3	0.13—0.15	6.1—7.3	<1	Low.
100	90—100	70—90	55—75	20—45	<0.06	0.14—0.16	7.9—8.4	<1	High.
.....	.....	.....	.....	.....	<0.06	.....	7.9—8.4	.....	
5—100	85—95	65—75	20—30	10—20	0.2—0.63	0.17—0.19	8.5—9.0	<1	Moderate.
5—100	50—75	15—25	.....	(3)	6.3—20.0	0.07—0.10	6.6—8.4	<1	Low.
100	75—90	5—10	.....	(3)	20.0+	0.05—0.07	7.9—8.4	<1	Low.
5—100	50—75	15—25	.....	(3)	6.3—20.0	0.07—0.11	6.6—8.4	<1	Low.
5—100	60—70	25—35	.....	(3)	6.3—20.0	0.11—0.13	7.9—8.4	<1	Low.
75—90	50—70	35—50	.....	.....	2.0—6.3	0.11—0.13	6.1—7.3	>1	Low.
75—90	55—70	45—60	25—40	10—20	0.2—0.63	0.16—0.18	6.6—7.3	>1	Moderate.
.....	.....	.....	.....	.....	<0.06	.....	7.4—7.8	.....	
5—100	50—70	15—20	.....	(3)	6.3—20.0	0.06—0.08	5.6—7.3	>1	Low.
55—65	50—60	5—15	.....	(3)	6.3—20.0	0.04—0.06	5.6—6.1	>1	Low.
5—100	50—70	15—20	.....	(3)	6.3—20.0	0.06—0.08	5.6—7.3	>1	Low.

TABLE 5.—*Estimated*

oil series and ap symbols	Depth to— Bedrock or hardpan	Depth to— Seasonal high water table	Depth from surface (typical profile)	Classification: USDA texture	Classification: Unified	Classification: AASHO	Percentage: Larger than 3 inches	Percentage: No. 4 (4.7 mm.)
	Feet	*Feet*	*Inches*					
ville—continued C, MsD	> 5	(1)	0—20	Sandy loam	SM	A—2, A—4	100	95—100
			20—60	Loamy coarse sand.	SM	A—1, A—2	100	100
ta: MuE	1—2	(1)	0—9	Stony clay loam.	CL	A—6, A—7	75—95	75—95
			9—17	Clay	CH, MH	A—7	100	100
			17	Olivine basalt.				
len: D, OgE	> 5	(1)	0—48	Gravelly sandy loam.	GM, SM	A—1	85—100	65—80
			48—60	Gravelly loamy sand.	GM, SM	A—1	85—100	65—80
D	> 5	(1)	0—60	Fine sandy loam.	SM	A—4	100	90—100
appa: PaA, 2.	> 5	(1)	0—20	Fine sandy loam.	SM	A—4	100	100
			20—63	Loam	ML	A—4	100	100
ns: PeC, PgB, PgD2.	> 5	(1)	0—12	Loam and gravelly loam.	ML	A—4	100	85—100
			12—44	Gravelly clay loam.	CL	A—6	100	95—100
			44—60	Very gravelly sandy clay loam.	GC	A—2	60—90	40—50
tia: PlB, PlD,	> 5	(1)	0—18	Fine sandy loam and loam that is cobbly in places.	SM, ML	A—4	100	100
			18—39	Heavy clay loam.	CL,CH,MH	A—6, A—7	100	100
			39—57	Sandy clay loam.	CL	A—6	100	100
			57	Stratified alluvium.				
ville: C, PrD	> 5	(1)	0—66	Clay that is cobbly in places.	CH, MH	A—7	90—95	85—90
C, PtB, PvD2	3—4	(1)	0—36	Clay	CH, MH	A—7	90—95	85—90
			36	Calcareous marl or sandstone.				
na: aA, RaB2, RaB3, RaC2, RaC3, RaD2, RaD3, RaE3, ReC2, RmE3, RnD2, RnE3. (For properties of Buren soils in mapping units RmE3, RnD2, and RnE3, refer to Buren series in this table.	> 5	(1)	0—23	Sandy loam	SM	A—4	100	95—100
			23—68	Sandy clay loam.	SC,ML,CL	A—4, A—6	100	95—100
			68—74	Fine sandy loam.	SC	A—6	100	95—100

Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
Inches per hour	*Inches per inch of soil*	*pH value*	*Mmhos/cm at 25° C.*	
2.0—6.3	0.11—0.13	5.6—6.1	> 1	Low.
6.3—20.0	0.05—0.07	5.6—7.3	> 1	Low.
0.2—0.63	0.17—0.19	5.6—6.5	> 1	Moderate.
0.06—0.2	0.14—0.16	5.6—6.0	> 1	High.
2.0—6.3	0.07—0.09	5.6—6.5	> 1	Low.
2.0—6.3	0.05—0.07	5.6—6.5	> 1	Low.
2.0—6.3	0.13—0.15	5.6—6.5	> 1	Low.
2.0—6.3	0.13—0.15	6.1—7.3	> 1	Low.
0.63—2.0	0.16—0.18	7.4—8.4	> 1	Moderate.
0.63—2.0	0.15—0.17	6.1—7.3	> 1	Moderate.
0.06—0.2	0.13—0.15	6.1—7.3	> 1	Moderate.
0.63—2.0	0.10—0.12	6.1—7.3	> 1	Low.
0.63—2.0	0.13—0.15	5.6—6.5	> 1	Low.
< 0.06	0.04—0.06	6.6—8.4	1—4	High.
0.2—0.63	0.14—0.16	7.9—8.4	1—4	Moderate.
0.06—0.20	0.14—0.16	6.6—8.4	> 1	High.
0.06—0.20	0.14—0.16	7.4—8.4	1—8 +	High.
2.0—6.3	0.11—0.13	6.1—7.3	> 1	Low.
0.2—0.63	0.18—0.20	6.1—8.4	> 1	Low.
2.0—6.3	0.13—0.15	6.1—8.4	> 1	Low.

LE 5.—*Estimated*

	Percentage	
	Larger than inches	No. 4 (4.7 mm.)
	100	95—100
	100	95—100
	100	95—100
	100	95—100
	100	100
	100	100
	100	95—100
	—100	85—95
	—100	50—80
	)—75	30—40
	—100	80—100
	—100	70—95
	100	100
	100	95—100
	100	100
	100	100
	100	100
	100	100
	100	100
	100	100
	100	100
	0—90	70—80

values					
Plastic index	Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
	Inches per hour	*Inches per inch of soil*	*pH value*	*Mmhos/cm at 25° C.*	
(3)	2.0—6.3	0.11—0.13	6.1—7.3	>1	Low.
5—15	0.2—0.63	0.19—0.21	6.1—8.4	>1	Low.
(3)	2.0—6.3	0.13—0.15	7.4—8.4	>1	Low.
(3)	2.0—6.3	0.13—0.15	7.4—8.4	>1	Low.
(3)	2.0—6.3	0.06—0.08	7.4—8.4	>1	Low.
5—15	0.63—2.0	0.16—0.18	7.4—8.4	<1	Low.
5—10	0.63—2.0	0.16—0.18	6.6—8.4	<1	Low.
(3)	2.0—6.3	0.13—0.15	6.1—7.3	<1	Low.
(3)	6.3—20.0	0.05—0.07	6.1—7.8	<1	Low.
(3)	6.3—20.0	0.03—0.05	6.1—7.8	<1	Low.
5—10	0.63—2.0	0.14—0.18	6.1—6.5	<1	Moderate.
30—45	0.2—0.63	0.12—0.14	6.1—6.5	<1	Moderate.
5—10	0.63—2.0	0.16—0.18	6.1—7.3	<1	Moderate.
(3)	2.0—6.3	0.10—0.12	5.6—6.0	<1	Low.
(3)	6.3—20.0	0.05—0.07	5.6—6.0	<1	Low.
(3)	2.0—6.3	0.09—0.11	7.9—8.4	4—15	Low.
5—15	0.63—2.0	0.13—0.18	7.9—9.0+	4—15+	Low.
0—10	2.0—6.3	0.11—0.13	7.9—8.4	4—15+	Low.
10—20	0.2—0.63	0.16—0.20	7.9—9.0+	4—15+	Moderate.
(3)	6.3—20.0	0.06—0.08	6.6—7.8	<1	Low.
.....	6.3—20.0	0.05—0.07	6.1—7.8	<1	Low.
(3)	6.3—20.0	0.05—0.07	6.1—7.8	<1	Low.

TABLE 5.—*Estimated*

Soil series and map symbols	Depth to— Bedrock or hardpan	Depth to— Seasonal high water table	Depth from surface (typical profile)	USDA texture	Unified	AASHO	Percentage Larger than 3 inches	Percentage No. 4 (4.7 mm.)
Vallecitos: VaE3, VdF2.	1—1½	(1)	0—12	Loam	ML, CL	A—4	100	95—100
			12—20	Heavy clay loam.	CL	A—6, A—7	100	95—100
			20	Sandstone.				
Vallecitos, thick solum variant: VeC2, VeD2, VeF2.	1½—4	(1)	0—8	Loam	ML, CL	A—4	100	95—100
			8—27	Clay loam and sandy clay.	SC, CL	A—6, A—7	100	95—100
			27—48	Loam	ML, CL	A—4	100	95—100
			48	Sandstone.				
Visalia: VlC2, VmA, VmC.	>5	(1)	0—60	Sandy loam and fine sandy loam.	SM	A—2	100	100
Vista: VsC, VsD2, VsF2, VtF2.	1½—3	(1)	0—24	Coarse sandy loam that is gravelly in places.	SM	A—2	100	95—100
			24	Weathered granodiorite.				
Waukena:								
Wa, Wb, Wc	>5	>5	0—11	Loamy fine sand to fine sandy loam.	SM	A—2	100	100
			11—60	Clay loam	ML, CL	A—6, A—7	100	100
Wd	>5	>5	0—12	Loam to clay loam.	ML, CL	A—6, A—7	100	100
			12—36	Sandy clay	SC, CL	A—6	100	100
			36—60	Clay loam	ML, CL	A—6, A—7	100	100
Willows:								
Wf, Wg, Wh	>5	3—5	0—60	Silty clay	CH, MH	A—7	100	100
Wm, Wn	>5	3—5	0—42	Silty clay	CH, MH	A—7	100	100
			42	Cemented lenses.				
Wyman:								
WxD2	>5	(1)	0—12	Fine sandy loam.	SM	A—2	100	100
			12—36	Loam	ML, CL	A—6	100	100
			36—60	Coarse sandy loam.	SM	A—2	100	100
WyC2	>5	(1)	0—14	Loam	CL	A—6	100	100
			14—36	Clay loam	ML, CL	A—6	100	100
			36—50	Loam	CL	A—6	100	100
			50—60	Coarse sandy loam.	SM	A—2	100	100
Yokohl: YbC, YbD2, YbE3, YkE2.	1—3½	(1)	0—10	Loam that is cobbly in places.	ML, CL	A—4	100	100
			10—26	Clay	CH	A—7	100	100
			26	Indurated hardpan.				
Ysidora:								
YrD2	1—3	(1)	0—12	Very fine sandy loam.	ML	A—4	100	100
			12—29	Clay loam	CL	A—6	100	95—100
			29	Indurated hardpan.				
YsC2, YsE2, YsE3	1—3	(1)	0—12	Gravelly very fine sandy loam.	ML	A—4	90—100	85—95
			12—29	Gravelly clay loam.	ML, CL	A—6	90—100	85—95
			29	Indurated hardpan.				

[1] Depth not significant.
[2] Available water capacity is 0.10-0.12 for mapping unit AbF.
[3] [illegible]

berg values	Plastic index	Permeability	Available water capacity	Reaction	Salinity[1]	Shrink-swell potential
5	5—10	0.63—2.0	0.16—0.18	5.1—6.5	<1	Moderate.
5	10—20	0.2—0.63	0.19—0.21	5.1—6.5	<1	High.
5	5—10	0.63—2.0	0.16—0.18	6.1—7.3	<1	Moderate.
5	15—25	0.2—0.63	0.19—0.21	6.1—8.4	<1	High.
5	5—10	0.63—2.0	0.16—0.18	7.9—8.4	<1	Moderate.
...	(3)	2.0—6.3	0.11—0.15	5.6—7.8	<1	Low.
...	(3)	2.0—6.3	0.10—0.12	5.6—6.5	<1	Low.
...	(3)	2.0—6.3	0.09—0.11	7.9—9.0	4—15	Low.
)	10—30	0.06—0.02	0.19—0.21	7.9—9.0+	4—15	Moderate.
)	10—30	0.2—0.63	0.18—0.21	7.9—9.0	4—15	Moderate.
)	10—20	0.06—0.2	0.15—0.17	7.9—9.0	4—15+	High.
)	10—30	0.2—0.63	0.19—0.21	7.9—9.0+	4—15+	Moderate.
)	25—40	0.06—0.2	0.15—0.17	7.9—9.0+	4—15+	High.
)	25—40	0.06—0.2	0.15—0.17	7.9—9.0+	4—15+	High.
...	(3)	2.3—6.0	0.13—0.15	6.1—7.3	<1	Low.
	10—20	0.2—0.63	0.16—0.18	6.6—7.8	<1	Moderate.
...	(3)	2.3—6.0	0.10—0.12	7.4—8.4	<1	Low.
	10—20	0.63—2.0	0.16—0.18	6.1—7.3	<1	Moderate.
	10—20	0.2—0.63	0.19—0.21	6.6—7.8	<1	Moderate.
	10—20	0.63—2.0	0.16—0.18	7.4—8.4	<1	Moderate.
...	(3)	2.3—6.0	0.10—0.12	7.4—8.4	<1	Low.
	5—10	0.63—2.0	0.16—0.18	5.6—7.3	<1	Moderate.
	25—35	0.06—0.2	0.14—0.16	6.6—8.4	<4	High.
...	...	<0.06	...	7.9—8.4	...	
	0—10	0.63—2.0	0.15—0.17	5.6—6.5	<1	Low.
	10—20	0.2—0.63	0.19—0.21	5.6—6.5	<1	Moderate.
...	...	<0.06	...	6.6—7.8	...	
	0—10	2.0—6.3	0.13—0.15	5.6—6.5	<1	Low.
	10—20	0.2—0.63	0.17—0.19	5.6—6.5	<1	Moderate.
...	...	<0.06	...	6.6—7.8	...	...

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TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—			Hydrologic soil group	Soil
	Topsoil	Sand and gravel	Road fill		Road location
Bull Trail: BsC2, BsD2, BsE3, BtD2, BtE3.	Good: In all units except BtD2 and BtE3, which have a stony surface layer.	Unsuitable: Mostly more than 50 percent fines.	Good	B	Moderate shrink-swell potential; moderately steep slopes in places.
Buren: BuC2, BuD2, BvD3, BxC2.	Fair: Moderately deep tp deep; clay loam below a depth of 12 inches.	Unsuitable: More than 50 percent fines.	Poor: A—6	C	Moderate shrink-swell potential; slopes to 15 percent.
Cajalco: CaC2, CaD2, CaF2, CbD2, CbF2.	Good to fair in units CaC2, CaD2, and CaF2, moderately deep to deep to rock; poor in units CbD2 and CbF2, rock out crops.	Poor to unsuitable for sand, 25 to 50 percent fines; unsuitable for gravel, less than 25 percent gravel.	Good to poor: A—2, A—6.	C	Moderate shrink-swell potential; steep slopes; gabbro at a depth of 18 to 46 inches.
Calpine: CcC2, CcD2, CdC2	Good	Fair to poor for sand, 10 to 45 percent fines; unsuitable for gravel, less than 25 percent gravel.	Good	B	Most features favorable.
Chino: Ce, Cf, Cg	Fair to poor: Slightly to strongly saline-alkali.	Unsuitable: More than 50 percent fines.	Poor: A—6	B—C	Moderate shrink-swell potential; water table at a depth of 1½ to 5 feet.
Cieneba: ChC, ChD2, ChF2, CkD2, CkF2.	Poor: Shallow to rock.	Good to poor for sand, 15 to 35 percent fines; poor to unsuitable for gravel, 0 to 40 percent gravel.	Good	C	Rock at a depth of 10 to 22 inches; steep slopes in places.
Cortina: ClC, CmC, CnC, CoA, CpA, CrD.	Poor: Many pebbles and cobblestones.	Good for sand and gravel.	Good	A	Slopes to 15 percent; units CmC and ClC subject to flooding.
Crafton: CsF2, CtF2, CuE	Poor: Stony and moderately deep.	Good to poor: 20 to 30 percent fines; 10 to 40 percent gravel.	Good	C	Rock at a depth of 20 to 36 inches; steep slopes in places.
Crouch: CvD2, CwD2, CwE2, CyE2, CyF2.	Fair to poor: Moderately deep to deep.	Poor for sand, 20 to 30 percent fines; unsuitable for gravel, less than 25 percent gravel.	Good	C	Rock at a depth of 22 to 46 inches; steep slopes in places.

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TABLE 6.—*Engineering*

as source of—		Hydrologic soil group	Soil
and gravel	Road fill		Road location
poor for 15 to 35 nt fines; table for , less than percent .	Good	A	Slopes to 15 percent ..
poor for 15 to 30 nt fines; able for , less than percent ; poor for in all ex- units DnB rA, which to 30 per- ravel.	Good	A—C	Subject to blowing by wind; water table at a depth of 1 to 4 feet.
ble: More 50 percent	Fair: A—4	C	Moderate shrink-swell potential; hardpan at a depth of 20 to 42 inches; water table at a depth of 2½ to 5 feet in places.
itable: than 50 ent fines.	Fair: A—4	C	Rock at a depth of 24 to 50 inches; steep slopes in places.
ble: Most- re than 50 ent fines.	Fair: A—4	C	Moderate shrink-swell potential; hardpan at a depth of 20 to 54 inches.
poor for 15 to 50 ent fines; table for , less than percent .	Good	B—C	Moderate shrink-swell potential; rock at a depth of 10 to 36 inches; steep slopes in places.
r sand, 35 0 percent ; unsuit- for gravel, than 25 nt gravel.	Fair: A—4	D	Rock at a depth of 10 to 20 inches; steep slopes in places.
able for , mostly than 50 ent fines; table for in units GaC, and , less than percent ; poor for in units GdC, and , 20 to 35 nt gravel.	Fair: A—4	B	Most features favor- able.

interpretations—Continued

features affecting—				Soil limitations for use as a septic tank filter field
Water retention		Agricultural drainage	Irrigation	
Embankments	Reservoir area			
Fair stability; slight compressibility; poor resistance to piping.	Rapid permeability; slopes to 15 percent.	Drainage not needed	Moderate available water capacity; very rapid intake rate; slopes to 15 percent.	Slight to moderate on 0 to 5 percent slopes; severe on 5 to 15 percent slopes.
Fair stability; slight compressibility; poor resistance to piping.	Moderately rapid to rapid permeability; water table at a depth of 1 to 4 feet.	Moderately rapid to rapid permeability; water table at a depth of 1 to 4 feet.	Low to moderate available water capacity; very rapid intake rate; slight to strong salinity.	Severe: Flooding; water table.
Poor to good stability; medium to high compressibility; poor to good resistance to piping.	Moderate permeability over very slow permeability; hardpan at a depth of 20 to 42 inches; water table at a depth of 2½ to 5 feet in places.	Moderate permeability over very slow permeability; hardpan at a depth of 20 to 42 inches; water table at a depth of 2½ to 5 feet in places.	Moderate available water capacity; medium intake rate; units Dt, Dv, and Dw are moderately to strongly saline-alkali.	Severe: Depth to hardpan; permeability; water table.
Poor to good stability; medium to high compressibility; poor to good resistance to piping.	Moderate permeability; rock at a depth of 24 to 50 inches; steep slopes in places.	Drainage not needed	Low available water capacity; rapid intake rate; steep slopes in places.	Severe: Depth to rock; slope.
Poor to good stability; medium to high compressibility; poor to good resistance to piping.	Moderate permeability over very slow permeability; hardpan at a depth of 20 to 54 inches.	Moderate permeability over very slow permeability; hardpan at a depth of 20 to 54 inches.	Low to moderate available water capacity; medium intake rate; unit EoB slightly saline-alkali.	Severe: Depth to hardpan.
Fair stability; slight compressibility; poor to good resistance to piping.	Moderate permeability; rock at a depth of 10 to 36 inches; steep slopes in places.	Drainage not needed	Low to moderate available water capacity; medium intake rate; steep slopes in places.	Severe: Depth to bedrock; slope.
Fair stability; slight compressibility; poor resistance to piping.	Moderately rapid permeability; rock at a depth of 10 to 20 inches; steep slopes in places.	Drainage not needed	Low to very low available water capacity; rapid intake rate; steep slopes in places.	Severe: Depth to bedrock; slope.
Poor to good stability; medium to high compressibility; poor to good resistance to piping.	Moderate permeability; slopes to 15 percent.	Drainage not needed	Moderate to high available water capacity; medium intake rate; slopes to 15 percent.	Slight to moderate on 0 to 8 percent slopes, permeability and slope; severe on 8 to 15 percent slopes, slope.

	Soil limitations for use as a septic tank filter field
ıvail- city; rate; teep	Severe: Slope; depth.
.vail- city; rate; :ent.	Slight to moderate for units GhC, and GlC, slope; GhD, moderate to severe for units GkD, GmD, GnD, slope; flooding.
vail- city; rate; y sa-	Slight for units GoB, GwA, GsB, GxA, GtA, GpB, GrB; moderate for unit GvB, water table; moderate to severe for unit GtD, slope; severe for unit GuB, water table.
r ca- in- ıtely ıces.	Slight on 0 to 5 percent slopes; moderate on 5 to 8 percent slopes; severe on 8 to 25 percent slopes.
vail- city; rate; :ent.	Slight on 0 to 8 percent slopes; severe on 8 to 15 percent slopes.
ıvail- city;	Slight for unit HlA; moderate for unit HlC, slope; severe for unit HhA2, moderately slow permeability.
.vail- city; e in- ıtely ıces.	Slight on 0 to 5 percent slopes; moderate on 5 to 8 percent slopes; severe on 8 to 25 percent slopes.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as source of—			Hydrologic soil group	Soil
	Topsoil	Sand and gravel	Road fill		Road location
Las Posas: LaC, LaC2, LaD2, LaE3, LcD2, LkD2, LkF3.	Poor: Shallow to clay.	Unsuitable: More than 50 percent fines.	Poor: A—6, A—7; stony in places.	C	High shrink-swell potential; rock at a depth of 10 to 45 inches; steep slopes in places.
Lodo: LoF2, LpE2, LpF2	Poor: Shallow to rock.	Unsuitable for sand, more than 50 percent fines; poor for gravel, 30 to 50 percent gravel.	Fair: A—4	D	Rock at a depth of 8 to 15 inches; steep slopes in places.
Madera: MaA, MaB2, MaD2, MbC2.	Poor: Shallow to clay.	Unsuitable: Mostly more than 50 percent fines.	Fair to poor: A—4, A—6, A—7.	D	High shrink-swell potential; hardpan at a depth of 10 to 36 inches; slopes to 15 percent.
Metz: MdC, MeD, MfA, MgB, MhB, MlD.	Poor: Sandy, gravelly, and subject to flooding.	Good to fair for sand, 5 to 35 percent fines; poor to unsuitable for gravel, 0 to 50 percent gravel.	Good	A	Occasional to frequent flooding.
Monserate: MmB, MmC2, MmD2, MmE3, MnD2, MnE3.	Poor: Shallow to moderately deep to hardpan; sandy clay loam subsoil.	Unsuitable: Mostly more than 50 percent fines.	Good to fair: A—4, A—6.	C	Moderate shrink-swell potential; hardpan at a depth of 10 to 36 inches; steep slopes in places.
Mottsville: MoC, MoD, MrE, MsC, MsD, MtE2.	Poor: Loamy sand that is cobbly in places.	Good to poor for sand, 0 to 45 percent fines; poor to unsuitable for gravel, 0 to 50 percent gravel.	Good	A	Moderately steep slopes in places; unit MrE subject to frequent flooding.
Murrieta: MuE	Poor: Stony and shallow to rock.	Unsuitable: More than 50 percent fines.	Poor: A—6, A—7.	D	High shrink-swell potential; rock at a depth of 12 to 20 inches; moderately steep slopes.
Oak Glen: OgD, OgE, OkD	Good in unit OkD; fair in units OgD and OgE, gravelly.	Good to poor for sand, 5 to 50 percent fines; poor to unsuitable for gravel, 5 to 50 percent gravel.	Good	B	Moderately steep slopes in places.
Pachappa: PaA, PaC2	Good	Unsuitable: Mostly more than 50 percent fines.	Fair: A—4	B	Most features favorable.
Perkins: PeC, PgB, PgC, PgD2 ..	Poor: Clay loam below a depth of 12 inches; gravelly.	Unsuitable for sand to a depth of 44 inches; fair below, 15 to 20 percent fines; good to unsuitable for gravel, 15 to 80 percent gravel.	Good to poor: A—4, A—6, A—6.	C	Slopes to 15 percent ...

oir area	Agricultural drainage	Irrigation	Soil limitations for use as a septic tank filter field
permeability; a depth of 10 inches; steep places.	Drainage not needed	Low to moderate available water capacity; moderate to slow intake rate; steep slopes in places.	Severe: Moderately slow permeability.
permeability; a depth of 8 inches; steep places.	Drainage not needed	Low available water capacity; rapid intake rate; steep slopes in places.	Severe: Depth to bedrock; slope.
permeability; at a depth of 36 inches; 15 percent.	Very slow permeability; hardpan at a depth of 10 to 36 inches; slopes to 15 percent.	Low to moderately low available water capacity; moderate intake rate; slopes to 15 percent.	Severe: Very slow permeability.
ery rapid per- y; slopes to nt.	Drainage not needed	Low to moderate available water capacity; rapid intake rate; slopes to 15 percent.	Slight on 0 to 5 percent slopes; moderate on 5 to 8 percent slopes; severe on 8 to 15 percent slopes; unit MeD subject to flooding on all slopes.
slow perme- ver very slow ility; hardpan h of 10 to 36 moderately pes in places.	Moderately slow permeability over very slow permeability; hardpan at a depth of 10 to 36 inches; moderately steep slopes in places.	Low to moderate available water capacity; moderate to rapid intake rate; moderately steep slopes in places.	Severe: Very slow permeability.
ermeability; pes in places.	Drainage not needed	Low to moderate available water capacity; rapid to very rapid intake rate; moderately steep slopes in places.	Moderate on 2 to 8 percent slopes; severe on 8 to 25 percent slopes.
eability; rock h of 12 to 20 moderately pes.	Drainage not needed	Low available water capacity; slow intake rate; moderately steep slopes.	Severe: Slow permeability.
rapid per- ; moderately pes in places.	Drainage not needed	Moderate available water capacity; rapid to moderate intake rate; moderately steep slopes in places.	Severe: Slope.
permeability ..	Drainage not needed	High available water capacity; moderate intake rate.	Moderate: Moderate permeability.
rmeability; 15 percent.	Slow permeability	Moderate to high available water capacity; moderate intake rate; slopes to 15 percent.	Severe: Slow permeability.

TABLE 6.—*Engineering*

Suitability as source of—			Hydrologic soil group	Soil
psoil	Sand and gravel	Road fill		Road location
Shallow ıy.	Unsuitable: Mostly more than 50 percent fines.	Poor to fair: A—4, A—6.	D	High shrink-swell potential; moderately steep slopes in places.
Clay	Unsuitable: More than 50 percent fines.	Poor: A—7 ...	D	High shrink-swell potential; unit PrD cobbly; slopes to 15 percent.
Clay	Unsuitable: More than 50 percent fines.	Poor: A—7 ...	D	High shrink-swell potential; rock or sediment at a depth of 24 to 42 inches; slopes to 15 percent.
Clay loam ' a depth inches.	Fair to unsuitable: 35 to 55 percent fines.	Fair to poor: A—4, A—6.	B	Steep slopes in places ..
Moderdeep; clay below a ı of 12 s.	Unsuitable: More than 40 percent fines.	Fair to poor: A—4, A—6.	C C	Low shrink-swell potential; unrelated sediment at a depth of 15 to 42 inches; steep slopes in places.
.....	Unsuitable: All units more than 50 percent fines, except unit SfA, which is 15 to 20 percent fines and fair for sand.	Good to poor: A—4, A—6.	B	Subject to occasional to frequent flooding; slopes to 15 percent.
Moderdeep.	Unsuitable: More than 50 percent fines.	Fair: A—4	C	Soft sandstone at a depth of 20 to 30 inches; steep slopes.
Shallow ck.	Unsuitable: More than 50 percent fines.	Fair: A—4	C	Rock at a depth of 10 to 20 inches; steep slopes.
Stony, y, and very lly sand.	Good for sand and gravel.	Good	A	Subject to flooding; moderately steep slopes in places; cobbly and stony.
Moderdeep.	Unsuitable: More than 50 percent fines.	Fair to poor: A—4, A—7.	C	Moderate shrink-swell potential; conglomerate at a depth of 20 to 36 inches; steep slopes.

Irrigation	Soil limitations for use as a septic tank filter field
w available water capacity; moderate intake rate; moderately teep slopes in places.	Severe: Very slow permeability.
derate to high available water capacity; low intake rate; lopes to 15 percent.	Severe: Slow permeability.
w to moderate available water capacity; low intake rate; lopes to 15 percent.	Severe: Slow permeability.
gh available water capacity; moderate intake rate; steep slopes n places.	Severe: Moderately slow permeability.
w to moderate available water capacity; moderate intake rate; steep slopes in places.	Severe: Moderately slow permeability.
derate to high available water capacity; moderate intake rate; slopes to 15 percent.	Slight on units SeA, SfA, SgA; moderate on units SeC2 and SgC, slope; severe on units SdD, SeD2, and SgD2, slope.
w available water capacity; moderate intake rate; steep slopes.	Severe: Depth to bedrock; slope.
ry low to low available water capacity; rapid intake rate; steep slopes.	Severe: Depth to bedrock; slope.
w available water capacity; very rapid ntake rate; moderately steep slopes in places.	Severe: Slope.
ry low to low available water capacity; moderate intake rate; steep slopes.	Severe: Moderately slow permeability; slope.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability as a source of—			Hydrologic soil group	Soil
	Topsoil	Sand and gravel	Road fill		Road location
Temescal: TaF2, TbF2	Poor: Shallow to rock.	Unsuitable: More than 50 percent fines.	Fair: A—4	D	Moderate shrink-swell potential; rock at a depth of 10 to 20 inches; steep slopes.
Tollhouse: TfF2, ThD2, ThE2	Poor: Shallow to rock.	Good to fair for sand, 0 to 30 percent fines; poor to unsuitable for gravel, 5 to 30 percent gravel.	Good	D	Rock at a depth of 10 to 20 inches; steep slopes in places.
Traver: Tp2, Tr2, Ts, Tt2	Poor: Slightly to strongly saline-alkali.	Poor to unsuitable for sand, mostly more than 40 percent fines; unsuitable for gravel, less than 25 percent gravel.	Fair to poor: A—4, A—6, A—7.	B—C	Most features favorable.
Tujunga: TuB, TvC, TwC	Poor: Sand and gravelly sand.	Good to fair for sand, 0 to 20 percent fines; poor to unsuitable for gravel, 0 to 50 percent gravel.	Good	A	Subject to flooding
Vallecitos: VaE3, VdF2	Poor: Shallow to rock.	Unsuitable: More than 50 percent fines.	Fair to poor: A—4, A—6.	D	High shrink-swell potential; rock at a depth of 10 to 20 inches; steep slopes.
Vallecitos, thick solum variant: VeC2, VeD2, VeF2.	Poor: Sandy clay at a depth of 8 inches.	Unsuitable: More than 45 percent fines.	Fair to poor: A—4, A—6, A—7.	C	High shrink-swell potential; rock at a depth of 20 to 50 inches; steep slopes in places.
Visalia: VlC2, VmA, VmC	Good	Poor for sand, 25 to 35 percent fines; unsuitable for gravel, less than 25 percent gravel.	Good	C	Most features favorable.
Vista: VsC, VsD2, VsF2, VtF2	Fair: Moderately deep	Poor for sand, 25 to 35 percent fines; unsuitable for gravel, less than 25 percent gravel.	Good	B	Rock at a depth of 20 to 36 inches; steep slopes in places.
Waukena: Wa, Wb, Wc, Wd	Poor: Saline-alkali.	Unsuitable: Mostly more than 50 percent fines.	Poor: A—6, A—7.	D	Most features favorable.
Willows:					
Wf, Wg, Wh	Poor: Silty clay	Unsuitable: More than 50 percent fines.	Poor: A—7	D	High shrink-swell potential.
Wm, Wn	Poor: Silty clay	Unsuitable: More than 50 percent fines.	Poor: A—7	D	High shrink-swell potential; cemented lenses at a depth of 36 to 48 inches.

Irrigation	Soil limitations for use as a septic tank filter field
ery low to low available water capacity; moderate intake rate; steep slopes.	Severe: Depth to bedrock; slope.
ery low to low available water capacity; rapid intake rate; steep slopes in places.	Severe: Depth to bedrock; slope.
igh available water capacity; moderate intake rate; slightly to strongly saline-alkali.	Severe: Moderate and moderately slow permeability.
ow available water capacity; rapid intake rate.	Slight in unit TuB; moderate in unit TwC, slope; severe in unit TvC, flooding.
ow available water capacity; moderate intake rate; steep slopes.	Severe: Depth to bedrock; slope.
ow to moderate available water capacity; moderate intake rate; steep slopes in places.	Severe: Moderately slow permeability.
igh available water capacity; moderate intake rate.	Slight on unit VmA; moderate on units VlC2 and VmC, slope.
ow to moderate available water capacity; rapid intake rate; steep slopes in places.	Severe: Depth to bedrock; slope.
Moderate to high available water capacity; rapid to moderate intake rate; slightly to strongly saline-alkali.	Severe: Slow permeability.
High available water capacity; very slow intake rate; slightly to strongly saline-alkali.	Severe: Slow permeability.
Moderate available water capacity; very slow intake rate; moderately to strongly saline-alkali.	Severe: Slow permeability.

TABLE 6.—*Engineering*

Hydrologic soil group	Soil
	Road location
B	Moderate shrink-swell potential; slopes to 15 percent.
D	High shrink-swell potential; hardpan at a depth of 10 to 40 inches; steep slopes in places.
C	Moderate shrink-swell potential; hardpan at a depth of 10 to 36 inches; moderately steep slopes in places.

a source of sand and gravel, their
of construction material was con-
r specific engineering use of the
d by onsite investigation. The suit-
use as road fill was based on esti-
te soil properties and on test data

scientists have classified the soil
into four hydrologic groups. The
imates of the intake of water dur-
storm of long duration, after the
has an opportunity to swell, with-
t of any vegetation. Also consid-
easonal high water table and to a
. The grouping is tentative and
further data and experience are
s are:

ff potential: This group consists
apid infiltration rate even when
se soils are mainly deep, are well
drained, and consist of sand,

ly low runoff potential: This
that have a moderate infiltration
etted. These soils are mostly mod-
moderately well drained to well
ely fine textured to moderately
also have moderately slow per-
ly rapid permeability, and they
f water transmission.

ly high runoff potential: This
that have a slow infiltration rate
d. Most of these soils have a layer
d movement of water, have mod-
ne texture, and have a water table
hey are mostly well drained and
d, but some are somewhat poorly
y have slowly permeable to very

Soil limitations for use as a septic tank filter field
Severe: Moderately slow permeability.
Severe: Slow over very slow permeability.
Severe: Moderately slow over very slow permeability.

light," moderate," or
on permeability, slope,
rainage, and hazard of
ıe septic soil absorption
the site. It consists of
that effluent from the
sonable uniformity into

onal development, the
for such use must be
ımon properties affect-
ional purposes are tex-
lrainage; flooding; the
on the soils; and depth
ther restrictive layers.
cteristics, soil scientists
of the Western River-
amp areas, and picnic
of the soil limitations
vn in table 7.
specified uses have been
e. The soil features are
ratings. Not considered
rtation lines, the water
rating of *slight* means
ıtions for the use speci-
that the soil has one or
for the purpose speci-
ctors increases the cost
necessary practices. A
l has one or more prop-
r the purpose specified.
factors is possible, but
in cost.

.E 7.—*Soil interpretations for recreational uses*

Recreational uses		
Play areas	Camp areas	Picnic areas
re: Clay	Severe: Clay	Severe: Clay.
re: Clay	Severe: Clay	Severe: Clay.
re: Clay	Severe: Clay	Severe: Clay.
re: Cobbly clay	Severe: Cobbly clay	Severe: Cobbly clay.
re: Slopes more than 5 rcent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
t	Slight	Slight.
re: Slopes more than 5 rcent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
re: Slopes more than 5 rcent.	Moderate: Moderately slow permeability.	Moderate: Gravelly loam.
re: Slopes more than 5 rcent.	Severe: Slopes more than 9 percent.	Moderate: Gravelly loam.
re: Slopes more than 15 rcent.	Severe: Slopes more than 15 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Moderate: Slopes to 8 percent.	Moderate: Slopes to 8 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes to 25 percent.	Severe: Slopes to 25 percent.	Severe: Slopes to 25 percent.
re: Slopes more than 5 rcent.	Moderate: Moderately slow permeability.	Moderate: Gravelly clay loam.
erate: Moderately deep..	Slight	Slight.
re: Slopes more than 5 rcent.	Moderate: Slopes to 8 percent.	Moderate: Slopes to 8 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
t	Slight	Slight.
re: Slopes more than 5 rcent.	Moderate: Slopes to 8 percent.	Moderate: Slopes to 8 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
erate: Slopes to 5 percent.	Slight	Slight.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 5 to 15 percent.
re: Slopes more than 5 rcent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
re: Slopes more than 5 rcent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Clay	Severe: Clay	Severe: Clay.
re: Clay	Severe: Clay	Severe: Clay.
re: Cobbly clay	Severe: Cobbly clay	Severe: Cobbly clay.
ere: Very shallow to ck.	Severe: Very shallow ro rock.	Severe: Very shallow to rock.
re: Poorly drained	Severe: Poorly drained	Severe: Poorly drained.
ere: Very slow permeability.	Severe: Very slow permeability.	Moderate: Slopes 2 to 8 percent.

Continued

uses	
s	Picnic areas
v perme-	Moderate: Slopes 8 to 15 percent.
.....	Severe: Clay.
.....	Severe: Clay.
.....	Slight.
to 8 per-	Moderate: Slopes 2 to 8 percent.
lust prob-	Severe: Silt loam dust problem.
re than 8	Moderate: Slopes 8 to 15 percent.
ely deep..	Moderate: Slopes 5 to 8 percent.
re than 8	Severe: Slopes more than 15 percent.
re than 8	Moderate: Slopes 8 to 15 percent.
re than 8	Severe: Slopes more than 15 percent.
ely deep..	Moderate: Slopes 2 to 8 percent.
re than 8	Moderate: Slopes 8 to 15 percent.
re than 8	Moderate: Slopes 8 to 15 percent.
ely deep..	Moderate: Slopes 2 to 8 percent.
re than 8	Moderate: Slopes 8 to 15 percent.
to 8 per-	Moderate: Slopes 2 to 8 percent.
re than 8	Severe: Slopes more than 15 percent.
o 15 per-	Moderate: Slopes 5 to 15 percent.
re than 8	Severe: Slopes more than 15 percent.
to 8 per-	Moderate: Slopes 2 to 8 percent.
re than 8	Moderate: Slopes 8 to 15 percent.
to 8 per-	Moderate: Slopes 2 to 8 percent.
lust prob-	Severe: Silt loam dust problem.
lust prob-	Severe: Silt loam dust problem.
ned	Severe: Poorly drained.
re than 8	Severe: Slopes more than 15 percent.
re than 8	Severe: Rocky.
.....	Moderate: Slopes 5 to 8 percent.
re than 8	Moderate: Slopes 8 to 15 percent.
re than 8	Severe: Slopes more than 15 percent.
coarse	Moderate: Slopes 2 to 8 percent.
loamy	Moderate: Gravelly loamy sand.
loamy	Moderate: Cobbly loamy sand.
ipid per-	Slight.
y sandy	Slight.
.....	Moderate: Cobbly.

Soil interpretations for recreational uses—Continued

Recreational uses		
Play areas	Camp areas	Picnic areas
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Fine sand	Severe: Fine sand	Severe: Fine sand.
erate: Loamy fine sand ..	Moderate: Loamy fine sand..	Moderate: Loamy fine sand.
erate: Loamy fine sand ..	Moderate: Loamy fine sand..	Moderate: Loamy fine sand.
erate: Loamy sand	Moderate: Loamy sand	Moderate: Loamy sand.
re: Poorly drained	Severe: Poorly drained	Severe: Poorly drained.
erate: Loamy sand	Moderate: Loamy sand	Moderate: Loamy sand.
erate: Loamy fine sand ..	Moderate: Loamy fine sand ..	Moderate: Loamy fine sand.
erate: Loamy fine sand ..	Moderate: Loamy fine sand ..	Moderate: Loamy fine sand.
re: Silt loam dust prob- n.	Severe: Silt loam dust problem.	Severe: Silt loam dust problem.
erate: Moderately deep ..	Moderate: Moderately deep ..	Moderate: Somewhat poorly drained.
erate: Moderately deep ..	Moderate: Moderately deep ..	Moderate: Somewhat poorly drained.
re: Silt loam dust prob- n.	Severe: Silt loam dust problem.	Severe: Silt loam dust p roblem.
re: Silt loam dust prob- n.	Severe: Silt loam dust problem.	Severe: Silt loam dust problem.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes more than 5 rcent.	Moderate: Moderately deep ..	Moderate: Slopes 2 to 8 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
erate: Moderately deep.	Moderate: Moderately deep ..	Slight.
re: Slopes more than 5 rcent.	Moderate: Moderately deep ..	Moderate: Slopes 2 to 8 percent.
erate: Moderately deep ..	Moderate: Moderately deep ..	Slight.
ıt	Slight	Slight.
re: Slopes more than 5 rcent.	Moderate: Moderately deep ..	Moderate: Slopes 2 to 8 percent.
erate: Moderately deep ..	Moderate: Moderately deep ..	Slight.
erate: Slopes 0 to 5 per- nt.	Slight	Slight.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
re: Slopes more than 5 rcent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
ere: Shallow to athered rock.	Severe: Shallow to weathered rock.	Moderate: Slopes 5 to 8 percent.
ere: Shallow to athered rock; rocky.	Severe: Shallow to weathered rock; rocky.	Severe: Slopes more than 15 percent.

Table 7.—*Soil interpretations for recreational uses—Continued*

Soil name	Recreational uses		
	Play areas	Camp areas	Picnic areas
ky sandy loam, shal- 15 percent slopes,	Severe: Shallow to weathered rock; rocky.	Severe: Shallow to weathered rock; rocky.	Moderate: Rocky.
ky sandy loam, 15 to lopes, eroded.	Severe: Shallow to weathered rock; rocky.	Severe: Shallow to weathered rock; rocky.	Severe: Slopes more than 15 percent.
sandy loam, 2 to 8 es, eroded.	Severe: Slopes more than 5 percent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
sandy loam, shallow, ent slopes, eroded.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
ine sandy loam, 25 to lopes, eroded.	Severe: Shallow to weathered rock; rocky.	Severe: Shallow to weathered rock; rocky.	Severe: Slopes more than 15 percent.
fine sandy loam, 8 to lopes, eroded.	Severe: Shallow to weathered rock; rocky.	Severe: Shallow to weathered rock; rocky.	Severe: Slopes to 25 percent.
ndy loam, 5 to 25 es, eroded.	Severe: Shallow to weathered rock.	Severe: Shallow to weathered rock.	Severe: Slopes to 25 percent.
velly very fine sandy percent slopes.	Severe: Slopes more than 5 percent.	Moderate: Gravelly very fine sandy loam.	Moderate: Gravelly very fine sandy loam.
y fine sandy loam, 0 slopes.	Slight	Slight	Slight.
y fine sandy loam, 2 slopes.	Severe: Slopes more than 5 percent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
y fine sandy loam, 8 t slopes, eroded.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
velly very fine sandy percent slopes.	Moderate: Gravelly very fine sandy loam.	Moderate: Gravelly very fine sandy loam.	Moderate: Gravelly very fine sandy loam.
velly very fine sandy 15 percent slopes,	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Gravelly very fine sandy loam.
ine sandy loam, 15 to lopes, eroded.	Severe: Shallow to rock	Severe: Shallow to rock	Severe: Slopes more than 15 percent.
fine sandy loam, 25 ent slopes, severely	Severe: Shallow to rock; rocky.	Severe: Shallow to rock; rocky.	Severe: Slopes more than 15 percent.
y very fine sandy 50 percent slopes,	Severe: Shallow to rock; rocky.	Severe: Shallow to rock; rocky.	Severe: Slopes more than 15 percent.
elly loamy fine sand, ent slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 2 to 15 percent.
ny sand, 0 to 8 per-	Severe: Slopes more than 5 percent.	Moderate: Loamy sand	Moderate: Loamy sand.
my sand, 8 to 15 es.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Loamy sand.
ny sand, channeled, 2 t slopes.	Severe: Flooded	Severe: Flooded	Severe: Flooded.
ny sand, deep, 2 to 8 es.	Severe: Slopes more than 5 percent.	Moderate: Loamy sand	Moderate: Loamy sand.
ly loamy fine sand, 2 t slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 2 to 15 percent.
amy fine sand, drain- rcent slopes.	Moderate: Slopes 0 to 5 percent.	Slight	Slight.
ndy loam, drained, 0 to 5 percent	Moderate: Slopes 0 to 5 percent.	Slight	Slight.
ndy loam, sandy sub- ined, 0 to 5 percent	Moderate: Slopes 0 to 5 percent.	Slight	Slight.
ndy loam, sandy sub- ined, saline-alkali, 0 slopes.	Moderate: Slopes 0 to 5 percent.	Slight	Slight.
fine sandy loam, 2 percent slopes.	Slight	Slight	Slight.
fine sandy loam, o 15 percent slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 5 to 15 percent.
e sandy loam, poorly ne-alkali, 0 to 5 per-	Severe: Poorly drained	Severe: Poorly drained	Severe: Poorly drained.
e sandy loam, saline- percent slopes.	Moderate: Somewhat poorly drained.	Moderate: Somewhat poorly drained.	Moderate: Somewhat poorly drained.
e sandy loam, loamy drained, 0 to 2 per-	Moderate: Dust problem	Moderate: Dust problem	Moderate: Dust problem.

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Table 7.—*Soil interpretations for recreational uses—Continued*

Soil name	Recreational uses		
	Play areas	Camp areas	Picnic areas
oamy fine sand, gravelly substratum, 0 to 5 percent s.	Moderate: Loamy fine sand ..	Moderate: Loamy fine sand ..	Moderate: Loamy fine sand.
amy fine sand, sandy loam ratum, 0 to 5 percent slopes.	Moderate: Loamy fine sand ..	Moderate: Loany fine sand ...	Moderate: Loamy fine sand.
oamy sand, 2 to 8 percent s.	Moderate: Loamy sand	Moderate: Loamy sand	Moderate: Loamy sand.
oamy sand, channeled, 0 to rcent slopes.	Severe: Flooded	Severe: Flooded	Severe: Flooded.
ravelly sandy loam, 2 to 15 nt slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 2 to 15 percent.
ate sandy loam, 5 to 8 per- slopes, eroded.	Severe: Slopes more than 5 percent.	Moderate: Moderately deep..	Moderate: Slopes 5 to 8 percent.
ate sandy loam, 0 to 5 per- slopes.	Moderate: Moderately deep ..	Moderate: Moderately deep..	Slight.
ate sandy loam, 8 to 15 nt slopes, eroded.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
ate sandy loam, 15 to 25 nt slopes, severely eroded.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
ate sandy loam, shallow, 5 percent slopes, eroded.	Severe: Shallow to hardpan...	Severe: Shallow to hardpan...	Moderate: Slopes 5 to 15 percent.
ate sandy loam, shallow, 15 5 percent slopes, severely d.	Severe: Shallow to hardpan...	Severe: Shallow to hardpan...	Severe: Slopes more than 15 percent.
ille loamy sand, 2 to 8 per- slopes.	Severe: Slopes more than 5 percent.	Moderate: Loamy sand	Moderate: Loamy sand.
ille loamy sand, 8 to 15 nt slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Loamy sand.
ille cobbly loamy sand, 8 to rcent slopes.	Severe: Flooded	Severe: Flooded	Severe: Flooded.
ille sandy loam, 2 to 8 per- slopes.	Severe: Slopes more than 5 percent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
ille sandy loam, 8 to 15 nt slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
ille cobbly sandy loam, 8 to rcent slopes, eroded.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
a stony clay loam, 2 to 25 nt slopes.	Severe: Slow permeability.....	Severe: Slow permeability.....	Severe: Slopes more than 15 percent.
en fine sandy loam, 5 to 15 nt slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 5 to 15 percent.
en gravelly sandy loam, 8 to rcent slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
len gravelly sandy loam, 15 percent slopes.	Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
pa fine sandy loam, 2 to 8 nt slopes, eroded.	Severe: Slopes more than 5 percent.	Moderate: Slopes 2 to 8 percent.	Moderate: Slopes 2 to 8 percent.
pa fine sandy loam, 0 to 2 nt slopes.	Slight	Slight	Slight.
gravelly loam, 5 to 8 per- slopes.	Severe: Slow permeability.....	Severe: Slow permeability.....	Moderate: Slopes 5 to 8 percent.
gravelly loam, 2 to 5 per- slopes.	Severe: Slow permeability.....	Severe: Slow permeability.....	Slight.
loam, 2 to 8 percent slopes..	Severe: Slow permeability.....	Severe: Slow permeability.....	Moderate: Slopes 2 to 8 percent.
gravelly loam, 8 to 15 nt slopes, eroded.	Severe: Slow permeability.....	Severe: Slow permeability.....	Moderate: Slopes 8 to 15 percent.
ia fine sandy loam, 0 to 5 nt slopes.	Severe: Very slow perme- ability.	Severe: Very slow perme- ability.	Slight.
ia fine sandy loam, 5 to 15 nt slopes.	Severe: Very slow perme- ability.	Severe: Very slow perme- ability.	Moderate: Slopes 5 to 15 percent.
ia cobbly fine sandy loam, 8 percent slopes.	Severe: Very slow perme- ability.	Severe: Very slow perme- ability.	Moderate: Cobbly.
ille cobbly clay, 2 to 15 nt slopes.	Severe: Cobbly clay	Severe: Cobbly clay	Severe: Cobbly clay.
ille clay, 0 to 8 percent s.	Severe: Clay	Severe: Clay	Severe: Clay.
ille clay, moderately deep, 2 percent slopes.	Severe: Clay	Severe: Clay	Severe: Clay.
ille clay, moderately deep, tly saline-alkali, 0 to 5 per- slopes.	Severe: Clay	Severe: Clay	Severe: Clay.
ille gravelly clay, moderately , 2 to 15 percent slopes, ed.	Severe: Gravelly clay	Severe: Gravelly clay	Severe: Gravelly clay.

Picnic areas
Slight.
Slight.
Slight.
Moderate: Slopes 5 to 8 percent.
Moderate: Slopes 5 to 8 percent.
Moderate: Slopes 8 to 15 percent.
Moderate: Slopes 8 to 15 percent.
Severe: Slopes more than 15 percent.
Moderate: Slopes 8 to 15 percent.
Severe: Slopes more than 15 percent.
Moderate: Slopes 0 to 8 percent.
Moderate: Slopes 0 to 8 percent.
Moderate: Slopes 5 to 15 percent.
Moderate: Slopes 5 to 15 percent.
Severe: Slopes more than 15 percent.
Severe: Slopes more than 15 percent.
Severe: Slopes more than 15 percent.
Severe: Slopes more than 15 percent.
Severe: Flooded.
Severe: Very shallow to rock.
Severe: Very shallow to rock.
Moderate: Dust problem.
Moderate: Dust problem.
Moderate: Dust problem.
Moderate: Dust problem.
Slight.
Moderate: Slopes 2 to 8 percent.
Moderate: Slopes 8 to 15 percent.
Severe: Flooded.
Severe: Slopes more than 15 percent.
Severe: Slopes more than 15 percent.
Severe: Slopes more than 15 percent.

ontinued

es	Picnic areas
ock	Moderate: Slopes 8 to 15 percent.
.....	Severe: Flooded.
than 8	Severe: Slopes more than 15 percent.
than 8	Severe: Slopes more than 15 percent.
than 8	Severe: Slopes more than 15 percent.
rock;	Severe: Slopes more than 15 percent.
ock	Severe: Slopes more than 15 percent.
than 8	Severe: Slopes more than 15 percent.
ock	Moderate: Slopes 5 to 15 percent.
rock;	Severe: Slopes more than 15 percent.
ock	Severe: Slopes more than 15 percent.
e sand ..	Moderate: Loamy fine sand.
e sand ..	Moderate: Loamy fine sand.
lem	Moderate: Dust problem.
lem	Moderate: Dust problem.
.....	Severe: Flooded.
nd	Moderate: Loamy sand.
loamy	Moderate: Gravelly loamy sand.
ock	Severe: Slopes more than 15 percent.
rock;	Severe: Slopes more than 15 percent.
y slow	Moderate: Slopes 2 to 8 percent.
than 8	Moderate: Slopes 8 to 15 percent.
than 8	Severe: Slopes more than 15 percent.
o 8 per-	Moderate: Slopes 0 to 8 percent.
lem	Moderate: Dust problem.
lem	Moderate: Dust problem.
than 8	Moderate: Slopes 8 to 15 percent.
y deep.	Moderate: Slopes 2 to 8 percent.
than 8	Severe: Slopes more than 15 percent.
than 8	Severe: Slopes more than 15 percent.
lity.....	Moderate: Dust problem.
ility.....	Moderate: Dust problem.
ility.....	Moderate: Dust problem.
y slow	Moderate: Loamy fine sand.
d	Severe: Poorly drained.
.....	Severe: Silty clay.
.....	Severe: Silty clay.

.—*Soil interpretations for recreational uses—Continued*

Recreational uses		
Play areas	Camp areas	Picnic areas
evere: Silty clay	Severe: Silty clay	Severe: Silty clay.
evere: Silty clay	Severe: Silty clay	Severe: Silty clay.
evere: Silty clay	Severe: Silty clay	Severe: Silty clay.
evere: Slopes more than 5 percent.	Moderate: Moderately slow permeability.	Moderate: Slopes 2 to 8 percent.
evere: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 8 to 15 percent.
evere: Slow permeability	Severe: Slow permeability	Moderate: Slopes 2 to 8 percent.
evere: Slow permeability	Severe: Slow permeability	Moderate: Slopes 8 to 15 percent.
evere: Slow permeability	Severe: Slow permeability	Severe: Slopes more than 15 percent.
evere: Slow permeability	Severe: Slow permeability	Severe: Slopes more than 15 percent.
Moderate: Moderately deep	Moderate: Moderately deep	Moderate: Slopes 2 to 8 percent.
Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Severe: Slopes more than 15 percent.
Severe: Slopes more than 5 percent.	Severe: Slopes more than 8 percent.	Moderate: Slopes 2 to 15 percent.

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The influences of each soil-forming factor on the soils in the Western Riverside Area are summarized in the pages that follow.

Parent material

Parent material is the weathered rock or unconsolidated mass from which soils form. It is largely responsible for the chemical and mineralogical composition of soils. In the Western Riverside Area, the soils formed about equally in residuum and in alluvium.

The soils that formed in residuum formed in material weathered from sedimentary, metasedimentary, igneous, metamorphic-igneous, and metaigneous rocks. The gently rolling to very steep soils are shallow or very shallow and rocks crop out in many places. Examples are soils of the Cieneba, Friant, Gaviota, Lodo, Temescal, and Tollhouse series. The more gently sloping soils are moderately deep and rocks crop out in only a few places. These soils generally are slightly to moderately developed. The Cajalco, Crafton, Crouch, Escondido, Fallbrook, Las Posas, and Vista soils are examples.

The soils that formed in alluvium are weakly developed to strongly developed. Those that are weakly developed generally occupy areas that are flooded frequently. They continually receive fresh deposits of material through erosion and deposition. Braided stream channels traverse many of the steep alluvial fans where the stream enters a broad plain. Examples of weakly developed soils are the Cortina, Metz, and Tujunga. The somewhat more developed soils occupy areas along streams that are only slightly dissected. They receive fresh deposits of material through flooding and stream bank erosion. The Hanford,

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inches. Examples are
dark A horizon.
of clay varies with the
clay content between
slight to more than 20
mple, have 20 percent
n the A1 horizon.
a higher clay content
wn to reddish brown,
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the opal accumulates
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more easily remember
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of the physical and chemical
on saline-alkali soils and of
oils are given in tables 9 and
, Friant, and Greenfield soils,
ofile described for the repre-
"Descriptions of the Soils."
Friant, and Greenfield soils,
resentative profile, represent
operties of these series. Each
places, but the results were
re given for only one sample.
dried, crushed with a rubber-
ened through a 2-millimeter,
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ssification[1]

oup	Order
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	Alfisols.
ts	Vertisols.
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	Alfisols.
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	Alfisols.
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	Alfisols.
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nge as more precise information

ercent organic carbon.—The percent of organic car- was determined by acid-dichromate digestion and ous sulfate titration, a modification of the Walkley- k method (*6*).

eral Nature of the Area

this section the physiography, relief, and drainage e Western Riverside Area are discussed. Then facts iven about the climate, water supply, and settlement development.

siography, Relief, and Drainage

e Western Riverside Area is made up of interior ys, mountains, and a number of small lakes and res- irs. The Cleveland National Forest, the San Ber- ino National Forest, and the Santa Ana Mountains er the Area. The San Jacinto Mountains, within the , are separated from the San Bernardino Mountains e San Gorgonio Pass. The Coachella Valley extends southeastward direction to the Salton Sea, which is de the survey area. The highest elevation of the pass out 2,500 feet. The San Jacinto River Valley is as h as 30 miles wide, is smooth to undulating, and is ly 1,500 to 2,000 feet in elevation. Prominent moun- peaks in the Area, and their elevation are: San onio, 11,485 fee, San Jacinto, 10,831 feet; Toro, 3 feet, and Santiago, 5,700 feet.

e Area is drained mainly by the Santa Ana River in northwestern part, the San Jacinto River in the San nto Basin, and the San Timoteo Creek north and west Beaumont. The San Timoteo Creek flows northwest- l into the Santa Ana River in San Bernardino nty. The Santa Ana River enters the Area north of rside and flows southwestward into the Prado Basin. escal Wash enters the Santa Ana River at Prado n and exists in the northwestern corner of the survey . It drains Temescal Canyon and takes the overflow Lake Elsinore. The San Jacinto River empties into Elsinore after all the water rights for Lake Hemet Railroad Canyon Reservoirs have been satisfied.

e Temecula River drains the southern part of the from Anza west, and flows into the Santa Margarita r in the southwestern corner of the Area. The Santa garita River flows into the ocean. The San Gorgonio r drains the area north and east of Banning into Whitewater River that flows to the Salton Sea outside he Area. The small area south and west of Anza ns southeastward into Coyote Creek to Borrego ey.

nate

the Western Riverside Area, summers are hot and and winters are cool and moist. From May to October rainfall averages 0.7 inch at the lower elevations, at et, and 2.2 inches at the 5,000-foot elevation, at lwild. Precipitation increases from September to ember and is greatest in December and January. It eases rapidly in March and April. The lower eleva- s receive less than 10 percent of the precipitation dur- June to October. The higher elevations receive 15 to ercent during the same period.

TABLE 9.—*Physical and chemical analyses of representative*

[Analyses by Soil Survey

Soil name and sample number	Horizon	Depth	Size class and diameter of particles[1]							Gravel (2—76 mm.)[2]	Bulk density (cores)	Moisture held at 15 atmospheres[1]
			Silt (0.05—0.002 mm.)	Clay (less than 0.002 mm.)	Very coarse sand (2.0—1.0 mm.)	Coarse sand (1.0—0.5 mm.)	Medium sand (0.5—0.25 mm.)	Fine sand (0.25—0.10 mm.)	Very fine sand (0.10—0.05 mm.)			
		Inches	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Gm./cc.*	*Percent*
Exeter sandy loam, 0 to 2 percent slopes; S57 Calif. 33—11 (1—7); (modal).	Ap	0—10	22.2	8.8	8.4	17.8	11.0	19.1	12.7	3	1.77	3.0
	A3	10—16	26.4	15.8	8.3	15.3	8.9	14.5	10.8	2	1.72	5.6
	B21t	16—25	29.1	19.2	9.2	12.9	7.2	12.3	10.1	2	1.65	6.8
	B22t	25—30	33.4	19.2	4.8	11.5	6.6	12.9	11.6	2	1.53	7.2
	B3ca	30—37	31.2	6.9	7.8	14.6	9.3	17.1	13.1	5	.....	6.6
	C1sim	37—50	Indurated hardpan.	.....	.....	.....	.....	.....	.....	.....	.....	.....
	C2ca	50—60	18.5	14.0	18.1	18.4	8.6	14.2	8.2	14	.....	5.5
Escondido fine sandy loam, 8 to 15 percent slopes, eroded; S57 Calif. 33—3 (1—4); (somewhat shallow for modal).[6]	A11	0—2	41.8	17.3	3.3	6.9	5.6	13.8	11.3	35	.....	6.6
	A12	2—8	45.3	19.9	1.3	5.5	4.6	12.2	11.2	13	.....	6.8
	B21	8—13	46.0	20.7	1.5	4.3	4.3	11.6	11.6	13	.....	7.1
	B22	13—19	46.2	22.2	2.4	5.4	4.0	10.0	9.8	24	.....	8.1
Friant rocky fine sandy loam, 25 to 50 percent slopes, eroded; S55 Calif. 33—9 (1—3); ( ).). .	A11	0—2	20.9	6.2	5.5	8.8	8.3	30.8	19.5	5	.....	5.5
	A12	2—9	20.5	7.6	3.9	8.6	8.5	31.0	19.9	10	.....	4.5
	A13	9—13	17.2	15.4	3.8	9.8	9.2	27.5	17.1	16	.....	7.8
Greenfield sandy loam, 8 to 15 percent slopes, eroded; S57 Calif. 33—16 (1—7); (somewhat more developed than modal).	Ap1	0—1	11.6	9.3	21.1	22.8	12.2	16.7	6.3	12	.....	4.8
	Ap2	1—8	14.4	5.8	18.8	24.9	12.7	17.1	6.3	2	.....	2.5
	A11	8—18	14.3	5.8	23.3	23.0	11.8	15.9	5.9	11	.....	2.6
	A12	18—32	16.0	6.1	15.0	23.3	12.9	19.4	7.3	14	.....	2.6
	B21t	32—41	13.8	13.9	18.7	21.0	11.4	15.4	5.8	16	.....	5.4
	B22t	41—47	10.5	13.4	19.0	26.3	12.3	14.1	4.4	15	.....	5.6
	C	47—64	7.7	12.0	16.9	30.0	13.5	15.3	4.6	17	.....	4.8
Lodo rocky loam, 8 to 25 percent slopes, eroded; S57 Calif. 33—4 (1—2); (modal).	A11	0—3	43.5	8.0	5.4	9.1	5.7	14.4	13.9	38	.....	5.1
	A12	3—8	41.8	10.6	4.0	8.4	6.0	15.0	14.2	40	.....	4.9
Monserate sandy loam, 5 to 8 percent slopes, eroded; S57 Calif. 33—13 (1—7); (modal).	Ap	0—5	27.7	7.7	9.9	13.9	9.0	19.0	12.8	10	.....	3.8
	A3	5—10	21.4	16.9	18.6	15.5	6.7	12.4	8.5	21	.....	5.8
	B21t	10—20	18.1	30.8	9.2	13.1	6.7	14.3	7.8	22	.....	10.2
	B22t	20—28	19.6	21.6	10.8	14.2	7.4	17.2	9.2	24	.....	7.9
	C1m	28—45	Indurated hardpan.	.....	.....	.....	.....	.....	.....	.....	.....	.....
	C2	45—57	9.6	5.1	22.7	25.7	10.5	19.2	7.2	29	.....	3.8
	C3	57—70	8.3	5.0	77.0	4.9	1.8	2.4	.6	29	.....	3.8
Placentia fine sandy loam, 0 to 5 percent slopes; S55 Calif. 33—15 (1—6); (modal).	A11	0—8	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.2
	A12	8—13	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.9
	A13	13—18	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.8
	B21t	18—31	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.5
	B22t	31—39	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.1
	B3	39—57	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.9

non saline-alkali soils of Western Riverside Area, California

Laboratory, Riverside, California]

Moisture at saturation	Reaction: Saturated paste	Reaction: In 1:10 soil water suspension	Cation exchange capacity (NaOAc)	Extractable cations (meq. per 100 grams of soil): Calcium	Magnesium	Hydrogen	Sodium[3]	Potassium	Base saturation, sum	Electrical conductivity (millimhos per cm. at 25° C.)	Carbonate as $CaCO_3$	Organic carbon
Percent	*pH*	*pH*							*Percent*		*Percent*	*Percent*
19.8	5.1	5.7	5.7	4.7	1.2	2.1	0.3	0.5	76	4.8	.....	0.39
24.1	6.4	6.5	10.8	7.7	2.5	2.8	.7	.3	80	5.3	.....	.19
27.8	6.8	7.3	16.5	12.7	4.5	1.5	.8	.3	92	4.8	.....	.16
29.1	7.0	7.2	18.2	13.6	5.2	1.3	.8	.2	94	5.0		.07
29.5	7.7	8.1	15.3	.....	.....	.....	.5	.2	(4)	2.2	6	.04
.....	7.8	8.2	.....	.....	.....	.....	.....	.....	.....	.....	(5)	.....
23.6	7.8	7.8	10.0	.....	.....	.....	.7	.2	(4)	1.3	(5)	.01
38.4	6.7	7.2	21.5	9.6	3.4	1.3	.5	.6	92	.9	.....	1.84
30.7	6.8	6.7	30.9	13.8	4.9	1.5	.5	.2	93	.4	.....	.28
30.7	6.5	7.4	29.3	14.7	4.9	.4	.6	.2	98	.4	.....	.22
33.8	6.7	7.1	31.3	17.6	5.8	2.6	.7	.2	90	.4	.....	.22
39.1	6.2	6.2	15.8	9.0	1.4	4.6	.2	.4	71	.4	.....	2.14
29.9	6.7	6.7	11.5	6.6	1.2	2.0	.1	.3	80	.4	.....	.71
32.1	6.6	6.6	12.4	4.4	1.5	2.1	.1	.5	75	.3	.....	.29
36.1	6.5	7.2	9.7	7.6	1.8	2.4	.3	.6	81	2.3	.....	1.95
21.9	6.4	6.8	5.2	3.1	1.0	2.0	.2	.4	70	.4	.....	.55
19.3	5.8	6.4	5.4	2.5	.7	2.0	.5	.3	67	.2	.....	.29
18.3	6.1	6.6	4.6	2.6	1.0	1.4	.4	.2	75	.1	.....	.16
21.1	6.2	6.6	7.5	4.8	2.1	1.8	.4	.2	81	.3	.....	.08
22.7	6.3	6.3	7.9	5.0	3.0	1.6	.4	.2	84	.3	.....	.09
24.7	6.4	6.5	7.1	4.3	2.7	.7	.6	.1	92	.2	.....	.05
32.2	6.4	6.3	12.4	7.5	2.3	2.0	.5	.7	85	.6	.....	1.07
24.5	6.2	6.3	13.6	7.1	2.8	2.0	.5	.3	84	.4	.....	.52
26.9	6.7	6.7	7.3	4.3	2.2	1.8	.3	.7	81	.8	.....	.57
24.2	6.7	6.4	9.1	5.6	2.6	2.3	.3	.4	79	.4	.....	.29
33.9	6.6	6.7	17.8	10.9	4.8	2.6	.5	.3	86	.2	.....	.24
32.1	6.9	6.8	18.0	11.7	4.6	1.7	.7	.2	91	.5	.....	.12
.....	7.9	7.4	.....	.....	.....	.....	.....	.....	.....	.....	(5)	.....
28.7	7.9	7.8	8.9	.....	.....	.....	.5	.2	.....	.3	(5)	.01
27.3	7.9	7.7	8.3	.....	.....	.....	.6	.2	.....	.4	(5)	.02
23.2	5.4	5.9	7.0	2.3	.9	2.7	.2	.2	57	.2	.....	.38
23.3	5.1	5.7	7.9	3.0	3.9	3.0	.2	.2	71	.2	.....	.27
21.4	6.1	6.8	9.9	4.6	2.3	2.3	.6	.1	77	.3	.....	.14
39.9	7.2	8.2	19.5	8.3	6.7	2.1	2.1	.1	89	.9	.....	.27
45.4	8.0	9.0	18.3	.....	.....	.....	2.8	.1	.....	2.0	2.0	.13
38.4	8.0	8.9	13.9	.....	.....	.....	2.6	.1	.....	3.4	(5)	.08

f representative

Bulk density (cores)	Moisture held at 15 atmospheres[1]
Gm./cc.	*Percent*
.....	4.4
.....	6.2
.....	6.8
.....	7.7
.....	9.8
.....	10.5
.....	11.6
.....	11.4
.....	5.0
.....	4.9
.....	4.8
.....	5.4
.....	3.5
.....	3.4
.....	3.8
.....	4.0

of representative

lyses by Soil Survey

Moisture at saturation	Reaction	
	Saturated paste	In 1:10 soil water suspension
Percent	*pH*	*pH*
35.1	6.6	6.7
30.9	6.4	6.8
35.8	8.2	8.5
42.1	8.8	9.6
45.5	9.0	9.8
54.5	9.0	9.8
52.9	8.9	9.8
65.4	7.5	8.0
71.0	7.9	8.3
84.6	8.0	9.2
83.0	7.9	8.5
84.1	7.8	8.0
86.5	7.8	8.0

non saline-alkali soils of Western Riverside Area, California—Continued

Moisture at saturation	Reaction: Saturated paste	Reaction: In 1:10 soil water suspension	Cation exchange capacity (NaOAc)	Extractable cations (meq. per 100 grams of soil): Calcium	Magnesium	Hydrogen	Sodium[3]	Potassium	Base saturation, sum	Electrical conductivity (millimhos per cm. at 25° C.)	Carbonate as CaCO3	Organic carbon
Percent	*pH*	*pH*							*Percent*		*Percent*	*Percent*
21.7	5.9	6.6	8.7	4.0	1.2	2.4	.1	.5	71	1.1	.....	.40
23.1	6.4	6.7	11.2	5.5	1.7	3.0	.1	.4	72	.3	.....	.45
25.8	6.6	6.9	12.4	5.8	2.6	3.0	.1	.4	75	.4	.....	.34
28.2	6.7	7.0	14.2	6.4	3.1	3.7	.1	.3	73	.3	.....	.22
34.8	6.9	7.2	18.0	8.2	4.3	3.5	.2	.2	79	.2	.....	.13
38.5	7.0	7.4	20.4	9.9	4.8	3.5	.2	.1	81	.2	.....	.09
37.0	7.0	7.5	23.4	11.5	5.7	3.9	.3	.1	85	.2	.....	.07
35.6	7.0	7.5	21.6	12.3	6.1	3.3	.3	.1	85	.2	.....	.10
28.0	7.6	8.2	13.8	.....	.....	.....	.2	.6	(4)	.8	< 1	.61
26.2	7.8	8.9	14.7	.....	.....	.....	.2	.3	(4)	.6	1	.24
26.2	8.0	9.0	14.7	.....	.....	.....	.2	.2	(4)	.4	2	.16
26.6	8.0	8.9	16.3	.....	.....	.....	.3	.2	(4)	.5	3	.12
31.5	6.4	6.4	10.3	6.1	.9	2.3	.2	.4	74	.4	.....	1.09
27.8	6.2	6.3	9.3	5.3	1.0	2.3	.1	.3	74	.3	.....	.65
24.7	6.7	6.2	7.5	4.3	1.2	1.0	.2	.3	86	.2	.....	.20
24.9	6.9	6.8	8.5	4.9	1.5	.8	.1	.2	89	.2	.....	.14

[4] Horizons calcareous; assumed 100 percent base saturation.
[5] Trace.
[6] Escondido fine sandy loam, 8 to 15 percent slopes, eroded, has more clay in the B horizon than Escondido soils mapped elsewhere in California.

saline-alkali soils of Western Riverside Area, California

Laboratory, Riverside, California]

Cation exchange capacity (NaOAc)	Extractable cations (meq. per 100 grams of soil): Calcium	Magnesium	Sodium[2]	Potassium	Exchangeable sodium (ESP)[3]	Ions in saturation extract (meq. per liter): Calcium	Magnesium	Sodium	Bicarbonate	Chloride	Electrical conductivity (millimhos per cm. at 25° C.)	Carbonate as CaCO3	Gypsum	Organic carbon
					Percent							*Percent*	*Percent*	*Percent*
5.0	2.6	0.7	0.5	0.7	10	1.1	0.4	2.8	2.8	1.6	0.5	0	0	0.67
5.4	2.4	.8	1.2	.5	22	.8	.3	6.2	1.1	3.6	.8	0	0	.29
8.5	2.9	2.3	3.6	.5	42	2.1	2.0	57.0	4.4	11.5	5.6	0	0	.14
10.9	.....	.....	6.7	.6	61	1.0	1.2	66.0	2.5	15.4	7.5	1	0	.08
10.3	.....	.....	7.0	.5	68	.4	.7	66.0	3.1	15.5	7.2	3	0	.05
16.2	.....	.....	13.4	1.2	83	.5	.9	90.0	2.5	21.3	9.5	5	0	.06
14.2	.....	.....	12.2	.9	86	.8	1.0	106.0	2.3	25.2	11.0	5	0	.01
38.1	.....	.....	3.8	1.7	10	23.1	6.6	28.8	5.0	27.4	5.6	3	0	.98
40.3	.....	.....	8.1	.7	20	8.1	4.6	52.0	4.6	57.6	7.0	5	0	.68
40.0	.....	.....	19.7	1.2	49	8.4	4.6	105.0	4.6	105.1	11.5	5	0	.60
41.1	.....	.....	19.4	1.1	47	41.1	13.6	173.0	3.1	155.5	15.1	5	0	.45
41.0	.....	.....	21.0	1.0	51	32.4	17.4	198.0	2.6	195.8	11.0	6	.4	.41
41.3	.....	.....	18.7	.9	45	44.5	16.3	216.0	2.6	204.0	23.3	6	1	.35

[2] Exchangeable sodium (extractable sodium—sodium in saturation extract).
[3] Exchangeable sodium percentage.

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Glossary

Alkali soil. Generally, a highly alkaline soil. Specifically, an alkali soil has so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that the growth of most crop plants is low from this cause.

Alluvial fan. A fan-shaped deposit of sand, gravel, and fine material dropped by a stream where it flows out onto a level plain or meets a slower stream.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available water holding capacity). Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Calcareous soil. A soil containing enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in many soils of warm-temperate areas, as in the Southwestern

name of any soil that contains 85 percent
not more than 10 percent clay.
rock largely composed of particles deposited
ı water. The chief sedimentary rocks are
gravel; sandstone, from sand; shale, from
e, from soft masses of calcium carbonate.
intermediate types. Some wind-deposited
ınsolidated into sandstone.
al particles in a soil that range in diameter
ıit of clay (0.002 millimeter) to the lower
sand (0.05 millimeter). Soil of the silt
30 percent or more silt and less than 12

e-dimensional body on the earth's surface
ts and that has properties resulting from
ct of climate and living matter acting on
erial, as conditioned by relief over periods

rt of a soil profile, above the parent ma-
processes of soil formation are active. The
soil includes the A and B horizons. Gen-
eristics of the material in these horizons
the underlying material. The living roots
d animal life characteristic of the soil are
the solum.
ırrangement of primary soil particles into
ı or clusters that are separated from ad-
and have properties unlike those of an
naggregated primary soil particles. The
f soil structure are—*platy* (laminated),
axis of aggregates longer than horizontal),
with rounded tops), *blocky* (angular or
granular. Structureless soils are (1) *single*
by itself, as in dune sand) or (2) *massive*
ring together without any regular cleavage,
s and hardpans).
lly, the part of the soil below the solum.
ordinarily moved in tillage, or its equiva-
l soil, about 5 to 8 inches in thickness. The

An old alluvial plain, ordinarily flat or
ng a river, lake, or the sea. Stream terraces
led second bottoms, as contrasted to flood
ldom subject to overflow. Marine terraces
the sea and are generally wide.
lative proportions of sand, silt, and clay
of soil. The basic textural classes, in order
ortion of fine particles, are *sand, loamy*
loam, silt loam, silt, sandy clay loam, clay
am, sandy clay, silty clay, and *clay.* The
and sandy loam classes may be further
ng "coarse," "fine," or "very fine."
tion of the soil in relation to the growth of
soil structure. Good tilth refers to the fri-
associated with high noncapillary porosity
ar structure. A soil in poor tilth is non-
ggregated, and difficult to till.
hest part of the soil or underlying rock
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ed, water table may be separated from a
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nanent wilting point). The moisture con-
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ng unit and that of the soil
rticular mapping unit is not
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llows:

for soils, tables 4, 5, and 6,
h 135.
s, table 7, p. 136.

	Vegetative soil group	Range site		Storie index rating
e		Site	Page	Number
	C	Clayey	98	28
	C	Clayey	98	25
	C	Clayey	98	13
	C	Clayey	98	20
	A	Loamy Uplands	101	81
	A	Loamy Uplands	101	77
	A	Loamy Uplands	101	81
	A	Loamy	99	77
	A	Loamy	99	69
	A	Loamy	99	64
	A	Loamy	99	61
	A	Loamy	99	51
	A	Shallow Loamy	99	25
	A	Loamy	99	64
	G	Loamy	99	56
	G	Loamy	99	50
	A	Loamy	99	76
	A	Loamy	99	72
	A	Loamy	99	62
	G	Loamy	99	59
	A	Loamy	99	72
	A	Loamy	99	62
	G	Loamy	99	56, 86

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GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Vegetative soil group	Range site: Site	Range site Page	Storie index rating Number
AtD2	Arlington and Greenfield fine sandy loams, 8 to 15 percent slopes, eroded	14	IVe-8 (19)	78	----------	--	G	Loamy	99	50, 77
AtF3	Arlington and Greenfield fine sandy loams, 15 to 35 percent slopes, severely eroded	14	----------	--	VIe-8 (19), VIe-1 (19)	81, 80	G, A	Loamy	99	19, 61
AuC	Auld clay, 2 to 8 percent slopes	15	IIe-5 (19)	73	----------	--	C	Clayey	98	41
AuD	Auld clay, 8 to 15 percent slopes	15	IIIe-5 (19)	75	----------	--	C	Clayey	98	35
AyF	Auld cobbly clay, 8 to 50 percent slopes	15	----------	--	VIe-5 (19)	80	C	Clayey	98	17
BaG	Badland	15	----------	--	VIIIe-1 (19, 20)	82	J	---------	--	5
Bb	Bishop silt loam	16	----------	--	VIw-1 (20)	81	E	Cienega	100	14
BdC	Bonsall fine sandy loam, 2 to 8 percent slopes	16	IVe-3 (19)	78	----------	--	D	Claypan	98	41
BdD	Bonsall fine sandy loam, 8 to 15 percent slopes	17	IVe-3 (19)	78	----------	--	D	Claypan	98	36
BfC	Bosanko clay, 2 to 8 percent slopes	17	IIIe-5 (19)	75	----------	--	C	Clayey	98	33
BfD	Bosanko clay, 8 to 15 percent slopes	18	IIIe-5 (19)	75	----------	--	C	Clayey	98	31
BhA	Buchenau loam, slightly saline-alkali, 0 to 2 percent slopes	18	IIs-8 (19)	74	----------	--	F	Loamy	99	41
BhC	Buchenau loam, slightly saline-alkali, 2 to 8 percent slopes	18	IIIe-6 (19)	75	----------	--	F	Loamy	99	31
BkC2	Buchenau silt loam, 2 to 8 percent slopes, eroded	19	IIIe-1 (19)	74	----------	--	A	Loamy	99	64
BsC2	Bull Trail sandy loam, 5 to 8 percent slopes, eroded	19	----------	--	IVec-1 (20)	78	A	Loamy Uplands	101	69
BsD2	Bull Trail sandy loam, 8 to 15 percent slopes, eroded	19	----------	--	IVec-1 (20)	78	A	Loamy Uplands	101	58
BsE3	Bull Trail sandy loam, 8 to 25 percent slopes, severely eroded	19	----------	--	VIIe-1 (20)	81	A	Loamy Uplands	101	27
BtD2	Bull Trail stony sandy loam, 8 to 15 percent slopes, eroded	20	----------	--	VIe-7 (20)	80	A	Loamy Uplands	101	38
BtE3	Bull Trail stony sandy loam, 8 to 25 percent slopes, severely eroded	20	----------	--	VIe-7 (20)	80	A	Loamy Uplands	101	19
BuC2	Buren fine sandy loam, 2 to 8 percent slopes, eroded	20	IIIe-8 (19)	75	----------	--	G	Loamy	99	56
BuD2	Buren fine sandy loam, 8 to 15 percent slopes, eroded	20	IVe-8 (19)	78	----------	--	G	Loamy	99	50
BvD3	Buren loam, 5 to 15 percent slopes, severely eroded	21	IVe-8 (19)	78	----------	--	G	Loamy	99	36
BxC2	Buren loam, deep, 2 to 8 percent slopes, eroded	21	IIe-1 (19)	73	----------	--	A	Loamy	99	69
CaC2	Cajalco fine sandy loam, 2 to 8 percent slopes, eroded	21	IIIe-1 (19)	74	----------	--	A	Loamy	99	60
CaD2	Cajalco fine sandy loam, 8 to 15 percent slopes, eroded	21	IVe-1 (19)	77	----------	--	A	Loamy	99	55
CaF2	Cajalco fine sandy loam, 15 to 35 percent slopes, eroded	21	----------	--	VIe-1 (19)	80	A	Shallow Loamy	99	42

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Vegetative soil group	Range site: Site	Range site Page	Storie index rating Number
CbD2	Cajalco rocky fine sandy loam, 5 to 15 percent slopes, eroded--	22	----------	--	VIe-7 (19)	80	A	Shallow Loamy	99	24
CbF2	Cajalco rocky fine sandy loam, 15 to 50 percent slopes, eroded-	22	----------	--	VIe-7 (19)	80	A	Shallow Loamy	99	13
CcC2	Calpine sandy loam, 2 to 8 percent slopes, eroded----------	22	IIe-1 (20)	73	IVec-1 (20)	78	A	Loamy Uplands	101	81
CcD2	Calpine sandy loam, 8 to 15 percent slopes, eroded----------	22	IIIe-1 (20)	74	IVec-1 (20)	78	A	Loamy Uplands	101	69
CdC2	Calpine loam, 2 to 8 percent slopes, eroded----------	23	IIe-1 (20)	73	IVec-1 (20)	78	A	Loamy Uplands	101	86
Ce	Chino silt loam, drained----------	23	I-1 (19)	72	----------	--	A	Silty Basin	100	51
Cf	Chino silt loam, drained, saline-alkali----------	23	IVs-6 (19)	79	----------	--	F	Silty Basin	100	20
Cg	Chino silt loam, strongly saline-alkali----------	23	IVw-6 (19)	79	----------	--	F	Silty Basin	100	6
ChC	Cieneba sandy loam, 5 to 8 percent slopes----------	24	IVe-1 (19)	77	----------	--	A	Shallow Loamy	99	44
ChD2	Cieneba sandy loam, 8 to 15 percent slopes, eroded----------	24	----------	--	VIe-1 (19)	80	A	Shallow Loamy	99	37
ChF2	Cieneba sandy loam, 15 to 50 percent slopes, eroded----------	24	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	22
CkD2	Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded----------	24	----------	--	VIe-7 (19)	80	A	Shallow Loamy	99	21
CkF2	Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded----------	23	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	14
ClC	Cortina gravelly loamy sand, 2 to 8 percent slopes----------	25	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	13
CmC	Cortina cobbly loamy sand, 2 to 8 percent slopes----------	25	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	12
CnC	Cortina gravelly coarse sandy loam, 2 to 8 percent slopes-----	24	IIIs-4 (19)	77	----------	--	B	Sandy	99	42
CoA	Cortina sandy loam, 0 to 2 percent slopes----------	25	IIIs-0 (19)	76	----------	--	B	Sandy	99	65
CpA	Cortina gravelly sandy loam, 0 to 2 percent slopes----------	25	IVs-0 (19)	79	----------	--	B	Sandy	99	25
CrD	Cortina cobbly sandy loam, 2 to 12 percent slopes----------	25	IVs-4 (19)	79	----------	--	B	Sandy	99	36
CsF2	Crafton rocky sandy loam, 25 to 50 percent slopes, eroded----------	25	----------	--	VIe-7 (20)	80	A	Loamy Uplands	101	10
CtF2	Crafton fine sandy loam, 15 to 35 percent slopes, eroded----------	26	----------	--	VIe-1 (20)	80	A	Loamy Uplands	101	34

GUIDE TO MAPPING UNITS--Continued

Mapping unit	Page	Capability unit: Irrigated Symbol	Page	Capability unit: Dryland Symbol	Page	Vegetative soil group	Range site	Page	Storie index rating Number
on rocky fine sandy loam, 15 25 percent slopes----------	26	----------	--	VIe-7 (20)	80	A	Loamy Uplands	101	24
h loamy sand, 8 to 15 percent pes, eroded----------	27	----------	--	IVec-1 (20)	78	B	Coarse Sandy	100	34
h sandy loam, 8 to 15 percent pes, eroded----------	27	----------	--	IVec-1 (20)	78	A	Loamy Uplands	101	40
h sandy loam, 15 to 25 per- t slopes, eroded----------	27	----------	--	VIe-1 (20)	80	A	Loamy Uplands	101	35
h rocky sandy loam, 8 to 25 cent slopes, eroded----------	27	----------	--	VIe-7 (20)	80	A	Loamy Uplands	101	23
h rocky sandy loam, 25 to 50 cent slopes, eroded----------	26	----------	--	VIe-7 (20)	80	A	Loamy Uplands	101	12
fine sand, 2 to 15 percent pes, wind-eroded----------	27	IIIe-4 (19)	75	----------	--	B	Sandy	99	42
loamy fine sand, 0 to 2 cent slopes----------	27	IIe-4 (19)	73	----------	--	B	Sandy	99	72
loamy sand, 0 to 5 percent pes----------	28	IIIw-4 (19)	76	----------	--	B	Sandy	99	46
loamy sand, poorly drained, o 2 percent slopes----------	28	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	19
loamy sand, gravelly sub- atum, 0 to 5 percent slopes--	28	IVw-0 (19)	79	----------	--	B	Sandy	99	30
loamy fine sand, 0 to 2 cent slopes----------	28	IIIw-4 (19)	76	----------	--	E	Sandy	99	51
loamy fine sand, saline- ali, 0 to 5 percent slopes---	28	IIIw-6 (19)	76	----------	--	F	Sandy	99	28
loamy fine sand, gravelly stratum, 0 to 2 percent pes----------	28	IIIw-0 (19)	76	----------	--	B	Sandy	99	41
o fine sandy loam, eroded----	29	IIIe-8 (19)	75	----------	--	G	Sandy Basin	100	41
o fine sandy loam, saline- ali----------	29	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	24
o silt loam----------	29	IIIs-8 (19)	77	----------	--	G	Silty Basin	100	43
o silt loam, saline-alkali---	29	IIIs-6 (19)	77	----------	--	F	Silty Basin	100	24
o silt loam, strongly saline- ali----------	30	IVw-6 (19)	79	----------	--	F	Silty Basin	100	7
dido fine sandy loam, 2 to 8 cent slopes, eroded----------	30	IIIe-8 (19)	75	----------	--	G	Loamy	99	54
dido fine sandy loam, 8 to 15 cent slopes, eroded----------	30	IVe-8 (19)	78	----------	--	G	Loamy	99	48
dido fine sandy loam, 15 to percent slopes, eroded-------	30	----------	--	VIe-8 (19)	81	G	Loamy	99	45
dido rocky fine sandy loam, 8 50 percent slopes, eroded----	30	----------	--	VIe-8 (19)	81	G	Loamy	99	50
r sandy loam, 0 to 2 percent pes----------	31	IIIs-8 (19)	77	----------	--	G	Loamy	99	56
r sandy loam, 2 to 8 percent pes, eroded----------	31	IIIe-8 (19)	75	----------	--	G	Loamy	99	53

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Page	Capability unit: Dryland Symbol	Page	Vegetative soil group	Range site Site	Page	Storie index rating Number
EoB	Exeter sandy loam, slightly saline-alkali, 0 to 5 percent slopes----	31	IIIs-6 (19)	77	----------	--	F	Loamy	99	40
EpA	Exeter sandy loam, deep, 0 to 2 percent slopes----------	31	IIs-8 (19)	74	----------	--	A	Loamy	99	68
EpC2	Exeter sandy loam, deep, 2 to 8 percent slopes, eroded----------	31	IIe-1 (19)	73	----------	--	A	Loamy	99	61
EwB	Exeter very fine sandy loam, 0 to 5 percent slopes----------	32	IIIe-8 (19)	75	----------	--	G	Loamy	99	56
EyB	Exeter very fine sandy loam, deep, 0 to 5 percent slopes----------	32	IIe-1 (19)	73	----------	--	A	Loamy	99	68
FaD2	Fallbrook sandy loam, 8 to 15 percent slopes, eroded----------	32	IVe-1 (19)	77	----------	--	A	Loamy	99	45
FaE2	Fallbrook sandy loam, 15 to 25 percent slopes, eroded----------	32	----------	--	VIe-1 (19)	80	A	Loamy	99	44
FbC2	Fallbrook sandy loam, shallow, 5 to 8 percent slopes, eroded---------	32	IVe-1 (19)	77	----------	--	G	Shallow Loamy	99	25
FbF2	Fallbrook sandy loam, shallow, 15 to 35 percent slopes, eroded-----	33	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	22
FcD2	Fallbrook rocky sandy loam, shallow, 8 to 15 percent slopes, eroded----------	33	----------	--	VIe-7 (19)	80	G	Shallow Loamy	99	15
FcF2	Fallbrook rocky sandy loam, shallow, 15 to 50 percent slopes, eroded----------	33	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	9
FfC2	Fallbrook fine sandy loam, 2 to 8 percent slopes, eroded----------	33	IIIe-1 (19)	74	----------	--	A	Loamy	99	53
FkD2	Fallbrook fine sandy loam, shallow, 8 to 15 percent slopes, eroded---	33	IVe-1 (19)	77	----------	--	G	Shallow Loamy	99	24
FwE2	Friant fine sandy loam, 5 to 25 percent slopes, eroded----------	34	----------	--	VIe-8 (19)	81	G	Shallow Loamy	99	22
FyE2	Friant rocky fine sandy loam, 8 to 25 percent slopes, eroded--------	34	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	16
FyF2	Friant rocky fine sandy loam, 25 to 50 percent slopes, eroded--------	33	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	8
GaA	Garretson very fine sandy loam, 0 to 2 percent slopes----------	34	I-1 (19)	72	----------	--	A	Loamy	99	100
GaC	Garretson very fine sandy loam, 2 to 8 percent slopes----------	34	IIe-1 (19)	73	----------	--	A	Loamy	99	90
GaD2	Garretson very fine sandy loam, 8 to 15 percent slopes, eroded-----	34	IIIe-1 (19)	74	----------	--	A	Loamy	99	81
GdA	Garretson gravelly very fine sandy loam, 0 to 2 percent slopes------	35	IIs-4 (19)	74	----------	--	A	Loamy	99	75
GdC	Garretson gravelly very fine sandy loam, 2 to 8 percent slopes------	34	IIe-1 (19)	73	----------	--	A	Loamy	99	71
GdD2	Garretson gravelly very fine sandy loam, 8 to 15 percent slopes, eroded----------	35	IIIe-1 (19)	74	----------	--	A	Loamy	99	61
GeG3	Gaviota rocky fine sandy loam, 25 to 75 percent slopes, severely eroded----------	35	----------	--	VIIIs-1 (19, 20)	82	J	---------	--	3

GUIDE TO MAPPING UNITS--Continued

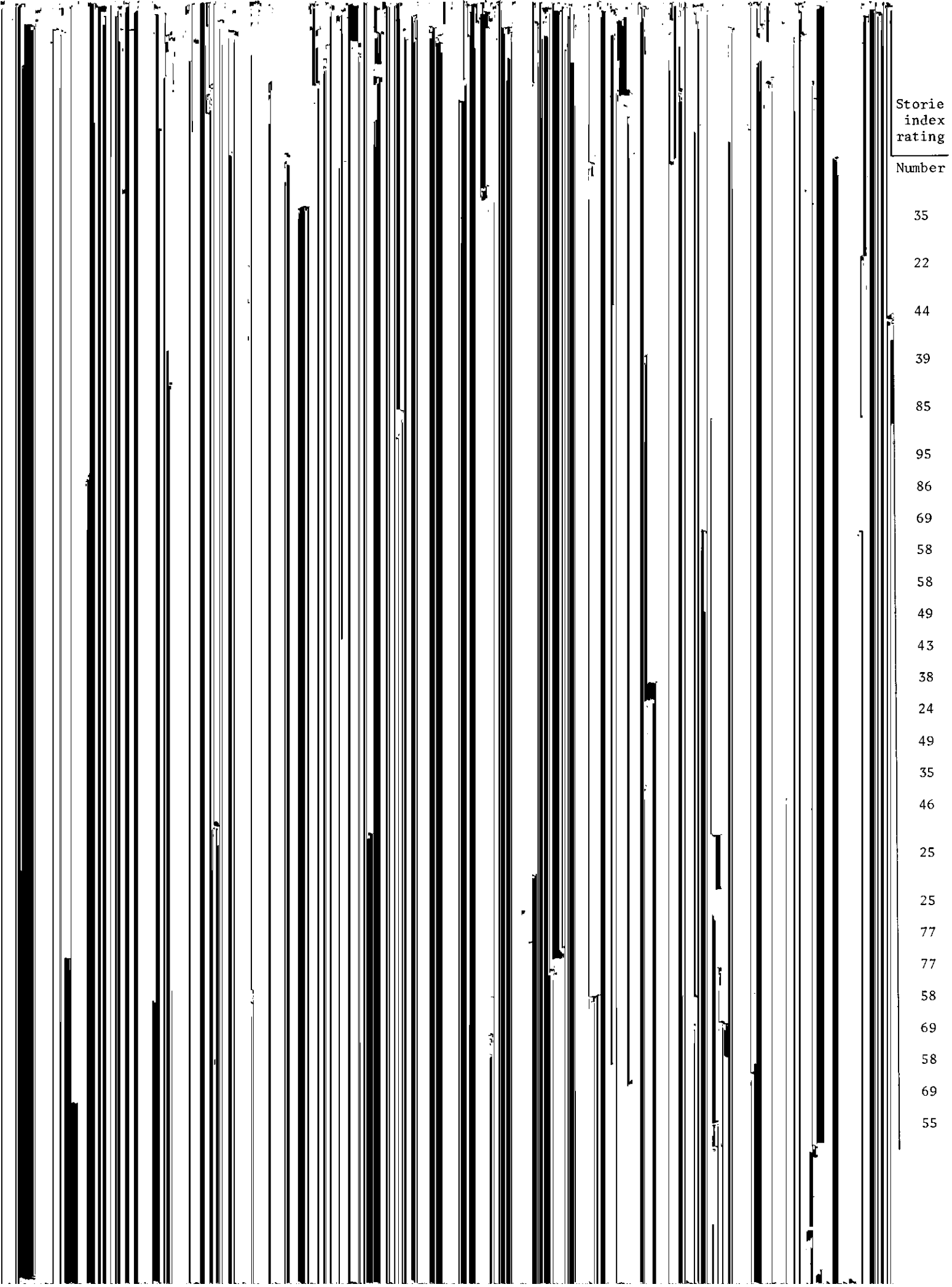
Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Vegetative soil group	Range site Site	Range site Page	Storie index rating Number
GfF2	Gaviota very fine sandy loam, 15 to 50 percent slopes, eroded	35	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	14
GgF2	Gaviota rocky very fine sandy loam, 25 to 50 percent slopes, eroded	35	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	8
GhC	Gorgonio loamy sand, 0 to 8 percent slopes	36	IIIs-4 (19)	77	----------	--	B	Sandy	99	57
GhD	Gorgonio loamy sand, 8 to 15 percent slopes	36	IVs-4 (19)	79	----------	--	B	Sandy	99	54
GkD	Gorgonio loamy sand, channeled, 2 to 15 percent slopes	36	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	27
GlC	Gorgonio loamy sand, deep, 2 to 8 percent slopes	36	IIs-4 (19)	74	----------	--	B	Sandy	99	68
GmD	Gorgonio gravelly loamy fine sand, 2 to 15 percent slopes	35	IVs-4 (19)	79	----------	--	B	Sandy	99	45
GnD	Gorgonio cobbly loamy fine sand, 2 to 15 percent slopes	36	----------	--	VIe-7 (19)	80	B	Sandy	99	31
GoB	Grangeville loamy fine sand, drained, 0 to 5 percent slopes	37	IIs-4 (19)	74	----------	--	A	Sandy Basin	100	55
GpB	Grangeville sandy loam, drained, saline-alkali, 0 to 5 percent slopes	37	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	51
GrB	Grangeville sandy loam, sandy substratum, drained, 0 to 5 percent slopes	37	IIIs-0 (19)	76	----------	--	B	Sandy Basin	100	58
GsB	Grangeville sandy loam, sandy substratum, drained, saline-alkali, 0 to 5 percent slopes	37	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	39
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent slopes	37	I-1 (19)	72	----------	--	A	Sandy Basin	100	71
GtD	Grangeville fine sandy loam, drained, 5 to 15 percent slopes	38	IIIe-6 (19)	75	----------	--	A	Sandy Basin	100	61
GuB	Grangeville fine sandy loam, poorly drained, saline-alkali, 0 to 5 percent slopes	38	IVw-6 (19)	79	----------	--	F	Sandy Basin	100	9
GvB	Grangeville fine sandy loam, saline-alkali, 0 to 5 percent slopes	38	IIIw-6 (19)	76	----------	--	F	Sandy Basin	100	18
GwA	Grangeville fine sandy loam, loamy substratum, drained, 0 to 2 percent slopes	38	I-1 (19)	72	----------	--	A	Sandy Basin	100	67
GxA	Grangeville fine sandy loam, loamy substratum, drained, saline-alkali, 0 to 2 percent slopes	38	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	23
GyA	Greenfield sandy loam, 0 to 2 percent slopes	39	I-1 (19)	72	----------	--	A	Loamy	99	90

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Vegetative soil group	Range site: Site	Range site Page	Storie index rating Number
GyC2	Greenfield sandy loam, 2 to 8 percent slopes, eroded	38	IIe-1 (19)	73	----------	--	A	Loamy	99	81
GyD2	Greenfield sandy loam, 8 to 15 percent slopes, eroded	39	IIIe-1 (19)	74	----------	--	A	Loamy	99	73
GyE2	Greenfield sandy loam, 15 to 25 percent slopes, eroded	39	IVe-1 (19)	77	----------	--	A	Loamy	99	65
GzG	Gullied land	39	----------	--	VIIIe-1 (19, 20)	82	J	--------	--	5
HaC	Hanford loamy fine sand, 0 to 8 percent slopes	40	IIs-4 (19)	74	IVsc-4 (20)	80	A	Sandy	99	81
HcA	Hanford coarse sandy loam, 0 to 2 percent slopes	40	IIs-4 (19)	74	----------	--	A	Sandy	99	77
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes	39	IIe-1 (19)	73	IVec-1 (20)	78	A	Sandy	99	86
HcD2	Hanford coarse sandy loam, 8 to 15 percent slopes, eroded	40	IIIe-1 (19)	74	IVec-1 (20)	78	A	Sandy	99	65
HdD2	Hanford cobbly coarse sandy loam, 2 to 15 percent slopes, eroded	40	----------	--	VIe-7 (19), VIe-7 (20)	80	B	Sandy	99	26
HeC2	Hanford coarse sandy loam, deep, 2 to 8 percent slopes, eroded	40	IIIs-0 (19)	76	----------	--	B	Sandy	99	62
HfD	Hanford sandy loam, 2 to 15 percent slopes	40	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	41
HgA	Hanford fine sandy loam, 0 to 2 percent slopes	40	I-1 (19)	72	----------	--	A	Loamy	99	100
HhA2	Hilmar loamy sand, 0 to 2 percent slopes, eroded	41	IIe-4 (19)	73	----------	--	A	Sandy	99	62
HlA	Hilmar loamy very fine sand, 0 to 2 percent slopes	41	IIe-4 (19)	73	----------	--	A	Sandy	99	51
HlC	Hilmar loamy very fine sand, 2 to 8 percent slopes	41	IIIe-1 (19)	74	----------	--	A	Sandy	99	49
HnC	Honcut sandy loam, 2 to 8 percent slopes	41	IIe-1 (19)	73	----------	--	A	Loamy	99	86
HnD2	Honcut sandy loam, 8 to 15 percent slopes, eroded	42	IIIe-1 (19)	74	----------	--	A	Loamy	99	73
HoE	Honcut cobbly sandy loam, 2 to 25 percent slopes	42	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	20
HuC2	Honcut loam, 2 to 8 percent slopes, eroded	42	IIe-1 (19)	73	----------	--	A	Loamy	99	90
LaC	Las Posas loam, 2 to 8 percent slopes	43	IIIe-1 (19)	74	----------	--	G	Loamy	99	53
LaC2	Las Posas loam, 5 to 8 percent slopes, eroded	43	IVe-1 (19)	77	----------	--	G	Loamy	99	42
LaD2	Las Posas loam, 8 to 15 percent slopes, eroded	42	IVe-1 (19)	77	----------	--	G	Loamy	99	47
LaE3	Las Posas loam, 8 to 25 percent slopes, severely eroded	43	----------	--	VIe-1 (19)	80	G	Shallow Loamy	99	29
LcD2	Las Posas stony loam, 8 to 15 percent slopes, eroded	43	----------	--	VIe-7 (19)	80	G	Loamy	99	28
LkD2	Las Posas rocky loam, 8 to 15 percent slopes, eroded	43	----------	--	VIe-7 (19)	80	G	Loamy	99	22
LkF3	Las Posas rocky loam, 15 to 50 percent slopes, severely eroded	43	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	13
LoF2	Lodo gravelly loam, 15 to 50 percent slopes, eroded	44	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	10

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Vegetative soil group	Range site: Site	Range site Page	Storie index rating Number
LpE2	Lodo rocky loam, 8 to 25 percent slopes, eroded	43	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	10
LpF2	Lodo rocky loam, 25 to 50 percent slopes, eroded	44	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	6
MaA	Madera fine sandy loam, 0 to 2 percent slopes	44	IIIs-3 (19)	76	----------	--	D	Claypan	98	32
MaB2	Madera fine sandy loam, 2 to 5 percent slopes, eroded	44	IIIe-3 (19)	74	----------	--	D	Claypan	98	30
MaD2	Madera fine sandy loam, 5 to 15 percent slopes, eroded	45	IVe-3 (19)	78	----------	--	D	Claypan	98	27
MbC2	Madera fine sandy loam, shallow, 2 to 8 percent slopes, eroded	45	IVe-3 (19)	78	----------	--	D	Claypan	98	21
MdC	Metz loamy sand, 2 to 8 percent slopes	45	IIIs-4 (19)	77	----------	--	B	Sandy	99	58
MeD	Metz loamy sand, channeled, 0 to 15 percent slopes	45	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	29
MfA	Metz loamy fine sand, 0 to 2 percent slopes	45	IIIs-4 (19)	77	----------	--	B	Sandy	99	77
MgB	Metz loamy fine sand, gravelly sand substratum, 0 to 5 percent slopes	45	IVs-0 (19)	79	----------	--	B	Sandy	99	69
MhB	Metz loamy fine sand, sandy loam substratum, 0 to 5 percent slopes	45	IIs-4 (19)	74	----------	--	A	Sandy	99	73
M1D	Metz gravelly sandy loam, 2 to 15 percent slopes	46	IIIs-4 (19)	77	----------	--	A	Sandy	99	42
MmB	Monserate sandy loam, 0 to 5 percent slopes	46	IIIe-8 (19)	75	----------	--	G	Loamy	99	30
MmC2	Monserate sandy loam, 5 to 8 percent slopes, eroded	46	IIIe-8 (19)	75	----------	--	G	Loamy	99	29
MmD2	Monserate sandy loam, 8 to 15 percent slopes, eroded	47	IVe-8 (19)	78	----------	--	G	Loamy	99	26
MmE3	Monserate sandy loam, 15 to 25 percent slopes, severely eroded	47	----------	--	VIe-8 (19)	81	G	Loamy	99	18
MnD2	Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded	47	----------	--	VIe-8 (19)	81	G	Shallow Loamy	99	17
MnE3	Monserate sandy loam, shallow, 15 to 25 percent slopes, severely eroded	47	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	15
MoC	Mottsville loamy sand, 2 to 8 percent slopes	47	IIIs-4 (20)	77	IVsc-4 (20)	80	B	Coarse Sandy	100	57
MoD	Mottsville loamy sand, 8 to 15 percent slopes	47	IVs-4 (20)	79	IVsc-4 (20)	80	B	Coarse Sandy	100	48
MrE	Mottsville cobbly loamy sand, 8 to 25 percent slopes	47	----------	--	VIIw-4 (20)	82	J	Coarse Sandy	100	16
MsC	Mottsville sandy loam, 2 to 8 percent slopes	48	IIIs-4 (20)	77	IVsc-4 (20)	80	A	Coarse Sandy	100	86
MsD	Mottsville sandy loam, 8 to 15 percent slopes	48	IIIs-4 (20)	77	IVsc-4 (20)	80	A	Coarse Sandy	100	69


Storie index rating
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	Capability unit				Vegetative soil group	Range site		Storie index rating
	Irrigated		Dryland					
Page	Symbol	Page	Symbol	Page		Site	Page	Number
--- 54	----------	--	VIe-1 (19)	80	A	Loamy	99	52
--- 54	IVe-1 (19)	77	----------	--	G	Loamy	99	54
--- 54	----------	--	VIe-1 (19)	80	G	Loamy	99	38
--- 54	IIIe-1 (19)	74	----------	--	A	Loamy	99	77
--- 54	IIIe-1 (19)	74	----------	--	G	Loamy	99	64
--- 55	----------	--	VIe-1 (19), VIe-8 (19)	80, 81	A, G	Loamy	99	49, 32
--- 55	IVe-8 (19)	78	----------	--	A	Loamy	99	65, 50
ed- 55	----------	--	VIe-1 (19), VIe-8 (19)	80, 81	A, G	Loamy, Shallow Loamy	99	55, 34
--- 55	----------	--	VIIIw-4 (19, 20)	82	J	---------	--	--
--- 55	----------	--	VIIIs-1 (19, 20)	82	J	---------	--	--
--- 55	----------	--	VIIIe-1 (19, 20)	82	J	---------	--	5
--- 57	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	39
--- 56	I-1 (19)	72	----------	--	A	Loamy	99	86
--- 56	IIe-1 (19)	73	----------	--	A	Loamy	99	86
--- 56	IIIe-1 (19)	74	----------	--	A	Loamy	99	77
--- 56	IIs-4 (19)	74	----------	--	A	Loamy	99	95
--- 56	I-1 (19)	72	----------	--	A	Loamy	99	95
--- 56	IIe-1 (19)	73	----------	--	A	Loamy	99	86
--- 57	IIIe-1 (19)	74	----------	--	A	Loamy	99	77
--- 57	IVe-1 (19)	77	----------	--	A	Loamy	99	41
--- 57	----------	--	VIe-1 (19)	80	A	Loamy	99	18
--- 58	----------	--	VIec-4 (20)	81	G	Shallow Loamy Uplands	101	22
ed- 58	----------	--	VIIe-4 (20)	81	J	Shallow Loamy Uplands	101	6

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Vegetative soil group	Range site: Site	Range site Page	Storie index rating Number
SrE	Soboba cobbly loamy sand, 2 to 25 percent slopes	58	----------	--	VIIs-4 (19)	82	J	Sandy Alluvial	99	26
SsD	Soboba stony loamy sand, 2 to 15 percent slopes	58	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	14
StF2	Soper loam, 15 to 35 percent slopes, eroded	59	----------	--	VIe-1 (19)	80	A	Loamy	99	35
SuF2	Soper cobbly loam, 25 to 50 percent slopes, eroded	59	----------	--	VIIe-1 (19)	81	J	Loamy	99	17
TaF2	Temescal loam, 15 to 50 percent slopes, eroded	60	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	18
TbF2	Temescal rocky loam, 15 to 50 percent slopes, eroded	59	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	12
TeG	Terrace escarpments	60	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	5
TfF2	Tollhouse rocky coarse sandy loam, 8 to 50 percent slopes, eroded	60	----------	--	VIIe-4 (20)	81	J	Shallow Loamy Uplands	101	9
ThD2	Tollhouse sandy loam, 5 to 15 percent slopes, eroded	60	----------	--	VIIe-1 (20)	81	A	Shallow Loamy Uplands	101	25
ThE2	Tollhouse sandy loam, 15 to 25 percent slopes, eroded	60	----------	--	VIIe-1 (20)	81	J	Shallow Loamy Uplands	101	22
Tp2	Traver loamy fine sand, eroded	61	IIe-1 (19)	73	----------	--	A	Sandy Basin	100	55
Tr2	Traver loamy fine sand, saline-alkali, eroded	61	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	37
Ts	Traver fine sandy loam, saline-alkali	61	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	41
Tt2	Traver fine sandy loam, strongly saline-alkali, eroded	61	IVs-6 (19)	79	----------	--	F	Sandy Basin	100	12
TuB	Tujunga loamy sand, 0 to 5 percent slopes	62	IVs-0 (19)	79	----------	--	B	Sandy	99	62
TvC	Tujunga loamy sand, channeled, 0 to 8 percent slopes	62	----------	--	VIIw-4 (19)	82	J	Sandy Alluvial	99	31
TwC	Tujunga gravelly loamy sand, 0 to 8 percent slopes	62	IVs-4 (19)	79	----------	--	B	Sandy	99	38
VaE3	Vallecitos loam, 8 to 25 percent slopes, severely eroded	62	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	23
VdF2	Vallecitos rocky loam, 8 to 50 percent slopes, eroded	63	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	12
VeC2	Vallecitos loam, thick solum variant, 2 to 8 percent slopes, eroded	63	IIIe-8 (19)	75	----------	--	G	Loamy	99	45
VeD2	Vallecitos loam, thick solum variant, 8 to 15 percent slopes, eroded	64	IVe-8 (19)	78	----------	--	G	Loamy	99	38

'IDE TO MAPPING UNITS--Continued

	Capability unit				Vegetative soil group	Range site		Storie index rating
	Irrigated		Dryland					
Page	Symbol	Page	Symbol	Page		Site	Page	Number
- 64	----------	--	VIe-1 (19)	80	G	Loamy	99	24
- 64	IIe-1 (19)	73	----------	--	A	Loamy	99	77
- 64	I-1 (19)	72	----------	--	A	Loamy	99	90
- 64	IIe-1 (19)	73	----------	--	A	Loamy	99	86
- 65	IIIe-1 (19)	74	----------	--	A	Loamy	99	49
- 65	IVe-1 (19)	77	----------	--	A	Loamy	99	35
- 65	----------	--	VIe-1 (19)	80	A	Loamy	99	34
- 65	----------	--	VIe-7 (19)	80	A	Loamy	99	23
- 66	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	30
- 66	IIIs-6 (19)	77	----------	--	F	Sandy Basin	100	34
- 66	IVs-6 (19)	79	----------	--	F	Sandy Basin	100	10
- 66	IIIs-6 (19)	77	----------	--	F	Silty Basin	100	11
- 67	----------	--	VIw-1 (20)	81	E	Cienega	100	--
- 67	IIIw-5 (19)	76	----------	--	E	Silty Basin	100	40
- 67	IIIw-6 (19)	76	----------	--	F	Silty Basin	100	25
- 67	IVw-6 (19)	79	----------	--	F	Silty Basin	100	5
- 68	IIIw-6 (19)	76	----------	--	F	Silty Basin	100	35
- 68	IVw-6 (19)	79	----------	--	F	Silty Basin	100	9
- 68	IIIe-1 (19)	74	----------	--	A	Loamy	99	77
- 68	IIe-1 (19)	73	----------	--	A	Loamy	99	86
- 69	IVe-3 (19)	78	----------	--	D	Claypan	98	32
- 69	IVe-3 (19)	78	----------	--	D	Claypan	98	27
- 69	----------	--	VIe-8 (19)	81	D	Claypan	98	15
- 69	----------	--	VIe-7 (19)	80	D	Claypan	98	17

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit: Irrigated Symbol	Capability unit: Irrigated Page	Capability unit: Dryland Symbol	Capability unit: Dryland Page	Vegetative soil group	Range site: Site	Range site: Page	Storie index rating: Number
YrD2	Ysidora very fine sandy loam, 2 to 15 percent slopes, eroded-------	70	IVe-8 (19)	78	----------	--	G	Loamy	99	44
YsC2	Ysidora gravelly very fine sandy loam, 2 to 8 percent slopes, eroded----------	70	IIIe-8 (19)	75	----------	--	G	Loamy	99	39
YsE2	Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, eroded----------	70	IVe-8 (19)	78	----------	--	G	Loamy	99	33
YsE3	Ysidora gravelly very fine sandy loam, 8 to 25 percent slopes, severely eroded----------	70	----------	--	VIIe-1 (19)	81	J	Shallow Loamy	99	21