Appendix G

Custom USDA Soil Resource Reports

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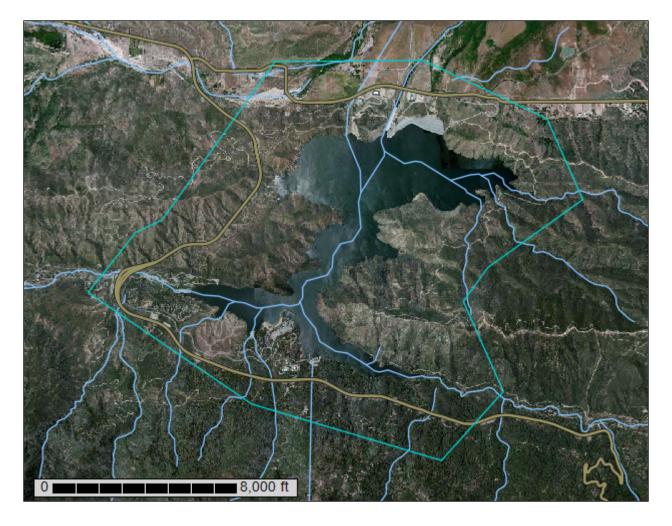


United States Department of Agriculture

NRCS

Natural Resources Conservation Service A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants Custom Soil Resource Report for San Bernardino County, California, Mojave River Area; and San Bernardino National Forest Area, California

Silverwood Lake Area



## Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http:// offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/? cid=nrcs142p2\_053951).

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

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

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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## **How Soil Surveys Are Made**

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soillandscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

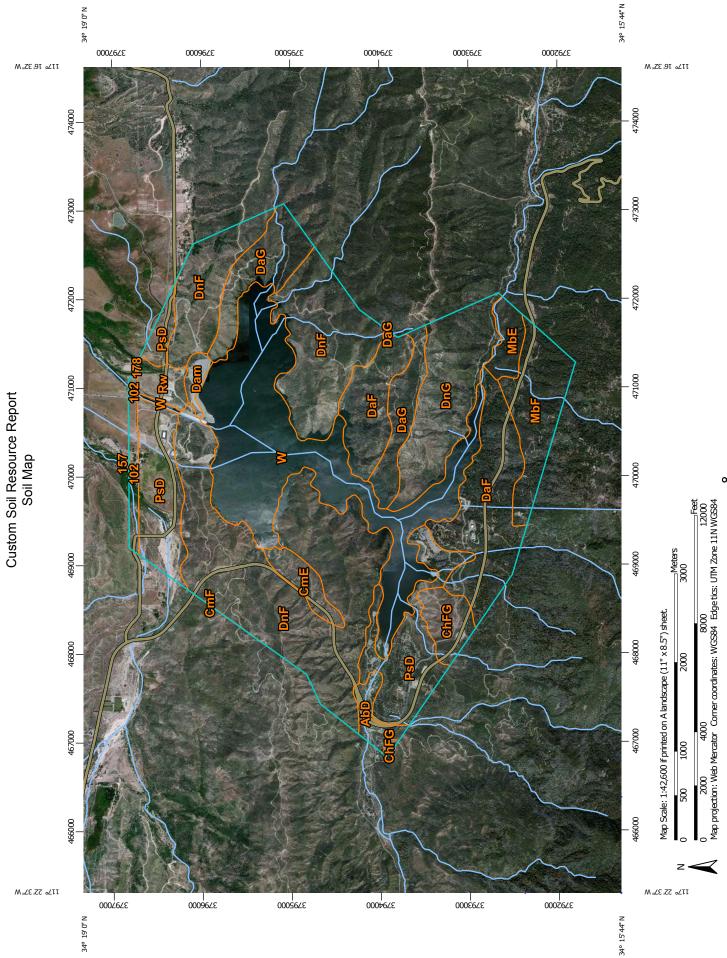
While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

## Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



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Custom Soil Resource Report

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## Map Unit Legend

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San Bernardino County, Califor		ornia, Mojave River Area (CA671)	
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102	AVAWATZ-OAK GLEN ASSOCIATION, GENTLY SLOPING*	51.3	1.1%
157	RIVERWASH	0.7	0.0%
178	WATER	1.8	0.0%
Subtotals for Soil Survey Area	· I	53.8	1.1%
Totals for Area of Interest		4,738.1	100.0%

San Bernardino National Forest Area, California (CA777)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AbD	Soboba-Hanford families association, 2 to 15 percent slopes	54.9	1.2%
ChFG	Typic Xerorthents, warm-Typic Haploxeralfs-Badland complex, 30 to 100 percent slopes	94.2	2.0%
CmE	Modesto-Osito families association, 15 to 30 percent slopes	68.4	1.4%
CmF	Osito-Modesto families association, 30 to 50 percent slopes	1.0	0.0%
DaF	Pacifico-Wapi families complex, 30 to 50 percent slopes	546.3	11.5%
DaG	Wapi-Pacifico families-Rock outcrop complex, 50 to 75 percent slopes	292.8	6.2%
Dam	Dams	30.3	0.6%
DnF	Trigo family-Lithic Xerorthents, warm complex, 30 to 50 percent slopes	1,499.6	31.6%
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	341.5	7.2%
MbE	Morical-Wind River families complex, 15 to 30 percent slopes	65.7	1.4%
MbF	Morical-Wind River families complex, 30 to 50 percent slopes	228.6	4.8%
PsD	Avawatz-Oak Glen, dry families association, 2 to 15 percent slopes	514.8	10.9%
Rw	Riverwash	57.4	1.2%

San Bernardino National For		rest Area, California (CA777)	
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
W	W Water areas		18.8%
Subtotals for Soil Survey Area		4,684.3	98.9%
Totals for Area of Interest		4,738.1	100.0%

## **Map Unit Descriptions**

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## San Bernardino County, California, Mojave River Area

## 102—AVAWATZ-OAK GLEN ASSOCIATION, GENTLY SLOPING\*

## **Map Unit Setting**

National map unit symbol: hkr6 Elevation: 3,400 to 5,200 feet Mean annual precipitation: 6 to 9 inches Mean annual air temperature: 57 to 61 degrees F Frost-free period: 150 to 250 days Farmland classification: Prime farmland if irrigated

## **Map Unit Composition**

Avawatz and similar soils: 50 percent Oak glen and similar soils: 40 percent Minor components: 10 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Avawatz**

## Setting

Landform: Alluvial fans Landform position (two-dimensional): Footslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite sources

## **Typical profile**

H1 - 0 to 15 inches: sandy loam H2 - 15 to 60 inches: loamy sand

## **Properties and qualities**

Slope: 2 to 9 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: Rare Frequency of ponding: None Available water storage in profile: Low (about 4.6 inches)

## Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: A Ecological site: COARSE LOAMY (R020XE003CA)

## **Description of Oak Glen**

## Setting

Landform: Alluvial fans Landform position (two-dimensional): Backslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite sources

#### **Typical profile**

H1 - 0 to 22 inches: sandy loam H2 - 22 to 60 inches: sandy loam

## **Properties and qualities**

Slope: 2 to 9 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Moderate (about 7.2 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: A Ecological site: COARSE LOAMY (R020XE003CA)

## **Minor Components**

## Haploxerolls

Percent of map unit: 5 percent Landform: Fan remnants

### Xerofluvents

Percent of map unit: 5 percent

## 157—RIVERWASH

#### Map Unit Setting

National map unit symbol: hksz Elevation: 650 to 4,000 feet Mean annual precipitation: 3 to 6 inches Mean annual air temperature: 59 to 66 degrees F Frost-free period: 180 to 290 days Farmland classification: Not prime farmland

## **Map Unit Composition**

*Riverwash:* 90 percent *Minor components:* 10 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

## **Description of Riverwash**

#### Setting

Landform: Channels Down-slope shape: Linear Across-slope shape: Linear

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8w

## **Minor Components**

Villa

Percent of map unit: 5 percent

#### Victorville

Percent of map unit: 5 percent

## **178—WATER**

## Map Unit Composition

*Water:* 100 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

## San Bernardino National Forest Area, California

## AbD—Soboba-Hanford families association, 2 to 15 percent slopes

## **Map Unit Setting**

National map unit symbol: htr5 Elevation: 1,600 to 4,000 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

## **Map Unit Composition**

Soboba family and similar soils: 50 percent Hanford family and similar soils: 30 percent Minor components: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Soboba Family**

## Setting

Landform: Flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium

## **Typical profile**

H1 - 0 to 8 inches: very cobbly loamy sand
H2 - 8 to 24 inches: very cobbly loamy sand
H3 - 24 to 60 inches: stratified very cobbly sand to very cobbly loamy fine sand

## **Properties and qualities**

Slope: 2 to 10 percent
Percent of area covered with surface fragments: 3.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.67 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.4 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: A

## **Description of Hanford Family**

## Setting

Landform: Alluvial fans Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium

## **Typical profile**

H1 - 0 to 6 inches: sandy loam H2 - 6 to 60 inches: sandy loam

## **Properties and qualities**

Slope: 5 to 15 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Runoff class: Low Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Moderate (about 7.8 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: A

## **Minor Components**

Riverwash Percent of map unit: 10 percent

## Soboba family, nonskeletal

Percent of map unit: 10 percent

## ChFG—Typic Xerorthents, warm-Typic Haploxeralfs-Badland complex, 30 to 100 percent slopes

## Map Unit Setting

National map unit symbol: htrh Elevation: 2,000 to 4,000 feet Mean annual precipitation: 10 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

## **Map Unit Composition**

*Typic xerorthents, warm, and similar soils:* 35 percent *Typic haploxeralfs and similar soils:* 30 percent *Badland:* 15 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

## **Description of Typic Xerorthents, Warm**

#### Setting

Landform: Terraces Landform position (two-dimensional): Footslope Landform position (three-dimensional): Riser Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from sedimentary rock

#### **Typical profile**

H1 - 0 to 8 inches: sandy loam

- H2 8 to 30 inches: sandy loam
- H3 30 to 34 inches: weathered bedrock

## **Properties and qualities**

Slope: 40 to 70 percent Depth to restrictive feature: 20 to 34 inches to paralithic bedrock Natural drainage class: Somewhat excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Low (about 3.9 inches)

### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: B

## **Description of Typic Haploxeralfs**

## Setting

Landform: Terraces Landform position (two-dimensional): Footslope Landform position (three-dimensional): Riser Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from sedimentary rock

## **Typical profile**

*H1 - 0 to 2 inches:* gravelly sandy loam *H2 - 2 to 10 inches:* gravelly sandy clay loam

H3 - 10 to 22 inches: gravely sandy eta

H4 - 22 to 39 inches: gravely sandy loam

H5 - 39 to 43 inches: weathered bedrock

## **Properties and qualities**

Slope: 30 to 50 percent
Depth to restrictive feature: 39 to 43 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.8 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C

## **Description of Badland**

#### Setting

Landform: Terraces Landform position (two-dimensional): Footslope Landform position (three-dimensional): Riser Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from sedimentary rock

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8e

## CmE—Modesto-Osito families association, 15 to 30 percent slopes

## Map Unit Setting

National map unit symbol: htrj Elevation: 1,800 to 4,200 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### Map Unit Composition

Modesto family and similar soils: 40 percent Osito family and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Modesto Family**

### Setting

Landform: Hills Landform position (two-dimensional): Footslope Landform position (three-dimensional): Head slope Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 8 inches: fine sandy loam

- H2 8 to 28 inches: sandy clay loam
- H3 28 to 50 inches: fine sandy loam
- H4 50 to 54 inches: weathered bedrock

## **Properties and qualities**

Slope: 15 to 30 percent
Depth to restrictive feature: 50 to 54 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: C

## **Description of Osito Family**

## Setting

Landform: Hills Landform position (two-dimensional): Footslope Landform position (three-dimensional): Head slope Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 5 inches: coarse sandy loam H2 - 5 to 13 inches: coarse sandy loam H3 - 13 to 17 inches: weathered bedrock

## **Properties and qualities**

Slope: 15 to 30 percent Depth to restrictive feature: 13 to 17 inches to paralithic bedrock Natural drainage class: Well drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.7 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D

## CmF—Osito-Modesto families association, 30 to 50 percent slopes

## Map Unit Setting

National map unit symbol: htrk Elevation: 1,800 to 4,200 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

### Map Unit Composition

*Osito family and similar soils:* 40 percent *Modesto family and similar soils:* 30 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

### **Description of Osito Family**

#### Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Head slope, side slope Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from sandstone

## Typical profile

H1 - 0 to 5 inches: coarse sandy loam H2 - 5 to 13 inches: coarse sandy loam H3 - 13 to 17 inches: weathered bedrock

## Properties and qualities

Slope: 30 to 50 percent Depth to restrictive feature: 13 to 17 inches to paralithic bedrock Natural drainage class: Well drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.7 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D

## **Description of Modesto Family**

#### Setting

Landform: Hills

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

#### **Typical profile**

H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 28 inches: loam

H3 - 28 to 50 inches: fine sandy loam

H4 - 50 to 54 inches: weathered bedrock

## **Properties and qualities**

Slope: 30 to 50 percent
Depth to restrictive feature: 50 to 54 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C

## DaF—Pacifico-Wapi families complex, 30 to 50 percent slopes

## **Map Unit Setting**

National map unit symbol: htrn Elevation: 5,000 to 8,000 feet Mean annual precipitation: 20 to 35 inches Mean annual air temperature: 46 to 54 degrees F Frost-free period: 120 to 175 days Farmland classification: Not prime farmland

## **Map Unit Composition**

Pacifico family and similar soils: 50 percent Wapi family and similar soils: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Pacifico Family**

#### Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

#### **Typical profile**

H1 - 0 to 3 inches: loamy coarse sand H2 - 3 to 15 inches: loamy coarse sand H3 - 15 to 19 inches: weathered bedrock

## **Properties and qualities**

Slope: 30 to 50 percent
Depth to restrictive feature: 15 to 19 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.0 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

## **Description of Wapi Family**

## Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

## **Typical profile**

*H1 - 0 to 7 inches:* loamy sand *H2 - 7 to 10 inches:* gravelly loamy sand

H3 - 10 to 15 inches: weathered bedrock

H4 - 15 to 19 inches: unweathered bedrock

## **Properties and qualities**

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 15 inches to paralithic bedrock; 15 to 19 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.6 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

## DaG—Wapi-Pacifico families-Rock outcrop complex, 50 to 75 percent slopes

## Map Unit Setting

National map unit symbol: http Elevation: 4,000 to 7,800 feet Mean annual precipitation: 20 to 35 inches Mean annual air temperature: 46 to 54 degrees F Frost-free period: 120 to 175 days Farmland classification: Not prime farmland

#### Map Unit Composition

Wapi family and similar soils: 35 percent Pacifico family and similar soils: 30 percent Rock outcrop: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.

### **Description of Wapi Family**

#### Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 7 inches: loamy sand

H2 - 7 to 10 inches: gravelly loamy sand

H3 - 10 to 15 inches: weathered bedrock

H4 - 15 to 19 inches: unweathered bedrock

## **Properties and qualities**

Slope: 50 to 75 percent
 Depth to restrictive feature: 10 to 15 inches to paralithic bedrock; 15 to 19 inches to lithic bedrock
 Natural drainage class: Somewhat excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 0.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

## **Description of Pacifico Family**

## Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 3 inches: loamy coarse sand

H2 - 3 to 15 inches: loamy coarse sand

H3 - 15 to 19 inches: weathered bedrock

## **Properties and qualities**

Slope: 50 to 75 percent
Depth to restrictive feature: 15 to 19 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.0 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

## **Description of Rock Outcrop**

## Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 4 inches: unweathered bedrock

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8e

## Dam—Dams

Map Unit Composition Dam: 100 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## DnF—Trigo family-Lithic Xerorthents, warm complex, 30 to 50 percent slopes

## **Map Unit Setting**

National map unit symbol: htry Elevation: 1,790 to 6,400 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

## Map Unit Composition

*Trigo family and similar soils:* 60 percent *Lithic xerorthents, warm, and similar soils:* 15 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

## **Description of Trigo Family**

## Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 3 inches: coarse sandy loam
H2 - 3 to 12 inches: coarse sandy loam
H3 - 12 to 16 inches: weathered bedrock

## **Properties and qualities**

Slope: 30 to 50 percent Depth to restrictive feature: 12 to 16 inches to paralithic bedrock Natural drainage class: Somewhat excessively drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.5 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D

### **Description of Lithic Xerorthents, Warm**

#### Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

#### Typical profile

*H1 - 0 to 18 inches:* gravelly sandy loam *H2 - 18 to 22 inches:* unweathered bedrock

### **Properties and qualities**

Slope: 30 to 50 percent Depth to restrictive feature: 18 to 22 inches to lithic bedrock Natural drainage class: Excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.4 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D

## DnG—Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes

## Map Unit Setting

National map unit symbol: htrz Elevation: 1,790 to 6,400 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

*Trigo family and similar soils:* 50 percent *Lithic xerorthents, warm, and similar soils:* 20 percent *Minor components:* 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Trigo Family**

## Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 3 inches: coarse sandy loam H2 - 3 to 12 inches: coarse sandy loam H3 - 12 to 16 inches: weathered bedrock

## **Properties and qualities**

Slope: 50 to 75 percent Depth to restrictive feature: 12 to 16 inches to paralithic bedrock Natural drainage class: Somewhat excessively drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.5 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

## **Description of Lithic Xerorthents, Warm**

## Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

## **Typical profile**

*H1 - 0 to 18 inches:* gravelly sandy loam *H2 - 18 to 22 inches:* unweathered bedrock

## **Properties and qualities**

Slope: 50 to 75 percent Depth to restrictive feature: 18 to 22 inches to lithic bedrock Natural drainage class: Excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.4 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

## **Minor Components**

## Rock outcrop

Percent of map unit: 8 percent

## Unnamed, shallow fine sandy loam soils Percent of map unit: 8 percent

Springdale family Percent of map unit: 7 percent

#### Ramona family

Percent of map unit: 7 percent

## MbE—Morical-Wind River families complex, 15 to 30 percent slopes

#### Map Unit Setting

National map unit symbol: htsv Elevation: 4,500 to 6,000 feet Mean annual precipitation: 25 to 35 inches Mean annual air temperature: 46 to 54 degrees F Frost-free period: 120 to 175 days Farmland classification: Not prime farmland

#### Map Unit Composition

Morical family and similar soils: 50 percent Wind river family and similar soils: 25 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Morical Family**

## Setting

Landform: Mountains Landform position (two-dimensional): Footslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

#### **Typical profile**

*H1 - 0 to 8 inches:* loam *H2 - 8 to 50 inches:* loam

H3 - 50 to 54 inches: weathered bedrock

#### **Properties and qualities**

Slope: 15 to 30 percent

#### **Custom Soil Resource Report**

Depth to restrictive feature: 50 to 54 inches to paralithic bedrock Natural drainage class: Well drained Runoff class: Very high Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Moderate (about 7.5 inches)

### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: C

#### **Description of Wind River Family**

#### Setting

Landform: Mountains Landform position (two-dimensional): Footslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

#### **Typical profile**

H1 - 0 to 19 inches: sandy loam H2 - 19 to 34 inches: sandy loam H3 - 34 to 45 inches: sandy loam H4 - 45 to 49 inches: weathered bedrock

### **Properties and qualities**

Slope: 15 to 30 percent Depth to restrictive feature: 45 to 49 inches to paralithic bedrock Natural drainage class: Well drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Moderate (about 6.0 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: A

## MbF—Morical-Wind River families complex, 30 to 50 percent slopes

### Map Unit Setting

National map unit symbol: htsw

*Elevation:* 4,500 to 6,000 feet *Mean annual precipitation:* 25 to 35 inches *Mean annual air temperature:* 46 to 54 degrees F *Frost-free period:* 120 to 175 days *Farmland classification:* Not prime farmland

### **Map Unit Composition**

Morical family and similar soils: 40 percent Wind river family and similar soils: 35 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Morical Family**

### Setting

Landform: Mountains Landform position (two-dimensional): Footslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 8 inches: loam H2 - 8 to 50 inches: loam H3 - 50 to 54 inches: weathered bedrock

## **Properties and qualities**

Slope: 30 to 50 percent
Depth to restrictive feature: 50 to 54 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C

## **Description of Wind River Family**

## Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

## **Typical profile**

H1 - 0 to 19 inches: sandy loam H2 - 19 to 34 inches: sandy loam H3 - 34 to 45 inches: sandy loam H4 - 45 to 49 inches: weathered bedrock

#### **Properties and qualities**

Slope: 30 to 50 percent Depth to restrictive feature: 45 to 49 inches to paralithic bedrock Natural drainage class: Well drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Moderate (about 6.0 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: A

## PsD—Avawatz-Oak Glen, dry families association, 2 to 15 percent slopes

## Map Unit Setting

National map unit symbol: htsz Elevation: 3,200 to 6,000 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### Map Unit Composition

Avawatz family and similar soils: 50 percent Oak glen family, dry, and similar soils: 25 percent Minor components: 25 percent Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Avawatz Family**

## Setting

Landform: Flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium

## **Typical profile**

H1 - 0 to 8 inches: gravelly loamy coarse sand

H2 - 8 to 24 inches: gravelly coarse sand

H3 - 24 to 60 inches: stratified gravelly loamy coarse sand to loamy coarse sand

### **Properties and qualities**

Slope: 2 to 10 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Excessively drained Runoff class: Very low Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.67 to 19.98 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Low (about 3.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: A

### Description of Oak Glen Family, Dry

#### Setting

Landform: Alluvial fans Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium

#### **Typical profile**

H1 - 0 to 14 inches: sandy loam H2 - 14 to 23 inches: coarse sandy loam H3 - 23 to 60 inches: loamy sand

## **Properties and qualities**

Slope: 5 to 15 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Runoff class: Low Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Moderate (about 7.9 inches)

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: A

## **Minor Components**

#### Wilshire family

Percent of map unit: 9 percent

## Riverwash

Percent of map unit: 8 percent

## Hodgson family

Percent of map unit: 8 percent

## Rw—Riverwash

## Map Unit Setting

National map unit symbol: htt3 Elevation: 1,600 to 6,000 feet Mean annual precipitation: 10 to 35 inches Mean annual air temperature: 46 to 64 degrees F Frost-free period: 120 to 200 days Farmland classification: Not prime farmland

## Map Unit Composition

*Riverwash:* 80 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

## **Description of Riverwash**

## Setting

Landform: Flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium

## Properties and qualities

*Slope:* 2 to 10 percent *Frequency of flooding:* Frequent

## Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8w

## W—Water areas

## Map Unit Composition

*Water:* 95 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

# Soil Information for All Uses

## **Soil Properties and Qualities**

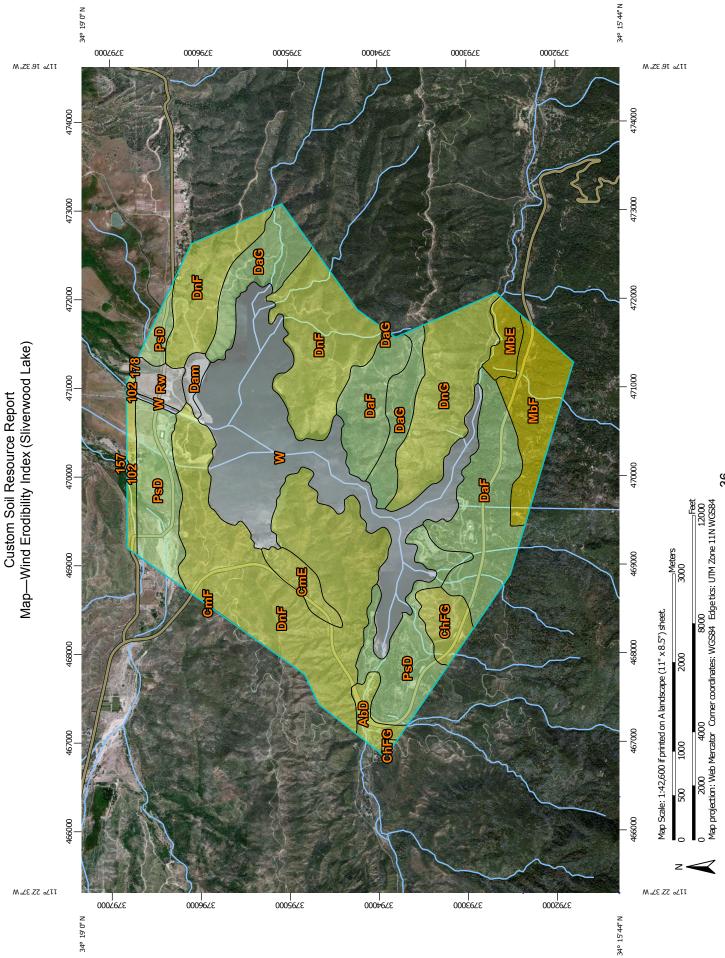
The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## **Soil Erosion Factors**

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

### Wind Erodibility Index (Sliverwood Lake)

The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.



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38       Transportation         48		Streams and Canals	
<ul> <li>A8</li> <li>56</li> <li>67</li> <li>88</li> <li>134</li> <li>134</li> <li>134</li> <li>135</li> <li>136</li> <li>137</li> <li>138</li> <li>160</li> <li>180</li> <li></li></ul>	_	Transportation	Y our area of interest (AOI) includes more than one soil survey area. These survey areas may have been manad at different scales with
56     Interstate Highways       86     U S Routes       134     Najor Roads       160     Najor Roads       180     Local Roads       220     Background       220     Aerial Photography	48	+++ Rails	a different land use in mind, at different times, or at different levels
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imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.			The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background
			imagery displayed on these maps. As a result, some minor snitting of map unit boundaries may be evident.

### Table—Wind Erodibility Index (Sliverwood Lake)

Wind Erodibility I	ndex— Summary by Map	Unit — San Bernardino Co	ounty, California, Mojave R	River Area (CA671)
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
102	AVAWATZ-OAK GLEN ASSOCIATION, GENTLY SLOPING*	86	51.3	1.1%
157	RIVERWASH		0.7	0.0%
178	WATER		1.8	0.0%
Subtotals for Soil Surve	ey Area		53.8	1.1%
Totals for Area of Intere	est		4,738.1	100.0%

Wind Erodibi	lity Index— Summary by Ma	ap Unit — San Bernardino I	National Forest Area, Calif	iornia (CA777)
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
AbD	Soboba-Hanford families association, 2 to 15 percent slopes	86	54.9	1.2%
ChFG	Typic Xerorthents, warm- Typic Haploxeralfs- Badland complex, 30 to 100 percent slopes	86	94.2	2.0%
CmE	Modesto-Osito families association, 15 to 30 percent slopes	86	68.4	1.4%
CmF	Osito-Modesto families association, 30 to 50 percent slopes	86	1.0	0.0%
DaF	Pacifico-Wapi families complex, 30 to 50 percent slopes	134	546.3	11.5%
DaG	Wapi-Pacifico families- Rock outcrop complex, 50 to 75 percent slopes	134	292.8	6.2%
Dam	Dams		30.3	0.6%
DnF	Trigo family-Lithic Xerorthents, warm complex, 30 to 50 percent slopes	86	1,499.6	31.6%
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	86	341.5	7.2%
MbE	Morical-Wind River families complex, 15 to 30 percent slopes	56	65.7	1.4%
MbF	Morical-Wind River families complex, 30 to 50 percent slopes	56	228.6	4.8%

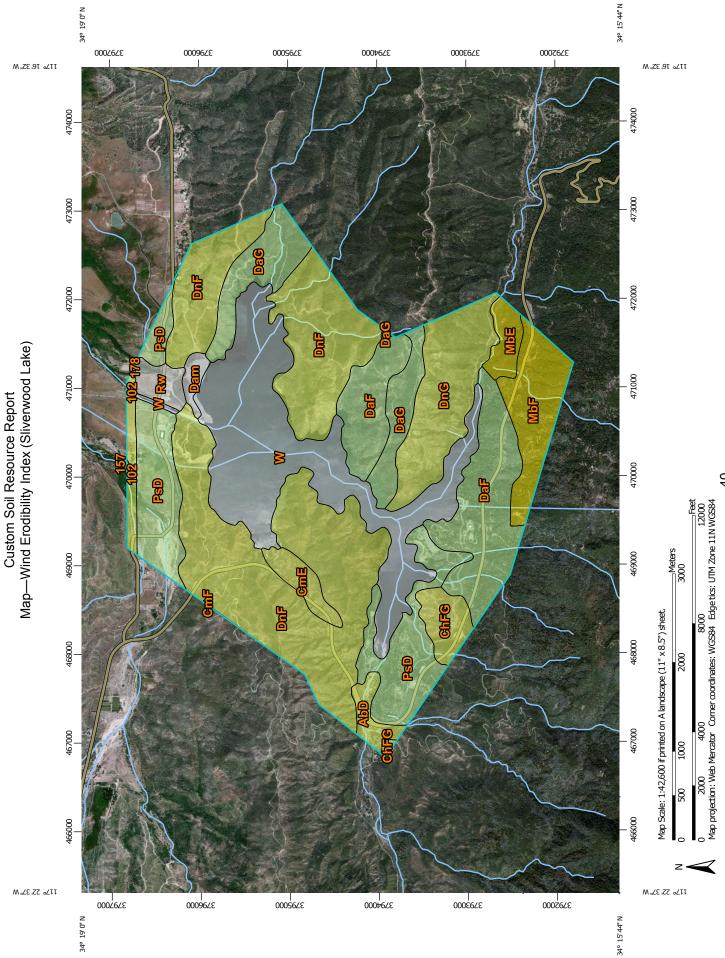
Wind Erodibili	ty Index— Summary by Ma	ap Unit — San Bernardino	National Forest Area, Ca	lifornia (CA777)
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
PsD	Avawatz-Oak Glen, dry families association, 2 to 15 percent slopes	134	514.8	10.9%
Rw	Riverwash		57.4	1.2%
W	Water areas		888.7	18.8%
Subtotals for Soil Surve	y Area		4,684.3	98.9%
Totals for Area of Intere	st		4,738.1	100.0%

### Rating Options—Wind Erodibility Index (Sliverwood Lake)

Units of Measure: tons per acre per year Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher

### Wind Erodibility Index (Sliverwood Lake)

The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.



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			of map unit boundaries may be evident.

### Table—Wind Erodibility Index (Sliverwood Lake)

Wind Erodibility I	ndex— Summary by Map	Unit — San Bernardino Co	ounty, California, Mojave F	River Area (CA671)
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
102	AVAWATZ-OAK GLEN ASSOCIATION, GENTLY SLOPING*	86	51.3	1.1%
157	RIVERWASH		0.7	0.0%
178	WATER		1.8	0.0%
Subtotals for Soil Surve	y Area		53.8	1.1%
Totals for Area of Intere	st		4,738.1	100.0%

Wind Erodibi	lity Index— Summary by Ma	ap Unit — San Bernardino I	National Forest Area, Calif	ornia (CA777)
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
AbD	Soboba-Hanford families association, 2 to 15 percent slopes	86	54.9	1.2%
ChFG	Typic Xerorthents, warm- Typic Haploxeralfs- Badland complex, 30 to 100 percent slopes	86	94.2	2.0%
CmE	Modesto-Osito families association, 15 to 30 percent slopes	86	68.4	1.4%
CmF	Osito-Modesto families association, 30 to 50 percent slopes	86	1.0	0.0%
DaF	Pacifico-Wapi families complex, 30 to 50 percent slopes	134	546.3	11.5%
DaG	Wapi-Pacifico families- Rock outcrop complex, 50 to 75 percent slopes	134	292.8	6.2%
Dam	Dams		30.3	0.6%
DnF	Trigo family-Lithic Xerorthents, warm complex, 30 to 50 percent slopes	86	1,499.6	31.6%
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	86	341.5	7.2%
MbE	Morical-Wind River families complex, 15 to 30 percent slopes	56	65.7	1.4%
MbF	Morical-Wind River families complex, 30 to 50 percent slopes	56	228.6	4.8%

Wind Erodibili	ty Index— Summary by M	ap Unit — San Bernardino I	National Forest Area, Cal	ifornia (CA777)
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
PsD	Avawatz-Oak Glen, dry families association, 2 to 15 percent slopes	134	514.8	10.9%
Rw	Riverwash		57.4	1.2%
W	Water areas		888.7	18.8%
Subtotals for Soil Surve	ey Area		4,684.3	98.9%
Totals for Area of Intere	st		4,738.1	100.0%

### Rating Options—Wind Erodibility Index (Sliverwood Lake)

Units of Measure: tons per acre per year Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher

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United States Department of Agriculture

Natural Resources Conservation

Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants Custom Soil Resource Report for San Bernardino County Southwestern Part, California, and San Bernardino National Forest Area, California

**Devil Canyon** 



# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http:// offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/? cid=nrcs142p2\_053951).

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

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

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# **How Soil Surveys Are Made**

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soillandscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Custom Soil Resource Report

Area of Interest (AOI) Area of Interest (AOI) Soils Soils Soil Map Unit Polygons Soil Map Unit Lines Soil Map Unit Points Special Point Features	terest (AOI)			
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© Blowout	-	Water Features	tures	Maps from the Web Soil Survey are based on the Web Mercator
Borrow Pit		{	Streams and Canals	projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the
XX Clay Spot		Iransportation HI Rai	ation Rails	Albers equal-area conic projection, should be used if more accurate
Closed Depression	pression	2	Interstate Highways	נמוכחמווטוא טו טאמווכב טו מוכמ מוכ ובקטוובט.
🔏 Gravel Pit		2	US Routes	This product is generated from the USDA-NRCS certified data as of
Gravelly Spot	tpot	8	Major Roads	the version date(s) listed below.
🕲 Landfill		8	, Local Roads	Soil Survey Area: San Bernardino County Southwestern Part,
🙏 🗼 Lava Flow		Background	bt	California Survey Area Data: Version 7, Sep 3, 2015
🚢 Marsh or swamp	swamp	1	Aerial Photography	
🙊 Mine or Quarry	uarry			Soil Survey Area: San Bernardino National Forest Area, California Survey Area Data: Version 7 Sep 30 2014
Miscellane	<b>Miscellaneous Water</b>			
Perennial Water	Water			Your area of interest (AOI) includes more than one soil survey area.
Rock Outcrop	srop			a different land use in mind, at different times, or at different levels
+ Saline Spot	ot			of detail. This may result in map unit symbols, soil properties, and interactions that do not completely acres acress coll properties.
Sandy Spot	ot			much pretations that up not compretely agree across som survey e boundaries.
Reverely E	Severely Eroded Spot			200 ماناسم سميا (ميتمالم محمد ماما لماماما منه ماناسا معم الما
Sinkhole				our map our side a clabered (as space anows) for map scares 1.30, or larger.
Slide or Slip	qi			
Sodic Spot	÷			Date(s) aerial images were photographed: May 25, 2010—Jun 3, 2010
				The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting

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# Map Unit Legend

	San Bernardino County Southwest	estern Part, California (CA677)		
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
Cr	Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20	95.3	6.8%	
НаС	Hanford coarse sandy loam, 2 to 9 percent slopes	4.6	0.3%	
HaD	Hanford coarse sandy loam, 9 to 15 percent slopes	47.0	3.4%	
RmE2	Ramona sandy loam, 15 to 30 percent slopes, eroded	7.2	0.5%	
SoC	Soboba gravelly loamy sand, 0 to 9 percent slopes	21.2	1.5%	
SpC	Soboba stony loamy sand, 2 to 9 percent slopes	136.0	9.7%	
TvC	Tujunga gravelly loamy sand, 0 to 9 percent slopes	233.5	16.7%	
W Water		38.0	2.7%	
Subtotals for Soil Survey Area		582.8	41.7%	
Totals for Area of Interest		1,398.8	100.0%	

San Bernardino National Fore		rest Area, California (CA777)		
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
ChDE	Ramona family-Typic Xerorthents, warm association, 2 to 30 percent slopes	14.2	1.0%	
CmF	Osito-Modesto families association, 30 to 50 percent slopes	201.6	14.4%	
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	331.3	23.7%	
EsD	Riverwash-Soboba families association, 2 to 15 percent slopes	60.4	4.3%	
FLG Springdale family-Lithic Xerorthents association,dry, 50 to 75 percent slopes		208.4	14.9%	
Subtotals for Soil Survey Area		816.0	58.3%	
Totals for Area of Interest		1,398.8	100.0%	

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly

indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

### San Bernardino County Southwestern Part, California

#### Cr-Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20

#### **Map Unit Setting**

National map unit symbol: 2tb7z Elevation: 500 to 5,500 feet Mean annual precipitation: 10 to 39 inches Mean annual air temperature: 45 to 64 degrees F Frost-free period: 240 to 365 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

*Cieneba and similar soils:* 60 percent *Rock outcrop:* 30 percent *Minor components:* 10 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

#### **Description of Cieneba**

#### Setting

Landform: Mountain slopes, hillslopes Down-slope shape: Linear, convex, concave Across-slope shape: Convex, concave Parent material: Residuum weathered from granite

#### **Typical profile**

A - 0 to 8 inches: sandy loam C - 8 to 14 inches: sandy loam

#### **Properties and qualities**

Slope: 30 to 50 percent
Percent of area covered with surface fragments: 10.0 percent
Depth to restrictive feature: 12 to 20 inches to paralithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.7 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D

#### **Description of Rock Outcrop**

#### Setting

Landform: Ridges, mountain slopes Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Convex Across-slope shape: Convex

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8

#### **Minor Components**

#### Typic xerorthent, eroded Percent of map unit: 5 percent

#### Typic xerorthent, moderately deep Percent of map unit: 5 percent

#### HaC—Hanford coarse sandy loam, 2 to 9 percent slopes

#### Map Unit Setting

National map unit symbol: hck3 Elevation: 150 to 900 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 63 degrees F Frost-free period: 250 to 280 days Farmland classification: Prime farmland if irrigated

#### Map Unit Composition

Hanford and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Hanford**

#### Setting

Landform: Alluvial fans Landform position (two-dimensional): Backslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite

#### Typical profile

- H1 0 to 12 inches: sandy loam
- H2 12 to 60 inches: fine sandy loam, sandy loam, coarse sandy loam
- H2 12 to 60 inches:
- H2 12 to 60 inches:

#### **Properties and qualities**

Slope: 2 to 9 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Runoff class: Low Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches *Frequency of flooding:* Rare *Frequency of ponding:* None *Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) *Available water storage in profile:* Very high (about 20.3 inches)

#### Interpretive groups

Land capability classification (irrigated): 2e Land capability classification (nonirrigated): 3e Hydrologic Soil Group: A

#### **Minor Components**

Greenfield, sandy loam Percent of map unit: 10 percent

### Tujunga, loamy sand

Percent of map unit: 5 percent

#### HaD—Hanford coarse sandy loam, 9 to 15 percent slopes

#### **Map Unit Setting**

National map unit symbol: hck4 Elevation: 150 to 900 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 63 degrees F Frost-free period: 250 to 280 days Farmland classification: Farmland of statewide importance

#### Map Unit Composition

Hanford and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Hanford**

#### Setting

Landform: Alluvial fans Landform position (two-dimensional): Backslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite

#### **Typical profile**

H1 - 0 to 12 inches: sandy loam H2 - 12 to 60 inches: fine sandy loam, sandy loam, coarse sandy loam H2 - 12 to 60 inches: H2 - 12 to 60 inches:

#### **Properties and qualities**

Slope: 9 to 15 percent Depth to restrictive feature: More than 80 inches Natural drainage class: Well drained Runoff class: Low Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water storage in profile: Very high (about 20.3 inches)

#### Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 3e Hydrologic Soil Group: A

#### **Minor Components**

Greenfield, sandy loam Percent of map unit: 10 percent

#### Ramona, sandy loam

Percent of map unit: 5 percent

#### RmE2—Ramona sandy loam, 15 to 30 percent slopes, eroded

#### Map Unit Setting

National map unit symbol: hckl Elevation: 250 to 3,500 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 63 degrees F Frost-free period: 230 to 320 days Farmland classification: Not prime farmland

#### Map Unit Composition

Ramona and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Ramona**

#### Setting

Landform: Terraces Landform position (two-dimensional): Footslope Landform position (three-dimensional): Tread Down-slope shape: Concave Across-slope shape: Concave Parent material: Alluvium derived from granite

#### **Typical profile**

H1 - 0 to 23 inches: sandy loam H2 - 23 to 32 inches: loam H3 - 32 to 54 inches: sandy clay loam, clay loam H3 - 32 to 54 inches: sandy loam, loam H4 - 54 to 60 inches: H4 - 54 to 60 inches:

#### **Properties and qualities**

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.9 inches)

#### Interpretive groups

Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C

#### **Minor Components**

Greenfield, sandy loam Percent of map unit: 10 percent

#### Monserate, sandy loam

Percent of map unit: 5 percent

#### SoC—Soboba gravelly loamy sand, 0 to 9 percent slopes

#### Map Unit Setting

National map unit symbol: hckt Elevation: 30 to 4,200 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 61 to 63 degrees F Frost-free period: 175 to 250 days Farmland classification: Not prime farmland

#### Map Unit Composition

Soboba and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Soboba**

#### Setting

Landform: Alluvial fans Landform position (two-dimensional): Backslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite

#### **Typical profile**

*H1 - 0 to 12 inches:* gravelly loamy sand *H2 - 12 to 36 inches:* very gravelly loamy sand *H3 - 36 to 60 inches:* very stony sand

#### **Properties and qualities**

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water storage in profile: Low (about 3.2 inches)

#### Interpretive groups

Land capability classification (irrigated): 4s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: A

#### **Minor Components**

#### Delhi, fine sand

Percent of map unit: 5 percent

#### Unnamed

Percent of map unit: 5 percent

#### Tujunga, gravelly loam

Percent of map unit: 3 percent

#### Unnamed

Percent of map unit: 2 percent Landform: Drainageways

#### SpC—Soboba stony loamy sand, 2 to 9 percent slopes

#### Map Unit Setting

National map unit symbol: hckv Elevation: 10 to 4,200 feet Mean annual precipitation: 10 to 25 inches Mean annual air temperature: 59 to 64 degrees F Frost-free period: 210 to 350 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

Soboba and similar soils: 85 percent Minor components: 15 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Soboba**

#### Setting

Landform: Alluvial fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite

#### **Typical profile**

A - 0 to 10 inches: very stony loamy sand C - 10 to 60 inches: very stony sand

#### **Properties and qualities**

Slope: 2 to 9 percent
Percent of area covered with surface fragments: 0.1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water storage in profile: Very low (about 2.5 inches)

#### Interpretive groups

Land capability classification (irrigated): 4s Land capability classification (nonirrigated): 6s Hydrologic Soil Group: A

#### **Minor Components**

#### Hanford

Percent of map unit: 5 percent Landform: Alluvial fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear

#### Tujunga, gravelly loamy coarse sand

Percent of map unit: 5 percent Landform: Alluvial fans Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear

#### Ramona

Percent of map unit: 5 percent Landform: Alluvial fans, terraces Landform position (three-dimensional): Tread *Down-slope shape:* Linear *Across-slope shape:* Linear

#### TvC—Tujunga gravelly loamy sand, 0 to 9 percent slopes

#### Map Unit Setting

National map unit symbol: hcl2 Elevation: 10 to 1,500 feet Mean annual precipitation: 10 to 25 inches Mean annual air temperature: 59 to 64 degrees F Frost-free period: 250 to 350 days Farmland classification: Not prime farmland

#### Map Unit Composition

*Tujunga and similar soils:* 85 percent *Minor components:* 15 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

#### **Description of Tujunga**

#### Setting

Landform: Alluvial fans Landform position (two-dimensional): Backslope Landform position (three-dimensional): Tread Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium derived from granite

#### **Typical profile**

*H1 - 0 to 36 inches:* gravelly loamy sand *H2 - 36 to 60 inches:* gravelly sand, gravelly loamy sand *H2 - 36 to 60 inches:* 

#### **Properties and qualities**

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Low (about 5.5 inches)

#### Interpretive groups

Land capability classification (irrigated): 4s Land capability classification (nonirrigated): 4e Hydrologic Soil Group: A

#### **Minor Components**

#### Unnamed

Percent of map unit: 5 percent Landform: Drainageways

#### Soboba, gravelly loamy sand Percent of map unit: 5 percent

#### Delhi, fine sand Percent of map unit: 5 percent

#### W-Water

#### Map Unit Composition

*Water:* 100 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

#### **Description of Water**

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8

### San Bernardino National Forest Area, California

# ChDE—Ramona family-Typic Xerorthents, warm association, 2 to 30 percent slopes

#### **Map Unit Setting**

National map unit symbol: htrg Elevation: 2,000 to 4,000 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

Ramona family and similar soils: 60 percent Typic xerorthents, warm, and similar soils: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Ramona Family**

#### Setting

Landform: Terraces Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser Down-slope shape: Concave Across-slope shape: Convex Parent material: Alluvium

#### **Typical profile**

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 18 inches: gravelly sandy loam
H3 - 18 to 48 inches: cobbly sandy clay loam
H4 - 48 to 60 inches: gravelly sandy loam
H5 - 60 to 70 inches: gravelly loamy coarse sand

#### **Properties and qualities**

Slope: 2 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.2 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: C

#### Description of Typic Xerorthents, Warm

#### Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from sedimentary rock

#### **Typical profile**

H1 - 0 to 8 inches: sandy loam H2 - 8 to 30 inches: sandy loam H3 - 30 to 34 inches: weathered bedrock

#### **Properties and qualities**

Slope: 10 to 30 percent Depth to restrictive feature: 20 to 34 inches to paralithic bedrock Natural drainage class: Somewhat excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Low (about 3.9 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: B

#### CmF—Osito-Modesto families association, 30 to 50 percent slopes

#### Map Unit Setting

National map unit symbol: htrk Elevation: 1,800 to 4,200 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

Osito family and similar soils: 40 percent Modesto family and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Osito Family**

#### Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Head slope, side slope Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from sandstone

#### **Typical profile**

*H1 - 0 to 5 inches:* coarse sandy loam *H2 - 5 to 13 inches:* coarse sandy loam

H3 - 13 to 17 inches: weathered bedrock

#### **Properties and qualities**

Slope: 30 to 50 percent Depth to restrictive feature: 13 to 17 inches to paralithic bedrock Natural drainage class: Well drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.7 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: D

#### **Description of Modesto Family**

#### Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

#### **Typical profile**

H1 - 0 to 8 inches: fine sandy loam

H2 - 8 to 28 inches: loam

H3 - 28 to 50 inches: fine sandy loam

H4 - 50 to 54 inches: weathered bedrock

#### **Properties and qualities**

Slope: 30 to 50 percent
Depth to restrictive feature: 50 to 54 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 6e Hydrologic Soil Group: C

# DnG—Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes

#### Map Unit Setting

National map unit symbol: htrz Elevation: 1,790 to 6,400 feet Mean annual precipitation: 10 to 20 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### Map Unit Composition

*Trigo family and similar soils:* 50 percent *Lithic xerorthents, warm, and similar soils:* 20 percent *Minor components:* 30 percent *Estimates are based on observations, descriptions, and transects of the mapunit.* 

#### **Description of Trigo Family**

#### Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granodiorite

#### **Typical profile**

H1 - 0 to 3 inches: coarse sandy loam

H2 - 3 to 12 inches: coarse sandy loam

H3 - 12 to 16 inches: weathered bedrock

#### **Properties and qualities**

Slope: 50 to 75 percent Depth to restrictive feature: 12 to 16 inches to paralithic bedrock Natural drainage class: Somewhat excessively drained Runoff class: Medium Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.5 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

#### **Description of Lithic Xerorthents, Warm**

#### Setting

Landform: Hills Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granodiorite

#### **Typical profile**

H1 - 0 to 18 inches: gravelly sandy loam H2 - 18 to 22 inches: unweathered bedrock

#### **Properties and qualities**

Slope: 50 to 75 percent Depth to restrictive feature: 18 to 22 inches to lithic bedrock Natural drainage class: Excessively drained Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water storage in profile: Very low (about 1.4 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

#### **Minor Components**

Rock outcrop Percent of map unit: 8 percent

#### Unnamed, shallow fine sandy loam soils Percent of map unit: 8 percent

Springdale family Percent of map unit: 7 percent

#### Ramona family

Percent of map unit: 7 percent

#### EsD—Riverwash-Soboba families association, 2 to 15 percent slopes

#### **Map Unit Setting**

National map unit symbol: hts5 Elevation: 1,600 to 4,000 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 55 to 64 degrees F Frost-free period: 150 to 200 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

*Riverwash:* 50 percent Soboba family and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Riverwash**

#### Setting

Landform: Alluvial flats Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Alluvium

#### **Properties and qualities**

Slope: 2 to 10 percent Frequency of flooding: Frequent

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 8w

#### **Description of Soboba Family**

#### Setting

Landform: Alluvial flats Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf Down-slope shape: Concave Across-slope shape: Convex Parent material: Alluvium

#### **Typical profile**

H1 - 0 to 8 inches: very cobbly loamy sand

- H2 8 to 24 inches: very cobbly sand
- H3 24 to 60 inches: stratified very cobbly sand to very cobbly loamy fine sand

#### **Properties and qualities**

Slope: 5 to 15 percent
Percent of area covered with surface fragments: 3.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.67 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.4 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4e Hydrologic Soil Group: A

# FLG—Springdale family-Lithic Xerorthents association,dry, 50 to 75 percent slopes

#### Map Unit Setting

National map unit symbol: htsc Elevation: 3,000 to 7,000 feet Mean annual precipitation: 15 to 25 inches Mean annual air temperature: 46 to 54 degrees F Frost-free period: 120 to 175 days Farmland classification: Not prime farmland

#### **Map Unit Composition**

Springdale family, dry, and similar soils: 40 percent Lithic xerorthents, dry, and similar soils: 35 percent Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Springdale Family, Dry**

#### Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Concave Parent material: Residuum weathered from granite

#### **Typical profile**

- H1 0 to 5 inches: gravelly loamy coarse sand
- H2 5 to 25 inches: very gravelly loamy sand
- H3 25 to 45 inches: very gravelly coarse sand
- H4 45 to 49 inches: unweathered bedrock

#### **Properties and qualities**

Slope: 50 to 70 percent
Depth to restrictive feature: 45 to 49 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.5 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: A

#### **Description of Lithic Xerorthents, Dry**

#### Setting

Landform: Mountains Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank Down-slope shape: Concave Across-slope shape: Convex Parent material: Residuum weathered from granite

#### **Typical profile**

*H1 - 0 to 18 inches:* very gravelly loamy sand *H2 - 18 to 22 inches:* unweathered bedrock

#### **Properties and qualities**

Slope: 60 to 75 percent
Depth to restrictive feature: 18 to 22 inches to lithic bedrock
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.1 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: D

# Soil Information for All Uses

## **Soil Properties and Qualities**

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

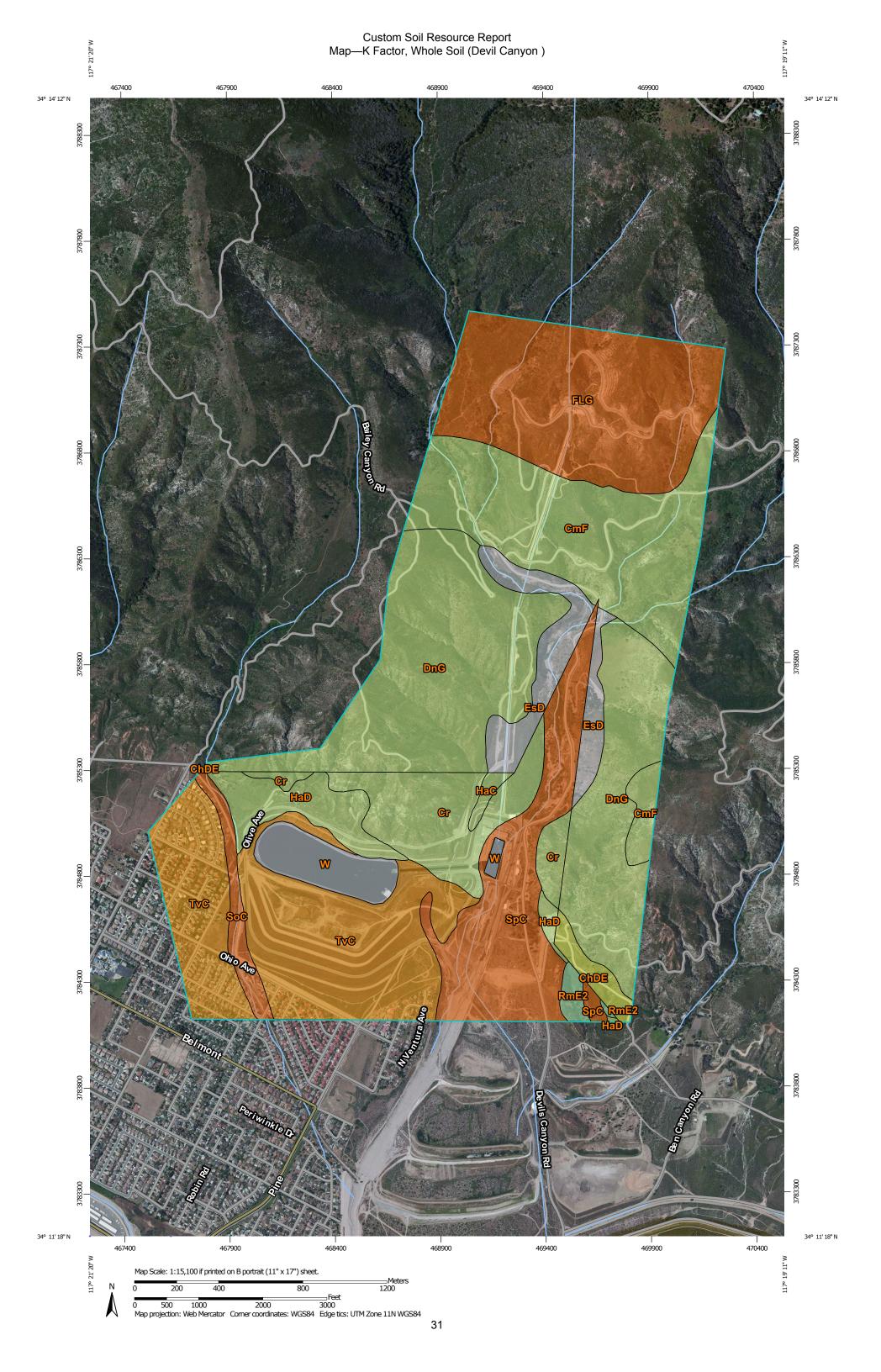
## **Soil Erosion Factors**

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

### K Factor, Whole Soil (Devil Canyon)

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.



Area of Interest (AOI) Area of Interest (AOI) Soils Soil Rating Polygons Soil Rating Polygons 15 15 15 15 16 17 15 16 17 15 16 17 17 16 17 16 17 17 16 17 16 17 17 16 17 17 16 17 16 17 17 16 17 17 16 17 17 18 18 18 18 18 18 18 18 18 18	rest (AOI) Area of Interest (AOI) g Polygons 05 10 11 17 28 28 28 28 37 24 28 37 37 49 64 Not rated or not available 05 05 10	<pre> 4</pre>	All LEGEND         24         28         37	Name       Streams and Canals         Transportation       Eails         Interstate Highways       US Routes         Najor Roads       Local Roads         Background       Aerial Photography	Amaterial and
	.17 .20		.64 Not rated or not available		Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.
		Water Features	tures		Date(s) aerial images were photographed: May 25, 2010—Jun 3, 2010
					The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

### Table—K Factor, Whole Soil (Devil Canyon)

K Factor, Whole	e Soil— Summary by Map L	Init — San Bernardino C	County Southwestern Part, Ca	lifornia (CA677)
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cr	Cieneba-Rock outcrop complex, 30 to 50 percent slopes, MLRA 20	.24	95.3	6.8%
НаС	Hanford coarse sandy loam, 2 to 9 percent slopes	.24	4.6	0.3%
HaD	Hanford coarse sandy loam, 9 to 15 percent slopes	.24	47.0	3.4%
RmE2	Ramona sandy loam, 15 to 30 percent slopes, eroded	.28	7.2	0.5%
SoC	Soboba gravelly loamy sand, 0 to 9 percent slopes	.05	21.2	1.5%
SpC	Soboba stony loamy sand, 2 to 9 percent slopes	.05	136.0	9.7%
TvC	Tujunga gravelly loamy sand, 0 to 9 percent slopes	.10	233.5	16.7%
W	Water		38.0	2.7%
Subtotals for Soil Survey Area			582.8	41.7%
Totals for Area of Interest			1,398.8	100.0%

K Factor, Wh	K Factor, Whole Soil— Summary by Map Unit — San Bernardino National Forest Area, California (CA777)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI	
ChDE	Ramona family-Typic Xerorthents, warm association, 2 to 30 percent slopes	.20	14.2	1.0%	
CmF	Osito-Modesto families association, 30 to 50 percent slopes	.24	201.6	14.4%	
DnG	Trigo family-Lithic Xerorthents, warm complex, 50 to 75 percent slopes	.24	331.3	23.7%	
EsD	Riverwash-Soboba families association, 2 to 15 percent slopes		60.4	4.3%	
FLG	Springdale family-Lithic Xerorthents association,dry, 50 to 75 percent slopes	.05	208.4	14.9%	

K Factor, Who	K Factor, Whole Soil— Summary by Map Unit — San Bernardino			fornia (CA777)
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area			816.0	58.3%
Totals for Area of Interes	st		1,398.8	100.0%

### Rating Options—K Factor, Whole Soil (Devil Canyon )

Aggregation Method: Dominant Condition Component Percent Cutoff: None Specified Tie-break Rule: Higher Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

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