

# Formation of the Soils

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Soil is a three-dimensional body covering the land surface and supporting plants. This covering has developed through natural processes. The processes that influence soil development are the result of an interaction of parent material, topography, time, climate, and living organisms (plants and animals). The interaction of these five soil-forming factors affects the formation of every soil. The relative effect varies from one soil to another and in many instances over short distances. Variations of soil depth and the internal properties from one place to another result from the interaction of these soil-forming factors. Humans have an increasing influence on soil development through activities that cause changes in the five soil-forming factors.

The area has a history dominated by faulting and uplifting of the Coast Range. Two major fault zones, the San Joaquin and the Ortigalita, have created the landscape in the area. The San Joaquin Fault is the dominant boundary between the forces of erosion of the terraces, foothills, and mountains to the west and the forces of deposition to the east. The Ortigalita Fault is the dominant boundary between the Franciscan Formation and the Panoche Formation.

In the paragraphs that follow a brief discussion is given relating the five soil-forming factors to the area. Most of the conclusions and comparisons are based on numerous field observations of the soils, vegetation, and parent material found throughout the area. These observations were then compared with laboratory data on specific soils.

## Parent Material

Parent material is defined as the unconsolidated and more or less chemically weathered mineral or organic matter from which the solum of soils is developed by pedogenic processes. Most of the parent material originated from the Coast Range.

Following mountain building (uplifting and folding), mechanical and chemical weathering of exposed bedrock produces a layer of loose broken rock material. On steep slopes, this material is intermittently moved downhill by gravity and water. It

can be moved both very short distances, and long distances to the bottom of the slope or into a steep drainageway.

## Parent Material of the Mountains and Foothills

The parent material of the mountains and foothills can be divided into three major groups. These groups are the calcareous influence of the Moreno and Panoche Formations; the noncalcareous influence of the Franciscan Formation of sandstone and shales; and the Franciscan Formation of the ultra mafic rocks.

Wisflat and Arburua soils dominate the Moreno and Panoche Formations. Both soils are strongly or violently effervescent to HCl throughout the profile. The typical profile of Wisflat is found on a western aspect and is shallow with no profile development. However, the typical profile of Arburua is found on a northern aspect and is moderately deep and has developed a cambic horizon with secondary soft masses of calcareous material.

Honker, Gaviota, and Gonzaga soils dominate the sandstones and shales of the Franciscan Formation. The typical profile of Honker is found on a southern aspect and is moderately deep with a thin dark colored surface and an argillic horizon over sandstone. The typical profile of Gaviota is also found on a southern aspect and is shallow with no profile development over sandstone. The typical profile of Gonzaga is found on a northwest aspect and is moderately deep with a dark surface horizon and an argillic horizon over shale.

Hentine and Henneke soils dominate the ultra mafic rocks or serpentine of the Franciscan Formation. Common characteristics of soils on this parent material is the imbalance of calcium and magnesium, magnesium toxicity, heavy metal toxicity, or low levels of essential nutrients. From the laboratory data run on selected soils in the area, the Ca-Mg ratio of soils influenced by serpentinitic rock ranged from 0.1 to 0.7, whereas the Ca-Mg ratio of the other soils ranged from 1.4 to 8.9. The higher ratio of these soils is more than likely a reflection of the parent material from the Panoche and/or Moreno Formations. Also, the extractable magnesium in the soils influenced by serpentinitic rock ranged from 16.6 to 42.7

millequivalents per 100 grams, and the extractable manganese in the other soils ranged from 4.9 to 12.1 millequivalents per 100 grams.

The typical profile of Hentine is found on a south-facing slope and is shallow with a dark surface and a loamy-skeletal argillic horizon over serpentinized peridotite. The typical profile of Henneke is found on a northeast-facing slope and is shallow with a dark surface and a clayey-skeletal argillic horizon over serpentine.

### **Parent Material of the Flood Plains, Interfan Basins, and Alluvial Fans**

Three major alluvial deposits are recognized— alluvial fan deposits, San Luis Ranch alluvium, and Dos Palos alluvium. These alluvial deposits are a rough approximation of the soils of the survey area.

### **Topography**

The topography influences soil development through its effect on drainage, runoff, and depth of penetration by soil moisture. The flood plains, interfan basins, alluvial fans, terraces, foothills, and, mountains occurring throughout the area each have a dominant relief. For example, Merritt and other soils on flood plains are nearly level and accumulate excess runoff and erosional material from higher landforms. These soils are poorly drained, formed in stratified alluvium, and have a thick, dark surface horizon.

In contrast are the soils on low or uplifted terraces. These soils are nearly level to rolling and accumulate minimal to no runoff and have a subsoil that has been stable enough to accumulate clays. A good example is Damluis soils. These soils are well drained; have a thick, dark surface layer; and have an argillic horizon.

Most of the mountains and foothills show a marked difference in soil development resulting from the aspect of the side slopes within a local area. This is reflected by a higher content of organic matter, thicker surface layer, or deeper soil depth. For example, Gonzaga soils, which are dominantly on north-facing slopes have a thicker and darker surface layer than Honker soils, which are dominantly on south-facing slopes.

### **Time**

Soil development begins when the geologic material is exposed to weathering. Time combined with the erosional and leaching effect of precipitation has also influenced the development of soils. When differences in precipitation are added, the soils that develop can be completely different.

### **Climate**

Soil development is influenced by the variation in temperature, moisture, and their seasonal distribution which varies with elevation and aspect. Generally, precipitation increases and soil temperature decreases with increasing elevation. Also, in the same area, the effective moisture and soil temperature on north-facing slopes will be more moist and cooler than those on south-facing slopes.

The complex topography of flood plains, interfan basins, alluvial fans, terraces, foothills, and mountains within the survey area influences the climate throughout the area. Three moisture regimes, xeric, aridic, and aquic, are recognized throughout the area. One temperature regime, thermic, is recognized.

Storms originate both from the southwest and northwest and move to the east. Therefore, the highest precipitation is in the west with about 18 inches of precipitation, and the lowest is in the east with about 10 inches of precipitation. As the storm moves to the east, the highest precipitation will be in the mountains and a rain-shadow area will be created in the valley.

### **Living Organisms**

While the soil itself is not considered to be alive, its mineral and organic components are critical as a substrate for myriads of micro-organisms and macro-organisms. The effective moisture provided to these organisms has had the greatest influence on the past and present-day vegetation. The amount of precipitation combined with elevational and aspect changes has influenced the temperature and effective moisture.

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# Glossary

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**ABC soil.** A soil having an A, a B, and a C horizon.

**AC soil.** A soil having only an A and a C horizon.

Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial fan.** The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

**Alluvial plain.** A flood plain or a low-gradient delta. It may be modern or relict.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipyridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Area reclaim (in tables).** An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Arroyo.** The flat-floored channel of an ephemeral

stream, commonly with very steep to vertical banks cut in alluvium.

**Aspect.** The direction in which a slope faces.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 2.5
Low .....	2.5 to 5
Moderate .....	5 to 7.5
High .....	7.5 to 10
Very high .....	more than 10

**Back slope.** The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

**Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

**Basin.** A depressed area with no or limited surface outlet. Examples are closed depressions in a glacial till plain, lake basin, river basin, or fault-bordered intermontane structure such as the Bighorn Basin of Wyoming.

**Bedding planes.** Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

**Bedding system.** A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Butte.** An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- California bearing ratio (CBR).** The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Canyon.** A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity (CEC).** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Catsteps.** Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.
- Channeled.** Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.
- Clayey soil.** Silty clay, sandy clay, or clay.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Closed depression.** A low area completely surrounded by higher ground and having no natural outlet.
- Coarse fragments.** Mineral or rock particles larger than 2 millimeters in diameter.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

- Cobbly soil material.** Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Compressible** (in tables). Excessive decrease in volume of soft soil under load.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane that typically takes the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.
- Conglomerate.** A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.
- Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.
- Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.
- Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."
- Consolidated sandstone.** Sandstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry, are not easily crushed, and cannot be textured by the usual field method.
- Consolidated shale.** Shale that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry and are not easily crushed.
- Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
- Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.
- Cropping system.** Growing crops according to a planned system of rotation and management practices.
- Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.
- Cross-slope farming.** Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.
- Cuesta.** A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.
- Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.
- Debris flow.** (mudflow) A mass movement process involving rapid flow of highly viscous mixtures of debris, water, and entrapped air. Water content may range up to 60 percent. A mudflow is a type

of debris flow with clastic particles of sand size and finer.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deep soil.** A soil that is 40 to 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Divided-slope farming.** A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

**Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** An area of ground at a lower elevation than the surrounding ground and in which water

collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

**Draw.** A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion (geologic).*—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion (accelerated).*—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

**Excess fines** (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

- Excess lime** (in tables). Excess carbonates in the soil that restrict the growth of some plants.
- Excess salts** (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.
- Excess sodium** (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.
- Excess sulfur** (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.
- Extrusive rock**. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.
- Fallow**. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.
- Fan terrace**. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.
- Fast intake** (in tables). The rapid movement of water into the soil.
- Fault**. A fracture or fracture zone of the earth with displacement along one side in respect to the other.
- Fertility, soil**. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Field moisture capacity**. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.
- Fill slope**. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine textured soil**. Sandy clay, silty clay, or clay.
- Firebreak**. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of fire fighters and equipment. Designated roads also serve as firebreaks.
- Flood plain**. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Fluvial**. Of or pertaining to rivers; produced by river action, as a fluvial plain.
- Foothill**. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.
- Foot slope**. The inclined surface at the base of a hill.
- Forb**. Any herbaceous plant not a grass or a sedge.
- Fragile** (in tables). A soil that is easily damaged by use or disturbance.
- Genesis, soil**. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai**. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.
- Gleyed soil**. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Graded stripcropping**. Growing crops in strips that grade toward a protected waterway.
- Grassed waterway**. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel**. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material**. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water**. Water filling all the unblocked pores of underlying material below the water table.
- Gully**. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Gypsum**. A mineral consisting of hydrous calcium sulfate.
- Hard bedrock**. Bedrock that cannot be excavated except by blasting or by the use of special

equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Head out.** To form a flower head.

**High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Hill slope.** The steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of the hill. In descending order, geomorphic components of a simple hill slope may include shoulder, back slope, foot slope, and toe slope. However, all of these components are not necessarily present in any given hill slope continuum. In addition, complex hill slopes may include two or more back slope to toe slope sequences.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons of mineral soil are as follows:

*O horizon.*—An organic layer of fresh and decaying plant residue.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon.*—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these;

(2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon.*—Soft, consolidated bedrock beneath the soil.

*R layer.*—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Hummock.** A rounded or conical mound or knoll, hillock, or other small elevation. Also, a slight rise of ground above a level surface.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Hydrophyte.** A plant that grows in water or in wet or saturated soils. See xerophyte, mesophyte.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasesers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasesers commonly are the shorter plants and the less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as

contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Intake family.** Each soil has its own intake characteristics. These intake characteristics have been grouped into eight groups and have been assigned intake family numbers. The surface texture determines the intake families. However, other soil properties, such as cracking, structure, bulk density, crusting, and amount and continuity of pores, should be considered (USDA, SCS, 1988). The intake family, in inches per hour, is expressed as follows:

C, SiC .....	0.1
SC, SiCL .....	0.3
CL, SCL, Si .....	0.5
SiL .....	0.7
L, VFSL .....	1.0
FSL, SL, CoSL, L .....	1.5
VFS, LS, LCoS, VFS, FS .....	3.0
S, CoS .....	4.0

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high
1.75 to 2.5 .....	high
More than 2.5 .....	very high

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of

chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:  
*Basin.*—Water is applied rapidly to nearly level plains surrounded by levees or dikes.  
*Border.*—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

*Controlled flooding.*—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*—Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Knoll.** A small, low, rounded hill rising above adjacent landforms.

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

- Loamy soil.** Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.
- Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.
- Low strength.** The soil is not strong enough to support loads.
- Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.
- Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.
- Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.
- Meta basic.** A basic igneous rock which shows evidence of having been subjected to metamorphism.
- Meta igneous.** An igneous rock which shows evidence of having been subjected to metamorphism.
- Meta volcanic.** A volcanic rock which shows evidence of having been subject to metamorphism.
- Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.
- Metamorphism.** The mineralogical and structural adjustment of solid rocks to physical and chemical conditions which have been imposed at depth below the surface zones of weathering and cementation.
- Metasediment.** A sediment or sedimentary rock which shows evidence of having been subject to metamorphism.
- Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.
- Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.
- Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.
- Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.
- Moderately deep soil.** A soil that is 20 to 40 inches deep over bedrock or to other material that restricts the penetration of plant roots.
- Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.
- Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.
- Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.
- Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).
- Mound.** A low rounded hill of earth, natural or artificial.
- Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.
- Mudflow.** (Mass move) A general term for a mass-movement landform and a process characterized by a flowing mass of predominantly fine-grained earth material possessing a high degree of fluidity during movement. If more than half of the solid fraction of such a mass consists of material larger than sand size, the term debris flow is preferable.
- Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.
- Mulch.** A natural or artificial layer of plant residue or other materials, such as sand or paper, on the soil surface.
- Munsell notation.** A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.
- Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.
- Neutral soil.** A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

**Observed rooting depth.** Depth to which roots have been observed to penetrate.

**Organic matter.** Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low .....	less than 0.5 percent
Low .....	0.5 to 1.0 percent
Moderately low .....	1.0 to 2.0 percent
Moderate .....	2.0 to 4.0 percent
High .....	4.0 to 8.0 percent
Very high .....	more than 8.0 percent

**Oxbow.** The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** A gently sloping erosional surface developed at the foot of a receding hill or mountain slope. The surface may be essentially bare, exposing earth material that extends beneath adjacent uplands; or it may be thinly mantled with alluvium and colluvium.

**Pedisediment.** A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly (in tables).** The slow movement of water through the soil adversely affects the specified use.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow .....	0.00 to 0.01 inch
Very slow .....	0.01 to 0.06 inch
Slow .....	0.06 to 0.2 inch
Moderately slow .....	0.2 to 0.6 inch
Moderate .....	0.6 inch to 2.0 inches
Moderately rapid .....	2.0 to 6.0 inches
Rapid .....	6.0 to 20 inches
Very rapid .....	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piping (in tables).** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Pitting (in tables).** Pits caused by melting around ice. They form on the soil after plant cover is removed.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poor filter (in tables).** Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Poor outlets (in tables).** Refers to areas where

surface or subsurface drainage outlets are difficult or expensive to install.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).**

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Quartzite, metamorphic.** Rock consisting mainly of quartz that formed through recrystallization of quartz-rich sandstone or chert.

**Quartzite, sedimentary.** Very hard but unmetamorphosed sandstone consisting chiefly of quartz grains.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a

soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid .....	less than 3.5
Extremely acid .....	3.5 to 4.4
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Moderately acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Slightly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regeneration.** The new growth of a natural plant community, developing from seed.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relict stream terrace.** One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Ridge.** A long, narrow elevation of the land surface, usually sharp crested with steep sides and forming an extended upland between valleys. The term is used in areas of both hill and mountain relief.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

**Riverwash.** Unstable areas of sandy, silty, clayey, or gravelly sediments. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rock outcrop.** Exposures of bare bedrock other than lava flows and rock-lined pits.

**Rooting depth** (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Rubbleland.** Areas that have more than 90 percent of the surface covered by stones or boulders. Voids contain no soil material and virtually no vegetation other than lichens. The areas commonly are at the base of mountain slopes, but some are on mountain slopes as deposits of cobbles, stones, and boulders left by Pleistocene glaciation or by periglacial phenomena.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

**Salinity.** The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline .....	0 to 4
Slightly saline .....	4 to 8
Moderately saline .....	8 to 16
Strongly saline .....	More than 16

**Salty water** (in tables). Water that is too salty for consumption by livestock.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in

diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sandy soil.** Sand or loamy sand.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Sedimentary plain.** An extensive nearly level to gently rolling or moderately sloping area that is underlain by sedimentary bedrock and that has a slope of 0 to 8 percent.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Sedimentary uplands.** Land areas of bedrock formed from water- or wind-deposited sediments. They are higher on the landscape than the flood plain.

**Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

**Semiconsolidated sedimentary beds.** Soft geologic sediments that disperse when fragments are placed in water. The fragments are hard or very hard when dry. Determining the texture by the usual field method is difficult.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shallow soil.** A soil that is 10 to 20 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shoulder slope.** The uppermost inclined surface at the top of a hillside. It is the transition zone from the back slope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.

**Shrink-swell** (in tables). The shrinking of soil when

dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silica-sesquioxide ratio.** The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

**Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

**Slippage** (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level .....	0 to 2 percent
Gently sloping .....	2 to 5 percent
Moderately sloping .....	5 to 9 percent
Strongly sloping .....	9 to 15 percent
Moderately steep .....	15 to 30 percent
Steep .....	30 to 50 percent
Very steep .....	50 percent and higher

Classes for complex slopes are as follows:

Nearly level .....	0 to 2 percent
Undulating .....	2 to 5 percent
Gently rolling .....	5 to 9 percent
Rolling .....	9 to 15 percent
Hilly .....	15 to 30 percent
Steep .....	30 to 50 percent
Very steep .....	50 percent and higher

**Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

**Slope alluvium.** Sediment gradually transported on mountains or hill slopes primarily by alluvium processes and characterized by particle sorting. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of coarse fragments and may be separated by stone lines. Sorting of rounded or subrounded gravel or cobbles and burnished ped contrast with unsorted colluvial deposits.

**Slow intake** (in tables). The slow movement of water into the soil.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Small stones** (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of sodium to calcium plus magnesium. The degrees of sodicity and their respective ratios are:

Slight .....	less than 13:1
Moderate .....	13-30:1
Strong .....	more than 30:1

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging

between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Species.** A single, distinct kind of plant or animal having certain distinguishing characteristics.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Strath terrace.** A surface cut formed by the erosion of hard or semiconsolidated bedrock and thinly mantled with stream deposits.

**Stratified.** Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

**Stream channel.** The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

**Stream terrace.** One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands that provide

vegetative barriers to soil blowing and water erosion.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are: *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.

**Summit.** A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Tailwater.** The water directly downstream of a structure.

**Talus.** Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Terrace.** An embankment, or ridge, constructed

across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace** (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer** (in tables). Otherwise suitable soil material too thin for the specified use.

**Till plain.** An extensive area of nearly level to undulating soils underlain by glacial till.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toe slope.** The outermost inclined surface at the base of a hill; part of a foot slope.

**Too arid** (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

**Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Toxicity** (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Trafficability.** The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

**Tread.** The relatively flat terrace surface that was cut or built by stream or wave action.

**Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.

**Understory.** Any plants in a forest community that grow to a height of less than 5 feet.

**Unstable fill** (in tables). Risk of caving or sloughing on banks of fill material.

**Upland** (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Valley.** An elongated depressional area primarily developed by stream action.

**Variation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Varve.** A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

**Very deep soil.** A soil that is more than 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Very shallow soil.** A soil that is less than 10 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Water spreading.** Diverting runoff from natural channels by means of a system of dams, dikes, or ditches and spreading it over relatively flat surfaces.

**Water table, perched.** The surface of a local zone of saturation held above the main body of ground water by an impermeable layer or stratum, generally clay, and separated from the main body of ground water by an unsaturated zone.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windbreak.** A living barrier of trees or combination of trees and shrubs located adjacent to farm or ranch headquarters and designed to protect the area from cold or hot winds and drifting snow. Also headquarters and livestock windbreaks.

**Windthrow.** The uprooting and tipping over of trees by the wind.

# Appendices

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*Appendix A* is an excerpt from California supplement CA-4 to the National Conservation Planning Manual, dated February 1981, United States Department of Agriculture, Soil Conservation Service.

*Appendix B* includes guides for assigning land capability classes, subclasses, and units. The original documentation is a California supplement dated November 1969. Any revisions are noted in the appendix.

*Appendix C* is an edited version of the ratings guides described in the National Soil Survey Handbook, Part 620, dated November 1993, United States Department of Agriculture, Soil Conservation Service. These guides provided the basis for the interpretive ratings given in the tables Recreational development, Building site development, Sanitary facilities, Construction materials, and Water management. Soils are rated for the uses expected to be important or potentially important to users of soil survey information. Ratings for proposed uses are given in terms of limitations and restrictive features. Only the most restrictive features are listed in the tables. Therefore, if a soil is rated severe, only those soil features that cause the soil to be rated severe are given. There may be other limitations that should be overcome if the soil is to be used for a specific purpose. The guides in appendix C show in the first column the properties or features used as criteria for rating the soil for the use. The properties are listed in descending order of estimated importance. In the "Limits" column, limits of the properties are given for rating the soils and for recognizing a restrictive property or properties. In the "Restrictive feature" column, a key phrase indicates the feature causing the problem.

## Appendix A.—Prime Farmlands—California

Prime farmland is land best suited for producing food, forage, fiber, and oilseed crops and also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land but not urban buildup land or water). It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

Prime farmland meets all of the following criteria:

1. The soils have:
  - a. Aquic, udic, ustic, or xeric moisture regimes and an available water capacity of at least 4 inches (10 cm) per 40 to 60 inches (1 to 1.52 meters) of soil to produce the commonly grown cultivated crops (cultivated crops include, but are not limited to, grain, forage, fiber, oilseed, sugarbeets, vegetables, orchard, vineyard, and bush fruit crops) adapted to the region in 7 or more years out of 10; or
  - b. Xeric, ustic, aridic, or torric moisture regimes in which the available water capacity is at least 4 inches (10 cm) per 40 to 60 inches (1 to 1.52 meters) of soil and the area has a developed irrigation water supply that is dependable (a dependable water supply is one in which enough water is available for irrigation in 8 out of 10 years for the crops commonly grown) and of adequate quality; and,
2. The soils have a temperature regime that is frigid, mesic, thermic, or hyperthermic (pergelic and cryic regimes are excluded). These are soils that, at a depth of 20 inches (50 cm), have a mean annual temperature higher than 32 degrees F (0 degrees C). In addition, the mean summer temperature at this depth in soils with an O horizon is higher than 47 degrees F (8 degrees C); in soils that have no O horizon, the mean summer temperature is higher than 59 degrees F (15 degrees C); and,
3. The soils have a pH between 4.5 and 8.4 in all horizons within a depth of 40 inches (1 meter); and,
4. The soils either have no water table or have a water table that is maintained at a sufficient depth during the cropping season to allow cultivated crops common to the area to be grown; and,
5. The soils can be managed so that, in all horizons within a depth of 40 inches (1 meter), during part of each year the conductivity of the saturation extract is less than 4 mmhos/cm and the exchangeable sodium percentage (ESP) is less than 15; and,
6. The soils are not flooded frequently during the growing season (less often than once in 2 years); and,
7. The product of K (erodibility factor) x percent slope is less than 2.0; and,
8. The soils have a permeability rate of at least 0.06 inch (0.15 cm) per hour in the upper 20 inches (50 cm) and the mean annual soil temperature at a depth of 20 inches (50 cm) is less than 59 degrees F (15 degrees C); the permeability rate is not a limiting factor if the mean annual soil temperature is 59 degrees F (15 degrees C) or higher; and,
9. Less than 10 percent of the surface layer [upper 6 inches (15 cm)] in these soils consists of rock fragments coarser than 3 inches (7.6 cm); and,
10. The soils have a minimum rooting depth of 40 inches (1 meter).

The national Land Inventory Monitoring (LIM) definitions have been slightly modified for California standards: criterion 1 is a California definition, not a national one. Part A which reads “AWC of at least 4 inches (10 cm), per 40 to 60 inches (1 to 1.52 meters) of soil” is a California definition.

**Appendix B.—Guide for Placing Soils in Capability Classes**

Criteria	Capability class							
	1	2	3	4	5	6 <sup>12</sup>	7 <sup>13</sup>	8 <sup>14</sup>
Effective soil depth (in) <sup>1</sup>	≥40	≥40	≥20	≥10	≥20	≥10	Any	Any
ETp 32 degrees F .....	≥20	≥14	≥10	≥6	≥6	≥4	---	Any
4ETa .....	≥20	≥16	≥12	≥8	≥8	≥6	≥2	Any
Surface texture (irrigated) .....	SL-CL	LS-C, may be GR	Any, may be GR, CB	Any, may be GRV, CBV, ST <sup>10</sup>	Any, may be GRX, CBX, STV	Any, may be GRX, CBX, STV	Any	Any
Surface texture (nonirrigated) ..	SL-CL	SL-C, may be GR	SL-C, may be, GR, CB	LS-C, GRV, CBV, ST <sup>10</sup>	Any, may be GRX, CBX, STV	Any, may be GRX, CBX, STV	Any	Any
Permeability (in/hr) <sup>2</sup> .....	0.2-6.0	0.06-20	<0.06-20	Any	Any	Any	Any	Any
Depth to water table (in) <sup>3</sup> .....	Well or mod. well >60	Somewhat poorly through Somewhat excessively >36	Poorly through Excessively >20	Poorly through Excessively >20	Any	Any	Any	Any
Available water capacity (in) <sup>9</sup> ..	≥7.5 avg. AWC ≥0.13 in/in	≥5.0 avg. AWC ≥0.08 in/in	≥3.5 avg. AWC ≥0.06 in/in	≥2.5 avg. AWC ≥0.04 in/in	≥3.0 avg. AWC	≥2.0 avg. AWC	≥1.0 avg. AWC	Any
Slope (%): <sup>5, 6, 7</sup>								
Group A .....	<2	<5	<8	<15	<2	<25	<50	Any
Group B .....	<2	<8	<15	<25	<2	<50	<75	Any
Erosion hazard	None or slight	None through moderate	None through high	Any	None or slight	Any	Any	Any
Flooding .....	None or rare	None through occasional	None through occasional	None through frequent <sup>11</sup>	Any	Any	Any	Any
Salinity/EC x 10 at 25 °C (mmhos/cm) <sup>8</sup>	<4	<8	<16	<16	<8	Dryland, <16 Irrigated, any	Any	Any
Alkali ESP <sup>8</sup> .....	None	<25	<50	<50	<25	Dryland, <25 Irrigated, <50	Any	Any

### Guide for Placing Soils in Capability Classes—Continued

Criteria	Capability class							
	1	2	3	4	5	6 <sup>12</sup>	7 <sup>13</sup>	8 <sup>14</sup>
Toxic substances <sup>9</sup>	None	None or slight	None through moderate	None through moderate	None or slight	Dryland, slight Irrigated, slight through moderate	Any	Any
Frost-free season (32 degrees F)	≥140 days	≥100 days	≥80 days	≥50 days	Any	Any	Any	Any

<sup>1</sup> Claypans with permeability of less than 0.06 inch/hour will be treated as limiting the effective depth.

<sup>2</sup> Permeability of the least permeable subsurface horizon.

<sup>3</sup> Depth to the water table during the growing season.

<sup>4</sup> Available moisture between field capacity and wilting point.

<sup>5</sup> Use erosion hazard to help determine upper slope percent.

<sup>6</sup> In existing mapping units 9 percent and 30 percent can be substituted for 8 percent and 25 percent.

<sup>7</sup> Column A includes soils with K factors of 0.37 or more and soils that are subject to rill and gully erosion, such as soils that formed in granitic material and soils that have a claypan. Other soils are in group B.

<sup>8</sup> For salts and alkali to be a major limitation, there should be other soil limitations, such as slow permeability or high water tables.

<sup>9</sup> Such as boron and magnesium, which are leached with difficulty.

<sup>10</sup> Coarse fragments interfere with tillage but do not prevent cropping.

<sup>11</sup> Frequent flooding that does not prevent normal cropping.

<sup>12</sup> Range and woodland mechanical practices can be applied to class VI land.

<sup>13</sup> Range and woodland mechanical practices are impractical on class VII land.

<sup>14</sup> Class 8 land have limitations that precluded their use for commercial plant production and restrict their use to recreation, water supply, or esthetic purposes.

**Guide for Placing Soils in Capability Subclasses in California—A**

(Where wind velocities are low and/or soils are irrigated. Only soils in capability classes 2 through 8 are assigned to a subclass.)

Soil properties	Subclass by slope range <sup>1</sup>			
	0-2%	2-9%	9-15%	15+%
1. Moderately slowly, moderately, moderately rapidly, rapidly, and very rapidly permeable, moderately well drained, well drained, somewhat excessively drained, and excessively drained soils more than 20 inches deep that have the following textures:				
a. Fine and very fine .....	s	e	e	e
b. Moderately fine .....	s <sup>2,3</sup>	e	e	e
c. Medium .....	s <sup>2,3</sup>	e	e	e
d. Moderately coarse, with or without a textural B .....	s <sup>2,3</sup>	e	e	e
e. Coarse and very coarse, with a textural B .....	s	e	e	e
f. Coarse and very coarse, with little or no textural B .....	s	s	s	e
2. Slowly and very slowly permeable soils that are more than 20 inches deep: <sup>4</sup>				
a. Well drained and moderately well drained .....	s	e	e	e
b. Somewhat poorly drained .....	w	e	e	e
3. Wet, poorly drained and very poorly drained soils:				
a. Moderately coarse to fine textured (includes claypans and fragipans) .....	w	w	w	e
b. Coarse textured with little or no textural B <sup>5</sup> .....	w	w	w	e
c. Deep organic soils <sup>5</sup> .....	w	w	w	e
4. Excessively drained, somewhat excessively drained, and moderately well drained, shallow and very shallow soils:				
a. 10 to 20 inches deep to bedrock ....	s	e	e	e
b. 0 to 10 inches deep to bedrock .....	s	s	s	s <sup>5</sup>

**Guide for Placing Soils in Capability Subclasses—A (Continued)**

Soil properties	Subclass by slope range			
	0-2%	2-9%	9-15%	15+%
5. Excessively drained, somewhat excessively drained, well drained, and moderately well drained, saline and sodic soils (moderate to severe salinity and sodicity) .....	s	e	e	e
6. Soils that have a very cobbly, extremely cobbly, very gravelly, extremely gravelly, very stony, or extremely stony surface layer .....	s	s	s	s <sup>6</sup>
7. Soils that are subject to damaging overflow .....	w	w	w	e

<sup>1</sup> For soils in capability classes 2 and 3. Class 1 land is excluded.

<sup>2</sup> Where these soils are more than 40 inches deep, they are generally in class 1.

<sup>3</sup> Use "C" only for dryland if soil is class 1 irrigated.

<sup>4</sup> Permeability of the B horizon or control section.

<sup>5</sup> Including somewhat poorly drained soils.

<sup>6</sup> Subclass "e" if slope is more than 50 percent.

<sup>7</sup> Subclass "e" if slope is more than 30 percent.

**Guide for Placing Soils in Capability Subclasses in California—B**

(Where wind velocities are high and the soils are not irrigated. Only soils in capability classes 2 through 8 are assigned to a subclass.)

Soil properties	Subclass by slope range <sup>1</sup>			
	0-2%	2-9%	9-15%	15+%
1. Moderately slowly, moderately, moderately rapidly, rapidly, and very rapidly permeable, moderately well drained, well drained, somewhat excessively drained, and excessively drained soils more than 20 inches deep that have the following textures:				
a. Fine and very fine .....	s	e	e	e
b. Moderately fine .....	e	e	e	e
c. Medium .....	e	e	e	e
d. Moderately coarse, with or without a textural B .....	e	e	e	e
e. Coarse and very coarse, with a textural B .....	e	e	e	e
f. Coarse and very coarse, with little or no textural B .....	e	e	e	e
2. Slowly and very slowly permeable soils that are more than 20 inches deep: <sup>4</sup>				
a. Well drained and moderately well drained .....	s	e	e	e
b. Somewhat poorly drained .....	w	e	e	e
3. Wet, poorly drained and very poorly drained soils:				
a. Moderately coarse to fine textured (includes claypans and fragipans) .....	w	w	w	e
b. Coarse textured with little or no textural B <sup>5</sup> .....	w	w	w	e
c. Deep organic soils <sup>5</sup> .....	w	w	w	e
4. Excessively drained, somewhat excessively drained, and moderately well drained, shallow and very shallow soils:				
a. 10 to 20 inches deep to bedrock ....	s	s	e	e
b. 0 to 10 inches deep to bedrock .....	s	s	s	s <sup>6</sup>

**Guide for Placing Soils in Capability Subclasses—B (Continued)**

Soil properties	Subclass by slope range			
	0-2%	2-9%	9-15%	15+%
5. Excessively drained, somewhat excessively drained, well drained, and moderately well drained, saline and sodic soils (moderate to severe salinity and sodicity) .....	s	e	e	e
6. Soils that have a very cobbly, extremely cobbly, very gravelly, extremely gravelly, very stony, or extremely stony surface layer .....	s	s	s	s <sup>7</sup>
7. Soils that are subject to damaging overflow .....	w	w	w	e

<sup>1</sup> For soils in capability classes 2 through 8. Class 1 land is excluded.  
<sup>2</sup> Where these soils are more than 40 inches deep, they are generally in class I.  
<sup>3</sup> Use "C" only for dryland if soil is class 1 irrigated.  
<sup>4</sup> Permeability of the B horizon or control section.  
<sup>5</sup> Including somewhat poorly drained soils.  
<sup>6</sup> Subclass "e" if slope is more than 50 percent.  
<sup>7</sup> Subclass "e" if slope is more than 30 percent.

**Guide for Placing Soils in Capability Units**

<b>Capability Unit</b>	<b>Principal Soil Property or Limitation</b>
1	Potential or actual wind or water erosion hazard.
2	Drainage or overflow hazard (somewhat or poorly drained, flooded or ponded).
3	Slowly or very permeable subsoils or substrata.
4	Coarse or gravelly textures.
5	Fine or very fine textures.
6	Salinity or alkali, sufficient to constitute a continuing limitation or hazard.
7	Stones, cobbles, or rocks sufficient to interfere with tillage.
8	Hardpan or hard unweathered bedrock within the root zone.
9	Low inherent fertility, associated with strong acidity, low calcium-magnesium ratio, or excess calcium, boron, or molybdenum.
10	High organic matter content—peats and mucks.
11	Coarse sandy or very gravelly substrata limiting to root penetration and moisture retention.

### **Appendix C.—Criteria Used in Rating Soils for Selected Uses**

The following tables show the criteria used in rating soils for selected uses in tables 11, 12, 13, 14, and 15 in this survey. Soils are rated for the uses expected to be important or potentially important to users of soil survey information. Ratings for proposed uses are given in terms of limitations and restrictive features. Only the most restrictive features are listed in the tables. Therefore, if a soil is rated severe, only those soil features that cause the soil to be rated severe are given. There may be other limitations that should be overcome if the soil is to be used for a specific purpose.

The first column in the guides in this appendix shows the properties or features used as criteria for rating the soil for the use. The properties are listed in descending order of estimated importance. In the "Limits" column, limits of the properties are given for rating the soils and for recognizing a restrictive property or properties. In the "Restrictive feature" column, a key phrase indicates the feature causing the problem.

## Camp Areas

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Flooding .....	None	---	Rare, common	Flooding.
3. Slope (percent) .....	<8	8-15	>15	Slope.
4. USDA texture modifier (surface layer) .....	---	STV, BYV, CB, FL	STX, BYX, CBX, FLX, CBV, FLV, CNX, CRX, SHX, SYX	Large stones.
5. Coarse fragments in the surface layer (percent) <sup>1</sup> .....	<25	25-50	>50	Small stones.
6. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2.5	1.5-2.5	<1.5	Wetness.
7. Permeability in the upper 40 inches (in/hr) <sup>2</sup>	>0.6	0.06-0.6	<0.06	Percs slowly.
8. USDA texture (surface layer) <sup>2</sup> .....	---	---	SC, SIC, C	Too clayey.
9. Unified (surface layer) .....	---	---	PT	Excess humus.
10. USDA texture (surface layer) .....	---	LCOS, VFS, <sup>3</sup> LFS, <sup>3</sup> LS	COS, S, FS	Too sandy.
11. Depth to bedrock (inches) .....	---	---	<20	Depth to rock.
12. Depth to cemented pan (inches) .....	---	---	<20	Cemented pan.
13. USDA texture (surface layer) <sup>4</sup> .....	---	SIL, SI, VFSL, L	---	Dusty.
14. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	---	---	>12 (natric, halic, alkali phases)	Excess sodium.
15. Salinity in the surface layer (mmhos/cm) ...	<4	4-8	>8	Excess salt.
16. Soil reaction (pH in the surface layer) .....	---	---	<3.6	Too acid.
17. Other .....	---	---	( <sup>5</sup> )	Fragile.

<sup>1</sup> 100 minus percent passing No. 10 sieve.

<sup>2</sup> Rate soils in UST, TOR, ARID, BOR, or XER suborders, great groups, or subgroups one class better.

<sup>3</sup> Rate *slight* if finer textured material is within 20 inches of the surface.

<sup>4</sup> Disregard unless soil is in TOR, ARID, or XER suborders, great groups, or subgroups.

<sup>5</sup> If the soil is easily damaged by use or disturbance, rate *severe—fragile*.

## Picnic Areas

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Slope (percent) .....	<8	8-15	>15	Slope.
3. Flooding .....	None, rare, occasional	Frequent	---	Flooding.
4. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2.5	1.0-2.5	<1.0	Wetness.
5. USDA texture modifier (surface layer) .....	---	STV, BYV, CB, FL	STX, BYX, CBX, FLX, CBV, FLV, CNX, CRX, SHX, SYX	Large stones.
6. USDA texture (surface layer) <sup>1</sup> .....	---	---	SC, SIC, C	Too clayey.
7. USDA texture (surface layer) .....	---	LCOS, VFS, <sup>2</sup> LFS, <sup>2</sup> LS	COS, S, FS	Too sandy.
8. Unified (surface layer) .....	---	---	PT	Excess humus.
9. Coarse fragments in the surface layer (percent) <sup>3</sup> .....	<25	25-50	>50	Small stones.
10. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	---	---	>12 (natric, halic, alkali phases)	Excess sodium.
11. Salinity in the surface layer (mmhos/cm) ...	<4	4-8	>8	Excess salt.
12. Soil reaction (pH) in the surface layer .....	---	---	<3.6	Too acid.
13. Permeability in the upper 40 inches (in/hr) <sup>1</sup>	>0.6	0.06-0.6	<0.06	Percs slowly.
14. USDA texture (surface layer) <sup>4</sup> .....	---	SIL, SI, VFSL, L	---	Dusty.
15. Depth to bedrock (inches) .....	---	---	<20	Depth to rock.
16. Depth to cemented pan (inches) .....	---	---	<20	Cemented pan.
17. Other .....	---	---	( <sup>5</sup> )	Fragile.

<sup>1</sup> Rate soils in UST, TOR, ARID, BOR, or XER suborders, great groups, or subgroups one class better.

<sup>2</sup> Rate *slight* if finer textured material is within 20 inches of the surface.

<sup>3</sup> 100 minus percent passing No. 10 sieve.

<sup>4</sup> Disregard unless soil is in TOR, ARID, or XER suborders, great groups, or subgroups.

<sup>5</sup> If the soil is easily damaged by use or disturbance, rate *severe*—*fragile*.

**Playgrounds**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. USDA texture modifier (surface layer) .....	---	ST	STV, STX, BYV, BYX, CB, CBV, FL, FLV, BY, CBX, CNX, CRX, FLX, SHX, SYX	Large stones.
3. Slope (percent) .....	<2	2-6	>6	Slope.
4. Coarse fragments in the surface layer (percent) <sup>1</sup> .....	<10	10-25	>25	Small stones.
5. USDA texture (surface layer) <sup>2</sup> .....	---	---	SC, SIC, C	Too clayey.
6. USDA texture (surface layer) .....	---	LCOS, VFS, <sup>3</sup> LFS, <sup>3</sup> LS	COS, S, FS	Too sandy.
7. Unified (surface layer) .....	---	---	PT	Excess humus.
8. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2.5	1.5-2.5	<1.5	Wetness.
9. Flooding .....	None, rare	Occasional	Frequent	Flooding.
10. Depth to bedrock (inches) .....	>40	<sup>4</sup> 20-40	<20	Depth to rock.
11. Depth to cemented pan (inches) .....	>40	<sup>4</sup> 20-40	<20	Cemented pan.
12. Permeability in the upper 40 inches (in/hr) <sup>2</sup> .....	>0.6	0.06-0.6	<0.06	Percs slowly.
13. USDA texture (surface layer) <sup>5</sup> .....	---	SIL, SI, VFSL, L	---	Dusty.
14. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	---	---	>12 (natric, halic, alkali phases)	Excess sodium.
15. Salinity in the surface layer (mmhos/cm) ...	<4	4-8	>8	Excess salt.
16. Soil reaction (pH) in the surface layer .....	---	---	<3.6	Too acid.
17. Other .....	---	---	<sup>(6)</sup>	Fragile.

<sup>1</sup> 100 minus percent passing No. 10 sieve.

<sup>2</sup> Rate soils in UST, TOR, ARID, BOR, or XER suborders, great groups, or subgroups one class better.

<sup>3</sup> Rate *slight* if finer textured material is within 20 inches of the surface.

<sup>4</sup> Rate *slight* if slopes are 0 to 2 percent.

<sup>5</sup> Disregard unless soil is in TOR, ARID, or XER suborders, great groups, or subgroups.

<sup>6</sup> If the soil is easily damaged by use or disturbance, rate *severe*—*fragile*.

## Paths and Trails

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Fraction greater than 3 inches in the surface layer (percent by weight) .....	<25	25-50	>50	Large stones.
3. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2	1-2	<1	Wetness.
4. USDA texture (surface layer) <sup>1</sup> .....	---	---	SC, SIC, C	Too clayey.
5. USDA texture (surface layer) .....	---	LCOS, VFS, <sup>2</sup> LFS, <sup>2</sup> LS	COS, S, FS	Too sandy.
6. Unified (surface layer) .....	---	---	PT	Excess humus.
7. Slope (percent) .....	<15	15-25	>25	Slope.
8. Erosion factor K (surface layer) .....	---	---	<sup>3</sup> >.3	Erodes easily.
9. Coarse fragments in the surface layer (percent by weight) <sup>4</sup> .....	---	---	>65	Small stones.
10. Flooding .....	None, rare, occasional	Frequent	---	Flooding.
11. USDA texture (surface layer) <sup>5</sup> .....	---	SIL, SI, VFSL, L	---	Dusty.
12. Other .....	---	---	( <sup>6</sup> )	Fragile.

<sup>1</sup> Rate soils in UST, TOR, ARID, BOR, or XER suborders, great groups, or subgroups one class better.

<sup>2</sup> Rate *slight* if finer textured material is within 20 inches of the surface.

<sup>3</sup> Disregard if slopes are 8 percent or less.

<sup>4</sup> 100 minus percent passing No. 10 sieve.

<sup>5</sup> Disregard unless soil is in TOR, ARID, or XER suborders, great groups, or subgroups.

<sup>6</sup> If the soil is easily damaged by use or disturbance, rate *severe—fragile*.

**Septic Tank Absorption Fields**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Total subsidence (inches) .....	---	---	>24	Subsides.
3. Flooding .....	None	Rare	Common	Flooding.
4. Depth to bedrock (inches) .....	>72	40-72	<40	Depth to rock.
5. Depth to cemented pan (inches) .....	>72	40-72	<40	Cemented pan.
6. Depth to high water table (feet) .....	---	---	+	Ponding.
	>6	4-6	<4	Wetness.
7. Permeability (in/hr):				
24 to 60 inches .....	2.0-6.0	<sup>1</sup> 0.6-2.0	<0.6	Percs slowly.
24 to 40 inches .....	---	---	>6.0	Poor filter.
8. Slope (percent) .....	<8	8-15	>15	Slope.
9. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	<25	25-50	>50	Large stones.
10. Downslope movement .....	---	---	(3)	Slippage.
11. Formation of pits .....	---	---	(4)	Pitting.

<sup>1</sup> Recheck to see if rating should be *slight*.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>4</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

## Sewage Lagoons

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Permeability between 12 and 60 inches (in/hr) .....	<0.6	0.6-2.0	>2.0	Seepage.
3. Depth to bedrock (inches) .....	>60	40-60	<40	Depth to rock.
4. Depth to cemented pan .....	>60	40-60	<40	Cemented pan.
5. Flooding .....	None, rare	---	Common <sup>1</sup>	Flooding.
6. Slope (percent) .....	<2	2-7	>7	Slope.
7. Unified (any depth) .....	---	OL, OH	PT	Excess humus.
8. Depth to high water table (feet) .....	---	---	+	Ponding.
	>5	<sup>2</sup> 3.5-5	<sup>2</sup> <3.5	Wetness.
9. Fraction greater than 3 inches (percent by weight) <sup>3</sup> .....	<20	20-35	>35	Large stones.
10. Downslope movement .....	---	---	(4)	Slippage.
11. Formation of pits .....	---	---	(5)	Pitting.
12. Differential settling .....	---	---	(6)	Unstable fill.

<sup>1</sup> If floodwater will not enter or damage the sewage lagoon because of low velocity and a water depth of less than 5 feet, disregard flooding.

<sup>2</sup> If the floor of the sewage lagoon has a layer at least 20 inches thick with permeability of less than 0.2 in/hr, disregard wetness.

<sup>3</sup> Weighted average to 20 inches.

<sup>4</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>5</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

<sup>6</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

**Sanitary Landfill (Trench)**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Flooding .....	None	Rare	Common	Flooding.
3. Depth to bedrock (inches) .....	---	---	<72	Depth to rock.
4. Depth to cemented pan (inches):				
Thick .....	---	---	<72	Cemented pan.
Thin .....	---	<72	---	Cemented pan.
5. Permeability of bottom layer (in/hr) <sup>1</sup> .....	---	---	>2.0	Seepage.
6. Depth to high water table (feet) .....	---	---	+	Ponding.
Apparent .....	---	---	<6	Wetness.
Perched .....	>4	2-4	<2	Wetness.
7. Slope (percent) .....	<8	8-15	>15	Slope.
8. USDA texture <sup>1 2 3</sup> .....	---	CL, SC, SICL	SIC, C	Too clayey.
9. USDA texture <sup>3</sup> .....	---	LCOS, LS, LFS, LVFS	COS, S, FS, VFS, SG	Too sandy.
10. Unified <sup>3</sup> .....	---	---	OL, OH, PT	Excess humus.
11. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<20	20-35	>35	Large stones.
12. Sodium adsorption ratio in the upper 40 inches or great group or phase <sup>1</sup> .....	---	---	>12 (natric, halic, alkali phases)	Excess sodium.
13. Soil reaction (pH) at any depth .....	---	---	<3.6	Too acid.
14. Salinity at any depth (mmhos/cm) .....	---	---	>16	Excess salt.
15. Downslope movement .....	---	---	<sup>(5)</sup>	Slippage.
16. Differential settling .....	---	---	<sup>(6)</sup>	Unstable fill.

<sup>1</sup> Disregard in all Aridisols except Salorthids and Aquic subgroups, in all Aridic subgroups, and in all Torri great groups of Entisols except Aquic subgroups.

<sup>2</sup> Rate one class better if the soil is in kaolinitic family and experience confirms.

<sup>3</sup> Thickest layer between 10 and 60 inches.

<sup>4</sup> Weighted average to 60 inches.

<sup>5</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>6</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

## Sanitary Landfill (Area)

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Flooding .....	None	Rare	Common	Flooding.
3. Depth to bedrock (inches) <sup>1</sup> .....	>60	40-60	<40	Depth to rock.
4. Depth to cemented pan (inches) <sup>1</sup> .....	>60	40-60	<40	Cemented pan.
5. Permeability between 20 and 40 inches (in/hr) <sup>1</sup> .....	---	---	>2.0	Seepage.
6. Depth to high water table (feet) .....	---	---	+	Ponding.
Apparent .....	>5	3.5-5	<3.5	Wetness.
Perched .....	>3	1.5-3	<1.5	Wetness.
7. Slope (percent) .....	<8	8-15	>15	Slope.
8. Downslope movement .....	---	---	( <sup>2</sup> )	Slippage.
9. Formation of pits .....	---	---	( <sup>3</sup> )	Pitting.
10. Differential settling .....	---	---	( <sup>4</sup> )	Unstable fill.

<sup>1</sup> Disregard in all Aridisols except Salorthids and Aquic subgroups, in all Aridic subgroups, and in all Torri great groups of Entisols except Aquic subgroups.

<sup>2</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>3</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

<sup>4</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

Daily Cover for Landfill

Property	Limits			Restrictive feature
	Good	Fair	Poor	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches) .....	>60	40-60	<40	Depth to rock.
3. Depth to cemented pan (inches) .....	>60	40-60	<40	Cemented pan.
4. Unified <sup>1</sup> .....	---	---	SP, SW, SP-SM, SW-SM, GP, GW, GP-GM, GW-GM	Seepage.
5. USDA texture <sup>1 2 3</sup> .....	---	CL, SICL, SC	SIC, C	Too clayey.
6. USDA texture <sup>1</sup> .....	---	LCOS, LS, LFS, VFS	S, FS, COS, SG	Too sandy.
7. Unified <sup>1 3</sup> .....	---	---	OL, OH, CH, MH	Hard to pack.
8. Coarse fragments (percent) <sup>1 4</sup> .....	<25	25-50	>50	Small stones.
9. Fraction greater than 3 inches (percent by weight) <sup>1 4</sup> .....	<25	25-50	>50	Large stones.
10. Slope (percent) .....	<8	8-15	>15	Slope.
11. Depth to high water table (feet) .....	---	---	+	Ponding.
	>3.5	1.5-3.5	<1.5	Wetness.
12. Unified <sup>1</sup> .....	---	---	PT	Excess humus.
13. Layer thickness (inches) .....	>60	40-60	<40	Thin layer.
14. Soil reaction (pH) <sup>1</sup> .....	---	---	<3.6	Too acid.
15. Salinity in the upper 60 inches (mmhos/cm) <sup>2</sup> .....	---	---	>16	Excess salt.
16. Sodium adsorption ratio or great group or phase <sup>1 2</sup> .....	---	---	>12 (halic, natric, alkali phases)	Excess sodium.
17. Carbonates .....	---	---	( <sup>5</sup> )	Excess lime.

<sup>1</sup> Thickest layer between 10 and 60 inches.

<sup>2</sup> Disregard in all Aridisols except Salorthids and Aquic subgroups, in all Aridic subgroups, and in all Torri great groups of Entisols except Aquic subgroups.

<sup>3</sup> Rate one class better if the soil is in kaolinitic family and experience confirms.

<sup>4</sup> 100 minus percent passing No. 10 sieve, plus fraction greater than 3 inches. Use dominant condition or restrictive feature.

<sup>5</sup> If the amount of carbonate is so high that plant growth is restricted, rate *poor—excess lime*.

Shallow Excavations

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches):				
Hard .....	>60	40-60	<40	Depth to rock.
Soft .....	>40	20-40	<20	Depth to rock.
3. Depth to cemented pan (inches):				
Thick .....	>60	40-60	<40	Cemented pan.
Thin .....	>40	20-40	<20	Cemented pan.
4. USDA texture (20 to 60 inches) .....	---	<sup>1</sup> SI	COS, S, FS, VFS, LCOS, LS, LFS, LVFS, G, SG	Cutbanks cave.
5. USDA texture (20 to 60 inches) .....	---	C, SIC	---	Too clayey.
6. Soil order .....	---	---	Vertisols	Cutbanks cave.
7. Bulk density between depths of 20 and 60 inches (g/cc) .....	---	>1.8	---	Dense layer.
8. Unified (20 to 60 inches) .....	---	---	OL, OH, PT	Excess humus.
9. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	<25	25-50	>50	Large stones.
10. Depth to high water table (feet) .....				
	---	---	+	Ponding.
	>6	2.5-6	<2.5	Wetness.
11. Flooding .....	None, rare	Common	---	Flooding.
12. Slope (percent) .....	<8	8-15	>15	Slope.
13. Downslope movement .....	---	---	<sup>(3)</sup>	Slippage.

<sup>1</sup> In areas of loess, rating should be *slight*.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe—slippage*.

**Dwellings Without Basements**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Total subsidence (inches) .....	---	---	>12	Subsides.
3. Flooding .....	None	---	Rare, common	Flooding.
4. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2.5	1.5-2.5	<1.5	Wetness.
5. Shrink-swell potential <sup>1</sup> .....	Low	Moderate	High, very high	Shrink-swell.
6. Unified <sup>1</sup> .....	---	---	OL, OH, PT	Low strength.
7. Slope (percent) .....	<8	8-15	>15	Slope.
8. Depth to bedrock (inches):				
Hard .....	>40	20-40	<20	Depth to rock.
Soft .....	>20	<20	---	Depth to rock.
9. Depth to cemented pan (inches):				
Thick .....	>40	20-40	<20	Cemented pan.
Thin .....	>20	<20	---	Cemented pan.
10. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	<25	25-50	>50	Large stones.
11. Downslope movement .....	---	---	<sup>(3)</sup>	Slippage.
12. Formation of pits .....	---	---	<sup>(4)</sup>	Pitting.
13. Differential settling .....	---	---	<sup>(5)</sup>	Unstable fill.

<sup>1</sup> Thickest layer between 10 and 40 inches.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>4</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

<sup>5</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

**Dwellings With Basements**

	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Total subsidence (inches) .....	---	---	>12	Subsides.
3. Flooding .....	None	---	Rare, common	Flooding.
4. Depth to high water table (feet) .....	---	---	+	Ponding.
	>6	2.5-6	<2.5	Wetness.
5. Depth to bedrock (inches):				
Hard .....	>60	40-60	<40	Depth to rock.
Soft .....	>40	20-40	<20	Depth to rock.
6. Depth to cemented pan (inches):				
Thick .....	>60	40-60	<40	Cemented pan.
Thin .....	>40	20-40	<20	Cemented pan.
7. Slope (percent) .....	<8	8-15	>15	Slope.
8. Shrink-swell potential <sup>1</sup> .....	Low	Moderate	High, very high	Shrink-swell.
9. Unified (bottom layer) .....	---	---	OL, OH, PT	Low strength.
10. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	<25	25-50	>50	Large stones.
11. Downslope movement .....	---	---	(3)	Slippage.
12. Formation of pits .....	---	---	(4)	Pitting.
13. Differential settling .....	---	---	(5)	Unstable fill.

<sup>1</sup> Thickest layer between 10 and 60 inches.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>4</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

<sup>5</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

**Small Commercial Buildings**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Total subsidence (inches) .....	---	---	>12	Subsides.
3. Flooding .....	None	---	Rare, common	Flooding.
4. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2.5	1.5-2.5	<1.5	Wetness.
5. Shrink-swell potential <sup>1</sup> .....	Low	Moderate	High, very high	Shrink-swell.
6. Slope (percent) .....	<4	4-8	>8	Slope.
7. Unified <sup>1</sup> .....	---	---	OL, OH, PT	Low strength.
8. Depth to bedrock (inches):				
Hard .....	>40	20-40	<20	Depth to rock.
Soft .....	>20	<20	---	Depth to rock.
9. Depth to cemented pan (inches):				
Thick .....	>40	20-40	<20	Cemented pan.
Thin .....	>20	<20	---	Cemented pan.
10. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	<25	25-50	>50	Large stones.
11. Downslope movement .....	---	---	(3)	Slippage.
12. Formation of pits .....	---	---	(4)	Pitting.
13. Differential settling .....	---	---	(5)	Unstable fill.

<sup>1</sup> Thickest layer between 10 and 40 inches.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>4</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

<sup>5</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

## Local Roads and Streets

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Total subsidence (inches) .....	---	---	>12	Subsides.
3. Depth to bedrock (inches):				
Hard .....	>40	20-40	<20	Depth to rock.
Soft .....	>20	<20	---	Depth to rock.
4. Depth to cemented pan (inches):				
Thick .....	>40	20-40	<20	Cemented pan.
Thin .....	>20	<20	---	Cemented pan.
5. Shrink-swell potential <sup>1</sup> .....	Low	Moderate	High, very high	Shrink-swell.
6. AASHTO group index number <sup>1 2 3</sup> .....	<5	5-8	>8	Low strength.
7. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2.51.0-2.5	<1.0	Wetness.	
8. Slope (percent) .....	<8	8-15	>15	Slope.
9. Flooding .....	None	Rare	Common	Flooding.
10. Potential for frost action .....	Low	Moderate	High	Frost action.
11. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<25	25-50	>50	Large stones.
12. Downslope movement .....	---	---	(5)	Slippage.
13. Formation of pits .....	---	---	(6)	Pitting.
14. Differential settling .....	---	---	(7)	Unstable fill.

<sup>1</sup> Thickest layer between 10 and 40 inches.

<sup>2</sup>  $GIN = (F-35)[.2 + .005(LL-40)] + .01 (F-15)(PI-10)$  where F = percent passing No. 200 sieve. If F is  $\leq 35$  and PI is  $\geq 11$ , use only part 2 of equation. Use median values.

<sup>3</sup> Rate one class better if the soil is in a kaolinitic family and experience confirms.

<sup>4</sup> Weighted average to 40 inches.

<sup>5</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>6</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

<sup>7</sup> If the soil is susceptible to differential settling, rate *severe*—*unstable fill*.

**Lawns, Landscaping, and Golf Fairways**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Salinity in the surface layer (mmhos/cm) ...	<4	4-8	>8	Excess salt.
3. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	---	---	>12 (halic, natric, alkali phases)	Excess sodium.
4. Soil reaction (pH) in the surface layer .....	---	---	>3.6	Too acid.
5. Sulfidic materials (great group) .....	---	---	Sulfaquents, Sulfishemists	Excess sulfur.
6. Coarse fragments in the surface layer (percent by weight) <sup>1</sup> .....	<25	25-50	>50	Small stones.
7. Fraction greater than 3 inches in the surface layer (percent by weight) .....	<5	5-30	>30	Large stones.
8. Depth to high water table (feet) .....	---	---	+	Ponding.
	>2	1-2	<1	Wetness.
9. Available water capacity (in/in) <sup>2</sup> .....	>.10	.05-.10	<.05	Droughty.
10. Flooding .....	None, rare	Occasional	Frequent	Flooding.
11. Slope (percent) .....	<8	8-15	>15	Slope.
12. Depth to bedrock (inches) .....	>40	20-40	<20	Depth to rock.
13. Depth to cemented pan (inches) .....	>40	20-40	<20	Cemented pan.
14. USDA texture (surface layer) <sup>3</sup> .....	---	---	SIC, C, SC	Too clayey.
15. USDA texture (surface layer) .....	---	---	FB, HM, MUCK, SP, MPT, PEAT	Excess humus.
16. USDA texture (surface layer) .....	---	LCOS, S	COS	Too sandy.
17. Carbonates .....	---	---	(4)	Excess lime.

<sup>1</sup> 100 minus percent passing No. 10 sieve.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> Rate one class better if the soil is in a kaolinitic family and experience confirms.

<sup>4</sup> If the amount of carbonate is so high that plant growth is restricted, rate *severe*—*excess lime*.

## Roadfill

Property	Limits			Restrictive feature
	Good	Fair	Poor	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches) .....	>60	40-60	<40	Depth to rock.
3. Depth to thick cemented pan (inches) .....	>60	40-60	<40	Cemented pan.
4. Shrink-swell potential <sup>1</sup> .....	Low	Moderate	High, very high	Shrink-swell.
5. AASHTO group index number <sup>1 2 3</sup> .....	<5	5-8	>8	Low strength.
6. Layer thickness (inches) .....	>60	30-60	<30	Thin layer.
7. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<25	25-50	>50	Large stones.
8. Depth to high water table (feet) .....	>3	1-3	<1	Wetness.
9. Slope (percent) .....	<15	15-25	>25	Slope.
10. Content of gypsum (percent) .....	---	10-15	>15	Excess gypsum.

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on the bottom layer, verify thickness.

<sup>2</sup>  $GIN = (F-35)[.2 + .005(LL-40)] + .01 (F-15)(PI-10)$  where F = percent passing No. 200 sieve. If F is  $\leq 35$  and PI is  $\geq 11$ , use only part 2 of equation. Use median values.

<sup>3</sup> Rate one class better if the soil is in a kaolinitic family and experience confirms.

<sup>4</sup> Weighted average to 40 inches.

**Sand**

Property	Limits		Restrictive feature
	Probable source	Improbable source	
1. USDA texture .....	---	Ice	Permafrost.
2. Unified <sup>1</sup> .....	SW, SP, SW-SM, SP-SM	---	---
	<sup>2</sup> GW, <sup>2</sup> GP, <sup>2</sup> GW-GM, <sup>2</sup> GP-GM	---	---
	---	<sup>3</sup> GW, <sup>3</sup> GP, <sup>3</sup> GW-GM, <sup>3</sup> GP-GM	Small stones.
	---	PT	Excess humus.
	---	All other	Excess fines.
3. Layer thickness (inches) .....	>36	<36	Thin layer.
4. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<50	>50	Large stones.

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on the bottom layer, verify thickness.

<sup>2</sup> Percent passing No. 4 sieve minus percent passing No. 200 sieve is greater than 25.

<sup>3</sup> Percent passing No. 4 sieve minus percent passing No. 200 sieve is less than 25.

<sup>4</sup> Thickest layer between 10 and 60 inches.

## Gravel

Property	Limits		Restrictive feature
	Probable source	Improbable source	
1. USDA texture .....	---	Ice	Permafrost.
2. Unified <sup>1</sup> .....	GW, GP, GW-GM, GP-GM <sup>2</sup> SW, <sup>2</sup> SP, <sup>2</sup> SW-SM, <sup>2</sup> SP-SM	---	---
	---	PT	Too sandy. Excess humus.
	---	All other	Excess fines.
3. Layer thickness (inches) .....	>36	<36	Thin layer.
4. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	<50	>50	Large stones.

<sup>1</sup> Evaluate the thickest layer between 10 and 60 inches and also the bottom layer. Choose the best rating. When rating is based on the bottom layer, verify thickness.

<sup>2</sup> 100 minus percent passing No. 4 sieve is greater than 25.

<sup>3</sup> 100 minus percent passing No. 4 sieve is less than 25.

<sup>4</sup> Thickest layer between 10 and 60 inches.

**Topsoil**

Property	Limits			Restrictive feature
	Good	Fair	Poor	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Depth to bedrock (inches) .....	>40	20-40	<20	Depth to rock.
3. Depth to cemented pan (inches)	>40	20-40	<20	Cemented pan.
4. Depth to bulk density greater than 1.8 g/cc (inches) .....	>40	20-40	<20	Area reclaim.
5. USDA texture <sup>1</sup> .....	---	LCOS, LS, LFS, LVFS	COS, S, FS, VFS	Too sandy.
6. USDA texture <sup>1</sup> .....	---	<sup>2</sup> SCL, <sup>2</sup> CL, <sup>2</sup> SICL	SIC, C, SC	Too clayey
7. USDA texture <sup>1</sup> .....	---	---	FB, HM, SP, MPT, MUCK, PEAT, CE	Excess humus.
8. Fraction greater than 3 inches (percent by weight): <sup>3</sup>				
0 to 40 inches .....	<5	5-25	>25	Large stones.
40 to 60 inches .....	<15	15-30	>30	Area reclaim.
9. Coarse fragments (percent): <sup>3</sup>				
0 to 40 inches .....	<5	5-25	>25	Small stones.
40 to 60 inches .....	<25	25-50	>50	Area reclaim.
10. Salinity (mmhos/cm) <sup>1</sup> .....	<4	4-8	>8	Excess salt.
11. Layer thickness (inches) .....	>40	20-40	<20	Thin layer.
12. Depth to high water table (feet) .....	---	---	<1	Wetness.
13. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	---	---	>12 (halic, natric, alkali phases)	Excess sodium.
14. Soil reaction (pH) <sup>1</sup> .....	---	---	<3.6	Too acid.
15. Slope (percent) .....	<8	8-15	>15	Slope.
16. Carbonates .....	---	---	<sup>(4)</sup>	Excess lime.

<sup>1</sup> Thickest layer between 0 and 40 inches.

<sup>2</sup> If the soil has more than 3 percent organic matter and less than 35 percent clay, rate *good*.

<sup>3</sup> 100 minus percent passing No. 10 sieve, plus fraction greater than 3 inches. Use dominant condition or restrictive feature.

<sup>4</sup> If the amount of carbonate is so high that plant growth is restricted, rate *poor—excess lime*.

## Pond Reservoir Areas

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Permeability between 20 and 60 inches (in/hr) .....	<0.6	0.6-2.0	>2.0	Seepage.
3. Depth to bedrock (inches) .....	>60	20-60	<20	Depth to rock.
4. Depth to cemented pan (inches) .....	>60	20-60	<20	Cemented pan.
5. Slope (percent) .....	<3	3-8	>8	Slope.
6. USDA texture (all depths) .....	---	---	MARL, GYP	Seepage.
7. Downslope movement .....	---	---	(1)	Slippage.
8. Formation of pits .....	---	---	(2)	Pitting.

<sup>1</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, rate *severe*—*slippage*.

<sup>2</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, rate *severe*—*pitting*.

**Embankments, Dikes, and Levees**

Property	Limits			Restrictive feature
	Slight	Moderate	Severe	
1. USDA texture .....	---	---	Ice	Permafrost.
2. Layer thickness (inches) .....	>60	30-60	>30	Thin layer.
3. Unified <sup>1</sup> .....	---	---	GW, GP, SW, SP, GW-GM, GP-GM, SW-SM, SP-SM, <sup>2</sup> SM, <sup>2</sup> GM	Seepage.
4. Unified <sup>1</sup> .....	---	<sup>3</sup> GM, <sup>4</sup> CL	<sup>5</sup> ML, <sup>6</sup> SM, <sup>6</sup> SP, CL-ML	Piping.
5. Unified <sup>1</sup> .....	---	---	PT, OL, OH	Excess humus.
6. Unified <sup>1</sup> .....	---	---	MH, <sup>7</sup> CH	Hard to pack.
7. Fraction greater than 3 inches (percent by weight) <sup>8</sup> .....	<15	15-35	>35	Large stones.
8. Depth to high water table (feet) .....	---	---	+	Ponding.
Apparent .....	>4	2-4	<2	Wetness.
Perched .....	>3	1-3	<1	Wetness.
9. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	---	---	>12 (natric, halic, alkali phases)	Excess sodium.
10. Salinity at any depth (mmhos/cm) .....	<8	8-16	>16	Excess salt.
11. Content of gypsum (percent) .....	---	5-10	>10	Excess gypsum.

<sup>1</sup> Thickest layer between 10 and 60 inches.

<sup>2</sup> Rate *moderate* if more than 20 percent passing No. 200 sieve and *slight* if more than 30 percent passing No. 200 sieve.

<sup>3</sup> Rate *slight* if less than 35 percent passing No. 200 sieve, less than 50 percent passing No. 40 sieve, and less than 65 percent passing No. 10 sieve. The soil must meet all three criteria before it is rated *slight*.

<sup>4</sup> Rate *slight* if PI is greater than 15.

<sup>5</sup> Rate *moderate* if PI is greater than 10.

<sup>6</sup> Rate *moderate* if less than 70 percent passing No. 40 sieve and less than 90 percent passing No. 10 sieve, and rate *slight* if less than 60 percent passing No. 40 sieve and less than 75 percent passing No. 10 sieve.

<sup>7</sup> Rate *moderate* if PI is less than 40.

<sup>8</sup> Weighted average to 40 inches.

### Drainage

Property	Limits	Restrictive feature <sup>1</sup>
1. USDA texture .....	Ice	Permafrost.
2. Depth to high water table (feet) <sup>2</sup> .....	<sup>3</sup> >3 +	Deep to water. Ponding.
3. Permeability in the upper 40 inches (in/hr) .....	<0.2	Percs slowly.
4. Depth to bedrock (inches) .....	<40	Depth to rock.
5. Depth to cemented pan (inches) .....	<40	Cemented pan.
6. Flooding .....	Common	Flooding.
7. Total subsidence .....	Any entry	Subsides.
8. Fraction greater than 3 inches (percent by weight) <sup>4</sup> .....	>25	Large stones.
9. Potential for frost action .....	High	Frost action.
10. Slope (percent) .....	>3	Slope.
11. USDA texture <sup>4</sup> .....	COS, S, FS, VFS, LCOS, LS, LFS, LVFS, SG, G	Cutbanks cave.
12. Salinity at any depth (mmhos/cm) .....	>8	Excess salt.
13. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	>12 (natric, halic, alkali phases)	Excess sodium.
14. Sulfidic materials (great group) .....	Sulfaquents, Sulfihemists	Excess sulfur.
15. Soil reaction (pH) at any depth .....	<3.6	Too acid.
16. Downslope movement .....	(5)	Slippage.
17. Complex landscape .....	(6)	Complex slope.
18. Availability of outlets .....	(7)	Poor outlets.

<sup>1</sup> If the soil has no restrictive features, the rating is *favorable*.

<sup>2</sup> If the soil is deep to water, disregard other properties.

<sup>3</sup> For irrigated areas, consider other restrictive features if the water table is between 3 and 5 feet.

<sup>4</sup> Thickest layer between 10 and 60 inches.

<sup>5</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, list *slippage* as a restrictive feature.

<sup>6</sup> If complex or irregular slopes cause difficulty in design, installation, or functioning of the system, list *complex slope* as a restrictive feature.

<sup>7</sup> If good outlets are difficult to find, list *poor outlets* as a restrictive feature.

**Irrigation**

Property	Limits	Restrictive feature <sup>1</sup>
1. USDA texture .....	Ice	Permafrost.
2. Slope (percent) .....	>3	Slope.
3. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	>25	Large stones.
4. Depth to high water table (feet) .....	+ <sup>3</sup> <3	Ponding. Wetness.
5. Available water capacity (in/in) <sup>2</sup> .....	<0.10	Droughty.
6. USDA texture (surface layer) .....	COS, S, FS, VFS, LCOS, LS, LFS, LVFS	Fast intake.
7. USDA texture (surface layer) .....	SIC, C, SC	Slow intake.
8. Wind erodibility group .....	1, 2, 3	Soil blowing.
9. Permeability in the upper 60 inches (in/hr) .	<0.2	Percs slowly.
10. Depth to bedrock (inches) .....	<40	Depth to rock.
11. Depth to cemented pan (inches) .....	<40	Cemented pan.
12. Fragipan (great group) .....	All Fragi	Rooting depth.
13. Bulk density in the upper 40 inches (g/cc) .	>1.7	Rooting depth.
14. Erosion factor K (surface layer) .....	>.35	Erodes easily.
15. Flooding .....	Common	Flooding.
16. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	>12 (natric, halic, alkali phases)	Excess sodium.
17. Salinity in the upper 40 inches (mmhos/cm)	>4	Excess salt.
18. Soil reaction (pH) at any depth .....	<3.6	Too acid.
19. Complex landscape .....	<sup>(4)</sup>	Complex slope.
20. Formation of pits .....	<sup>(5)</sup>	Pitting.
21. Carbonates .....	<sup>(6)</sup>	Excess lime.

<sup>1</sup> If the soil has no restrictive features, the rating is *favorable*.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> If depth to the water table is more than 3 feet during the growing season, disregard wetness.

<sup>4</sup> If complex or irregular slopes cause difficulty in design, installation, or functioning of the system, list *complex slope* as a restrictive feature.

<sup>5</sup> If the soil is susceptible to the formation of pits caused by the melting of ground ice when the ground cover is removed, list *pitting* as a restrictive feature.

<sup>6</sup> If the amount of carbonate is so high that plant growth is restricted, list *excess lime* as a restrictive feature.

## Terraces and Diversions

Property	Limits	Restrictive feature <sup>1</sup>
1. USDA texture .....	Ice	Permafrost.
2. Slope (percent) .....	>8	Slope.
3. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	>25	Large stones.
4. Depth to bedrock (inches) .....	<40	Depth to rock.
5. Depth to cemented pan (inches) .....	<40	Cemented pan.
6. Erosion factor K in the upper 40 inches .....	>.35	Erodes easily.
7. Depth to high water table (feet) .....	+ <3	Ponding. Wetness.
8. Fragipan (great group) .....	All Fragi	Rooting depth.
9. USDA texture <sup>3</sup> .....	COS, S, FS, LS, LCOS, SG	Too sandy.
10. Wind erodibility group .....	1, 2, 3	Soil blowing.
11. Permeability (in/hr) <sup>3</sup> .....	<0.2	Percs slowly.
12. Downslope movement .....	(4)	Slippage.
13. Complex landscape .....	(5)	Complex slope.
14. Availability of outlets .....	(6)	Poor outlets.
15. Content of gypsum (percent) .....	>5	Excess gypsum.

<sup>1</sup> If the soil has no restrictive features, the rating is *favorable*.

<sup>2</sup> Weighted average to 40 inches.

<sup>3</sup> Thickest layer between 10 and 60 inches.

<sup>4</sup> If the soil is susceptible to movement downslope when loaded, excavated, or wet, list *slippage* as a restrictive feature.

<sup>5</sup> If complex or irregular slopes cause difficulty in design, installation, or functioning of the system, list *complex slope* as a restrictive feature.

<sup>6</sup> If good outlets are difficult to find, list *poor outlets* as a restrictive feature.

**Grassed Waterways**

Property	Limits	Restrictive feature <sup>1</sup>
1. USDA texture .....	Ice	Permafrost.
2. Moisture regime .....	Aridic, Torric	Too arid.
3. Fraction greater than 3 inches (percent by weight) <sup>2</sup> .....	>15	Large stones.
4. Depth to high water table (feet) .....	<1.5	Wetness.
5. Slope (percent) .....	>8	Slope.
6. Salinity in the surface layer (mmhos/cm) ...	>4	Excess salt.
7. Sodium adsorption ratio in the upper 40 inches or great group or phase .....	>12 (natric, halic, alkali phases)	Excess sodium.
8. Erosion factor K in the upper 40 inches .....	>.35	Erodes easily.
9. Available water capacity (in/in) <sup>2</sup> .....	<0.10	Droughty.
10. Depth to bedrock (inches) .....	<40	Depth to rock.
11. Depth to cemented pan (inches) .....	<40	Cemented pan.
12. Fragipan (great group) .....	All Fragi	Rooting depth.
13. Bulk density in the upper 40 inches (g/cc) ..	>1.7	Rooting depth.
14. Permeability in the upper 40 inches (in/hr) ..	<0.2	Percs slowly.

<sup>1</sup> If the soil has no restrictive features, the rating is *favorable*.

<sup>2</sup> Weighted average to 40 inches.



# Tables

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Table 1.--Temperature and Precipitation  
(Recorded in the period 1961-90 at Newman, CA6168)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	2 years in 10 will have--			Average number of days with 0.10 inch or more	Average snowfall In
				Maximum temperature higher than--	Minimum temperature lower than--		Average	Less than--	More than--		
°F	°F	°F	°F	°F	Units	In	In	In		In	
January-----	54.5	35.6	45.1	69	21	171	2.24	0.82	3.42	4	0.0
February-----	62.6	39.1	50.9	76	26	306	1.74	0.48	2.85	4	0.0
March-----	68.1	41.3	54.7	83	29	450	1.46	0.60	2.39	4	0.0
April-----	75.2	44.0	59.6	94	33	588	0.80	0.22	1.42	2	0.0
May-----	84.0	49.5	66.8	103	38	830	0.16	0.06	0.51	0	0.0
June-----	91.7	55.2	73.5	107	43	1003	0.06	0.10	0.31	0	0.0
July-----	96.3	58.6	77.5	108	48	1161	0.03	0.10	0.25	0	0.0
August-----	94.2	58.0	76.1	106	48	1118	0.04	0.07	0.30	0	0.0
September---	89.2	54.3	71.8	103	44	953	0.29	0.11	1.07	0	0.0
October-----	80.4	48.2	64.3	96	35	744	0.52	0.27	1.05	1	0.0
November-----	65.2	40.6	52.9	81	27	383	1.68	0.55	2.95	4	0.0
December-----	54.9	35.4	45.1	69	21	174	1.51	0.48	2.45	4	0.0
Yearly:											
Average---	76.4	46.6	61.5	---	---	---	---	---	---	---	---
Extreme---	112	15	---	109	20	---	---	---	---	---	---
Total-----	---	---	---	---	---	7881	10.53	6.94	13.15	23	0.0

See footnote at end of table.

Table 1.--Temperature and Precipitation---Continued

(Recorded in the period 1961-90 at Mount Hamilton, CA5933)

Month	Temperature						Precipitation					
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	2 years in 10 will have--			Average number of days with 0.10 inch or more	Average snowfall In	
				Maximum temperature higher than--	Minimum temperature lower than--		Less than--	More than--	In			In
°F	°F	°F	°F	°F	Units	In	In	In	In	In		
January-----	49.6	37.4	43.5	70	15	161	3.37	1.42	5.02	6	4.2	
February----	50.2	37.3	43.8	68	21	150	3.17	1.05	4.90	6	1.8	
March-----	50.1	36.5	43.3	69	22	152	3.34	1.57	4.87	8	4.4	
April-----	55.7	39.8	47.8	78	24	254	1.92	0.70	2.93	5	2.3	
May-----	64.3	46.7	55.5	84	28	467	0.55	0.14	1.12	1	0.0	
June-----	72.8	55.1	64.0	90	34	691	0.14	0.08	0.43	0	0.0	
July-----	79.1	63.1	71.1	94	41	910	0.05	0.14	0.37	0	0.0	
August-----	78.3	62.5	70.4	95	42	911	0.09	0.07	0.48	0	0.0	
September---	73.8	57.1	65.4	91	39	736	0.41	0.12	1.08	0	0.0	
October-----	66.0	50.7	58.3	85	31	547	1.29	0.43	2.25	2	0.0	
November----	54.4	41.4	47.9	75	25	246	3.41	1.37	5.13	6	0.1	
December----	49.6	37.5	43.5	68	18	167	3.03	1.05	4.66	6	1.8	
Yearly:												
Average----	62.0	47.1	54.5	---	---	---	---	---	---	---	---	
Extreme----	103	7	---	96	15	---	---	---	---	---	---	
Total-----	---	---	---	---	---	5392	20.76	15.28	25.44	40	14.5	

\* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F.)

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Newman, CA6168)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 3	February 21	April 10
2 years in 10 later than--	January 23	February 11	March 30
5 years in 10 later than--	December 18	January 17	March 8
First freezing temperature in fall:			
1 year in 10 earlier than--	December 9	November 12	November 7
2 years in 10 earlier than--	December 16	November 21	November 11
5 years in 10 earlier than--	January 1	December 17	November 21

(Recorded in the period 1961-90 at Mount Hamilton, CA5933)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 8	May 13	May 31
2 years in 10 later than--	March 17	May 4	May 23
5 years in 10 later than--	January 25	April 17	May 8
First freezing temperature in fall:			
1 year in 10 earlier than--	November 22	November 5	October 27
2 years in 10 earlier than--	December 4	November 14	November 2
5 years in 10 earlier than--	December 31	December 2	November 13

Table 3.--Growing Season

(Recorded in the period 1961-90 at Newman, CA6168)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	317	264	213
8 years in 10	338	279	228
5 years in 10	> 365	307	256
2 years in 10	> 365	335	285
1 year in 10	> 365	350	300

(Recorded in the period 1961-90 at Mount Hamilton,  
CA5933)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	258	192	160
8 years in 10	300	205	170
5 years in 10	> 365	231	189
2 years in 10	> 365	257	208
1 year in 10	> 365	270	218

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
100	Capay clay, 0 to 2 percent slopes-----	11,150	2.8
101	Capay clay, wet, 0 to 2 percent slopes-----	8,185	2.1
102	Capay clay, loamy substratum, 0 to 2 percent slopes-----	4,505	1.1
106	Capay clay, 0 to 2 percent slopes, rarely flooded-----	1,610	0.4
110	El Solyo silty clay loam, 0 to 2 percent slopes-----	4,590	1.2
111	El Solyo clay loam, wet, 0 to 2 percent slopes-----	1,095	0.3
116	El Solyo silty clay loam, 0 to 2 percent slopes, rarely flooded-----	455	0.1
120	Vernalis-Zacharias complex, 0 to 2 percent slopes-----	12,035	3.1
121	Vernalis loam, wet, 0 to 2 percent slopes-----	310	0.1
122	Vernalis loam, 0 to 2 percent slopes-----	8,875	2.3
123	Vernalis clay loam, wet, 0 to 2 percent slopes-----	1,160	0.3
125	Vernalis clay loam, 0 to 2 percent slopes-----	9,235	2.3
126	Vernalis-Zacharias complex, 0 to 2 percent slopes, rarely flooded-----	2,030	0.5
127	Vernalis loam, 0 to 2 percent slopes, rarely flooded-----	3,325	0.8
128	Water-----	675	0.2
130	Stomar clay loam, 0 to 2 percent slopes-----	6,695	1.7
131	Stomar clay loam, wet, 0 to 2 percent slopes-----	1,070	0.3
140	Zacharias clay loam, 0 to 2 percent slopes-----	4,235	1.1
141	Zacharias clay loam, wet, 0 to 2 percent slopes-----	1,855	0.5
142	Zacharias gravelly clay loam, 0 to 2 percent slopes-----	4,845	1.2
144	Zacharias gravelly clay loam, 2 to 5 percent slopes-----	3,635	0.9
145	Zacharias clay loam, 2 to 5 percent slopes-----	5,495	1.4
146	Zacharias clay loam, 0 to 2 percent slopes, rarely flooded-----	1,790	0.5
147	Zacharias gravelly clay loam, 0 to 2 percent slopes, rarely flooded-----	420	0.1
150	Columbia fine sandy loam, 0 to 2 percent slopes, occasionally flooded-----	250	0.1
151	Columbia complex, 0 to 2 percent slopes, occasionally flooded-----	435	0.1
153	Columbia fine sandy loam, channeled, 0 to 2 percent slopes, frequently flooded-----	2,590	0.7
155	Columbia fine sandy loam, 0 to 2 percent slopes, rarely flooded-----	210	0.1
157	Columbia complex, 0 to 2 percent slopes, rarely flooded-----	480	0.1
159	Columbia complex, 0 to 2 percent slopes, frequently flooded-----	540	0.1
160	Merritt silty clay loam, 0 to 2 percent slopes, occasionally flooded-----	900	0.2
165	Merritt silty clay loam, 0 to 2 percent slopes, rarely flooded-----	635	0.2
170	Dospalos-Bolfar complex, 0 to 2 percent slopes, occasionally flooded-----	860	0.2
175	Dospalos-Bolfar complex, 0 to 2 percent slopes, rarely flooded-----	1,205	0.3
176	Dumps-----	230	*
180	Dello fine sandy loam, channeled, 0 to 2 percent slopes, frequently flooded-----	465	0.1
190	Clear Lake clay, 0 to 2 percent slopes, occasionally flooded-----	420	0.1
195	Clear Lake clay, 0 to 2 percent slopes, rarely flooded-----	825	0.2
200	Veritas sandy loam, 0 to 2 percent slopes, rarely flooded-----	860	0.2
210	Cortina gravelly sandy loam, 0 to 2 percent slopes, rarely flooded-----	2,375	0.6
215	Yokut sandy loam, 0 to 2 percent slopes-----	945	0.2
220	Xerofluvents-Xerorthents complex, 0 to 5 percent slopes, occasionally flooded-----	2,165	0.5
245	Bolfar-Columbia complex, 0 to 2 percent slopes, rarely flooded-----	585	0.1
246	Bolfar-Columbia complex, 0 to 2 percent slopes, occasionally flooded-----	115	*
252	Chaqua-Arburua complex, 5 to 8 percent slopes-----	880	0.2
253	Chaqua-Arburua complex, 8 to 15 percent slopes-----	2,230	0.6
255	Calla-Carbona complex, 30 to 50 percent slopes-----	3,135	0.8
270	Elsalado fine sandy loam, 0 to 2 percent slopes, rarely flooded-----	1,745	0.4
271	Elsalado loam, 0 to 2 percent slopes, rarely flooded-----	1,960	0.5
272	Elsalado loam, wet, 0 to 2 percent slopes-----	190	*
273	Elsalado fine sandy loam, 0 to 2 percent slopes-----	780	0.2
274	Elsalado loam, 0 to 2 percent slopes-----	2,320	0.6
281	Carbona clay loam, 2 to 8 percent slope-----	345	0.1
290	Carbona-Orogne complex, 15 to 30 percent slopes-----	25	*
291	Carbona-Orogne complex, 30 to 50 percent slopes-----	450	0.1
300	Damluis clay loam, 0 to 2 percent slopes-----	1,795	0.5
301	Damluis clay loam, 2 to 8 percent slopes-----	2,900	0.7
302	Damluis gravelly clay loam, 0 to 2 percent slopes-----	1,280	0.3
303	Damluis gravelly clay loam, 2 to 8 percent slopes-----	1,515	0.4
304	Damluis gravelly clay loam, 8 to 15 percent slopes-----	2,185	0.6
310	Deldota clay, 0 to 2 percent slopes-----	330	0.1
320	Dosamigos clay loam, 0 to 2 percent slopes-----	365	0.1
330	Pedcat clay loam, 0 to 2 percent slopes, rarely flooded-----	3,695	0.9
331	Pedcat clay loam, 0 to 2 percent slopes-----	615	0.2

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
340	Carranza-Woo complex, 0 to 2 percent slopes-----	100	*
350	Woo loam, 0 to 2 percent slopes-----	480	0.1
400	Alo-Vaquero complex, 15 to 30 percent slopes-----	80	*
401	Alo-Vaquero complex, 30 to 50 percent slopes-----	9,480	2.4
410	Ayar clay, 30 to 50 percent slopes-----	815	0.2
420	Ayar-Oneil complex, 30 to 50 percent slopes-----	1,000	0.3
430	Vaquero-Carbona complex, 8 to 30 percent slopes-----	3,255	0.8
500	Wisflat-Arburua-San Timoteo complex, 30 to 50 percent slopes-----	16,000	4.1
501	Wisflat-Arburua-San Timoteo complex, 50 to 75 percent slopes-----	19,720	5.0
502	Arburua-Wisflat complex, 8 to 15 percent slopes-----	330	0.1
505	Arburua-Contra Costa-Wisflat complex, 30 to 50 percent slopes-----	16,010	4.1
506	Arburua-Contra Costa-Wisflat complex, 50 to 75 percent slopes-----	16,880	4.3
510	Arburua-Wisflat-Rock outcrop, 30 to 65 percent slopes-----	4,595	1.2
520	Wisflat-Rock outcrop complex, 30 to 50 percent slopes-----	4,940	1.3
521	Wisflat-Rock outcrop complex, 50 to 75 percent slopes-----	22,780	5.8
530	Oneil silt loam, 15 to 30 percent slopes-----	40	*
540	Oquin fine sandy loam, 15 to 30 percent slopes-----	550	0.1
600	Gonzaga-Honker-Franciscan complex, 30 to 50 percent slopes-----	14,065	3.6
601	Gonzaga-Honker-Franciscan complex, 50 to 75 percent slopes-----	27,695	7.0
610	Honker-Vallecitos-Honker, eroded, complex, 30 to 50 percent slopes-----	5,425	1.4
611	Honker-Vallecitos-Honker, eroded, complex, 50 to 75 percent slopes-----	19,430	4.9
612	Honker-Vallecitos-Gonzaga complex, 30 to 50 percent slopes-----	2,770	0.7
613	Honker-Gaviota complex, 30 to 50 percent slopes-----	885	0.2
614	Honker-Gaviota complex, 50 to 70 percent slopes-----	1,300	0.3
615	Honker-Quinto complex, 30 to 50 percent slopes-----	260	0.1
620	Franciscan sandy loam, 50 to 70 percent slopes-----	2,340	0.6
625	Franciscan-Quinto-Honker complex, 50 to 75 percent slopes-----	10,440	2.6
630	Millsholm-Honker-Rock outcrop complex, 30 to 50 percent slopes-----	3,240	0.9
631	Millsholm-Honker-Rock outcrop complex, 50 to 75 percent slopes-----	200	*
635	Millsholm loam, 50 to 65 percent slopes-----	4,050	1.0
640	Quinto-Millsholm-Rock outcrop complex, 40 to 75 percent slopes-----	1,240	0.3
650	Quinto-Rock outcrop complex, 50 to 75 percent slopes-----	4,050	1.0
660	Gaviota loam, 30 to 50 percent slopes-----	6,110	1.5
661	Gaviota gravelly loam, 30 to 75 percent slopes, eroded-----	14,275	3.6
682	Henneke-Hentine-Rock outcrop complex, 30 to 70 percent slopes-----	6,075	1.5
683	Hentine-Rock outcrop-Henneke complex, 30 to 70 percent slopes-----	2,135	0.5
684	Hentine-Henneke complex, 30 to 70 percent slopes-----	615	0.2
685	Stonyford complex, 15 to 50 percent slopes-----	455	0.1
687	Hentine-Henneke-Rock outcrop complex, 30 to 70 percent slopes-----	2,220	0.6
690	Sehorn-Contra Costa complex, 30 to 50 percent slopes-----	990	0.3
695	Orogne sandy loam, 8 to 30 percent slopes-----	305	0.1
700	Hyttop-Franciscan-Vallecitos complex, 50 to 75 percent slopes-----	1,485	0.4
	Total-----	394,215	100.0

\* Less than 0.05 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Soil name
100	Capay clay, 0 to 2 percent slopes (where irrigated)
101	Capay clay, wet, 0 to 2 percent slopes (where irrigated)
102	Capay clay, loamy substratum, 0 to 2 percent slopes (where irrigated)
106	Capay clay, 0 to 2 percent slopes, rarely flooded (where irrigated)
110	El Solyo silty clay loam, 0 to 2 percent slopes (where irrigated)
111	El Solyo clay loam, wet, 0 to 2 percent slopes (where irrigated)
116	El Solyo silty clay loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
120	Vernalis-Zacharias complex, 0 to 2 percent slopes (where irrigated)
121	Vernalis loam, wet, 0 to 2 percent slopes (where irrigated)
122	Vernalis loam, 0 to 2 percent slopes (where irrigated)
123	Vernalis clay loam, wet, 0 to 2 percent slopes (where irrigated)
125	Vernalis clay loam, 0 to 2 percent slopes (where irrigated)
126	Vernalis-Zacharias complex, 0 to 2 percent slopes, rarely flooded (where irrigated)
127	Vernalis loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
130	Stomar clay loam, 0 to 2 percent slopes (where irrigated)
131	Stomar clay loam, wet, 0 to 2 percent slopes (where irrigated)
140	Zacharias clay loam, 0 to 2 percent slopes (where irrigated)
141	Zacharias clay loam, wet, 0 to 2 percent slopes (where irrigated)
142	Zacharias gravelly clay loam, 0 to 2 percent slopes (where irrigated)
144	Zacharias gravelly clay loam, 2 to 5 percent slopes (where irrigated)
145	Zacharias clay loam, 2 to 5 percent slopes (where irrigated)
146	Zacharias clay loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
147	Zacharias gravelly clay loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
150	Columbia fine sandy loam, partially drained, 0 to 2 percent slopes, occasionally flooded (where irrigated)
151	Columbia complex, 0 to 2 percent slopes, occasionally flooded (where irrigated)
153	Columbia fine sandy loam, channeled, partially drained, 0 to 2 percent slopes, frequently flooded (where irrigated and either protected from flooding or not frequently flooded during the growing season)
155	Columbia fine sandy loam, partially drained, 0 to 2 percent slopes, rarely flooded (where irrigated)
157	Columbia complex, 0 to 2 percent slopes, rarely flooded (where irrigated)
159	Columbia complex, 0 to 2 percent slopes, frequently flooded (where irrigated and either protected from flooding or not frequently flooded during the growing season)
160	Merritt silty clay loam, partially drained, 0 to 2 percent slopes, occasionally flooded (where irrigated)
165	Merritt silty clay loam, partially drained, 0 to 2 percent slopes, rarely flooded (where irrigated)
170	Dospalos-Bolfar complex, 0 to 2 percent slopes, occasionally flooded (where irrigated)
175	Dospalos-Bolfar complex, 0 to 2 percent slopes, rarely flooded (where irrigated)
190	Clear Lake clay, 0 to 2 percent slopes, occasionally flooded (where irrigated)
195	Clear Lake clay, 0 to 2 percent slopes, rarely flooded (where irrigated)
200	Veritas sandy loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
245	Bolfar-Columbia complex, 0 to 2 percent slopes, rarely flooded (where irrigated)
246	Bolfar-Columbia complex, 0 to 2 percent slopes, occasionally flooded (where irrigated)
270	Elsalado fine sandy loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
271	Elsalado loam, 0 to 2 percent slopes, rarely flooded (where irrigated)
272	Elsalado loam, wet, 0 to 2 percent slopes (where irrigated)
273	Elsalado fine sandy loam, 0 to 2 percent slopes (where irrigated)
274	Elsalado loam, 0 to 2 percent slopes (where irrigated)
281	Carbona clay loam, 2 to 8 percent slope (where irrigated)
300	Damluis clay loam, 0 to 2 percent slopes (where irrigated)
301	Damluis clay loam, 2 to 8 percent slopes (where irrigated)
302	Damluis gravelly clay loam, 0 to 2 percent slopes (where irrigated)
303	Damluis gravelly clay loam, 2 to 8 percent slopes (where irrigated)
310	Daldota clay, 0 to 2 percent slopes (where irrigated)
350	Woo loam, 0 to 2 percent slopes (where irrigated)

Table 6.--Farmland of Statewide Importance

(Only the soils considered farmland of statewide importance are listed. Urban or built-up areas of the soils listed are not considered farmland of statewide importance.)

Map symbol	Soil name
100	Capay clay, 0 to 2 percent slopes (where irrigated)
180	Dello fine sandy loam, channeled, 0 to 2 percent slopes
210	Cortina gravelly sandy loam, 0 to 2 percent slopes, rarely flooded
215	Yokut sandy loam, 0 to 2 percent slopes
304	Damluis gravelly clay loam, 8 to 15 percent slopes
340	Carranza-Woo complex, 0 to 2 percent slopes

Table 7.--Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Soil name and map symbol	Alfalfa hay	Apricots	Almonds	Walnuts	Beans, dry lima	Tomatoes	Sugar beets
	Tons	Bu	Lbs	Tons	Bu	Tons	Tons
100----- Capay	8.0	362	1,953	1.7	46	28.0	28.0
101----- Capay	8.0	338	1,700	1.2	43	25.0	30.0
102----- Capay	8.0	362	1,953	1.7	46	28.0	28.0
106----- Capay	8.0	362	1,953	1.7	46	28.0	28.0
110----- El Solyo	8.0	367	2,000	1.8	50	27.0	25.0
111----- El Solyo	7.0	342	1,700	1.2	39	24.0	27.0
116----- El Solyo	8.0	358	2,000	1.8	50	27.0	25.0
120: Vernalis-----	10.0	367	2,000	2.0	50	25.0	30.0
Zacharias-----	10.0	366	1,900	2.0	50	30.0	32.0
121----- Vernalis	8.0	342	1,700	1.3	39	25.0	30.0
122----- Vernalis	10.0	366	2,000	2.0	50	25.0	30.0
123----- Vernalis	8.0	342	1,700	1.3	39	25.0	30.0
125----- Vernalis	10.0	367	2,000	2.0	50	25.0	30.0
126: Vernalis-----	10.0	367	2,000	2.0	50	25.0	30.0
Zacharias-----	10.0	367	1,900	2.0	50	30.0	32.0
127----- Vernalis	10.0	367	2,000	2.0	50	25.0	30.0
130----- Stomar	9.0	350	1,800	1.8	46	25.0	30.0
131----- Stomar	8.0	333	1,500	1.2	36	25.0	30.0
140----- Zacharias	10.0	367	1,900	2.0	50	30.0	32.0
141----- Zacharias	8.0	342	1,700	1.3	39	30.0	31.0
142----- Zacharias	8.0	350	1,900	1.6	43	25.0	30.0

Table 7.--Yields per Acre of Crops--Continued

Soil name and map symbol	Alfalfa hay	Apricots	Almonds	Walnuts	Beans, dry lima	Tomatoes	Sugar beets
	Tons	Bu	Lbs	Tons	Bu	Tons	Tons
144, 145----- Zacharias	8.0	350	1,900	1.6	41	24.0	28.0
146----- Zacharias	10.0	367	1,900	2.0	50	30.0	32.0
147----- Zacharias	8.0	350	1,900	1.6	43	25.0	30.0
150----- Columbia	8.0	208	900	1.8	46	24.0	30.0
151: Columbia-----	8.0	250	900	1.8	46	24.0	30.0
Columbia, sandy substratum----	7.0	208	900	1.8	46	24.0	30.0
153----- Columbia	8.0	188	900	1.0	46	22.0	30.0
155----- Columbia	8.0	250	1,100	2.0	50	26.0	32.0
157: Columbia-----	7.0	208	1,000	1.9	48	25.0	31.0
Columbia, sandy substratum----	7.0	208	1,000	1.9	48	25.0	31.0
159: Columbia-----	7.0	188	800	1.0	43	23.0	30.0
Columbia, sandy substratum----	8.0	250	1,100	1.0	46	24.0	30.0
160----- Merritt	7.0	188	900	0.8	46	26.0	30.0
165----- Merritt	8.0	208	1,000	1.0	48	30.0	32.0
170, 175: Dospalos-----	8.0	250	1,100	2.0	50	24.0	30.0
Bolfar-----	7.0	208	1,000	1.0	48	26.0	31.0
180----- Dello	5.0	167	900	0.8	38	16.0	16.0
190----- Clear Lake	10.0	208	1,000	2.0	50	27.0	32.0
195----- Clear Lake	10.0	208	1,000	2.0	50	27.0	32.0
200----- Veritas	10.0	354	2,000	1.2	46	23.0	30.0

Table 7.--Yields per Acre of Crops--Continued

Soil name and map symbol	Alfalfa hay	Apricots	Almonds	Walnuts	Beans, dry lima	Tomatoes	Sugar beets
	Tons	Bu	Lbs	Tons	Bu	Tons	Tons
210----- Cortina	6.0	292	1,200	1.0	39	23.0	18.0
215----- Yokut	6.0	292	1,200	1.0	41	24.0	18.0
220: Xerofluvents---	5.0	271	1,000	0.8	36	20.0	16.0
Xerorthents---	5.0	271	1,000	0.8	36	20.0	16.0
245, 246: Bolfar-----	7.0	250	1,100	2.0	50	28.0	31.0
Columbia, sandy substratum----	8.0	250	1,100	2.0	50	28.0	30.0
270, 271----- Elsalado	10.0	333	2,000	2.0	45	30.0	32.0
272----- Elsalado	8.0	292	1,800	1.8	39	27.0	30.0
273, 274----- Elsalado	10.0	333	2,000	2.0	45	30.0	32.0
281----- Carbona	6.0	271	1,400	1.2	29	25.0	25.0
300----- Damluis	6.0	271	1,400	1.2	30	25.0	25.0
301----- Damluis	6.0	271	1,400	1.2	30	25.0	25.0
302----- Damluis	6.0	271	1,400	1.2	30	25.0	25.0
303----- Damluis	6.0	271	1,400	1.2	30	25.0	25.0
304----- Damluis	---	267	1,300	---	---	---	---
310----- Deldota	7.0	271	1,400	1.2	28	25.0	28.0
320----- Dosamigos	7.0	267	1,300	1.0	36	24.0	30.0
330, 331----- Pedcat	6.0	---	---	---	36	20.0	22.0
340: Carranza-----	---	300	---	---	---	---	---
Woo-----	8.0	250	1,500	1.0	---	---	---
350----- Woo	8.0	400	---	2.0	33	25.0	---

Table 8.--Land Capability Classification

(Land capability is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time.)

Map symbol and soil name	Land capability	
	N	I
100: Capay-----	4s-5	2s-5
101: Capay-----	4w-5	2w-5
102: Capay-----	4s-5	2s-5
106: Capay-----	4s-5	2s-5
110: El Solyo-----	4s-3	2s-3
111: El Solyo-----	4w-3	2w-3
116: El Solyo-----	4s-3	2s-3
120: Vernalis-----	4c-1	1
Zacharias-----	4c-1	1
121: Vernalis-----	4w-2	2w-2
122: Vernalis-----	4c-1	1
123: Vernalis-----	4w-2	2w-2
125: Vernalis-----	4c-1	1
126: Vernalis-----	4w-2	1
Zacharias-----	4w-2	1
127: Vernalis-----	4w-2	1
130: Stomar-----	4s-3	2s-3
131: Stomar-----	4w-3	2w-3
140: Zacharias-----	4c-1	1
141: Zacharias-----	4w-2	2w-2

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
142: Zacharias-----	4s-4	2s-4
144: Zacharias-----	4e-4	2e-4
145: Zacharias-----	4e-1	2e-1
146: Zacharias-----	4w-2	1
147: Zacharias-----	4w-2	2w-2
150: Columbia-----	4w-2	2w-2
151: Columbia-----	4w-2	2w-2
Columbia, sandy substratum-----	4w-11	3w-11
153: Columbia-----	4w-2	4w-2
155: Columbia-----	4w-2	2w-2
157: Columbia-----	4w-2	2w-2
Columbia, sandy substratum-----	4w-11	3w-11
159: Columbia-----	4w-2	2w-2
Columbia, sandy substratum-----	4w-11	3w-11
160: Merritt-----	4w-2	2w-2
165: Merritt-----	4w-2	2w-2
170: Dospalos-----	4w-3	2w-3
Bolfar-----	4w-3	2w-3
175: Dospalos-----	4w-3	2w-3
Bolfar-----	4w-3	2w-3
176: Dumps-----	8	---
180: Dello-----	4w-4	3w-4

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
190: Clear Lake-----	3w-5	2w-5
195: Clear Lake-----	4w-5	2w-5
200: Veritas-----	4s-8	2s-8
210: Cortina-----	4s-4	3s-4
215: Yokut-----	4s-4	3s-4
220: Xerofluvents-----	7w	---
Xerorthents-----	6e	---
245: Bolfar-----	4w-2	2w-2
Columbia, sandy substratum-----	4w-11	3w-11
246: Bolfar-----	4w-2	2w-2
Columbia, sandy substratum-----	4w-4	3w-4
252: Chaqua-----	4e-1	3e-1
Arburua-----	4e-8	3e-8
253: Chaqua-----	4e-1	3e-1
Arburua-----	4e-8	3e-8
255: Calla-----	6e	---
Carbona-----	6e	---
270: Elsalado-----	4c-1	1
271: Elsalado-----	4c-1	1
272: Elsalado-----	4w-2	2w-2
273: Elsalado-----	4c-1	1
274: Elsalado-----	4c-1	1

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
281: Carbona-----	4e-5	2e-5
290: Carbona-----	4e-5	---
Orognen-----	4e-5	---
291: Carbona-----	6e	---
Orognen-----	6e	---
300: Damluis-----	4s-3	2s-3
301: Damluis-----	4e-3	2e-3
302: Damluis-----	4s-4	2s-4
303: Damluis-----	4e-4	2e-4
304: Damluis-----	4e-4	3e-4
310: Deldota-----	4w-5	2w-5
320: Dosamigos-----	6w	3w-6
330: Pedcat-----	4w-6	3w-6
331: Pedcat-----	4w-6	3w-6
340: Carranza-----	4s-11	2s-11
Woo-----	4s-11	2s-11
350: Woo-----	4c-11	1
400: Alo-----	4e-3	---
Vaquero-----	4e-3	---
401: Alo-----	6e	---
Vaquero-----	6e	---
410: Ayar-----	6e	---

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
420:		
Ayar-----	6e	---
Oneil-----	7e	---
430:		
Vaquero-----	4e-3	---
Carbona-----	4e-3	---
500:		
Wisflat-----	7e	---
Arburua-----	6e	---
San Timoteo-----	6e	---
501:		
Wisflat-----	7e	---
Arburua-----	7e	---
San Timoteo-----	7e	---
502:		
Arburua-----	4e-8	---
Wisflat-----	7e	---
505:		
Arburua-----	6e	---
Contra Costa-----	6e	---
Wisflat-----	7e	---
506:		
Arburua-----	7e	---
Contra Costa-----	7e	---
Wisflat-----	7e	---
510:		
Arburua-----	6e	---
Wisflat-----	7e	---
Rock outcrop-----	8	---
520:		
Wisflat-----	7e	---
Rock outcrop-----	8	---
521:		
Wisflat-----	7e	---
Rock outcrop-----	8	---

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
530: Oneil-----	6e	---
540: Oquin-----	4e-1	---
600: Gonzaga-----	6e	---
Honker-----	6e	---
Franciscan-----	6e	---
601: Gonzaga-----	7e	---
Honker-----	7e	---
Franciscan-----	7e	---
610: Honker-----	6e	---
Vallecitos-----	6e	---
Honker, eroded-----	7e	---
611: Honker-----	7e	---
Vallecitos-----	7e	---
Honker, eroded-----	7e	---
612: Honker-----	6e	---
Vallecitos-----	6e	---
Gonzaga-----	6e	---
613: Honker-----	7e	---
Gaviota-----	7e	---
614: Honker-----	7e	---
Gaviota-----	7e	---
615: Honker-----	6e	---
Quinto-----	7e	---
620: Franciscan-----	7e	---

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
625:		
Franciscan-----	7e	---
Quinto-----	7e	---
Honker-----	7e	---
630:		
Millsholm-----	6e	---
Honker-----	6e	---
Rock outcrop-----	8	---
631:		
Millsholm-----	7e	---
Honker-----	7e	---
Rock outcrop-----	8	---
635:		
Millsholm-----	7e	---
640:		
Quinto-----	7e	---
Millsholm-----	7e	---
Rock outcrop-----	8	---
650:		
Quinto-----	7e	---
Rock outcrop-----	8	---
660:		
Gaviota-----	7e	---
661:		
Gaviota-----	7e	---
682:		
Henneke-----	7e	---
Hentine-----	7e	---
Rock outcrop-----	8	---
683:		
Hentine-----	7e	---
Rock outcrop-----	8	---
Henneke-----	7e	---
684:		
Hentine-----	7e	---
Henneke-----	7e	---

Table 8.--Land Capability Classification--Continued

Map symbol and soil name	Land capability	
	N	I
685:		
Stonyford-----	6e	---
Stonyford-----	7e	---
687:		
Hentine-----	7e	---
Henneke-----	7e	---
Rock outcrop-----	8	---
690:		
Sehorn-----	6e	---
Contra Costa-----	6e	---
695:		
Orognen-----	4e-3	---
700:		
Hytop-----	7e	---
Franciscan-----	7e	---
Vallecitos-----	7e	---

Table 9.--Storie Index Rating

(Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Rating factors						Index	Grade	Properties affecting X
	A	B	C	X1	X2	X3			
100----- Capay	0.80	0.55	1.00	0.90			40	3	Drainage
101----- Capay	0.80	0.55	1.00	0.80			35	4	High water table
102----- Capay	0.80	0.55	1.00	0.90			40	3	Drainage
106----- Capay	0.80	0.55	1.00	0.90	0.95		38	4	Drainage, flooding
110----- El Solyo	0.85	0.90	1.00	1.00			77	2	None
111----- El Solyo	0.85	0.85	1.00	0.90			65	2	High water table
116----- El Solyo	1.00	0.85	1.00	0.95			73	1	Flooding
120: Vernalis-----	1.00	0.85	1.00	1.00			83	1	None
Zacharias-----	0.95	0.85	1.00	1.00					None
121----- Vernalis	1.00	1.00	1.00	0.90			95	1	High water table
122----- Vernalis	1.00	1.00	1.00	1.00			100	1	None
123----- Vernalis	1.00	0.85	1.00	1.00			77	1	High water table
125----- Vernalis	1.00	0.85	1.00	1.00			85	1	None
126: Vernalis-----	1.00	0.85	1.00	0.95			79	2	Flooding
Zacharias-----	0.95	0.85	1.00	0.95					Flooding
127----- Vernalis	1.00	1.00	1.00	0.95			95	1	Flooding
130----- Stomar	0.80	0.85	1.00	1.00			68	2	None
131----- Stomar	0.80	0.85	1.00	0.90			61	2	High water table
140----- Zacharias	0.95	0.85	1.00	1.00			81	1	None
141----- Zacharias	0.95	0.85	1.00	.090			73	2	High water table
142----- Zacharias	0.95	0.75	1.00	1.00			67	2	None
144----- Zacharias	0.95	0.70	0.90	1.00			60	2	None

Table 9.--Storie Index Rating--Continued

Soil name and map symbol	Rating factors						Index	Grade	Properties affecting X
	A	B	C	X1	X2	X3			
145----- Zacharias	0.95	0.85	1.00	1.00			81	1	None
146----- Zacharias	0.95	0.85	1.00	0.95			77	2	Flooding
147----- Zacharias	0.95	0.70	1.00	0.95			63	2	Flooding
150----- Columbia	1.00	1.00	1.00	0.60	0.80		48	3	Drainage, flooding, channels
151: Columbia-----	1.00	1.00	1.00	0.60	0.80		46	3	Drainage, flooding
Columbia, sandy sub.--	0.90	1.00	1.00	0.60	0.80				
153----- Columbia	1.00	1.00	1.00	0.60	0.40	0.90	22	4	Drainage, flooding, channels
155----- Columbia	1.00	1.00	1.00	0.60	0.95		57	3	Drainage, flooding
157: Columbia-----	1.00	1.00	1.00	0.65	0.95		54	3	Drainage, flooding
Columbia, sandy sub.--	0.90	1.00	1.00	0.65	0.95				
159: Columbia-----	1.00	1.00	1.00	0.60	0.40		23	4	Drainage, flooding
Columbia, sandy sub.--	0.90	1.00	1.00	0.60	0.40				
160----- Merritt	1.00	0.90	1.00	0.40	0.80		29	4	Drainage, flooding
165----- Merritt	1.00	0.90	1.00	0.40	0.95		34	4	Drainage, flooding
170: Dospalos-----	1.00	0.60	1.00	0.40	0.80		23	4	Drainage, flooding
Bolfar-----	1.00	0.85	1.00	0.40	0.80				Drainage, flooding
175: Dospalos-----	1.00	0.60	1.00	0.40	0.95		27	4	Drainage, flooding
Bolfar-----	1.00	0.85	1.00	0.40	0.95				Drainage, flooding
180----- Dello	0.85	1.00	1.00	0.20	0.40	0.90	6	6	Drainage, flooding, channels
190----- Clear Lake	0.80	0.55	1.00	0.80	0.80		28	4	Drainage, flooding
195----- Clear Lake	0.80	0.55	1.00	0.80	0.95		32	4	Drainage, flooding
200----- Veritas	0.48	0.95	1.00	0.95	0.95		41	3	Drainage, flooding
210----- Cortina	0.80	0.70	1.00	0.95	0.95		51	3	Flooding, fertility
215----- Yokut	0.80	0.95	1.00	1.00			76	2	None



Table 9.--Storie Index Rating--Continued

Soil name and map symbol	Rating factors						Index	Grade	Properties affecting X
	A	B	C	X1	X2	X3			
310----- Deldota	0.80	0.55	1.00	0.60			26	4	Drainage
320----- Dosamigos	0.80	0.85	1.00	0.60	0.80		33	4	Drainage, flooding, saline/sodic
330----- Pedcat	0.80	0.85	1.00	0.40	0.60	0.95	16	5	Drainage, flooding, saline/sodic
331----- Pedcat	0.80	0.85	1.00	0.40	0.60		16	5	Drainage, flooding, saline/sodic
340: Carranza----- Woo-----	0.80 0.85	0.70 0.85	1.00 1.00	1.00 1.00			62	2	None None
350----- Woo	1.00	1.00	1.00	1.00			100	1	None
400: Alo----- Vaquero-----	0.70 0.70	0.60 0.60	0.75 0.75	1.00 1.00			32	4	None None
401: Alo----- Vaquero-----	0.70 0.70	0.60 0.60	0.40 0.40	1.00 1.00			17	5	None None
410----- Ayar	0.80	0.60	0.40	1.00			19	5	None
420: Ayar----- Oneil-----	0.80 0.60	0.60 1.00	0.40 0.40	1.00 1.00			21	4	None None
430: Vaquero----- Carbona-----	0.70 0.85	0.60 0.85	0.75 0.75	1.00 1.00			41	3	None None
500: Wisflat----- Arburua----- San timoteo-----	0.30 0.50 0.50	0.95 1.00 0.95	0.40 0.40 0.40	1.00 1.00 1.00			16	5	None None None
501: Wisflat----- Arburua----- San timoteo-----	0.30 0.50 0.50	0.95 1.00 0.95	0.20 0.20 0.20	1.00 1.00 1.00			7	6	Erosion Erosion Erosion
502: Arburua----- Wisflat-----	0.50 0.30	1.00 0.95	0.85 0.85	1.00 1.00			37	4	None None
505: Arburua----- Contra Costa----- Wisflat-----	0.50 0.70 0.30	1.00 0.85 0.95	0.40 0.40 0.40	1.00 1.00 1.00			19	5	None None None
506: Arburua----- Contra Costa----- Wisflat-----	0.50 0.70 0.30	1.00 0.85 0.95	0.20 0.20 0.20	1.00 1.00 1.00			10	5	None None None
510: Arburua----- Wisflat-----	0.50 0.30	1.00 0.95	0.35 0.35	1.00 1.00			13	5	None None

Table 9.--Storie Index Rating--Continued

Soil name and map symbol	Rating factors						Index	Grade	Properties affecting X
	A	B	C	X1	X2	X3			
510: Rock outcrop-----	0.00	0.00	0.00	0.00					
520: Wisflat-----	0.30	0.95	0.40	1.00			6	6	None
Rock outcrop-----	0.00	0.00	0.00	0.00					
521: Wisflat-----	0.30	0.95	0.20	1.00			3	6	None
Rock outcrop-----	0.00	0.00	0.00	0.00					
530-----	0.60	1.00	0.75	1.00			45	3	None
Oneil									
540-----	0.60	1.00	0.75	1.00			45	3	None
Oquin									
600: Gonzaga-----	0.60	1.00	0.40	1.00			22	4	None
Honker-----	0.45	0.95	0.40	1.00					None
Franciscan-----	0.60	1.00	0.40	1.00					None
601: Gonzaga-----	0.60	1.00	0.20	1.00			11	5	None
Honker-----	0.45	0.95	0.20	1.00					None
Franciscan-----	0.60	1.00	0.20	1.00					None
610: Honker-----	0.45	0.95	0.40	1.00			12	5	None
Vallecitos-----	0.40	0.70	0.40	1.00					None
Honker, eroded-----	0.30	0.70	0.40	0.90					Erosion
611: Honker-----	0.45	0.95	0.20	1.00			6	6	None
Vallecitos-----	0.40	0.60	0.20	1.00					None
Honker, eroded-----	0.30	0.70	0.20	0.80					Erosion
612: Honker-----	0.45	0.95	0.40	1.00			19	5	None
Vallecitos-----	0.40	1.00	0.40	1.00					None
Gonzaga-----	0.60	1.00	0.40	1.00					None
613: Honker-----	0.50	0.70	0.40	1.00			12	5	None
Gaviota-----	0.30	0.70	0.40	1.00					None
614: Honker-----	0.50	0.70	0.20	1.00			6	6	None
Gaviota-----	0.30	0.70	0.20	1.00					None
615: Honker-----	0.45	0.95	0.40	1.00			14	5	None
Quinto-----	0.40	0.60	0.40	1.00					None
620-----	0.70	0.95	0.20	1.00			13	5	None
Franciscan									
625: Franciscan-----	0.70	0.95	0.20	1.00			10	5	None
Quinto-----	0.40	0.60	0.20	1.00					None
Honker-----	0.45	0.95	0.20	1.00					None
630: Millsholm-----	0.45	1.00	0.40	1.00			14	5	None

Table 9.--Storie Index Rating--Continued

Soil name and map symbol	Rating factors						Index	Grade	Properties affecting X
	A	B	C	X1	X2	X3			
630:									
Honker-----	0.45	0.95	0.40	1.00					None
Rock outcrop-----	0.00	0.00	0.00	0.00					None
631:									
Millsholm-----	0.45	1.00	0.20	1.00			7	6	None
Honker-----	0.45	0.95	0.20	1.00					None
Rock outcrop-----	0.00	0.00	0.00	0.00					None
635-----	0.45	1.00	0.25	1.00			11	5	None
Millsholm									
640:									
Quinto-----	0.40	0.60	0.25	1.00			6	6	None
Millsholm-----	0.45	1.00	0.25	1.00					None
Rock outcrop-----	0.00	0.00	0.00	0.00					None
650:									
Quinto-----	0.40	0.60	0.20	1.00			3	6	None
Rock outcrop-----	0.00	0.00	0.00	0.00					None
660-----	0.30	1.00	0.30	1.00			9	6	None
Gaviota									
661-----	0.30	0.70	0.20	0.90			4	6	Erosion
Gaviota									
682:									
Henneke-----	0.40	0.70	0.30	0.60			4	6	Fertility
Hentine-----	0.40	0.60	0.30	0.60					Fertility
Rock outcrop-----	0.00	0.00	0.00	0.00					
683:									
Henneke-----	0.40	0.70	0.30	0.60			3	6	Fertility
Rock outcrop-----	0.00	0.00	0.00	0.00					Fertility
Hentine-----	0.40	0.70	0.30	0.60					
684:									
Henneke-----	0.30	0.60	0.40	0.60			4	6	Fertility
Hentine-----	0.45	0.70	0.40	0.60					Fertility
685:									
Stonyford-----	0.40	0.70	0.75	1.00			16	5	
Stonyford-----	0.40	0.70	0.40	1.00					
687:									
Hentine-----	0.30	0.60	0.30	0.60			3	6	Fertility
Henneke-----	0.45	0.70	0.30	0.60					Fertility
Rock outcrop-----	0.00	0.00	0.00	0.00					Fertility
690:									
Seahorn-----	0.55	0.60	0.30	1.00			18	5	Fertility
Contra Costa-----	0.70	0.85	0.30	1.00					Fertility
695-----	0.50	0.95	0.80	1.00			38	4	None
Orognen									
700:									
Hytow-----	0.40	1.00	0.20	1.00			9	6	None
Franciscan-----	0.70	0.95	0.20	1.00					None
Vallecitos-----	0.40	0.70	0.20	1.00					None

Table 10.--Rangeland Productivity and Characteristic Plant Communities

(Only the soils that are assigned an ecological site are listed.)

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
142: Zacharias-----	Loamy	Favorable	3,000	soft chess	25
		Normal	2,500	filaree	15
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
144: Zacharias-----	Loamy	Favorable	3,000	soft chess	25
		Normal	2,500	filaree	15
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
145: Zacharias-----	Clayey	Favorable	3,500	soft chess	25
		Normal	2,800	filaree	15
		Unfavorable	1,200	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
147: Zacharias-----	Loamy	Favorable	3,000	soft chess	25
		Normal	2,500	filaree	15
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
252: Chaqua-----	Loamy	Favorable	3,000	soft chess	30
		Normal	2,500	filaree	15
		Unfavorable	1,200	other annual forbs	10
				foxtail fescue	5
				other annual grasses	5
				purple needlegrass	5
				red brome	5
				wild oat	5
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	red brome	10
				wild oat	10
				Mediterranean barley	5
				filaree	5
				ripgut brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
253:					
Chaqua-----	Loamy	Favorable	3,000	soft chess	30
		Normal	2,500	filaree	15
		Unfavorable	1,200	other annual forbs	10
				foxtail fescue	5
				other annual grasses	5
				purple needlegrass	5
				red brome	5
				wild oat	5
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	red brome	10
				wild oat	10
				Mediterranean barley	5
				filaree	5
				ripgut brome	5
255:					
Calla-----	Loamy	Favorable	3,000	soft chess	25
		Normal	2,500	red brome	15
		Unfavorable	1,200	filaree	10
				foxtail fescue	10
				wild oat	10
				burclover	5
				clover	5
				ripgut brome	5
Carbona-----	Clayey	Favorable	3,500	soft chess	25
		Normal	2,800	filaree	15
		Unfavorable	1,200	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
281:					
Carbona-----	Clayey	Favorable	3,500	soft chess	25
		Normal	2,800	filaree	15
		Unfavorable	1,200	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
290:					
Carbona-----	Clayey	Favorable	3,500	soft chess	25
		Normal	2,800	filaree	15
		Unfavorable	1,200	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre			
				Pct	
290: Orognen-----	Loamy	Favorable	2,800	soft chess	25
		Normal	2,400	filaree	15
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
291: Carbona-----	Clayey	Favorable	3,500	soft chess	25
		Normal	2,800	filaree	15
		Unfavorable	1,200	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
Orognen-----	Loamy	Favorable	2,800	soft chess	25
		Normal	2,400	filaree	15
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				burclover	5
				clover	5
				foxtail fescue	5
300: Damluis-----	Fine loamy	Favorable	3,500	soft chess	30
		Normal	3,200	filaree	15
		Unfavorable	1,000	other annual forbs	10
				wild oat	10
				burclover	5
				foxtail fescue	5
				red brome	5
				ripgut brome	5
301: Damluis-----	Fine loamy	Favorable	3,500	soft chess	30
		Normal	3,200	filaree	15
		Unfavorable	1,000	other annual forbs	10
				wild oat	10
				burclover	5
				foxtail fescue	5
				red brome	5
				ripgut brome	5
302: Damluis-----	Fine loamy	Favorable	3,500	soft chess	25
		Normal	3,200	filaree	15
		Unfavorable	1,000	foxtail fescue	10
				other annual forbs	10
				red brome	10
				wild oat	10
				burclover	5
				ripgut brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
303: Damluis-----	Fine loamy	Favorable	3,500	soft chess	25
		Normal	3,200	filaree	15
		Unfavorable	1,000	foxtail fescue	10
				other annual forbs	10
				red brome	10
				wild oat	10
				burclover	5
				ripgut brome	5
304: Damluis-----	Fine loamy	Favorable	3,500	soft chess	25
		Normal	3,200	filaree	15
		Unfavorable	1,000	foxtail fescue	10
				other annual forbs	10
				red brome	10
				wild oat	10
				burclover	5
				ripgut brome	5
400: Alo-----	Clayey	Favorable	3,800	wild oat	40
		Normal	3,000	soft chess	15
		Unfavorable	1,500	burclover	5
				clover	5
				filaree	5
				foxtail fescue	5
				red brome	5
				ripgut brome	5
Vaquero-----	Clayey	Favorable	3,500	wild oat	35
		Normal	2,800	soft chess	15
		Unfavorable	1,500	filaree	10
				foxtail fescue	10
				burclover	5
				clover	5
				other annual forbs	5
				red brome	5
401: Alo-----	Clayey	Favorable	3,800	wild oat	40
		Normal	3,000	soft chess	15
		Unfavorable	1,500	burclover	5
				clover	5
				filaree	5
				foxtail fescue	5
				red brome	5
				ripgut brome	5
Vaquero-----	Clayey	Favorable	3,500	wild oat	35
		Normal	2,800	soft chess	15
		Unfavorable	1,500	filaree	10
				foxtail fescue	10
				burclover	5
				clover	5
				other annual forbs	5
				red brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
				Lb/acre	Pct
410: Ayar-----	Clayey low elevation	Favorable	3,200	red brome	20
		Normal	2,800	filaree	15
		Unfavorable	1,500	clover	10
				needlegrass	10
				ripgut brome	10
				foxtail fescue	5
				lupine	5
				soft chess	5
				wild oat	5
				blue oak	1
		juniper	1		
		saltbush	1		
420: Ayar-----	Clayey low elevation	Favorable	3,200	red brome	20
		Normal	2,800	filaree	15
		Unfavorable	1,500	clover	10
				needlegrass	10
				ripgut brome	10
				foxtail fescue	5
				lupine	5
				soft chess	5
				wild oat	5
				blue oak	1
		juniper	1		
		saltbush	1		
Oneil-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	wild oat	15
		Unfavorable	1,500	filaree	10
				other annual forbs	10
				ripgut brome	10
		burclover	5		
		red brome	5		
430: Vaquero-----	Clayey	Favorable	3,500	wild oat	35
		Normal	2,800	soft chess	15
		Unfavorable	1,500	filaree	10
				foxtail fescue	10
				burclover	5
				clover	5
		other annual forbs	5		
		red brome	5		
Carbona-----	Clayey	Favorable	4,600	burclover	20
		Normal	3,800	red brome	20
		Unfavorable	1,500	leporinum barley	15
				soft chess	15
				filaree	10
				clover	5
		foxtail fescue	5		
		ripgut brome	5		

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
500:					
Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	red brome	10
				wild oat	10
				Mediterranean barley	5
				filaree	5
				ripgut brome	5
San Timoteo----	Coarse loamy	Favorable	2,000	soft chess	25
		Normal	1,600	wild oat	20
		Unfavorable	1,000	American vetch	5
				California sagebrush	5
				buckbrush	5
				filaree	5
				foxtail fescue	5
				peavine	5
				red brome	5
				ripgut brome	5
				sugar sumac	5
				California live oak	1
501:					
Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	red brome	10
				wild oat	10
				Mediterranean barley	5
				filaree	5
				ripgut brome	5
San Timoteo----	Coarse loamy	Favorable	2,000	soft chess	25
		Normal	1,600	wild oat	20
		Unfavorable	1,000	American vetch	5
				California sagebrush	5
				buckbrush	5
				filaree	5
				foxtail fescue	5
				peavine	5
				red brome	5
				ripgut brome	5
				sugar sumac	5
				California live oak	1

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
		Lb/acre		Pct	
502:					
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	red brome	10
				wild oat	10
				Mediterranean barley	5
				filaree	5
				ripgut brome	5
Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
505:					
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	blue oak	5
				filaree	5
Contra Costa----	Clayey	Favorable	3,000	soft chess	30
		Normal	2,800	wild oat	20
		Unfavorable	1,500	burclover	10
				filaree	10
				California brome	5
				clover	5
				red brome	5
				ripgut brome	5
Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
506:					
Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	blue oak	5
				filaree	5
Contra Costa----	Clayey	Favorable	3,000	soft chess	30
		Normal	2,800	wild oat	20
		Unfavorable	1,500	burclover	10
				filaree	10
				California brome	5
				clover	5
				red brome	5
				ripgut brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
506: Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
510: Arburua-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	foxtail fescue	20
		Unfavorable	1,500	blue oak	5
				filaree	5
Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
520: Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
521: Wisflat-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,500	filaree	10
		Unfavorable	1,000	red brome	10
				ripgut brome	10
				wild oat	10
				California sagebrush	5
				clover	5
				foxtail fescue	5
530: Oneil-----	Fine loamy	Favorable	3,500	soft chess	35
		Normal	2,800	wild oat	15
		Unfavorable	1,500	filaree	10
				other annual forbs	10
				ripgut brome	10
				burclover	5
				red brome	5
540: Oquin-----	Coarse loamy	Favorable	2,000	soft chess	30
		Normal	1,600	filaree	10
		Unfavorable	800	red brome	10
				wild oat	10
				burclover	5
				foxtail fescue	5
				ripgut brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
600:					
Gonzaga-----	Loamy (blue oak)	Favorable	3,000	soft chess	25
		Normal	2,000	wild oat	20
		Unfavorable	1,000	ripgut brome	15
				foxtail fescue	10
				California buckeye	5
				blue oak	5
				filaree	5
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5
Franciscan-----	Loamy (blue oak)	Favorable	3,000	soft chess	20
		Normal	2,000	wild oat	20
		Unfavorable	1,000	foxtail fescue	15
				California buckwheat	5
				blue oak	5
				cheat grass	5
				purple needlegrass	5
				ripgut brome	5
				gray pine	1
601:					
Gonzaga-----	Loamy (blue oak)	Favorable	3,000	soft chess	25
		Normal	2,000	wild oat	20
		Unfavorable	1,000	ripgut brome	15
				foxtail fescue	10
				California buckeye	5
				blue oak	5
				filaree	5
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5
Franciscan-----	Loamy (blue oak)	Favorable	3,000	soft chess	20
		Normal	2,000	wild oat	20
		Unfavorable	1,000	foxtail fescue	15
				California buckwheat	5
				blue oak	5
				cheat grass	5
				purple needlegrass	5
				ripgut brome	5
				gray pine	1
610:					
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
610: Vallecitos-----	Loamy	Favorable	2,500	wild oat	30
		Normal	2,000	soft chess	20
		Unfavorable	1,200	filaree	10
				blue oak	5
				burclover	5
				needlegrass	5
				red brome	5
				ripgut brome	5
Honker, eroded--	Loamy (California sagebrush)	Favorable	2,200	red brome	20
		Normal	1,500	soft chess	20
		Unfavorable	1,000	California sagebrush	15
				foxtail fescue	15
				California buckwheat	5
				black sage	5
				filaree	5
				goldenbush	5
				wild oat	5
611: Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5
Vallecitos-----	Loamy	Favorable	2,500	wild oat	30
		Normal	2,000	soft chess	20
		Unfavorable	1,200	filaree	10
				blue oak	5
				burclover	5
				needlegrass	5
				red brome	5
				ripgut brome	5
Honker, eroded--	Loamy (California sagebrush)	Favorable	2,200	red brome	20
		Normal	1,500	soft chess	20
		Unfavorable	1,000	California sagebrush	15
				foxtail fescue	15
				California buckwheat	5
				black sage	5
				filaree	5
				goldenbush	5
				wild oat	5
612: Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
612: Vallecitos-----	Loamy	Favorable	2,500	soft chess	20
		Normal	2,000	wild oat	15
		Unfavorable	1,200	burclover	10
				filaree	10
				red brome	10
				California scrub oak	5
				blue oak	5
				needlegrass	5
				ripgut brome	5
Gonzaga-----	Loamy (blue oak)	Favorable	3,000	soft chess	25
		Normal	2,000	wild oat	20
		Unfavorable	1,000	foxtail fescue	10
				ripgut brome	10
				California buckeye	5
				California sagebrush	5
				blue oak	5
				filaree	5
				goldenbush	5
613: Honker-----	Clayey	Favorable	2,200	red brome	20
		Normal	1,500	soft chess	20
		Unfavorable	1,000	California sagebrush	15
				foxtail fescue	15
				California buckwheat	5
				black sage	5
				filaree	5
				goldenbush	5
				wild oat	5
Gaviota-----	Gravelly loamy	Favorable	2,500	manzanita	25
		Normal	1,800	California sagebrush	20
		Unfavorable	1,200	common chamise	10
				other annual grasses	10
				buckbrush	5
				purple needlegrass	5
614: Honker-----	Clayey	Favorable	2,200	red brome	20
		Normal	1,500	soft chess	20
		Unfavorable	1,000	California sagebrush	15
				foxtail fescue	15
				California buckwheat	5
				black sage	5
				filaree	5
				goldenbush	5
				wild oat	5
Gaviota-----	Gravelly loamy	Favorable	2,500	manzanita	25
		Normal	1,800	California sagebrush	20
		Unfavorable	1,200	common chamise	10
				other annual grasses	10
				buckbrush	5
				purple needlegrass	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
615:					
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5
Quinto-----	Shallow coarse loamy	Favorable	1,500	soft chess	30
		Normal	1,000	California buckwheat	15
		Unfavorable	800	red brome	10
				California sagebrush	5
				filaree	5
				foxtail fescue	5
				wild oat	5
620:					
Franciscan----	Loamy (blue oak)	Favorable	3,000	soft chess	30
		Normal	2,000	ripgut brome	15
		Unfavorable	1,000	miner's lettuce	10
				California buckeye	5
				blue oak	5
				filaree	5
				foxtail fescue	5
				gray pine	5
				sanicle	5
				wild oat	5
625:					
Franciscan----	Loamy (blue oak)	Favorable	3,000	soft chess	30
		Normal	2,000	ripgut brome	15
		Unfavorable	1,000	miner's lettuce	10
				California buckeye	5
				blue oak	5
				filaree	5
				foxtail fescue	5
				gray pine	5
				sanicle	5
				wild oat	5
Quinto-----	Shallow coarse loamy	Favorable	1,500	soft chess	30
		Normal	1,000	California buckwheat	15
		Unfavorable	800	red brome	10
				California sagebrush	5
				filaree	5
				foxtail fescue	5
				wild oat	5
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
			Lb/acre		Pct
630:					
Millsholm-----	Shallow loamy	Favorable	2,500	filaree	20
		Normal	1,500	foxtail fescue	20
		Unfavorable	1,200	soft chess	20
				burclover	5
				clover	5
				ripgut brome	5
				wild oat	5
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5
631:					
Millsholm-----	Shallow loamy	Favorable	2,500	filaree	20
		Normal	1,500	foxtail fescue	20
		Unfavorable	1,200	soft chess	20
				burclover	5
				clover	5
				ripgut brome	5
				wild oat	5
Honker-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	20
		Unfavorable	1,500	filaree	10
				burclover	5
				foxtail fescue	5
				red brome	5
635:					
Millsholm-----	Shallow loamy	Favorable	2,500	filaree	20
		Normal	1,500	foxtail fescue	20
		Unfavorable	1,200	soft chess	20
				burclover	5
				clover	5
				ripgut brome	5
				wild oat	5
640:					
Quinto-----	Shallow coarse loamy	Favorable	1,500	soft chess	30
		Normal	1,000	California buckwheat	15
		Unfavorable	800	red brome	10
				California sagebrush	5
				filaree	5
				foxtail fescue	5
				wild oat	5
Millsholm-----	Shallow loamy	Favorable	2,500	filaree	20
		Normal	1,500	foxtail fescue	20
		Unfavorable	1,200	soft chess	20
				burclover	5
				clover	5
				ripgut brome	5
				wild oat	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
641: Quinto-----	Shallow coarse loamy	Favorable	1,500	soft chess	30
		Normal	1,000	California buckwheat	15
		Unfavorable	800	red brome	10
				California sagebrush	5
				filaree	5
				foxtail fescue	5
				wild oat	5
660: Gaviota-----	Gravelly loamy	Favorable	2,500	manzanita	25
		Normal	1,800	California sagebrush	20
		Unfavorable	1,200	common chamise	10
				other annual grasses	10
				buckbrush	5
				purple needlegrass	5
661: Gaviota-----	Gravelly loamy	Favorable	2,500	manzanita	25
		Normal	1,800	California sagebrush	20
		Unfavorable	1,200	common chamise	10
				other annual grasses	10
				buckbrush	5
				purple needlegrass	5
682: Henneke-----	Gravelly loamy	Favorable	1,500	soft chess	35
		Normal	1,000	wild oat	15
		Unfavorable	500	buckbrush	5
				foxtail fescue	5
				gray pine	5
				manzanita	5
				purple needlegrass	5
Hentine-----	Gravelly loamy	Favorable	800	common chamise	60
		Normal	600	buckbrush	5
		Unfavorable	500	gray pine	5
				manzanita	5
				foxtail fescue	5
				purple needlegrass	5
				toyon	1
683: Hentine-----	Gravelly loamy (chamise)	Favorable	800	common chamise	60
		Normal	600	buckbrush	5
		Unfavorable	500	gray pine	5
				manzanita	5
				foxtail fescue	5
				purple needlegrass	5
				toyon	1
Henneke-----	Gravelly loamy	Favorable	1,500	soft chess	35
		Normal	1,000	wild oat	15
		Unfavorable	500	buckbrush	5
				foxtail fescue	5
				gray pine	5
				manzanita	5
				purple needlegrass	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry		
			weight		
			Lb/acre		Pct
684:					
Hentine-----	Gravelly loamy (chamise)	Favorable	800	common chamise	60
		Normal	600	buckbrush	5
		Unfavorable	500	gray pine	5
				manzanita	5
				foxtail fescue	5
				purple needlegrass	5
				toyon	1
Henneke-----	Gravelly loamy (chamise)	Favorable	800	common chamise	20
		Normal	600	buckbrush	10
		Unfavorable	500	leather oak	10
				manzanita	10
				California scrub oak	5
				ceanothus	5
				foxtail fescue	5
				gray pine	5
				purple needlegrass	5
				soap plant	5
				squirreltail	5
685:					
Stonyford-----	Gravelly loamy	Favorable	2,500	chamise	25
		Normal	2,000	manzanita	20
		Unfavorable	1,500	California scrub oak	10
				ceanothus	10
				soft chess	10
				needlegrass	5
				red brome	5
				ripgut brome	5
				wild oat	5
Stonyford-----	Gravelly loamy	Favorable	2,500	chamise	25
		Normal	2,000	manzanita	20
		Unfavorable	1,500	California scrub oak	10
				ceanothus	10
				soft chess	10
				needlegrass	5
				red brome	5
				ripgut brome	5
				wild oat	5
687:					
Hentine-----	Gravelly loamy	Favorable	800	common chamise	60
		Normal	600	buckbrush	5
		Unfavorable	500	gray pine	5
				manzanita	5
				foxtail fescue	5
				purple needlegrass	5
				toyon	1
Henneke-----	Gravelly loamy	Favorable	800	common chamise	20
		Normal	600	buckbrush	10
		Unfavorable	500	leather oak	10
				manzanita	10
				California scrub oak	5
				ceanothus	5
				foxtail fescue	5
				gray pine	5
				purple needlegrass	5
				soap plant	5
				squirreltail	5

Table 10.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
		Lb/acre		Pct	
690:					
Sehorn-----	Clayey low elevation	Favorable	2,400	soft chess	15
		Normal	2,000	wild oat	15
		Unfavorable	1,400	burclover	10
				filaree	10
				barley	5
				blue oak	5
				clover	5
				fescue	5
				needlegrass	5
				ripgut brome	5
Contra Costa----	Loamy	Favorable	3,000	soft chess	30
		Normal	2,800	wild oat	20
		Unfavorable	1,500	burclover	10
				filaree	10
				California brome	5
				clover	5
				red brome	5
				ripgut brome	5
695:					
Orognen-----	Loamy	Favorable	3,500	soft chess	30
		Normal	3,000	wild oat	20
		Unfavorable	1,500	filaree	10
				foxtail fescue	10
				leporinum barley	10
				red brome	5
700:					
Hytrop-----	Clayey	Favorable	4,000	wild oat	40
		Normal	3,200	soft chess	30
		Unfavorable	1,500	filaree	5
				foxtail fescue	5
				purple needlegrass	5
Franciscan-----	Loamy (blue oak)	Favorable	3,000	soft chess	20
		Normal	2,000	wild oat	15
		Unfavorable	1,000	foxtail fescue	10
				ripgut brome	10
				California sagebrush	5
				blue oak	5
				filaree	5
				goldenbush	5
Vallecitos-----	Loamy	Favorable	2,500	wild oat	30
		Normal	2,000	soft chess	20
		Unfavorable	1,200	filaree	10
				blue oak	5
				burclover	5
				needlegrass	5
				red brome	5
				ripgut brome	5

Table 11.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
100----- Capay	Slight-----	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
101, 102----- Capay	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
106----- Capay	Severe: flooding.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
110, 111----- El Solyo	Slight-----	Slight-----	Slight-----	Slight.
116----- El Solyo	Severe: flooding.	Slight-----	Slight-----	Slight.
120: Vernalis-----	Slight-----	Slight-----	Slight-----	Slight.
Zacharias-----	Slight-----	Slight-----	Moderate: small stones.	Slight.
121, 122----- Vernalis	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
123, 125----- Vernalis	Slight-----	Slight-----	Slight-----	Slight.
126: Vernalis-----	Severe: flooding.	Slight-----	Slight-----	Slight.
Zacharias-----	Severe: flooding.	Slight-----	Moderate: small stones.	Slight.
127----- Vernalis	Severe: flooding.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
130, 131----- Stomar	Slight-----	Slight-----	Slight-----	Slight.
140, 141----- Zacharias	Slight-----	Slight-----	Moderate: small stones.	Slight.
142, 144----- Zacharias	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
145----- Zacharias	Slight-----	Slight-----	Moderate: slope, small stones.	Slight.
146----- Zacharias	Severe: flooding.	Slight-----	Moderate: small stones.	Slight.
147----- Zacharias	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight.
150----- Columbia	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
151: Columbia-----	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
151: Columbia, sandy substratum-----	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
153----- Columbia	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
155----- Columbia	Severe: flooding.	Slight-----	Slight-----	Slight.
157: Columbia-----	Severe: flooding.	Slight-----	Slight-----	Slight.
Columbia, sandy substratum-----	Severe: flooding.	Slight-----	Slight-----	Slight.
159: Columbia-----	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
Columbia, sandy substratum-----	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
160----- Merritt	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
165----- Merritt	Severe: flooding.	Slight-----	Slight-----	Slight.
170: Dospalos-----	Severe: flooding, too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
Bolfar-----	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight.
175: Dospalos-----	Severe: flooding.	Slight-----	Slight-----	Slight.
Bolfar-----	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
180----- Dello	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
190----- Clear Lake	Severe: flooding, too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
195----- Clear Lake	Severe: flooding.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
200----- Veritas	Severe: flooding.	Slight-----	Slight-----	Slight.
210----- Cortina	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight.
215----- Yokut	Slight-----	Slight-----	Moderate: small stones.	Slight.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
220:				
Xerofluvents-----	Severe: flooding.	Slight-----	Moderate: slope, flooding.	Slight.
Xerorthents-----	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight.
245:				
Bolfar-----	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
Columbia, sandy substratum-----	Severe: flooding.	Slight-----	Slight-----	Slight.
246:				
Bolfar-----	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight.
Columbia, sandy substratum-----	Severe: flooding.	Slight-----	Moderate: flooding.	Slight.
252:				
Chaqua-----	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Severe: erodes easily.
Arburua-----	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Severe: erodes easily.
253:				
Chaqua-----	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
Arburua-----	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
255:				
Calla-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Carbona-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
270, 271-----	Severe: flooding.	Slight-----	Slight-----	Slight.
Elsalado				
272, 273, 274-----	Slight-----	Slight-----	Slight-----	Slight.
Elsalado				
281-----	Slight-----	Slight-----	Moderate: slope, small stones.	Slight.
Carbona				
290:				
Carbona-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Orognen-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
291: Carbona-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Orognen-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
300----- Damluis	Slight-----	Slight-----	Slight-----	Slight.
301----- Damluis	Slight-----	Slight-----	Moderate: slope.	Slight.
302, 303----- Damluis	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
304----- Damluis	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
310----- Deldota	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
320----- Dosamigos	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
330----- Pedcat	Severe: flooding, excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
331----- Pedcat	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
340: Carranza-----	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
Woo-----	Slight-----	Slight-----	Slight-----	Slight.
350----- Woo	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Severe: erodes easily.
400: Alo-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
Vaquero-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
401: Alo-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Vaquero-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
410----- Ayar	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
420: Ayar-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
420: Oneil-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
430: Vaquero-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
Carbona-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
500, 501: Wisflat-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Arburua-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
San Timoteo-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
502: Arburua-----	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
Wisflat-----	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
505, 506: Arburua-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Contra Costa-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Wisflat-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
510: Arburua-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Wisflat-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
520, 521: Wisflat-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
520, 521: Rock outcrop-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope.
530----- Oneil	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   erodes easily.
540----- Oquin	Severe:   slope.	Severe:   slope.	Severe:   slope.	Moderate:   slope.
600, 601: Gonzaga-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Franciscan-----	Severe:   slope.	Severe:   slope.	Severe:   slope,   small stones.	Severe:   slope.
610, 611: Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Vallecitos-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
Honker, eroded-----	Severe:   slope.	Severe:   slope.	Severe:   slope,   small stones.	Severe:   slope.
612: Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Vallecitos-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   erodes easily.
Gonzaga-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
613, 614: Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope,   small stones.	Severe:   slope.
Gaviota-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
615: Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Quinto-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
620----- Franciscan	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
625:				
Franciscan-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Quinto-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
630, 631:				
Millsholm-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   erodes easily.
Honker-----	Severe:   slope.	Severe:   slope.	Severe:   slope.	Severe:   slope.
Rock outcrop-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope.
635-----				
Millsholm	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   erodes easily.
640:				
Quinto-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
Millsholm-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   erodes easily.
Rock outcrop-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope.
650:				
Quinto-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
Rock outcrop-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope.
660-----				
Gaviota	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   erodes easily.
661-----				
Gaviota	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.
682:				
Henneke-----	Severe:   slope,   depth to rock.	Severe:   slope,   depth to rock.	Severe:   slope,   small stones,   depth to rock.	Severe:   slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
682: Hentine-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
Rock outcrop-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
683: Hentine-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
Rock outcrop-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Henneke-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
684: Hentine-----	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones, slope.
Henneke-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
685: Stonyford-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Stonyford-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
687: Hentine-----	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones, slope.
Henneke-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
Rock outcrop-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
690: Sehorn-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 11.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
690: Contra Costa-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
695----- Orognen	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
700: Hytap-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
Franciscan-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Vallecitos-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.

Table 12.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
100, 101, 102----- Capay	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: too clayey.
106----- Capay	Severe: cutbanks cave.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength.	Severe: too clayey.
110----- El Solyo	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
111----- El Solyo	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
116----- El Solyo	Moderate: too clayey.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength.	Slight.
120: Vernalis-----	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
Zacharias-----	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
121----- Vernalis	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
122----- Vernalis	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
123----- Vernalis	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
125----- Vernalis	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
126: Vernalis-----	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: shrink-swell, low strength, flooding.	Slight.
Zacharias-----	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: shrink-swell, low strength, flooding.	Slight.
127----- Vernalis	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: shrink-swell, low strength, flooding.	Slight.



Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
159: Columbia, sandy substratum-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
160----- Merritt	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
165----- Merritt	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
170: Dospalos-----	Moderate: too clayey, wetness, flooding.	Severe: flooding.	Severe: flooding, shrink-swell.	Severe: flooding.	Severe: low strength, flooding.	Severe: too clayey.
Bolfar-----	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
175: Dospalos-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding, shrink-swell.	Severe: flooding.	Severe: low strength.	Moderate: droughty.
Bolfar-----	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Slight.
180----- Dello	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
190----- Clear Lake	Moderate: too clayey, wetness, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Severe: too clayey.
195----- Clear Lake	Severe: cutbanks cave.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength.	Severe: too clayey.
200----- Veritas	Moderate: cemented pan.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
210----- Cortina	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: small stones, large stones.
215----- Yokut	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: droughty.
220: Xerofluvents-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
Xerorthents-----	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: small stones, droughty.
245: Bolfar-----	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
245: Columbia, sandy substratum-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
246: Bolfar-----	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Columbia, sandy substratum-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
252: Chaqua-----	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
Arburua-----	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Moderate: depth to rock, shrink-swell.	Moderate: depth to rock.
253: Chaqua-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope.	Moderate: slope.
Arburua-----	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, shrink-swell, slope.	Moderate: slope, depth to rock.
255: Calla-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Carbona-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
270, 271----- Elsalado	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
272----- Elsalado	Moderate: wetness.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Slight.
273, 274----- Elsalado	Slight-----	Slight-----	Slight-----	Slight-----	Slight-----	Slight.
281----- Carbona	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
290, 291: Carbona-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Orognen-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
300, 301----- Damluis	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
302, 303----- Damluis	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: small stones, large stones.
304----- Damluis	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: small stones, large stones, slope.
310----- Deldota	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Severe: too clayey.
320----- Dosamigos	Moderate: too clayey, wetness.	Severe: shrink-swell.	Moderate: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
330----- Pedcat	Moderate: too clayey, wetness.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength.	Severe: excess sodium.
331----- Pedcat	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: excess sodium.
340: Carranza----- Woo-----	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: small stones.
350----- Woo	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
400, 401: Alo----- Vaquero-----	Slight----- Severe: cutbanks cave, slope.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
410----- Ayar	Severe: cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, too clayey.
420: Ayar-----	Severe: cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, too clayey.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
420: Oneil-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
430: Vaquero-----	Severe: cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, too clayey.
Carbona-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
500, 501: Wisflat-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Arburua-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
San Timoteo-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
502: Arburua-----	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, shrink-swell, slope.	Moderate: slope, depth to rock.
Wisflat-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
505, 506: Arburua-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Contra Costa-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Wisflat-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
510: Arburua-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Wisflat-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
520, 521:						
Wisflat-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
530-----						
Oneil	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
540-----						
Oquin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
600, 601:						
Gonzaga-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Franciscan-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
610, 611:						
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Vallecitos-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: slope, depth to rock.
Honker, eroded---	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
612:						
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Vallecitos-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: slope, depth to rock.
Gonzaga-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
613, 614:						
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Gaviota-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
615:						
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Quinto-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
620-----						
Franciscan	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
625:						
Franciscan-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Quinto-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
630, 631:						
Millsholm-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: slope, depth to rock.
Honker-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Rock outcrop----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
635-----						
Millsholm	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: slope, depth to rock.
640:						
Quinto-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
640:						
Millsholm-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
650:						
Quinto-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
660, 661-----						
Gaviota	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
682:						
Henneke-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Hentine-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
683:						
Hentine-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Henneke-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
684:						
Hentine-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: large stones, slope, depth to rock.
Henneke-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
685:						
Stonyford-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
Stonyford-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
687:						
Hentine-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: large stones, slope, depth to rock.
Henneke-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
690:						
Sehorn-----	Severe: depth to rock, cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, too clayey.
Contra Costa----	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
695-----						
Orognen	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
700:						
Hytow-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Franciscan-----	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Vallecitos-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: slope, depth to rock.

Table 13.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
100----- Capay	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey.
101----- Capay	Severe: percs slowly.	Slight-----	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
102----- Capay	Severe: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
106----- Capay	Severe: percs slowly.	Slight-----	Severe: too clayey.	Moderate: flooding.	Poor: too clayey.
110----- El Solyo	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
111----- El Solyo	Severe: percs slowly.	Slight-----	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
116----- El Solyo	Severe: percs slowly.	Slight-----	Severe: too clayey.	Moderate: flooding.	Poor: too clayey, hard to pack.
120: Vernalis-----	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.
Zacharias-----	Severe: percs slowly.	Slight-----	Moderate: too clayey.	Slight-----	Fair: too clayey.
121----- Vernalis	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
122----- Vernalis	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.
123----- Vernalis	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
125----- Vernalis	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.
126: Vernalis-----	Moderate: flooding, percs slowly.	Moderate: seepage.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
Zacharias-----	Severe: percs slowly.	Slight-----	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
127----- Vernalis	Moderate: flooding, percs slowly.	Moderate: seepage.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
130----- Stomar	Severe: percs slowly.	Slight-----	Moderate: too clayey.	Slight-----	Fair: too clayey.
131----- Stomar	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
140----- Zacharias	Severe: percs slowly.	Slight-----	Moderate: too clayey.	Slight-----	Fair: too clayey.
141----- Zacharias	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
142----- Zacharias	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey, small stones.
144----- Zacharias	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, small stones.
145----- Zacharias	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
146----- Zacharias	Severe: percs slowly.	Slight-----	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey.
147----- Zacharias	Severe: percs slowly.	Moderate: seepage.	Moderate: flooding, too clayey.	Moderate: flooding.	Fair: too clayey, small stones.
150----- Columbia	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
151: Columbia-----	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
Columbia, sandy substratum-----	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness, thin layer.
153----- Columbia	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
155----- Columbia	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness.
157: Columbia-----	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
157: Columbia, sandy substratum-----	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness, thin layer.
159: Columbia-----	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
Columbia, sandy substratum-----	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness, thin layer.
160----- Merritt	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Fair: too sandy.
165----- Merritt	Severe: percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: flooding, wetness.	Fair: too sandy.
170: Dospalos-----	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.
Bolfar-----	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
175: Dospalos-----	Severe: wetness, percs slowly.	Slight-----	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Bolfar-----	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
180----- Dello	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy.
190----- Clear Lake	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.
195----- Clear Lake	Severe: wetness, percs slowly.	Slight-----	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
200----- Veritas	Moderate: flooding, cemented pan.	Severe: seepage.	Severe: cemented pan, seepage.	Severe: seepage.	Fair: cemented pan, thin layer.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
210----- Cortina	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
215----- Yokut	Severe: percs slowly.	Moderate: seepage.	Slight-----	Slight-----	Poor: small stones.
220: Xerofluvents-----	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: seepage, small stones.
Xerorthents-----	Moderate: flooding.	Moderate: slope.	Severe: seepage.	Moderate: flooding.	Poor: small stones.
245: Bolfar-----	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Columbia, sandy substratum-----	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: wetness, thin layer.
246: Bolfar-----	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Columbia, sandy substratum-----	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness, thin layer.
252: Chaqua-----	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, too clayey.
Arburua-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
253: Chaqua-----	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, too clayey, slope.
Arburua-----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
255: Calla-----	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
255: Carbona-----	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
270, 271----- Elsalado	Moderate: flooding, percs slowly.	Moderate: seepage.	Moderate: flooding.	Moderate: flooding.	Good.
272----- Elsalado	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Good.
273, 274----- Elsalado	Moderate: percs slowly.	Moderate: seepage.	Slight-----	Slight-----	Good.
281----- Carbona	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
290, 291: Carbona-----	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Orognen-----	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
300----- Damluis	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
301----- Damluis	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
302----- Damluis	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack, small stones.
303----- Damluis	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack, small stones.
304----- Damluis	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
310----- Deldota	Severe: wetness, percs slowly.	Slight-----	Moderate: wetness, too clayey.	Slight-----	Fair: too clayey.
320----- Dosamigos	Severe: wetness, percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
330----- Pedcat	Severe: wetness, percs slowly.	Slight-----	Severe: wetness, too clayey, excess sodium.	Moderate: flooding, wetness.	Poor: too clayey, excess sodium.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
331----- Pedcat	Severe: wetness, percs slowly.	Slight-----	Severe: wetness, too clayey, excess sodium.	Moderate: wetness.	Poor: too clayey, excess sodium.
340: Carranza-----	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
Woo-----	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight-----	Fair: too clayey.
350----- Woo	Severe: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey.
400, 401: Alo-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, hard to pack, slope.
Vaquero-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, hard to pack, slope.
410----- Ayar	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: hard to pack, slope.
420: Ayar-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: hard to pack, slope.
Oneil-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
430: Vaquero-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, hard to pack, slope.
Carbona-----	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
500, 501: Wisflat-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Arburua-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
500, 501: San Timoteo-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
502: Arburua-----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
Wisflat-----	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock.
505, 506: Arburua-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Contra Costa-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Wisflat-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
510: Arburua-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Wisflat-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
520, 521: Wisflat-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
530----- Oneil	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
540----- Oquin	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
600, 601:					
Gonzaga-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Franciscan-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
610, 611:					
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Vallecitos-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Honker, eroded----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
612:					
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Vallecitos-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Gonzaga-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
613, 614:					
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Gaviota-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
615:					
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
615: Quinto-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
620----- Franciscan	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
625: Franciscan-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Quinto-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
630, 631: Millsholm-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Honker-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
635----- Millsholm	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
640: Quinto-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Millsholm-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
650: Quinto-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
650: Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
660, 661----- Gaviota	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
682: Henneke-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, small stones.
Hentine-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
683: Hentine-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Henneke-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, small stones.
684: Hentine-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Henneke-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, small stones.
685: Stonyford-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Stonyford-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
687:					
Hentine-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Henneke-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, small stones.
Rock outcrop-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
690:					
Sehorn-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Contra Costa-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
695-----					
Orognen	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
700:					
Hytap-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Franciscan-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Vallecitos-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.

Table 14.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
100, 101----- Capay	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
102----- Capay	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
106----- Capay	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
110, 111, 116----- El Solyo	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
120: Vernalis-----	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Zacharias-----	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
121, 122, 123, 125---- Vernalis	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
126: Vernalis-----	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Zacharias-----	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
127----- Vernalis	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
130----- Stomar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, thin layer.
131----- Stomar	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, thin layer.
140, 141----- Zacharias	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
142, 144----- Zacharias	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
145, 146----- Zacharias	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
147----- Zacharias	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
150----- Columbia	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
151: Columbia-----	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
Columbia, sandy substratum-----	Good-----	Probable-----	Improbable: too sandy.	Good.
153, 155----- Columbia	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
157, 159: Columbia-----	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
Columbia, sandy substratum-----	Good-----	Probable-----	Improbable: too sandy.	Good.
160, 165----- Merritt	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
170: Dospalos-----	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Bolfar-----	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
175: Dospalos-----	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
Bolfar-----	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
180----- Dello	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
190, 195----- Clear Lake	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
200----- Veritas	Fair: cemented pan, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
210----- Cortina	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
215----- Yokut	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
220: Xerofluvents-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
Xerorthents-----	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
245, 246: Bolfar-----	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Columbia, sandy substratum-----	Good-----	Probable-----	Improbable: too sandy.	Good.
252: Chaquá-----	Fair: depth to rock, shrink-swell, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Arburua-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
253: Chaquá-----	Fair: depth to rock, shrink-swell, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Arburua-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
255: Calla-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Carbona-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
270, 271, 272, 273, 274----- Elsalado	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
281----- Carbona	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
290: Carbona-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Orognen-----	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
291: Carbona-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Orognen-----	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
300, 301----- Damluis	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
302, 303, 304----- Damluis	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
310----- Deldota	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
320----- Dosamigos	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
330, 331----- Pedcat	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
340: Carranza-----	Good-----	Improbable: small stones.	Probable-----	Poor: small stones, area reclaim.
Woo-----	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
350----- Woo	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
400, 401: Alo-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Vaquero-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
410----- Ayar	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
420: Ayar-----	Poor: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Oneil-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
430: Vaquero-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, slope.
Carbona-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
500, 501: Wisflat-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Arburua-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
San Timoteo-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
502: Arburua-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Wisflat-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
505, 506: Arburua-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Contra Costa-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Wisflat-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
510: Arburua-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Wisflat-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
520, 521: Wisflat-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
530----- Oneil	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
540----- Oquin	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
600, 601: Gonzaga-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Franciscan-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
610, 611: Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Vallecitos-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Honker, eroded-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
612:				
Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Vallecitos-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Gonzaga-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
613, 614:				
Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Gaviota-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
615:				
Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Quinto-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
620-----				
Franciscan	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
625:				
Franciscan-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Quinto-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
630, 631:				
Millsholm-----	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
630, 631: Honker-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
635----- Millsholm	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
640: Quinto-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Millsholm-----	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
650: Quinto-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
660, 661----- Gaviota	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
682: Henneke-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Hentine-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
683: Hentine-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
683: Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Henneke-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
684: Hentine-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Henneke-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
685: Stonyford-----	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Stonyford-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
687: Hentine-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Henneke-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Rock outcrop-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
690: Sehorn-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Contra Costa-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
695----- Orogneen	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
700:				
Hytrop-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Franciscan-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Vallecitos-----	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.

Table 15.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
100, 101----- Capay	Slight-----	Moderate: hard to pack.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
102----- Capay	Moderate: seepage.	Moderate: thin layer, hard to pack.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
106----- Capay	Slight-----	Moderate: hard to pack.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
110, 111, 116---- El Solyo	Slight-----	Severe: hard to pack.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
120: Vernalis-----	Moderate: seepage.	Severe: piping.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
Zacharias-----	Slight-----	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
121, 122----- Vernalis	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
123, 125----- Vernalis	Moderate: seepage.	Severe: piping.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
126: Vernalis-----	Moderate: seepage.	Severe: piping.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
Zacharias-----	Slight-----	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
127----- Vernalis	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
130, 131----- Stomar	Slight-----	Moderate: piping.	Deep to water	Percs slowly, erodes easily.	Erodes easily	Erodes easily, percs slowly.
140, 141----- Zacharias	Slight-----	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
142----- Zacharias	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-----	Favorable-----	Favorable.
144----- Zacharias	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope-----	Favorable-----	Favorable.
145----- Zacharias	Moderate: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
146----- Zacharias	Slight-----	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
147----- Zacharias	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable-----	Favorable-----	Favorable.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
150----- Columbia	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, flooding.	Soil blowing---	Favorable.
151: Columbia-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, flooding.	Soil blowing---	Favorable.
Columbia, sandy substratum-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily, flooding.	Erodes easily, soil blowing.	Erodes easily.
153----- Columbia	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, flooding.	Soil blowing---	Favorable.
155----- Columbia	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
157: Columbia-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
Columbia, sandy substratum-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily.	Erodes easily, soil blowing.	Erodes easily.
159: Columbia-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, flooding.	Soil blowing---	Favorable.
Columbia, sandy substratum-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily, flooding.	Erodes easily, soil blowing.	Erodes easily.
160----- Merritt	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
165----- Merritt	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
170: Dospalos-----	Slight-----	Moderate: hard to pack, wetness.	Deep to water	Droughty, slow intake, percs slowly.	Percs slowly---	Droughty, percs slowly.
Bolfar-----	Slight-----	Moderate: piping, wetness.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
175: Dospalos-----	Slight-----	Moderate: hard to pack, wetness.	Deep to water	Droughty, percs slowly.	Percs slowly---	Droughty, percs slowly.
Bolfar-----	Slight-----	Moderate: piping, wetness.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
180----- Dello	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing, flooding.	Too sandy, soil blowing.	Droughty.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting-			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
190----- Clear Lake	Slight-----	Moderate: hard to pack, wetness.	Deep to water	Slow intake, percs slowly, flooding.	Percs slowly---	Percs slowly.
195----- Clear Lake	Slight-----	Moderate: hard to pack, wetness.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
200----- Veritas	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing---	Favorable-----	Favorable.
210----- Cortina	Severe: seepage.	Severe: seepage.	Deep to water	Droughty-----	Too sandy-----	Droughty.
215----- Yokut	Moderate: seepage.	Slight-----	Deep to water	Droughty, soil blowing.	Favorable-----	Droughty.
220: Xerofluvents-----	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, flooding.	Too sandy-----	Droughty.
Xerorthents-----	Slight-----	Severe: seepage.	Deep to water	Droughty-----	Favorable-----	Droughty.
245: Bolfar-----	Moderate: seepage.	Moderate: piping, wetness.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Columbia, sandy substratum-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily.	Erodes easily, soil blowing.	Erodes easily.
246: Bolfar-----	Moderate: seepage.	Moderate: piping, wetness.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
Columbia, sandy substratum-----	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily, flooding.	Erodes easily, soil blowing.	Erodes easily.
252: Chaqua-----	Moderate: depth to rock, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Arburua-----	Moderate: seepage, depth to rock, slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
253: Chaqua-----	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Arburua-----	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
255:						
Calla-----	Severe: slope.	Moderate: piping.	Deep to water	Slope-----	Slope-----	Slope.
Carbona-----	Severe: slope.	Moderate: piping.	Deep to water	Slope, percs slowly.	Slope-----	Slope, percs slowly.
270----- Elsalado	Moderate: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily.	Erodes easily, soil blowing.	Erodes easily.
271, 272----- Elsalado	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
273----- Elsalado	Moderate: seepage.	Severe: piping.	Deep to water	Soil blowing, erodes easily.	Erodes easily, soil blowing.	Erodes easily.
274----- Elsalado	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
281----- Carbona	Moderate: slope.	Moderate: piping.	Deep to water	Slope, percs slowly.	Favorable-----	Percs slowly.
290, 291: Carbona-----	Severe: slope.	Moderate: piping.	Deep to water	Slope, percs slowly.	Slope-----	Slope, percs slowly.
Orognen-----	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope, droughty, percs slowly.	Slope, percs slowly.	Slope, droughty, percs slowly.
300----- Damluis	Slight-----	Moderate: hard to pack.	Deep to water	Percs slowly---	Percs slowly---	Percs slowly.
301----- Damluis	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly---	Percs slowly.
302----- Damluis	Slight-----	Moderate: hard to pack.	Deep to water	Percs slowly---	Percs slowly---	Percs slowly.
303----- Damluis	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly---	Percs slowly.
304----- Damluis	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
310----- Deldota	Slight-----	Moderate: piping.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
320----- Dosamigos	Slight-----	Moderate: hard to pack, excess salt.	Deep to water	Percs slowly, excess salt.	Percs slowly---	Percs slowly.
330, 331----- Pedcat	Slight-----	Severe: excess sodium.	Deep to water	Droughty, percs slowly.	Erodes easily, percs slowly.	Excess sodium, erodes easily, droughty.
340: Carranza-----	Severe: seepage.	Moderate: thin layer, piping, large stones.	Deep to water	Favorable-----	Large stones---	Large stones.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
340: Woo-----	Moderate: seepage.	Severe: piping.	Deep to water	Favorable-----	Favorable-----	Favorable.
350----- Woo	Slight-----	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
400, 401: Alo-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, depth to rock, percs slowly.	Too arid, slope, depth to rock.
Vaquero-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, depth to rock, percs slowly.	Too arid, slope, depth to rock.
410----- Ayar	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, percs slowly.	Too arid, slope, percs slowly.
420: Ayar-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, percs slowly.	Too arid, slope, percs slowly.
Oneil-----	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
430: Vaquero-----	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, depth to rock, percs slowly.	Too arid, slope, depth to rock.
Carbona-----	Severe: slope.	Moderate: piping.	Deep to water	Slope, percs slowly.	Slope-----	Slope, percs slowly.
500, 501: Wisflat-----	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock.	Slope, depth to rock.
Arburua-----	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
San Timoteo-----	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
502: Arburua-----	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Wisflat-----	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock.	Slope, depth to rock.
505, 506: Arburua-----	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
505, 506: Contra Costa-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Wisflat-----	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock.	Slope, depth to rock.
510: Arburua-----	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Wisflat-----	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
520, 521: Wisflat-----	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock.	Slope, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
530----- Oneil	Severe: slope.	Severe: piping.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
540----- Oquin	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
600, 601: Gonzaga-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Franciscan-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
610, 611: Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Vallecitos-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Honker, eroded---	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting-			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
612:						
Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Vallecitos-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Gonzaga-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
613, 614:						
Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.
Gaviota-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
615:						
Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Quinto-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
620-----						
Franciscan	Severe: slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
625:						
Franciscan-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
Quinto-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
630, 631:						
Millsholm-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Honker-----	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
Rock outcrop----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
635-----						
Millsholm	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
640:						
Quinto-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Millsholm-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
650:						
Quinto-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
660-----						
Gaviota	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
661-----						
Gaviota	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
682:						
Henneke-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Hentine-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
683:						
Hentine-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop-----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Henneke-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
684:						
Hentine-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Henneke-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
685:						
Stonyford-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
Stonyford-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
687:						
Hentine-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
Henneke-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop----	Severe: depth to rock, slope.	Slight-----	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
690:						
Sehorn-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, slow intake, percs slowly.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Contra Costa-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
695-----						
Orogneen	Severe: slope.	Moderate: piping.	Deep to water	Slope, soil blowing, percs slowly.	Slope, soil blowing.	Slope, percs slowly.
700:						
Hytap-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, droughty, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
Franciscan-----	Severe: slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.	Slope, depth to rock.
Vallecitos-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, percs slowly.	Slope, depth to rock, percs slowly.	Slope, droughty, depth to rock.

Table 16.--Engineering Index Properties

(The symbol &lt; means less than; &gt; means more than. Absence of an entry indicates that data were not estimated.)

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
100----- Capay	0-20 20-60	Clay----- Clay, silty clay	CH, CL CL, CH	A-7 A-7	0 0	100 100	100 100	95-100 95-100	85-95 85-95	40-60 40-60	20-35 20-35
101----- Capay	0-20 20-60	Clay----- Clay, silty clay	CH, CL CH, CL	A-7 A-7	0 0	100 100	100 100	95-100 95-100	85-95 85-95	40-60 40-60	20-35 20-35
102----- Capay	0-20 20-35 35-45 45-60	Clay----- Silty clay, clay Clay loam----- Loam-----	CH, CL CH, CL CL ML, CL-ML, CL	A-7 A-7 A-7 A-4	0 0 0 0	100 100 100 90-100	100 100 100 85-100	95-100 95-100 95-100 75-95	85-95 85-95 75-95 50-65	40-60 40-60 40-50 25-35	20-35 20-35 15-25 5-10
106----- Capay	0-20 20-60	Clay----- Clay, silty clay	CH, CL CL, CH	A-7 A-7	0 0	100 100	100 100	95-100 95-100	85-95 85-95	40-60 40-60	20-35 20-35
110----- El Solyo	0-17 17-60	Silty clay loam Silty clay loam, silty clay.	ML, CL ML, MH, CL, CH	A-6, A-7 A-7	0 0	100 100	100 100	95-100 95-100	75-90 90-95	35-45 40-55	10-20 15-25
111----- El Solyo	0-17 17-60	Clay loam----- Silty clay loam, silty clay.	ML, CL ML, MH, CL, CH	A-6, A-7 A-7	0 0	100 100	100 100	95-100 95-100	75-90 90-95	35-45 40-55	10-20 15-25
116----- El Solyo	0-17 17-60	Silty clay loam Silty clay loam, silty clay.	ML, CL ML, MH, CL, CH	A-6, A-7 A-7	0 0	100 100	100 100	95-100 95-100	75-90 90-95	35-45 40-55	10-20 15-25
120: Vernalis-----	0-20 20-62	Clay loam----- Loam, silt loam, clay loam.	CL CL, CL-ML	A-6 A-4, A-6	0 0	100 100	95-100 95-100	85-100 80-100	65-85 55-80	30-40 25-40	10-20 5-20
Zacharias-----	0-14 14-66	Clay loam----- Clay loam, loam	CL CL	A-6 A-6	0 0	85-100 85-100	75-100 75-100	65-90 60-90	60-80 50-80	30-40 30-40	10-15 10-20
121----- Vernalis	0-20 20-62	Loam----- Loam, silt loam, clay loam.	ML CL, CL-ML	A-4 A-4, A-6	0 0	100 100	95-100 95-100	80-100 80-100	55-85 55-85	25-35 25-40	NP-10 5-20
122----- Vernalis	0-20 20-62	Loam----- Loam, silt loam, clay loam.	ML CL, CL-ML	A-4 A-4, A-6	0 0	100 100	95-100 95-100	80-100 80-100	55-80 55-80	25-35 25-40	NP-10 5-20
123----- Vernalis	0-20 20-62	Clay loam----- Loam, silt loam, clay loam.	CL CL, CL-ML	A-6 A-4, A-6	0 0	100 100	95-100 95-100	85-100 80-100	65-85 55-85	30-40 25-40	10-20 5-20
125----- Vernalis	0-20 20-62	Clay loam----- Loam, silt loam, clay loam.	CL CL, CL-ML	A-6 A-4, A-6	0 0	100 100	95-100 95-100	85-100 80-100	65-85 55-80	30-40 25-40	10-20 5-20
126: Vernalis-----	0-20 20-62	Clay loam----- Loam, silt loam, clay loam.	CL CL, CL-ML	A-6 A-4, A-6	0 0	100 100	95-100 95-100	85-100 80-100	65-85 55-80	30-40 25-40	10-20 5-20
Zacharias-----	0-14 14-66	Clay loam----- Clay loam, loam	CL CL	A-6 A-6	0 0	85-100 85-100	75-100 75-100	65-90 60-90	60-80 50-80	30-40 30-40	10-15 10-20

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
127----- Vernalis	0-20	Loam-----	ML	A-4	0	100	95-100	80-100	55-80	25-35	NP-10
	20-62	Loam, silt loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-80	25-40	5-20
130----- Stomar	0-20	Clay loam-----	CL	A-6	0-5	95-100	90-100	85-95	65-85	30-40	10-20
	20-38	Clay loam, clay	CL, CH	A-7	0-5	95-100	90-100	85-100	70-95	40-60	20-35
	38-60	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	60-85	30-45	10-20
131----- Stomar	0-20	Clay loam-----	CL	A-6	0	100	95-100	90-100	65-85	30-40	10-20
	20-38	Clay, clay loam	CL, CH	A-7	0	100	95-100	90-100	75-95	40-60	20-35
	38-60	Clay loam, silty clay loam.	SC, CL	A-6	0	90-100	85-100	80-90	35-70	20-40	10-25
140, 141----- Zacharias	0-14	Clay loam-----	CL	A-6	0	85-100	75-100	65-90	60-80	30-40	10-15
	14-66	Clay loam, loam	CL	A-6	0	85-100	75-100	60-90	50-80	30-40	10-20
142, 144----- Zacharias	0-14	Gravelly clay loam.	GC, SC, CL	A-6	0	55-80	50-75	45-70	35-60	30-40	10-15
	14-66	Gravelly clay loam, gravelly loam.	GC, SC, CL	A-6	0	55-80	50-75	45-70	35-60	30-40	10-20
145, 146----- Zacharias	0-14	Clay loam-----	CL	A-6	0	85-100	75-100	65-90	60-80	30-40	10-15
	14-66	Clay loam, loam	CL	A-6	0	85-100	75-100	60-90	50-80	30-40	10-20
147----- Zacharias	0-14	Gravelly clay loam.	GC, SC, CL	A-6	0	55-80	50-75	45-70	35-60	30-40	10-15
	14-66	Gravelly clay loam, gravelly loam.	GC, SC, CL	A-6	0	55-80	50-75	45-70	35-60	30-40	10-20
150----- Columbia	0-14	Fine sandy loam	SM, SC-SM, SC	A-4	0	100	100	85-95	35-50	20-30	NP-10
	14-60	Stratified sandy loam to fine sandy loam.	SM, SC-SM, SC	A-4	0	100	100	80-95	35-50	20-30	NP-10
151: Columbia	0-14	Fine sandy loam	SM, SC-SM, SC	A-4	0	100	100	85-95	35-50	20-30	NP-10
	14-60	Stratified sandy loam to fine sandy loam.	SM, SC-SM, SC	A-4	0	100	100	80-95	35-50	20-30	NP-10
Columbia, sandy substratum-----	0-12	Fine sandy loam	SM, SC-SM	A-4	0	100	100	85-95	35-50	20-25	NP-5
	12-41	Sandy loam-----	SM, SC-SM	A-4	0	100	100	80-95	35-50	20-25	NP-5
	41-60	Stratified sand to loamy sand.	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-70	5-15	---	NP
153, 155----- Columbia	0-14	Fine sandy loam	SM, SC, SC-SM	A-4	0	100	100	85-95	35-50	20-30	NP-10
	14-60	Stratified sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	100	100	80-95	35-50	20-30	NP-10
157: Columbia	0-14	Fine sandy loam	SM, SC, SC-SM	A-4	0	100	100	85-95	35-50	20-30	NP-10
	14-60	Stratified sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	100	100	80-95	35-50	20-30	NP-10

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
157: Columbia, sandy substratum-----	0-12	Fine sandy loam	SM, SC-SM	A-4	0	100	100	85-95	35-50	20-25	NP-5
	12-41	Sandy loam-----	SM, SC-SM	A-4	0	100	100	80-95	35-50	20-25	NP-5
	41-60	Stratified sand to loamy sand.	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-70	5-15	---	NP
159: Columbia-----	0-14	Fine sandy loam	SM, SC, SC-SM	A-4	0	100	100	85-95	35-50	20-30	NP-10
	14-60	Stratified sandy loam, fine sandy loam	SM, SC, SC-SM	A-4	0	100	100	80-95	35-50	20-30	NP-10
Columbia, sandy substratum-----	0-12	Fine sandy loam	SM, SC-SM	A-4	0	100	100	85-95	35-50	20-25	NP-5
	12-41	Stratified sandy loam.	SM, SC-SM	A-4	0	100	100	80-95	35-50	20-25	NP-5
	41-60	Stratified sand to loamy sand.	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-70	5-15	---	NP
160, 165----- Merritt	0-12	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	10-20
	12-38	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	80-95	30-45	10-20
	38-60	Stratified loamy fine sand to silt loam.	SM, ML	A-4	0	100	100	95-100	40-60	---	NP
170: Dospalos-----	0-26	Clay-----	CL	A-7	0	100	100	90-100	70-95	40-50	15-25
	26-44	Clay loam, clay	CL, CH	A-7	0	100	100	90-100	70-95	40-65	15-35
	44-60	Clay loam, sandy clay loam, clay.	CL, CH	A-6, A-7	0	100	100	80-100	50-85	35-60	15-30
Bolfar-----	0-24	Clay loam-----	CL	A-6	0	100	100	90-100	75-80	30-40	10-20
	24-38	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	100	100	80-100	35-80	30-40	10-20
	38-60	Stratified sandy loam to clay loam.	CL	A-6	0	100	100	80-100	50-75	30-40	10-20
175: Dospalos-----	0-26	Clay loam-----	CL	A-7	0	100	100	90-100	70-95	40-50	15-25
	26-44	Clay loam, clay	CL, CH	A-7	0	100	100	90-100	70-95	40-65	15-35
	44-60	Clay loam, sandy clay loam, clay.	CL, CH	A-6, A-7	0	100	100	80-100	50-85	35-60	15-30
Bolfar-----	0-24	Clay loam-----	CL	A-6	0	100	100	90-100	75-80	30-40	10-20
	24-38	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	100	100	80-100	35-80	30-40	10-20
	38-60	Stratified sandy loam to clay loam.	CL, SC	A-6	0	100	100	60-95	35-75	30-40	10-20
180----- Dello	0-10	Fine sandy loam	SM, SC-SM	A-4	0	100	100	70-90	40-50	20-25	NP-5
	10-60	Stratified loamy fine sand to sand.	SM	A-2, A-3	0	100	100	50-70	5-20	---	NP
190, 195----- Clear Lake	0-16	Clay-----	CH, CL	A-7	0	100	100	95-100	85-95	40-70	20-40
	16-60	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-70	20-40

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
200----- Veritas	0-21	Sandy loam-----	SM, SC-SM,	A-4	0	100	90-100	70-85	35-50	20-30	NP-10
			SC								
	21-41	Sandy loam, fine sandy loam.	SM, SC-SM,	A-4	0	100	90-100	70-85	35-50	20-30	NP-10
	41-60	Cemented-----	---	---	---	---	---	---	---	---	---
210----- Cortina	0-6	Gravelly sandy loam.	SM, GM	A-2, A-4	0-10	55-80	50-75	35-60	25-40	20-30	NP-5
	6-38	Stratified very gravelly loamy sand to very gravelly loam.	GM	A-1, A-2	0-10	30-60	25-55	15-40	5-35	20-30	NP-5
	38-60	Stratified very gravelly sand to very gravelly loamy sand.	GP	A-1	0-10	30-60	25-55	15-45	15-25	---	NP
215----- Yokut	0-11	Sandy loam-----	SM, SC-SM,	A-4	0-5	90-100	85-95	55-75	35-50	20-30	NP-10
			SC								
	11-19	Loam, sandy clay loam.	CL-ML, ML,	A-4	0-5	90-100	85-95	70-85	35-60	25-35	5-10
	19-60	Stratified very gravelly loam to extremely gravelly sandy clay loam.	GM-GC, GC,	A-1, A-2	5-25	25-65	20-50	15-50	10-35	25-40	5-15
			SC								
220:											
Xerofluvents----	0-20	Variable-----	---	---	---	---	---	---	---	---	---
	20-60	Stratified very gravelly loamy coarse sand to sandy loam.	SM, GM, SP-SM	A-1, A-2, A-3	0-15	20-90	20-90	10-55	0-30	10-20	NP-5
Xerorthents----	0-4	Gravelly sandy loam.	SM	A-1	0-5	50-80	50-75	30-45	5-30	20-25	NP-10
	4-60	Stratified very gravelly sandy loam to gravelly sandy loam.	SM, GM	A-1, A-2	0-15	20-80	20-75	20-55	10-30	---	NP-5
245:											
Bolfar-----	0-24	Loam-----	CL-ML, ML,	A-4	0	100	100	85-95	60-75	25-35	5-10
			CL								
	24-38	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	100	100	80-100	35-80	30-40	10-20
	38-60	Stratified sandy loam to clay loam.	CL, SC	A-6	0	100	100	60-95	35-75	30-40	10-20
Columbia, sandy substratum-----											
	0-12	Fine sandy loam	SM, SC-SM	A-4	0	100	100	85-95	35-50	20-25	NP-5
	12-41	Sandy loam-----	SM, SC-SM	A-4	0	100	100	80-95	35-50	20-25	NP-5
	41-60	Stratified sand to loamy sand.	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-70	5-15	---	NP
246:											
Bolfar-----	0-24	Loam-----	CL-ML, ML,	A-4	0	100	100	85-95	60-75	25-35	5-10
			CL								
	24-38	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	100	100	80-100	35-80	30-40	10-20
	38-60	Stratified sandy loam to clay loam.	CL	A-6	0	100	100	80-100	50-75	30-40	10-20

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
246: Columbia, sandy substratum-----	0-12	Fine sandy loam	SM, SC-SM	A-4	0	100	100	85-95	35-50	20-25	NP-5
	12-41	Sandy loam-----	SM, SC-SM	A-4	0	100	100	80-95	35-50	20-25	NP-5
	41-60	Stratified sand to loamy sand.	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-70	5-15	---	NP
252, 253: Chaqua-----	0-18	Loam-----	CL-ML, CL, ML	A-4	0	100	95-100	85-95	55-75	25-35	5-10
	18-41	Loam, clay loam, sandy clay loam.	CL-ML, CL, SC-SM, SC	A-4, A-6	0-5	85-100	80-100	70-95	40-75	25-40	5-15
	41-45	Weathered bedrock	---	---	---	---	---	---	---	---	---
Arburua-----	0-6	Loam-----	CL-ML, CL	A-4	0	95-100	85-100	80-95	65-75	25-30	5-10
	6-22	Loam, clay loam	CL, CL-ML	A-4, A-6	0-5	90-100	75-100	70-100	50-75	25-40	5-20
	22-24	Weathered bedrock	---	---	---	---	---	---	---	---	---
	24-28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
255: Calla-----	0-11	Clay loam-----	CL	A-6	0	90-100	85-100	80-95	60-75	30-40	10-15
	11-30	Clay loam-----	CL	A-6	0	90-100	85-95	80-95	60-75	30-40	10-20
	30-60	Clay loam-----	CL	A-6	0	90-100	85-95	80-95	60-75	30-40	10-20
Carbona-----	0-15	Clay loam-----	CL	A-6, A-7	0	80-100	75-100	70-95	60-80	35-45	15-25
	15-24	Clay loam, clay	CL, CH	A-7	0	80-100	75-100	70-95	60-85	40-55	15-30
	24-50	Clay loam, clay	CL, CH	A-7	0	80-100	75-100	70-95	60-85	40-55	15-30
	50-60	Clay loam-----	CL	A-6, A-7	0	80-100	75-100	70-95	55-80	30-45	10-20
270-----	0-6	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	75-90	35-55	20-30	NP-5
Elsalado	6-26	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
	26-60	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
271, 272-----	0-6	Loam-----	ML	A-4	0	95-100	90-100	75-90	50-65	20-30	NP-5
Elsalado	6-26	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
	26-60	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
273-----	0-6	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	75-90	35-55	20-30	NP-5
Elsalado	6-26	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
	26-60	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
274-----	0-6	Loam-----	ML	A-4	0	95-100	90-100	75-90	50-65	20-30	NP-5
Elsalado	6-26	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
	26-60	Fine sandy loam, loam.	SM, ML	A-4	0	95-100	90-100	75-90	35-65	20-30	NP-5
281-----	0-15	Clay loam-----	CL	A-6, A-7	0	80-100	75-100	70-95	60-80	35-45	15-25
Carbona	15-24	Clay loam, clay	CL, CH	A-7	0	80-100	75-100	70-95	60-85	40-55	15-30
	24-50	Clay loam, clay	CL, CH	A-7	0	80-100	75-100	70-95	60-85	40-55	15-30
	50-60	Clay loam-----	CL	A-6, A-7	0	80-100	75-100	70-95	55-80	30-45	10-20
290, 291: Carbona-----	0-15	Clay loam-----	CL	A-6, A-7	0	80-100	75-100	70-95	60-80	35-45	15-25
	15-24	Clay loam, clay	CL, CH	A-7	0	80-100	75-100	70-95	60-85	40-55	15-30
	24-50	Clay loam, clay	CL, CH	A-7	0	80-100	75-100	70-95	60-85	40-55	15-30
	50-60	Clay loam-----	CL	A-6, A-7	0	80-100	75-100	70-95	55-80	30-45	10-20

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
						Pct					
290, 291: Orognen-----	0-11	Gravelly clay loam.	GC, SC, CL	A-6	0	60-80	50-75	50-70	35-60	30-40	15-20
	11-40	Gravelly clay loam, gravelly clay.	CL, CH, GC, SC	A-7	0	55-80	50-75	45-70	40-65	40-55	20-35
	40-60	Clay loam, clay	CL, CH	A-7	0	85-95	75-90	70-85	65-80	40-60	20-40
300, 301----- Damluis	0-22	Clay loam-----	CL	A-7	0-5	95-100	90-100	80-95	65-80	40-50	15-25
	22-30	Clay, sandy clay	CH	A-7	0-5	95-100	90-100	80-95	50-85	50-60	25-35
	30-40	Clay loam, sandy clay loam, sandy clay.	SC, CL	A-6, A-7	0-5	95-100	90-100	75-95	35-75	30-45	10-20
	40-60	Very gravelly sandy loam, very gravelly sandy clay loam.	GC, GM-GC	A-1, A-2	5-10	30-55	25-50	15-40	10-25	25-35	5-15
302, 303, 304---- Damluis	0-20	Gravelly clay loam.	CL, GC	A-7	5-10	55-80	50-75	45-70	35-60	40-50	15-25
	20-48	Gravelly clay, gravelly sandy clay.	CH, GC, SC	A-7	5-10	55-80	50-75	45-75	35-60	50-60	25-35
	48-58	Gravelly clay loam, gravelly sandy clay loam, gravelly sandy clay.	SC, GC	A-6, A-7, A-2	5-10	55-80	50-75	45-70	25-50	30-45	10-20
	58-60	Very gravelly sandy loam, very gravelly sandy clay loam.	GC, GM-GC	A-1, A-2	5-10	30-65	25-60	15-45	10-30	25-35	5-15
310----- Deldota	0-18	Clay-----	CL, CH	A-7	0	100	95-100	90-100	75-95	45-60	20-30
	18-23	Clay loam, clay	CL, CH	A-7	0	100	95-100	90-100	70-95	45-60	20-30
	23-60	Clay loam-----	ML, CL	A-6, A-7	0	100	95-100	90-100	70-80	35-45	10-20
320----- Dosamigos	0-15	Clay loam-----	CL	A-6, A-7	0	100	100	90-100	70-80	35-45	15-20
	15-42	Clay loam, clay	CL, CH	A-7	0	100	100	90-100	70-95	40-55	15-30
	42-60	Clay loam, clay, sandy clay.	CL, CH	A-7, A-6	0	100	95-100	85-100	50-95	35-55	15-30
330, 331----- Pedcat	0-7	Clay loam-----	CL	A-6, A-7	0	100	100	90-100	70-80	30-45	10-20
	7-25	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	45-55	20-30
	25-51	Clay, clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	80-100	70-95	35-50	15-25
	51-60	Stratified sandy clay loam to clay.	CL	A-6, A-7	0	100	100	75-100	50-85	35-50	15-25
340: Carranza-----	0-10	Gravelly clay loam.	GC, CL	A-6	0-5	65-90	60-75	50-70	40-55	30-40	10-15
	10-38	Gravelly sandy clay loam, gravelly clay loam.	GC, CL	A-6	5-20	60-90	55-75	50-70	35-55	30-40	10-20
	38-60	Stratified extremely gravelly loamy sand to extremely gravelly sandy loam.	GM	A-1	5-15	15-30	10-25	10-20	5-14	15-20	NP-5





Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
520, 521: Rock outcrop	0-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
530----- Oneil	0-14 14-30 30-34	Silt loam----- Silt loam, silty clay loam. Unweathered bedrock.	ML ML ---	A-4 A-4, A-6, A-7 ---	0 0 ---	95-100 90-95 ---	90-100 90-95 ---	85-100 90-95 ---	75-90 80-90 ---	30-40 30-45 ---	5-10 5-15 ---
540----- Oquin	0-24 24-31 31-35	Fine sandy loam Sandy loam, fine sandy loam, loam. Weathered bedrock	SM SM ---	A-4 A-4, A-2 ---	0 0 ---	95-100 100 ---	90-100 95-100 ---	65-85 60-70 ---	35-50 30-50 ---	20-30 20-30 ---	NP-5 NP-5 ---
600, 601: Gonzaga	0-18 18-29 29-38 38-42	Loam----- Gravelly loam, gravelly sandy clay loam. Gravelly clay loam, gravelly clay, gravelly sandy clay. Unweathered bedrock.	CL-ML, CL SC-SM, SC, GM-GC, GC CL, CH, SC, GC ---	A-4, A-6 A-4, A-6 A-7 ---	0 0-10 0-5 ---	90-100 60-80 60-80 ---	85-100 55-75 55-75 ---	65-95 50-70 50-70 ---	50-65 35-50 35-60 ---	25-35 25-35 40-60 ---	5-15 5-15 20-35 ---
Honker	0-7 7-16 16-36 36-40	Sandy loam----- Sandy clay loam, clay loam, loam. Gravelly clay loam, gravelly clay, gravelly sandy clay. Unweathered bedrock.	SC-SM, SC SC, CL CL, CH, SC, GC ---	A-4 A-6 A-7 ---	0-5 0-5 0-5 ---	90-100 95-100 60-80 ---	85-100 90-100 55-75 ---	50-70 75-95 50-70 ---	35-50 40-70 35-60 ---	20-30 30-40 40-60 ---	5-10 10-20 20-35 ---
Franciscan	0-14 14-29 29-33	Gravelly sandy loam. Gravelly loam, cobbly loam, cobbly clay loam. Unweathered bedrock.	GC, SC, GM-GC, SC-SM CL, SC, GC ---	A-2-4 A-6 ---	0-5 5-25 ---	65-80 70-85 ---	60-75 65-80 ---	45-60 60-75 ---	25-35 35-55 ---	20-30 30-40 ---	5-10 10-20 ---
610, 611: Honker	0-7 7-16 16-36 36-40	Sandy loam----- Sandy clay loam, clay loam, loam. Gravelly clay loam, gravelly clay, gravelly sandy clay. Unweathered bedrock.	SC-SM, SC SC, CL CL, CH, SC, GC ---	A-4 A-6 A-7 ---	0-5 0-5 0-5 ---	90-100 95-100 60-80 ---	85-100 90-100 55-75 ---	50-70 75-95 50-70 ---	35-50 40-70 35-60 ---	20-30 30-40 40-60 ---	5-10 10-20 20-35 ---













Table 17.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated.)

Soil name and map symbol	Depth		Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm	K	T	Pct			
100----- Capay	0-20	40-60	1.30-1.50	0.06-0.2	0.14-0.16	5.6-8.4	0-2	High-----	0.24	5	7	1-2	
	20-60	40-60	1.35-1.50	0.06-0.2	0.14-0.16	6.6-8.4	0-2	High-----	0.24				
101----- Capay	0-20	40-60	1.30-1.50	0.06-0.2	0.13-0.16	5.6-8.4	0-4	High-----	0.24	5	7	1-2	
	20-60	40-60	1.35-1.50	0.06-0.2	0.13-0.16	6.6-8.4	0-4	High-----	0.24				
102----- Capay	0-20	40-60	1.30-1.50	0.06-0.2	0.14-0.16	5.6-8.4	0-2	High-----	0.24	5	7	1-2	
	20-35	40-60	1.30-1.50	0.06-0.2	0.14-0.16	6.6-8.4	0-2	High-----	0.24				
	35-45	35-40	1.35-1.50	0.06-0.2	0.15-0.17	6.6-8.4	0-2	High-----	0.28				
	45-60	10-20	1.45-1.55	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.32				
106----- Capay	0-20	40-60	1.30-1.50	0.06-0.2	0.14-0.16	5.6-8.4	0-2	High-----	0.24	5	7	1-2	
	20-60	40-60	1.35-1.50	0.06-0.2	0.14-0.16	6.6-8.4	0-2	High-----	0.24				
110----- El Solyo	0-17	30-40	1.45-1.55	0.2-0.6	0.17-0.20	6.6-7.8	0-2	Moderate	0.43	5	4	.5-2	
	17-60	35-50	1.50-1.60	0.06-0.2	0.14-0.19	7.4-8.4	0-4	High-----	0.37				
111----- El Solyo	0-17	30-40	1.45-1.55	0.2-0.6	0.17-0.20	6.6-7.8	0-2	Moderate	0.43	5	4	.5-2	
	17-60	35-50	1.50-1.65	0.06-0.2	0.14-0.19	7.4-8.4	0-4	High-----	0.37				
116----- El Solyo	0-17	30-40	1.45-1.55	0.2-0.6	0.17-0.20	6.6-7.8	0-2	Moderate	0.43	5	4	.5-2	
	17-60	35-50	1.50-1.60	0.06-0.2	0.14-0.19	7.4-8.4	0-4	High-----	0.37				
120: Vernalis-----	0-20	27-35	1.45-1.55	0.2-0.6	0.17-0.18	6.6-8.4	0-2	Moderate	0.32	5	6	1-2	
	20-62	18-30	1.45-1.55	0.6-2.0	0.14-0.18	6.6-8.4	0-2	Moderate	0.37				
Zacharias-----	0-14	27-30	1.40-1.50	0.2-0.6	0.15-0.19	6.1-7.3	0-0	Moderate	0.37	5	6	1-2	
	14-66	25-35	1.40-1.55	0.2-0.6	0.13-0.18	6.6-7.8	0-0	Moderate	0.37				
121, 122----- Vernalis	0-20	18-27	1.55-1.65	0.6-2.0	0.14-0.17	6.6-8.4	0-2	Low-----	0.37	5	6	1-2	
	20-62	18-30	1.45-1.55	0.6-2.0	0.14-0.18	6.6-8.4	0-2	Moderate	0.37				
123, 125----- Vernalis	0-20	27-35	1.45-1.55	0.2-0.6	0.17-0.18	6.6-8.4	0-2	Moderate	0.32	5	6	1-2	
	20-62	18-30	1.45-1.55	0.6-2.0	0.14-0.18	6.6-8.4	0-2	Moderate	0.37				
126: Vernalis-----	0-20	27-35	1.45-1.55	0.2-0.6	0.17-0.18	6.6-8.4	0-2	Moderate	0.32	5	6	1-2	
	20-62	18-30	1.45-1.55	0.6-2.0	0.14-0.18	6.6-8.4	0-2	Moderate	0.37				
Zacharias-----	0-14	27-30	1.40-1.50	0.2-0.6	0.15-0.19	6.1-7.3	0-0	Moderate	0.37	5	6	1-2	
	14-66	25-35	1.40-1.55	0.2-0.6	0.13-0.18	6.6-7.8	0-0	Moderate	0.37				
127----- Vernalis	0-20	18-27	1.55-1.65	0.6-2.0	0.14-0.17	6.6-8.4	0-2	Low-----	0.37	5	6	1-2	
	20-62	18-30	1.45-1.55	0.6-2.0	0.14-0.18	6.6-8.4	0-2	Moderate	0.37				
130----- Stomar	0-20	27-35	1.40-1.55	0.2-0.6	0.16-0.18	6.6-7.3	0-0	Moderate	0.37	5	6	.5-2	
	20-38	35-60	1.35-1.50	0.06-0.2	0.15-0.18	6.6-8.4	0-2	High-----	0.32				
	38-60	27-40	1.40-1.55	0.2-0.6	0.16-0.18	7.4-8.4	0-2	Moderate	0.37				
131----- Stomar	0-20	27-35	1.40-1.55	0.2-0.6	0.17-0.19	6.6-7.3	0-0	Moderate	0.37	5	6	1-2	
	20-38	35-60	1.35-1.50	0.06-0.2	0.12-0.15	6.6-8.4	0-2	High-----	0.32				
	38-60	27-40	1.40-1.55	0.2-0.6	0.16-0.18	7.4-8.4	0-2	Moderate	0.37				
140----- Zacharias	0-14	27-30	1.40-1.50	0.2-0.6	0.15-0.19	6.1-7.3	0-0	Moderate	0.37	5	6	1-2	
	14-66	25-35	1.40-1.55	0.2-0.6	0.13-0.18	6.6-7.8	0-0	Moderate	0.37				

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter Pct
									K	T		
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					
141----- Zacharias	0-14	27-30	1.45-1.60	0.2-0.6	0.15-0.19	6.1-7.3	0-2	Moderate	0.37	5	6	1-2
	14-66	25-35	1.40-1.55	0.2-0.6	0.13-0.18	6.6-7.8	0-2	Moderate	0.37			
142, 144----- Zacharias	0-14	27-35	1.45-1.60	0.2-0.6	0.10-0.15	6.1-7.3	0-0	Moderate	0.20	5	7	1-2
	14-66	25-35	1.40-1.55	0.2-0.6	0.10-0.14	6.6-7.8	0-0	Moderate	0.24			
145, 146----- Zacharias	0-14	27-30	1.40-1.50	0.2-0.6	0.15-0.19	6.1-7.3	0-0	Moderate	0.37	5	6	1-2
	14-66	25-35	1.40-1.55	0.2-0.6	0.13-0.18	6.6-7.8	0-0	Moderate	0.37			
147----- Zacharias	0-14	27-35	1.45-1.60	0.2-0.6	0.10-0.15	6.1-7.3	0-0	Moderate	0.20	5	7	1-2
	14-66	25-35	1.40-1.55	0.2-0.6	0.10-0.14	6.6-7.8	0-0	Moderate	0.24			
150----- Columbia	0-14	10-18	1.50-1.60	2.0-6.0	0.12-0.14	6.1-7.8	0-0	Low-----	0.32	5	3	.5-2
	14-60	8-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32			
151: Columbia-----	0-14	10-18	1.50-1.60	2.0-6.0	0.12-0.14	6.1-7.8	0-0	Low-----	0.32	5	3	.5-2
	14-60	8-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32			
Columbia, sandy substratum-----	0-12	8-18	1.40-1.50	0.6-2.0	0.13-0.15	7.4-8.4	0-0	Low-----	0.49	4	3	1-2
	12-41	8-18	1.45-1.55	2.0-6.0	0.11-0.13	6.1-7.8	0-0	Low-----	0.32			
	41-60	0-5	1.60-1.70	6.0-20	0.05-0.08	6.1-7.8	0-0	Low-----	0.15			
153, 155----- Columbia	0-14	10-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32	5	3	.5-2
	14-60	8-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32			
157: Columbia-----	0-14	10-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32	5	3	.5-2
	14-60	8-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32			
Columbia, sandy substratum-----	0-12	8-18	1.40-1.50	0.6-2.0	0.13-0.15	7.4-8.4	0-0	Low-----	0.49	4	3	1-2
	12-41	8-18	1.45-1.55	2.0-6.0	0.13-0.15	6.1-7.8	0-0	Low-----	0.32			
	41-60	0-5	1.60-1.70	6.0-20	0.05-0.08	6.1-7.8	0-0	Low-----	0.15			
159: Columbia-----	0-14	10-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32	5	3	.5-2
	14-60	8-18	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.8	0-0	Low-----	0.32			
Columbia, sandy substratum-----	0-12	8-18	1.40-1.50	0.6-2.0	0.13-0.15	7.4-8.4	0-0	Low-----	0.49	5	3	1-2
	12-41	8-18	1.45-1.55	2.0-6.0	0.11-0.13	6.1-7.8	0-0	Low-----	0.32			
	41-60	0-5	1.60-1.70	6.0-20	0.05-0.08	6.1-7.8	0-0	Low-----	0.15			
160----- Merritt	0-12	27-35	1.35-1.50	0.2-0.6	0.17-0.19	6.6-8.4	0-0	Moderate	0.43	5	7	1-4
	12-38	20-30	1.35-1.55	0.2-0.6	0.15-0.19	7.9-8.4	0-0	Moderate	0.43			
	38-60	5-15	1.50-1.70	0.6-2.0	0.11-0.14	7.4-8.4	0-2	Low-----	0.32			
165----- Merritt	0-12	27-35	1.35-1.50	0.2-0.6	0.17-0.19	6.6-8.4	0-0	Moderate	0.43	5	4L	1-4
	12-38	20-30	1.35-1.55	0.2-0.6	0.15-0.19	7.9-8.4	0-0	Moderate	0.43			
	38-60	5-15	1.50-1.70	0.6-2.0	0.11-0.14	7.4-8.4	0-2	Low-----	0.32			
170: Dospalos-----	0-26	40-60	1.35-1.45	0.2-0.6	0.10-0.15	7.4-8.4	0-4	Moderate	0.32	5	7	1-3
	26-44	35-60	1.20-1.35	0.06-0.2	0.09-0.14	7.9-8.4	0-4	High-----	0.32			
	44-60	30-60	1.20-1.45	0.06-0.2	0.09-0.14	7.9-8.4	0-4	High-----	0.32			
Bolfar-----	0-24	27-35	1.35-1.45	0.2-0.6	0.13-0.17	7.4-8.4	0-4	Moderate	0.37	5	6	1-2
	24-38	18-35	1.35-1.50	0.2-0.6	0.12-0.17	7.9-8.4	0-4	Moderate	0.37			
	38-60	18-35	1.35-1.50	0.2-0.6	0.12-0.16	7.9-8.4	0-4	Moderate	0.43			

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility	Organic matter
	In	Pct		G/cc	In/hr	In/in	pH	mmhos/cm		K	T	group	Pct
175:													
Dospalos-----	0-26	35-40		1.35-1.45	0.2-0.6	0.10-0.15	7.4-8.4	0-4	Moderate	0.32	5	7	1-3
	26-44	35-60		1.20-1.35	0.06-0.2	0.09-0.14	7.9-8.4	0-4	High-----	0.32			
	44-60	30-60		1.20-1.45	0.06-0.2	0.09-0.14	7.9-8.4	0-4	High-----	0.32			
Bolfar-----	0-24	27-35		1.35-1.45	0.2-0.6	0.13-0.17	7.4-8.4	0-4	Moderate	0.37	5	6	1-2
	24-38	18-35		1.35-1.50	0.2-0.6	0.12-0.17	7.9-8.4	0-4	Moderate	0.37			
	38-60	18-25		1.40-1.50	0.2-0.6	0.12-0.16	7.9-8.4	0-4	Moderate	0.43			
180-----													
Dello-----	0-10	8-15		1.60-1.70	2.0-6.0	0.12-0.14	6.6-8.4	0-2	Low-----	0.28	2	3	0-1
	10-60	0-10		1.60-1.70	6.0-20	0.06-0.09	6.6-8.4	0-2	Low-----	0.15			
190-----													
Clear Lake-----	0-16	40-60		1.30-1.45	0.06-0.2	0.12-0.16	5.6-7.3	0-0	High-----	0.24	5	4	1-4
	16-60	40-60		1.25-1.40	0.06-0.2	0.12-0.16	7.4-8.4	0-4	High-----	0.24			
195-----													
Clear Lake-----	0-16	40-60		1.30-1.45	0.06-0.2	0.12-0.16	5.6-7.3	0-0	High-----	0.24	5	7	1-4
	16-60	40-60		1.25-1.40	0.06-0.2	0.12-0.16	7.4-8.4	0-4	High-----	0.24			
200-----													
Veritas-----	0-21	5-16		1.55-1.65	2.0-6.0	0.12-0.15	7.4-8.4	0-4	Low-----	0.28	3	3	1-2
	21-41	5-16		1.50-1.60	2.0-6.0	0.12-0.15	7.4-8.4	0-4	Low-----	0.32			
	41-60	---		---	---	---	---	---	-----	---			
210-----													
Cortina-----	0-6	10-25		1.45-1.60	2.0-6.0	0.07-0.14	5.6-8.4	0-0	Low-----	0.20	3	4	.5-1
	6-38	5-25		1.50-1.70	2.0-6.0	0.06-0.08	5.6-8.4	0-0	Low-----	0.10			
	38-60	0-10		1.60-1.70	6.0-20	0.03-0.05	5.6-8.4	0-0	Low-----	0.05			
215-----													
Yokut-----	0-11	12-18		1.45-1.60	2.0-6.0	0.10-0.12	5.6-6.5	0-0	Low-----	0.24	3	3	.5-1
	11-19	15-25		1.45-1.60	0.6-2.0	0.15-0.17	5.6-6.5	0-0	Low-----	0.32			
	19-60	20-30		1.45-1.60	0.2-0.6	0.04-0.05	7.4-8.4	0-2	Moderate	0.10			
220:													
Xerofluvents----	0-20	---		---	---	---	---	0-2	-----	---	4	5	---
	20-60	1-12		1.50-1.60	2.0-6.0	0.05-0.12	6.6-7.8	0-2	Low-----	0.10			
Xerorthents----	0-4	5-12		1.45-1.55	2.0-6.0	0.10-0.15	---	0-2	Low-----	0.10	5	4	0-1
	4-60	5-12		1.45-1.55	---	.07-.12	---	0-2	Low-----	0.10			
245:													
Bolfar-----	0-24	18-27		1.40-1.50	0.6-2.0	0.12-0.15	7.4-8.4	0-4	Low-----	0.43	5	6	1-2
	24-38	18-35		1.35-1.50	0.2-0.6	0.12-0.17	7.9-8.4	0-4	Moderate	0.37			
	38-60	18-25		1.40-1.50	0.2-0.6	0.12-0.16	7.9-8.4	0-4	Moderate	0.43			
Columbia, sandy substratum-----	0-12	8-18		1.40-1.50	0.6-2.0	0.13-0.15	7.4-7.8	0-0	Low-----	0.49	4	3	1-2
	12-41	8-18		1.45-1.55	2.0-6.0	0.13-0.15	6.1-7.8	0-0	Low-----	0.32			
	41-60	0-5		1.60-1.70	6.0-20	0.05-0.08	6.1-7.8	0-0	Low-----	0.15			
246:													
Bolfar-----	0-24	18-27		1.40-1.50	0.6-2.0	0.12-0.15	7.4-8.4	0-4	Low-----	0.43	5	6	1-2
	24-38	18-35		1.35-1.50	0.2-0.6	0.12-0.17	7.9-8.4	0-4	Moderate	0.37			
	38-60	18-35		1.35-1.50	0.2-0.6	0.12-0.16	7.9-8.4	0-4	Moderate	0.43			
Columbia, sandy substratum-----	0-12	8-18		1.40-1.50	0.6-2.0	0.13-0.15	7.4-7.8	0-0	Low-----	0.49	4	3	1-2
	12-41	8-18		1.45-1.55	2.0-6.0	0.11-0.13	6.1-7.8	0-0	Low-----	0.32			
	41-60	0-5		1.60-1.70	6.0-20	0.05-0.08	6.1-7.8	0-0	Low-----	0.15			
252, 253:													
Chaqua-----	0-18	22-27		1.40-1.50	0.6-2.0	0.14-0.16	7.4-8.4	0-0	Low-----	0.37	4	4L	.5-1
	18-41	18-30		1.40-1.50	0.2-0.6	0.14-0.17	7.4-8.4	0-0	Moderate	0.37			
	41-45	---		---	---	---	---	---	-----	---			

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay	Moist	Permea-	Available	Soil	Salinity	Shrink-	Erosion		Wind	Organic
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm	swell	potential	K	T	erodi-	bility
												group	Pct
252, 253:													
Arburua-----	0-6	18-27	1.45-1.55	0.6-2.0	0.13-0.16	7.4-8.4	0-2	Low-----	0.37	2	6		0-1
	6-22	18-30	1.40-1.55	0.6-2.0	0.12-0.18	7.9-8.4	0-2	Moderate	0.37				
	22-24	---	---	---	---	---	---	-----	-----				
	24-28	---	---	---	---	---	---	-----	-----				
255:													
Calla-----	0-11	27-35	1.40-1.50	0.2-0.6	0.16-0.18	7.4-8.4	0-0	Moderate	0.32	5	4L		.5-1
	11-30	27-35	1.40-1.50	0.2-0.6	0.16-0.18	7.4-8.4	0-2	Moderate	0.32				
	30-60	27-35	1.40-1.50	0.2-0.6	0.16-0.18	7.4-8.4	0-2	Moderate	0.32				
Carbona-----	0-15	35-40	1.35-1.50	0.06-0.2	0.15-0.18	7.4-8.4	0-4	Moderate	0.28	5	7		2-5
	15-24	35-45	1.30-1.50	0.06-0.2	0.13-0.18	7.4-8.4	0-4	High-----	0.32				
	24-50	35-45	1.30-1.50	0.06-0.2	0.13-0.18	7.9-8.4	0-4	High-----	0.32				
	50-60	27-40	1.40-1.50	0.2-0.6	0.15-0.18	7.9-8.4	0-4	Moderate	0.32				
270-----	0-6	8-18	1.55-1.65	2.0-6.0	0.13-0.15	7.4-8.4	0-2	Low-----	0.37	5	3		.5-1
Elsalado	6-26	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
	26-60	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
271, 272-----	0-6	8-18	1.45-1.60	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43	5	5		.5-1
Elsalado	6-26	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
	26-60	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
273-----	0-6	8-18	1.55-1.65	2.0-6.0	0.13-0.15	7.4-8.4	0-2	Low-----	0.37	5	3		.5-1
Elsalado	6-26	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
	26-60	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
274-----	0-6	8-18	1.45-1.60	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43	5	5		.5-1
Elsalado	6-26	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
	26-60	8-18	1.45-1.65	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Low-----	0.43				
281-----	0-15	35-40	1.35-1.50	0.06-0.2	0.15-0.18	7.4-8.4	0-4	Moderate	0.28	5	7		2-5
Carbona	15-24	35-45	1.30-1.50	0.06-0.2	0.13-0.18	7.4-8.4	0-4	High-----	0.32				
	24-50	35-45	1.30-1.50	0.06-0.2	0.13-0.18	7.9-8.4	0-4	High-----	0.32				
	50-60	27-40	1.40-1.50	0.2-0.6	0.15-0.18	7.9-8.4	0-4	Moderate	0.32				
290 , 291:													
Carbona-----	0-15	35-40	1.35-1.50	0.06-0.2	0.15-0.18	7.4-8.4	0-4	Moderate	0.28	5	7		2-5
	15-24	35-45	1.30-1.50	0.06-0.2	0.13-0.18	7.4-8.4	0-4	High-----	0.32				
	24-50	35-45	1.30-1.50	0.06-0.2	0.13-0.18	7.9-8.4	0-4	High-----	0.32				
	50-60	27-40	1.40-1.50	0.2-0.6	0.15-0.18	7.9-8.4	0-4	Moderate	0.32				
Orognen-----	0-11	27-35	1.40-1.55	0.2-0.6	0.12-0.15	6.6-7.8	0-0	Moderate	0.24	3	7		.5-1
	11-40	38-55	1.35-1.50	0.01-0.06	0.10-0.12	7.4-8.4	0-2	High-----	0.20				
	40-60	35-60	1.35-1.50	0.01-0.06	0.06-0.08	7.4-8.4	0-2	High-----	0.24				
300, 301-----	0-22	35-40	1.30-1.40	0.2-0.6	0.17-0.20	7.4-8.4	0-0	High-----	0.32	4	7		1-3
Damluis	22-30	45-55	1.30-1.40	0.06-0.2	0.15-0.17	7.9-8.4	0-0	High-----	0.28				
	30-40	28-40	1.30-1.45	0.2-0.6	0.16-0.17	7.9-8.4	0-2	Moderate	0.32				
	40-60	15-25	1.45-1.60	0.2-0.6	0.05-0.06	7.9-8.4	0-2	Low-----	0.10				
302, 303, 304----	0-20	35-40	1.30-1.40	0.2-0.6	0.15-0.16	7.4-8.4	0-0	High-----	0.20	5	7		1-3
Damluis	20-48	45-55	1.30-1.40	0.06-0.2	0.12-0.14	7.9-8.4	0-0	High-----	0.20				
	48-58	28-40	1.30-1.45	0.2-0.6	0.14-0.16	7.9-8.4	0-2	Moderate	0.15				
	58-60	15-25	1.45-1.60	0.2-0.6	0.05-0.06	7.9-8.4	0-2	Low-----	0.10				
310-----	0-18	40-50	1.30-1.45	0.06-0.2	0.15-0.16	7.4-8.4	0-2	High-----	0.28	5	7		1-3
Deldota	18-23	35-50	1.30-1.40	0.06-0.2	0.15-0.17	7.4-8.4	0-2	High-----	0.28				
	23-60	30-40	1.30-1.50	0.06-0.2	0.16-0.18	7.4-8.4	0-2	Moderate	0.24				

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm		K	T	group	Pct	
320----- Dosamigos	0-15	35-40	1.35-1.45	0.06-0.2	0.17-0.20	7.9-8.4	0-2	Moderate	0.28	5	4	1-2	
	15-42	37-50	1.25-1.40	0.01-0.06	0.12-0.17	7.9-8.4	2-8	High-----	0.28				
	42-60	30-45	1.30-1.50	0.06-0.2	0.09-0.16	7.9-8.4	2-16	Moderate	0.32				
330, 331----- Pedcat	0-7	27-38	1.35-1.45	0.2-0.6	0.10-0.16	6.6-7.8	0-2	Moderate	0.37	2	4	.5-1	
	7-25	40-50	1.35-1.45	0.01-0.06	0.09-0.13	7.9-8.4	0-4	High-----	0.32				
	25-51	30-45	1.35-1.45	0.06-0.2	0.09-0.12	7.9-9.0	8-16	High-----	0.32				
	51-60	30-45	1.40-1.50	0.06-0.2	0.09-0.12	7.9-9.0	0-4	High-----	0.32				
340: Carranza-----	0-10	27-35	1.35-1.45	0.6-2.0	0.14-0.17	6.6-7.3	0-0	Moderate	0.20	3	7	1-2	
	10-38	25-35	1.35-1.50	0.6-2.0	0.13-0.15	6.6-7.8	0-0	Moderate	0.20				
	38-60	5-15	1.50-1.70	6.0-20	0.01-0.03	6.6-7.8	0-0	Low-----	0.10				
Woo-----	0-19	27-35	---	0.2-0.6	0.15-0.19	6.6-8.4	0-0	Moderate	0.32	5	7	1-2	
	19-41	18-35	---	0.2-0.6	0.14-0.19	7.4-8.4	0-0	Moderate	0.32				
	41-62	5-15	---	2.0-6.0	0.06-0.08	7.4-8.4	<2	Low-----	0.20				
350----- Woo	0-16	18-27	---	0.6-2.0	0.14-0.17	6.6-8.4	0-0	Low-----	0.37	5	4L	1-2	
	16-67	18-35	---	0.2-0.6	0.14-0.19	7.4-8.4	<2	Moderate	0.32				
400, 401: Alo-----	0-12	40-55	1.25-1.45	0.06-0.2	0.14-0.16	6.1-7.8	0-2	High-----	0.24	3	7	1-3	
	12-35	35-55	1.20-1.35	0.06-0.2	0.14-0.17	6.6-8.4	0-2	High-----	0.24				
	35-39	---	---	---	---	---	---	-----	-----				
Vaquero-----	0-6	40-60	1.35-1.50	0.06-0.2	0.13-0.16	6.6-8.4	0-2	Very high	0.20	3	7	.5-2	
	6-35	40-60	1.35-1.50	0.06-0.2	0.09-0.17	7.4-9.0	2-16	Very high	0.28				
	35-39	---	---	---	---	---	---	-----	-----				
410----- Ayar	0-15	40-50	1.25-1.40	0.06-0.2	0.14-0.17	7.4-8.4	0-2	High-----	0.28	4	7	1-3	
	15-26	40-50	1.30-1.40	0.06-0.2	0.14-0.17	7.4-8.4	0-2	High-----	0.28				
	26-47	40-50	1.20-1.35	0.06-0.2	0.14-0.17	7.4-8.4	0-2	High-----	0.28				
	47-51	---	---	---	---	---	---	-----	-----				
420: Ayar-----	0-15	40-50	1.25-1.40	0.06-0.2	0.14-0.17	7.4-8.4	0-2	High-----	0.28	4	7	1-3	
	15-26	40-50	1.30-1.40	0.06-0.2	0.14-0.17	7.4-8.4	0-2	High-----	0.28				
	26-47	40-50	1.20-1.35	0.06-0.2	0.14-0.17	7.4-8.4	0-2	High-----	0.28				
	47-51	---	---	---	---	---	---	-----	-----				
Oneil-----	0-14	20-27	1.45-1.55	0.6-2.0	0.15-0.18	7.9-8.4	0-0	Low-----	0.43	2	6	1-3	
	14-30	20-35	1.45-1.55	0.2-0.6	0.14-0.20	7.9-8.4	0-0	Moderate	0.49				
	30-34	---	---	---	---	---	---	-----	-----				
500, 501: Arburua-----	0-6	18-27	1.45-1.55	0.6-2.0	0.13-0.16	7.4-8.4	0-2	Low-----	0.37	2	6	0-1	
	6-22	18-30	1.40-1.55	0.6-2.0	0.12-0.18	7.9-8.4	0-2	Moderate	0.37				
	22-24	---	---	---	---	---	---	-----	-----				
	24-28	---	---	---	---	---	---	-----	-----				
San Timoteo-----	0-5	8-18	1.50-1.60	2.0-6.0	0.11-0.14	7.4-8.4	0-2	Low-----	0.24	3	3	.5-1	
	5-22	8-18	1.50-1.60	2.0-6.0	0.11-0.15	7.9-8.4	0-2	Low-----	0.24				
	22-26	---	---	---	---	---	---	-----	-----				
502: Arburua-----	0-6	18-27	1.45-1.55	0.6-2.0	0.13-0.16	7.4-8.4	0-2	Low-----	0.37	2	6	0-1	
	6-22	18-30	1.40-1.55	0.6-2.0	0.12-0.18	7.9-8.4	0-2	Moderate	0.37				
	22-24	---	---	---	---	---	---	-----	-----				
	24-28	---	---	---	---	---	---	-----	-----				

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay Pct	Moist bulk density G/cc	Permea- bility In/hr	Available water capacity In/in	Soil reaction pH	Salinity mmhos/cm	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter Pct
	In	Pct								K	T		
502: Wisflat-----	0-5	7-18	1.50-1.60	2.0-6.0	0.10-0.13	7.4-8.4	0-2	Low-----	0.24	1	3	0-.1	
	5-10	5-18	1.50-1.60	2.0-6.0	0.09-0.15	7.4-8.4	0-2	Low-----	0.24				
	10-13	---	---	---	---	---	---	-----	-----				
	13-17	---	---	---	---	---	---	-----	-----				
505, 506: Arburua-----	0-6	18-27	1.45-1.55	0.6-2.0	0.13-0.16	7.4-8.4	0-2	Low-----	0.37	2	6	0-1	
	6-22	18-30	1.40-1.55	0.6-2.0	0.12-0.18	7.9-8.4	0-2	Moderate	0.37				
	22-24	---	---	---	---	---	---	-----	-----				
	24-28	---	---	---	---	---	---	-----	-----				
Contra Costa----	0-9	27-35	1.40-1.50	0.6-2.0	0.14-0.16	5.6-7.3	0-0	Moderate	0.32	2	6	.5-1	
	9-38	35-45	1.30-1.45	0.06-0.2	0.15-0.17	5.6-7.3	0-0	High-----	0.28				
	38-42	---	---	---	---	---	---	-----	-----				
Wisflat-----	0-5	7-18	1.50-1.60	2.0-6.0	0.10-0.13	7.4-8.4	0-2	Low-----	0.24	1	3	0-.1	
	5-10	5-18	1.50-1.60	2.0-6.0	0.09-0.15	7.4-8.4	0-2	Low-----	0.24				
	10-13	---	---	---	---	---	---	-----	-----				
	13-17	---	---	---	---	---	---	-----	-----				
510: Arburua-----	0-6	18-27	1.45-1.55	0.6-2.0	0.13-0.16	7.4-8.4	0-2	Low-----	0.37	2	6	0-1	
	6-22	18-30	1.40-1.55	0.6-2.0	0.12-0.18	7.9-8.4	0-2	Moderate	0.37				
	22-24	---	---	---	---	---	---	-----	-----				
	24-28	---	---	---	---	---	---	-----	-----				
Wisflat-----	0-5	7-18	1.50-1.60	2.0-6.0	0.10-0.13	7.4-8.4	0-2	Low-----	0.24	1	3	0-.1	
	5-10	5-18	1.50-1.60	2.0-6.0	0.09-0.15	7.4-8.4	0-2	Low-----	0.24				
	10-13	---	---	---	---	---	---	-----	-----				
	13-17	---	---	---	---	---	---	-----	-----				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	-----		8	---	
520, 521: Wisflat-----	0-5	7-18	1.50-1.60	2.0-6.0	0.10-0.13	7.4-8.4	0-2	Low-----	0.24	1	3	0-.1	
	5-10	5-18	1.50-1.60	2.0-6.0	0.09-0.15	7.4-8.4	0-2	Low-----	0.24				
	10-13	---	---	---	---	---	---	-----	-----				
	13-17	---	---	---	---	---	---	-----	-----				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	-----		8	---	
530----- Oneil	0-14	20-27	1.45-1.55	0.6-2.0	0.15-0.18	7.9-8.4	0-0	Low-----	0.43	2	6	1-3	
	14-30	20-35	1.45-1.55	0.2-0.6	0.14-0.20	7.9-8.4	0-0	Moderate	0.49				
	30-34	---	---	---	---	---	---	-----	-----				
540----- Oquin	0-24	12-18	1.50-1.60	2.0-6.0	0.13-0.15	7.4-8.4	0-2	Low-----	0.32	3	3	1-3	
	24-31	12-18	1.45-1.55	2.0-6.0	0.11-0.14	7.4-8.4	0-2	Low-----	0.37				
	31-35	---	---	---	---	---	---	-----	-----				
600, 601: Gonzaga-----	0-18	15-27	1.45-1.55	0.6-2.0	0.13-0.16	6.1-7.3	0-0	Low-----	0.32	2	5	1-5	
	18-29	15-27	1.45-1.55	0.2-0.6	0.11-0.14	6.6-7.3	0-0	Moderate	0.20				
	29-38	35-55	1.35-1.50	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	38-42	---	---	---	---	---	---	-----	-----				
Honker-----	0-7	10-20	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	1-3	
	7-16	20-35	1.40-1.55	0.2-0.6	0.15-0.18	6.1-7.3	0-0	Moderate	0.32				
	16-36	35-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	-----				

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility	Organic matter
	In	Pct		G/cc	In/hr	In/in	pH	mmhos/cm		K	T	group	Pct
600, 601: Franciscan-----	0-14	10-20	1.50-1.60	2.0-6.0	0.09-0.12	6.1-7.3	0-2	Low-----	0.24	2	3	2-3	
	14-29	20-35	1.40-1.55	0.2-0.6	0.12-0.16	6.1-7.3	0-2	Moderate	0.20				
	29-33	---	---	---	---	---	---	-----	-----				
610, 611: Honker-----	0-7	10-20	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	1-3	
	7-16	20-35	1.40-1.55	0.2-0.6	0.15-0.18	6.1-7.3	0-0	Moderate	0.32				
	16-36	35-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	-----				
Vallecitos-----	0-7	15-27	1.45-1.55	0.6-2.0	0.11-0.13	6.6-7.3	0-0	Low-----	0.24	1	6	1-2	
	7-16	35-50	1.35-1.50	0.06-0.2	0.09-0.11	6.6-7.3	0-0	High-----	0.20				
	16-20	---	---	---	---	---	---	-----	-----				
Honker, eroded--	0-4	15-27	1.45-1.55	0.2-0.6	0.11-0.14	6.6-7.3	0-0	Moderate	0.20	2	6	1-3	
	4-29	40-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	29-33	---	---	---	---	---	---	-----	-----				
612: Honker-----	0-7	10-20	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	1-3	
	7-16	20-35	1.40-1.55	0.2-0.6	0.15-0.18	6.1-7.3	0-0	Moderate	0.32				
	16-36	35-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	-----				
Vallecitos-----	0-7	15-27	1.45-1.55	0.6-2.0	0.13-0.16	6.1-6.5	0-0	Low-----	0.37	1	5	1-2	
	7-16	35-50	1.35-1.50	0.06-0.2	0.14-0.16	6.6-7.3	0-2	High-----	0.24				
	16-20	---	---	---	---	---	---	-----	-----				
Gonzaga-----	0-18	15-27	1.45-1.55	0.6-2.0	0.13-0.16	6.1-7.3	0-0	Low-----	0.32	2	5	1-5	
	18-29	15-30	1.40-1.55	0.2-0.6	0.14-0.18	6.6-7.3	0-0	Moderate	0.32				
	29-38	35-55	1.35-1.50	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.28				
	38-42	---	---	---	---	---	---	-----	-----				
613, 614: Honker-----	0-5	15-27	1.45-1.55	0.2-0.6	0.11-0.14	6.6-7.3	0-0	Moderate	0.20	2	6	1-3	
	5-20	20-35	1.40-1.55	0.2-0.6	0.11-0.14	6.6-7.3	0-0	Moderate	0.20				
	20-36	40-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	-----				
Gaviota-----	0-10	10-18	1.40-1.55	2.0-6.0	0.11-0.13	5.6-7.3	0-0	Low-----	0.24	1	6	0-1	
	10-14	---	---	---	---	---	---	-----	-----				
615: Honker-----	0-7	10-20	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	1-3	
	7-16	20-35	1.40-1.55	0.2-0.6	0.15-0.18	6.1-7.3	0-0	Moderate	0.32				
	16-36	35-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	-----				
Quinto-----	0-6	10-20	1.50-1.60	2.0-6.0	0.09-0.11	6.1-7.3	0-0	Low-----	0.20	1	4	1-3	
	6-17	20-35	1.45-1.55	0.2-0.6	0.10-0.13	6.1-7.8	0-0	Moderate	0.20				
	17-19	---	---	---	---	---	---	-----	-----				
620----- Franciscan	0-10	10-20	1.50-1.60	2.0-6.0	0.09-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	2-4	
	10-26	20-35	1.40-1.55	0.2-0.6	0.12-0.16	6.1-7.3	0-0	Moderate	0.32				
	26-38	20-35	1.40-1.55	0.2-0.6	0.10-0.14	6.1-7.3	0-0	Moderate	0.20				
	38-40	---	---	---	---	---	---	-----	-----				
625: Franciscan-----	0-10	10-20	1.50-1.60	2.0-6.0	0.09-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	2-4	
	10-26	20-35	1.40-1.55	0.2-0.6	0.12-0.16	6.1-7.3	0-0	Moderate	0.32				
	26-38	20-35	1.40-1.55	0.2-0.6	0.10-0.14	6.1-7.3	0-0	Moderate	0.20				
	38-40	---	---	---	---	---	---	-----	-----				

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay Pct	Moist bulk density G/cc	Permea- bility In/hr	Available water capacity In/in	Soil reaction pH	Salinity mmhos/cm	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter Pct
	In	Pct								K	T		
625: Quinto-----	0-6	10-20	1.50-1.60	2.0-6.0	0.09-0.11	6.1-7.3	0-0	Low-----	0.20	1	4	1-3	
	6-17	20-35	1.45-1.55	0.2-0.6	0.10-0.13	6.1-7.8	0-0	Moderate	0.20				
	17-18	---	---	---	---	---	---	-----	---				
Honker-----	0-7	10-20	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	1-3	
	7-16	20-35	1.40-1.55	0.2-0.6	0.15-0.18	6.1-7.3	0-0	Moderate	0.32				
	16-36	35-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	---				
630, 631: Millsholm-----	0-19	20-27	1.45-1.50	0.6-2.0	0.14-0.17	5.6-7.3	0-0	Low-----	0.37	1	6	.5-3	
	19-23	---	---	---	---	---	---	-----	---				
Honker-----	0-7	10-20	1.50-1.60	2.0-6.0	0.10-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	1-3	
	7-16	20-35	1.40-1.55	0.2-0.6	0.15-0.18	6.1-7.3	0-0	Moderate	0.32				
	16-36	35-55	1.35-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.15				
	36-40	---	---	---	---	---	---	-----	---				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	---		8	---	
635----- Millsholm	0-19	20-27	1.45-1.50	0.6-2.0	0.14-0.17	5.6-7.3	0-0	Low-----	0.37	1	6	.5-3	
	19-23	---	---	---	---	---	---	-----	---				
640: Quinto-----	0-6	10-20	1.50-1.60	2.0-6.0	0.09-0.11	6.1-7.3	0-0	Low-----	0.20	1	4	1-3	
	6-17	20-35	1.45-1.55	0.2-0.6	0.10-0.13	6.1-7.8	0-0	Moderate	0.20				
	17-19	---	---	---	---	---	---	-----	---				
Millsholm-----	0-19	20-27	1.45-1.50	0.6-2.0	0.14-0.17	5.6-7.3	0-0	Low-----	0.37	1	6	.5-3	
	19-23	---	---	---	---	---	---	-----	---				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	---		8	---	
650: Quinto-----	0-6	10-20	1.50-1.60	2.0-6.0	0.09-0.11	6.1-7.3	0-0	Low-----	0.20	1	4	1-3	
	6-17	20-35	1.45-1.55	0.2-0.6	0.10-0.13	6.1-7.8	0-0	Moderate	0.20				
	17-19	---	---	---	---	---	---	-----	---				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	---		8	---	
660----- Gaviota	0-10	10-18	1.45-1.55	2.0-6.0	0.12-0.15	5.6-7.3	0-0	Low-----	0.37	1	5	0-1	
	10-14	---	---	---	---	---	---	-----	---				
661----- Gaviota	0-10	10-18	1.40-1.55	2.0-6.0	0.11-0.13	5.6-7.3	0-0	Low-----	0.24	1	6	0-1	
	10-14	---	---	---	---	---	---	-----	---				
682: Henneke-----	0-5	20-40	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	---	Moderate	0.20	1	7	2-7	
	5-9	30-40	1.40-1.50	0.2-0.6	0.09-0.12	6.6-7.8	---	Moderate	0.20				
	9-19	35-55	1.35-1.45	0.2-0.6	0.06-0.09	6.6-7.8	0-2	Moderate	0.15				
	19-23	---	---	---	---	---	---	-----	---				
Hentine-----	0-4	20-27	1.25-1.35	0.6-2.0	0.09-0.13	6.6-7.8	0-0	Low-----	0.24	1	6	2-5	
	4-17	25-35	1.35-1.45	0.2-6.0	0.10-0.15	7.4-8.4	0-0	Low-----	0.17				
	17-21	---	---	---	---	---	---	-----	---				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	---		8	---	

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm			K	T	group	Pct
683:													
Hentine-----	0-4	20-27	1.25-1.35	0.6-2.0	0.09-0.13	6.6-7.8	0-0	Low-----	0.24	1	6		2-5
	4-17	25-35	1.35-1.45	0.2-6.0	0.10-0.15	7.4-8.4	0-0	Low-----	0.17				
	17-21	---	---	---	---	---	---	-----	---				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	---			8	---
Henneke-----	0-5	20-40	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	---	Moderate	0.20	1	7		2-7
	5-9	30-40	1.40-1.50	0.2-0.6	0.09-0.12	6.6-7.8	---	Moderate	0.20				
	9-19	35-55	1.35-1.45	0.2-0.6	0.06-0.09	6.6-7.8	0-2	Moderate	0.15				
	19-23	---	---	---	---	---	---	-----	---				
684:													
Hentine-----	0-4	20-27	1.15-1.25	0.6-2.0	0.09-0.13	6.6-7.8	0-0	Low-----	0.20	1	6		2-5
	4-14	25-35	1.30-1.45	0.2-6.0	0.10-0.15	7.4-8.4	0-0	Low-----	0.17				
	14-18	---	---	---	---	---	---	-----	---				
Henneke-----	0-5	20-40	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	---	Moderate	0.20	1	7		2-7
	5-9	30-40	1.40-1.50	0.2-0.6	0.09-0.12	6.6-7.8	---	Moderate	0.20				
	9-19	35-55	1.35-1.45	0.2-0.6	0.06-0.09	6.6-7.8	0-2	Moderate	0.15				
	19-23	---	---	---	---	---	---	-----	---				
685:													
Stonyford-----	0-6	20-27	---	0.6-2.0	0.12-0.14	5.6-7.3	0-0	Low-----	0.24	1	6		.5-2
	6-17	27-35	---	0.2-0.6	0.13-0.16	5.6-7.3	0-0	Moderate	0.24				
	17-21	---	---	---	---	---	---	-----	---				
Stonyford-----	0-6	20-27	---	0.6-2.0	0.12-0.14	5.6-7.3	0-0	Low-----	0.24	1	6		.5-2
	6-17	27-35	---	0.2-0.6	0.13-0.16	5.6-7.3	0-0	Moderate	0.24				
	17-21	---	---	---	---	---	---	-----	---				
687:													
Hentine-----	0-4	20-27	1.15-1.25	0.6-2.0	0.09-0.13	6.6-7.8	0-0	Low-----	0.20	1	6		2-5
	4-14	25-35	1.30-1.45	0.2-6.0	0.10-0.15	7.4-8.4	0-0	Low-----	0.17				
	14-18	---	---	---	---	---	---	-----	---				
Henneke-----	0-5	20-40	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	---	Moderate	0.20	1	7		2-7
	5-9	30-40	1.40-1.50	0.2-0.6	0.09-0.12	6.6-7.8	---	Moderate	0.20				
	9-19	35-55	1.35-1.45	0.2-0.6	0.06-0.09	6.6-7.8	0-2	Moderate	0.15				
	19-23	---	---	---	---	---	---	-----	---				
Rock outcrop----	0-60	---	---	0.06-6.0	---	---	---	-----	---			8	---
690:													
Sehorn-----	0-7	40-50	1.35-1.45	0.06-0.2	0.14-0.16	6.1-7.3	0-0	High-----	0.28	2	4		1-3
	7-26	40-50	1.35-1.45	0.06-0.2	0.14-0.16	6.6-8.4	0-2	High-----	0.28				
	26-30	---	---	---	---	---	---	-----	---				
Contra Costa----	0-9	27-35	1.40-1.50	0.6-2.0	0.14-0.16	5.6-7.3	0-0	Moderate	0.32	2	6		.5-1
	9-38	35-45	1.30-1.45	0.06-0.2	0.15-0.17	5.6-7.3	0-0	High-----	0.28				
	38-42	---	---	---	---	---	---	-----	---				
695-----													
Orogneen	0-5	10-20	1.50-1.60	2.0-6.0	0.10-0.13	6.1-7.8	0-1	Low-----	0.24	3	3		.5-1
	5-19	15-25	1.45-1.55	0.2-2.0	0.14-0.18	6.6-7.8	0-1	Moderate	0.28				
	19-47	35-60	1.35-1.40	0.01-0.06	0.12-0.16	6.6-8.4	0-2	High-----	0.24				
	47-60	30-40	1.35-1.40	0.2-0.6	0.09-0.15	7.4-8.4	0-2	Moderate	0.20				

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility In/hr	Available water capacity In/in	Soil reaction pH	Salinity mmhos/cm	Shrink- swell potential	Erosion		Wind erodi- bility group	Organic matter Pct
									factors	K		
700:												
Hytap-----	0-11	15-25	1.45-1.55	0.6-2.0	0.13-0.16	6.6-7.8	0-0	Low-----	0.37	3	5	1-3
	11-39	35-55	1.40-1.55	0.01-0.06	0.06-0.08	6.6-7.8	0-0	High-----	0.32			
	39-43	---	---	---	---	---	---	-----	---			
Franciscan-----	0-10	10-20	1.50-1.60	2.0-6.0	0.09-0.12	6.1-7.3	0-0	Low-----	0.24	2	3	2-4
	10-26	20-35	1.40-1.55	0.2-0.6	0.12-0.16	6.1-7.3	0-0	Moderate	0.32			
	26-38	20-35	1.40-1.55	0.2-0.6	0.10-0.14	6.1-7.3	0-0	Moderate	0.20			
	38-40	---	---	---	---	---	---	-----	---			
Vallecitos-----	0-7	15-27	1.45-1.55	0.6-2.0	0.11-0.13	6.6-7.3	0-0	Low-----	0.24	1	6	1-2
	7-16	35-50	1.35-1.50	0.06-0.2	0.09-0.11	6.6-7.3	0-0	High-----	0.20			
	16-20	---	---	---	---	---	---	-----	---			

Table 18.--Water Features

("Flooding," "water table," and such terms as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth Ft	Kind	Months
100----- Capay	D	None-----	---	---	>6.0	---	---
101----- Capay	D	None-----	---	---	4.0-6.0	Apparent	Jan-Dec
102----- Capay	D	None-----	---	---	>6.0	---	---
106----- Capay	D	Rare-----	---	---	>6.0	---	---
110----- El Solyo	C	None-----	---	---	>6.0	---	---
111----- El Solyo	C	None-----	---	---	4.0-6.0	Apparent	Dec-Mar
116----- El Solyo	C	Rare-----	---	---	>6.0	---	---
120: Vernalis-----	B	None-----	---	---	>6.0	---	---
Zacharias-----	B	None-----	---	---	>6.0	---	---
121----- Vernalis	B	None-----	---	---	4.0-6.0	Apparent	Jan-Dec
122----- Vernalis	B	None-----	---	---	>6.0	---	---
123----- Vernalis	B	None-----	---	---	4.0-6.0	Apparent	Jan-Dec
125----- Vernalis	B	None-----	---	---	>6.0	---	---
126: Vernalis-----	B	Rare-----	---	---	>6.0	---	---
Zacharias-----	B	Rare-----	---	---	>6.0	---	---
127----- Vernalis	B	Rare-----	---	---	>6.0	---	---
130----- Stomar	C	None-----	---	---	>6.0	---	---
131----- Stomar	C	None-----	---	---	4.0-6.0	Apparent	Jan-Dec
140----- Zacharias	B	None-----	---	---	>6.0	---	---
141----- Zacharias	B	None-----	---	---	4.0-6.0	Apparent	Dec-Mar

Table 18.--Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth Ft	Kind	Months
142, 144, 145----- Zacharias	B	None-----	---	---	>6.0	---	---
146, 147----- Zacharias	B	Rare-----	---	---	>6.0	---	---
150----- Columbia	C	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
151: Columbia-----	C	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
Columbia, sandy substratum-----	C	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
153----- Columbia	C	Frequent-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
155----- Columbia	C	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
157: Columbia-----	C	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
Columbia, sandy substratum-----	C	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
159: Columbia-----	C	Frequent-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
Columbia, sandy substratum-----	C	Frequent-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
160----- Merritt	B	Occasional-----	Brief to long	Dec-Apr	4.0-6.0	Apparent	Dec-Apr
165----- Merritt	B	Rare-----	---	---	4.0-6.0	Apparent	Dec-Apr
170: Dospalos-----	D	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
Bolfar-----	D	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
175: Dospalos-----	D	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
Bolfar-----	D	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
180----- Dello	C	Frequent-----	Brief to long	Dec-Apr	3.0-4.0	Apparent	Dec-Apr
190----- Clear Lake	D	Occasional-----	Brief to long	Dec-Apr	3.0-6.0	Apparent	Dec-Apr
195----- Clear Lake	D	Rare-----	---	---	3.0-6.0	Apparent	Dec-Apr
200----- Veritas	B	Rare-----	---	---	>6.0	---	---
210----- Cortina	B	Rare-----	---	---	>6.0	---	---

Table 18.--Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth Ft	Kind	Months
215----- Yokut	B	None-----	---	---	>6.0	---	---
220: Xerofluvents-----	A	Occasional-----	Brief to long	Dec-Apr	>6.0	---	---
Xerorthents-----	A	Rare-----	---	---	>6.0	---	---
245: Bolfar-----	D	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
Columbia, sandy substratum-----	C	Rare-----	---	---	3.0-5.0	Apparent	Dec-Apr
246: Bolfar-----	D	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
Columbia, sandy substratum-----	C	Occasional-----	Brief to long	Dec-Apr	3.0-5.0	Apparent	Dec-Apr
252, 253: Chaqua-----	B	None-----	---	---	>6.0	---	---
Arburua-----	C	None-----	---	---	>6.0	---	---
255: Calla-----	B	None-----	---	---	>6.0	---	---
Carbona-----	D	None-----	---	---	>6.0	---	---
270, 271----- Elsalado	B	Rare-----	---	---	>6.0	---	---
272----- Elsalado	B	None-----	---	---	4.0-6.0	Apparent	Dec-Mar
273, 274----- Elsalado	B	None-----	---	---	>6.0	---	---
281----- Carbona	D	None-----	---	---	>6.0	---	---
290, 291: Carbona-----	D	None-----	---	---	>6.0	---	---
Orognen-----	D	None-----	---	---	>6.0	---	---
300, 301, 302, 303, 304- Damluis	C	None-----	---	---	>6.0	---	---
310----- Deldota	D	None-----	---	---	3.5-5.0	Perched	Dec-Mar
320----- Dosamigos	D	None-----	---	---	3.5-5.0	Perched	Dec-Mar
330----- Pedcat	D	Rare-----	---	---	3.5-5.0	Apparent	Dec-Mar
331----- Pedcat	D	None-----	---	---	3.5-5.0	Apparent	Dec-Mar

Table 18.--Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth Ft	Kind	Months
340: Carranza-----	B	None-----	---	---	>6.0	---	---
Woo-----	B	None-----	---	---	>6.0	---	---
350----- Woo	B	None-----	---	---	>6.0	---	---
400, 401: Alo-----	D	None-----	---	---	>6.0	---	---
Vaquero-----	D	None-----	---	---	>6.0	---	---
410----- Ayar	D	None-----	---	---	>6.0	---	---
420: Ayar-----	D	None-----	---	---	>6.0	---	---
Oneil-----	C	None-----	---	---	>6.0	---	---
430: Vaquero-----	D	None-----	---	---	>6.0	---	---
Carbona-----	D	None-----	---	---	>6.0	---	---
500, 501: Wisflat-----	D	None-----	---	---	>6.0	---	---
Arburua-----	C	None-----	---	---	>6.0	---	---
San Timoteo-----	B	None-----	---	---	>6.0	---	---
502: Arburua-----	C	None-----	---	---	>6.0	---	---
Wisflat-----	D	None-----	---	---	>6.0	---	---
505, 506: Arburua-----	C	None-----	---	---	>6.0	---	---
Contra Costa-----	C	None-----	---	---	>6.0	---	---
Wisflat-----	D	None-----	---	---	>6.0	---	---
510: Arburua-----	C	None-----	---	---	>6.0	---	---
Wisflat-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
520, 521: Wisflat-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
530----- Oneil	C	None-----	---	---	>6.0	---	---
540----- Oquin	C	None-----	---	---	>6.0	---	---

Table 18.--Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth Ft	Kind	Months
600, 601: Gonzaga-----	D	None-----	---	---	>6.0	---	---
Honker-----	D	None-----	---	---	>6.0	---	---
Franciscan-----	C	None-----	---	---	>6.0	---	---
610, 611: Honker-----	D	None-----	---	---	>6.0	---	---
Vallecitos-----	D	None-----	---	---	>6.0	---	---
Honker, eroded-----	D	None-----	---	---	>6.0	---	---
612: Honker-----	D	None-----	---	---	>6.0	---	---
Vallecitos-----	D	None-----	---	---	>6.0	---	---
Gonzaga-----	D	None-----	---	---	>6.0	---	---
613, 614: Honker-----	D	None-----	---	---	>6.0	---	---
Gaviota-----	D	None-----	---	---	>6.0	---	---
615: Honker-----	D	None-----	---	---	>6.0	---	---
Quinto-----	D	None-----	---	---	>6.0	---	---
620----- Franciscan	C	None-----	---	---	>6.0	---	---
625: Franciscan-----	C	None-----	---	---	>6.0	---	---
Quinto-----	D	None-----	---	---	>6.0	---	---
Honker-----	D	None-----	---	---	>6.0	---	---
630, 631: Millsholm-----	D	None-----	---	---	>6.0	---	---
Honker-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
635----- Millsholm	D	None-----	---	---	>6.0	---	---
640: Quinto-----	D	None-----	---	---	>6.0	---	---
Millsholm-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
650: Quinto-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---

Table 18.--Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth Ft	Kind	Months
660, 661----- Gaviota	D	None-----	---	---	>6.0	---	---
682: Henneke-----	D	None-----	---	---	>6.0	---	---
Hentine-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
683: Hentine-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
Henneke-----	D	None-----	---	---	>6.0	---	---
684: Hentine-----	D	None-----	---	---	>6.0	---	---
Henneke-----	D	None-----	---	---	>6.0	---	---
685: Stonyford-----	D	None-----	---	---	>6.0	---	---
Stonyford-----	D	None-----	---	---	>6.0	---	---
687: Hentine-----	D	None-----	---	---	>6.0	---	---
Henneke-----	D	None-----	---	---	>6.0	---	---
Rock outcrop-----	D	None-----	---	---	>6.0	---	---
690: Sehorn-----	D	None-----	---	---	>6.0	---	---
Contra Costa-----	C	None-----	---	---	>6.0	---	---
695----- Orogne	D	None-----	---	---	>6.0	---	---
700: Hytop-----	D	None-----	---	---	>6.0	---	---
Franciscan-----	C	None-----	---	---	>6.0	---	---
Vallecitos-----	D	None-----	---	---	>6.0	---	---

Table 19.--Soil Features

(The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Soil name and map symbol	Bedrock		Cemented pan		Risk of corrosion	
	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
	In		In			
100, 101, 102----- Capay	>60	---	---	---	High-----	Moderate.
106----- Capay	>60	---	---	---	High-----	Moderate.
110, 111----- El Solyo	>60	---	---	---	High-----	Low.
116----- El Solyo	>60	---	---	---	High-----	Low.
120: Vernalis-----	>60	---	---	---	High-----	Low.
Zacharias-----	>60	---	---	---	High-----	Low.
121, 122, 123, 125----- Vernalis	>60	---	---	---	High-----	Low.
126: Vernalis-----	>60	---	---	---	High-----	Low.
Zacharias-----	>60	---	---	---	High-----	Low.
127----- Vernalis	>60	---	---	---	High-----	Low.
130, 131----- Stomar	>60	---	---	---	High-----	Low.
140, 141, 142, 144, 145----- Zacharias	>60	---	---	---	High-----	Low.
146, 147----- Zacharias	>60	---	---	---	High-----	Low.
150----- Columbia	>60	---	---	---	Moderate-----	Low.
151: Columbia-----	>60	---	---	---	Moderate-----	Low.
Columbia, sandy substratum-----	>60	---	---	---	Moderate-----	Low.
153----- Columbia	>60	---	---	---	Moderate-----	Low.
155----- Columbia	>60	---	---	---	Moderate-----	Low.
157: Columbia-----	>60	---	---	---	Moderate-----	Low.
Columbia, sandy substratum-----	>60	---	---	---	Moderate-----	Low.

Table 19.--Soil Features--Continued

Soil name and map symbol	Bedrock		Cemented pan		Risk of corrosion	
	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
	In		In			
159: Columbia-----	>60	---	---	---	Moderate-----	Low.
Columbia, sandy substratum-----	>60	---	---	---	Moderate-----	Low.
160-----	>60	---	---	---	High-----	Low.
Merritt						
165-----	>60	---	---	---	High-----	Low.
Merritt						
170: Dospalos-----	>60	---	---	---	High-----	Moderate.
Bolfar-----	>60	---	---	---	High-----	Low.
175: Dospalos-----	>60	---	---	---	High-----	Moderate.
Bolfar-----	>60	---	---	---	High-----	Low.
180-----	>60	---	---	---	High-----	Low.
Dello						
190-----	>60	---	---	---	High-----	Moderate.
Clear Lake						
195-----	>60	---	---	---	High-----	Moderate.
Clear Lake						
200-----	>60	---	40-60	Thick	High-----	Low.
Veritas						
210-----	>60	---	---	---	Moderate-----	Moderate.
Cortina						
215-----	>60	---	---	---	High-----	Low.
Yokut						
220: Xerofluvents-----	>60	---	---	---	Moderate-----	Low.
Xerorthents-----	>60	---	---	---	Moderate-----	Low.
245: Bolfar-----	>60	---	---	---	High-----	Low.
Columbia, sandy substratum-----	>60	---	---	---	Moderate-----	Low.
246: Bolfar-----	>60	---	---	---	High-----	Low.
Columbia, sandy substratum-----	>60	---	---	---	Moderate-----	Low.
252, 253: Chaqua-----	40-60	Soft	---	---	Moderate-----	Low.
Arburua-----	20-40	Hard	---	---	High-----	Low.

Table 19.--Soil Features--Continued

Soil name and map symbol	Bedrock		Cemented pan		Risk of corrosion	
	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
	In		In			
255:						
Calla-----	>60	---	---	---	High-----	Low.
Carbona-----	>60	---	---	---	High-----	Low.
270, 271----- Elsalado	>60	---	---	---	High-----	Low.
272, 273, 274----- Elsalado	>60	---	---	---	High-----	Low.
281----- Carbona	>60	---	---	---	High-----	Low.
290, 291:						
Carbona-----	>60	---	---	---	High-----	Low.
Orogne-----	>60	---	---	---	High-----	Low.
300, 301, 302, 303, 304----- Damluis	>60	---	---	---	High-----	Low.
310----- Deldota	>60	---	---	---	High-----	Low.
320----- Dosamigos	>60	---	---	---	High-----	Low.
330----- Pedcat	>60	---	---	---	High-----	Moderate.
331----- Pedcat	>60	---	---	---	High-----	Moderate.
340:						
Carranza-----	>60	---	---	---	Moderate-----	Low.
Woo-----	>60	---	---	---	High-----	Low.
350----- Woo	>60	---	---	---	High-----	Low.
400, 401:						
Alo-----	24-40	Soft	---	---	High-----	Low.
Vaquero-----	20-40	Soft	---	---	High-----	High.
410----- Ayar	40-60	Soft	---	---	High-----	Low.
420:						
Ayar-----	40-60	Soft	---	---	High-----	Low.
Oneil-----	20-40	Hard	---	---	Moderate-----	Low.
430:						
Vaquero-----	20-40	Soft	---	---	High-----	High.
Carbona-----	>60	---	---	---	High-----	Low.
500, 501:						
Wisflat-----	10-20	Hard	---	---	High-----	Low.

Table 19.--Soil Features--Continued

Soil name and map symbol	Bedrock		Cemented pan		Risk of corrosion	
	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
	In		In			
500, 501: Arburua-----	20-40	Hard	---	---	High-----	Low.
San Timoteo-----	20-40	Soft	---	---	High-----	Low.
502: Arburua-----	20-40	Hard	---	---	High-----	Low.
Wisflat-----	10-20	Hard	---	---	High-----	Low.
505, 506: Arburua-----	20-40	Hard	---	---	High-----	Low.
Contra Costa-----	20-40	Hard	---	---	Moderate-----	Moderate.
Wisflat-----	10-20	Hard	---	---	High-----	Low.
510: Arburua-----	20-40	Hard	---	---	High-----	Low.
Wisflat-----	10-20	Hard	---	---	High-----	Low.
Rock outcrop-----	0	Hard	---	---	---	---
520, 521: Wisflat-----	10-20	Hard	---	---	High-----	Low.
Rock outcrop-----	0	Hard	---	---	---	---
530----- Oneil	20-40	Hard	---	---	Moderate-----	Low.
540----- Oquin	20-40	Soft	---	---	High-----	Low.
600, 601: Gonzaga-----	20-40	Hard	---	---	High-----	Low.
Honker-----	20-40	Hard	---	---	Moderate-----	Low.
Franciscan-----	20-40	Hard	---	---	High-----	Low.
610, 611: Honker-----	20-40	Hard	---	---	Moderate-----	Low.
Vallecitos-----	10-20	Hard	---	---	High-----	Low.
Honker, eroded-----	20-40	Hard	---	---	Moderate-----	Low.
612: Honker-----	20-40	Hard	---	---	Moderate-----	Low.
Vallecitos-----	10-20	Hard	---	---	High-----	Low.
Gonzaga-----	20-40	Hard	---	---	High-----	Low.
613, 614: Honker-----	20-40	Hard	---	---	Moderate-----	Low.
Gaviota-----	10-20	Hard	---	---	Moderate-----	Moderate.
615: Honker-----	20-40	Hard	---	---	Moderate-----	Low.

Table 19.--Soil Features--Continued

Soil name and map symbol	Bedrock		Cemented pan		Risk of corrosion	
	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
	In		In			
615: Quinto-----	10-20	Hard	---	---	Moderate-----	Low.
620----- Franciscan	20-40	Hard	---	---	Moderate-----	Low.
625: Franciscan-----	20-40	Hard	---	---	Moderate-----	Low.
Quinto-----	10-20	Hard	---	---	Moderate-----	Low.
Honker-----	20-40	Hard	---	---	Moderate-----	Low.
630, 631: Millsholm-----	10-20	Hard	---	---	Moderate-----	Moderate.
Honker-----	20-40	Hard	---	---	Moderate-----	Low.
Rock outcrop-----	0	Hard	---	---	---	---
635----- Millsholm	10-20	Hard	---	---	Moderate-----	Moderate.
640: Quinto-----	10-20	Hard	---	---	Moderate-----	Low.
Millsholm-----	10-20	Hard	---	---	Moderate-----	Moderate.
Rock outcrop-----	0	Hard	---	---	---	---
650: Quinto-----	10-20	Hard	---	---	Moderate-----	Low.
Rock outcrop-----	0	Hard	---	---	---	---
660----- Gaviota	10-20	Hard	---	---	Moderate-----	Moderate.
661----- Gaviota	10-20	Hard	---	---	Moderate-----	Moderate.
682: Henneke-----	10-20	Hard	---	---	High-----	Moderate.
Hentine-----	10-20	Hard	---	---	Moderate-----	Moderate.
Rock outcrop-----	0	Hard	---	---	---	---
683: Hentine-----	10-20	Hard	---	---	Moderate-----	Moderate.
Rock outcrop-----	0	Hard	---	---	---	---
Henneke-----	10-20	Hard	---	---	High-----	Moderate.
684: Hentine-----	10-20	Hard	---	---	Moderate-----	Moderate.
Henneke-----	10-20	Hard	---	---	High-----	Moderate.
685: Stonyford-----	10-20	Hard	---	---	Moderate-----	Moderate.

Table 19.--Soil Features--Continued

Soil name and map symbol	Bedrock		Cemented pan		Risk of corrosion	
	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
	<u>In</u>		<u>In</u>			
685: Stonyford-----	10-20	Hard	---	---	Moderate-----	Moderate.
687: Hentine-----	10-20	Hard	---	---	Moderate-----	Moderate.
Henneke-----	10-20	Hard	---	---	High-----	Moderate.
Rock outcrop-----	0	Hard	---	---	---	---
690: Sehorn-----	20-40	Hard	---	---	High-----	Low.
Contra Costa-----	20-40	Hard	---	---	Moderate-----	Moderate.
695----- Orogne	>60	---	---	---	High-----	Low.
700: Hytow-----	20-40	Soft	---	---	High-----	Low.
Franciscan-----	20-40	Hard	---	---	Moderate-----	Low.
Vallecitos-----	10-20	Hard	---	---	High-----	Low.

Table 20.--Selected Physical Laboratory Data

Soil name and sample number	Hori- zon	Depth	Particle-size distribution							Water		Bulk		COLE
			Very coarse (2.0- 1.0 mm)	Sand			Very fine (0.1- 0.05 mm)	Silt (0.25- 0.002 mm)	Clay (>0.002 mm)	retained 1/3 bar	15 bar	1/3 bar	Oven- dry	
				Coarse (1.0-0.5 mm)	Medium (0.5- 0.25 mm)	Fine (0.25- 0.1 mm)								
			Pct-----							-Pct (wt)-		-g/cc g/cc		cm/cm
Capay----- S92CA-099-005	Ap	0-11	0.1	0.3	2.4	6.5	5.9	35.3	49.5	31.0	18.8	1.34	2.03	0.148
	A	11-20	0.2	0.3	2.1	6.2	5.9	35.2	50.1	30.1	19.2	1.55	2.58	0.185
	Bss1	20-30	0.2	0.4	2.0	6.2	6.6	33.9	50.7	25.5	20.5	1.55	1.95	0.080
	Bss2	30-39	0.1	0.4	2.0	7.2	6.4	33.0	50.9	27.7	19.6	1.41	2.01	0.125
	Bk1	39-51	0.2	0.3	2.3	8.1	7.1	34.7	47.3	25.5	17.6	1.49	1.96	0.096
Elsalado----- S92CA-099-009	Bk2	51-60	0.2	0.2	2.1	8.7	7.9	35.8	45.3	26.5	16.8	1.46	1.85	0.081
	Ap	0-6	2.2	1.9	6.1	20.3	19.6	33.4	16.5	22.1	7.3	1.48	1.57	0.019
	Bw1	6-18	0.5	1.0	4.4	21.2	23.2	35.2	14.5	18.2	6.8	1.50	1.67	0.035
	Bw2	18-26	0.3	0.7	4.2	22.6	28.7	32.2	11.3	16.7	5.9	1.40	1.45	0.012
	Bk1	26-33	0.3	0.4	2.8	23.6	25.8	35.4	11.7	19.2	5.7	1.64	1.81	0.033
El Solyo----- S92CA-099-006	Bk2	33-41	0.2	0.3	3.1	20.9	25.0	38.3	12.2	16.0	5.9	1.40	1.50	0.023
	Bk3	41-48	0.3	0.6	4.1	21.9	24.5	36.0	12.6	14.9	5.7	1.39	1.54	0.034
	Bk4	48-60	0.4	0.9	5.0	24.9	28.9	29.4	10.5	16.8	5.8	1.43	1.48	0.011
	Ap	0-10	0.1	0.3	1.6	5.0	7.6	52.5	32.9		12.4			
	AB	10-17	0.3	0.3	1.2	5.2	6.2	52.5	34.3	20.9	13.3	1.64	1.90	0.050
Henneke----- S92CA-099-004	Bt	17-30	0.2	0.3	1.2	6.9	5.6	47.4	38.4	20.5	13.3	1.60	1.80	0.040
	Btk1	30-45		0.1	0.7	4.0	6.8	51.6	36.8	21.8	12.6	1.59	1.82	0.046
	Btk2	45-60	0.4	0.4	0.7	2.4	5.6	49.0	41.5	20.2	13.7	1.58	1.78	0.041
	A	0-5	4.4	8.1	8.9	11.2	10.2	33.0	24.2	24.0	15.6	1.17	1.24	0.016
	BAt	5-9	5.0	7.4	8.1	9.1	9.5	26.1	34.8	26.5	17.9	1.29	1.48	0.039
Hentine----- S92CA-099-003	Bt	9-19	7.6	5.5	4.6	5.6	5.0	16.1	55.6		28.6			
	R	19									6.7			
	A	0-4	4.3	8.8	10.7	12.4	11.7	28.4	23.7	37.1	20.2	1.05	1.15	0.028
	Bt1	4-11	4.6	9.2	10.6	11.5	8.8	24.9	30.4	44.4	21.4	0.92	0.98	0.012
	Bt2	11-18	11.8	15.7	13.3	11.2	5.7	12.7	29.6	35.0	23.2	1.07	1.19	0.013
Vernalis----- S92CA-099-002	R	17									23.6			
	Ap	0-10	0.2	0.6	4.3	13.3	12.7	38.9	30.0	18.0	11.5	1.63	2.11	0.090
	A	10-20		0.3	4.1	12.6	13.8	39.3	29.9	17.0	13.2	1.47	1.70	0.050
	Bt	20-34	0.1	0.4	3.7	11.9	14.3	44.7	24.9	20.0	11.6	1.47	1.52	0.011
	Btk1	34-46	0.2	0.6	4.7	11.3	14.1	45.0	24.1	19.7	11.0	1.40	1.48	0.019
Zacharias----- S92CA-099-001	Btk2	46-62	0.1	0.6	3.9	10.3	13.8	46.8	24.5	20.2	11.0	1.40	1.57	0.039
	Ap	0-7	0.5	1.5	9.6	17.4	15.3	27.0	28.7		11.2			
	A	7-14	0.8	1.8	9.3	18.3	13.9	26.8	29.1	15.5	11.8	1.78	1.97	0.034
	Bt1	14-29	0.7	1.9	11.8	21.4	15.9	25.0	23.3	15.0	9.6	1.68	1.78	0.019
	Bt2	29-39	1.1	2.3	15.2	23.2	15.9	20.7	21.6	16.3	9.3	1.61	1.85	0.046
Zacharias----- S92CA-099-001	Bt3	39-50	0.5	1.0	7.5	17.7	24.9	29.7	18.7	14.0	8.5	1.52	1.62	0.021
	Bt4	50-66	0.1	0.3	3.2	11.3	13.3	43.8	28.0	17.1	10.1	1.64	1.81	0.033

Table 21.--Selected Chemical Laboratory Data

Soil name and sample number	Hori- zon	Depth	Organic carbon	pH							Water extracted from saturated paste				NH4OC extractable cations					CEC											
				Sat. paste (1:2)	[CaCl2 (1:1)]	H2O (1:1)	Ca	Mg	Na	K	Electri- cal conduct- ivity	Ca	Mg	Na	K	Sum of bases	Acid- ity														
																		-----Meq/l-----							dS/m	-----Meq/100 g-----					
																		In	Pct												
Capay----- S92CA-099-005	Ap	0-11	0.88	6.6	6.6	6.9	5.0	3.2	4.6	0.3	1.35	21.8	12.1	14.6	1.2	49.7	2.5	35.7													
	A	11-20	0.81	6.7	6.7	7.2	2.1	1.3	3.2	0.1	0.74	21.8	11.4	1.3	0.9	35.4	2.2	36.1													
	Bss1	20-30	0.73	6.6	6.6	7.0	2.1	1.2	3.6	0.2	0.76	21.3	11.8	1.5	1.0	35.6	2.9	35.6													
	Bss2	30-39	0.58	6.9	6.8	7.3	2.2	1.2	3.3	0.2	0.74	22.0	11.4	1.4	0.8	35.6	1.7	36.0													
	Bk1	39-51	0.43	7.8	7.8	8.2	2.7	1.3	3.4	0.1	0.80	35.2	10.9	1.3	0.6	48.0		35.3													
	Bk2	51-60	0.29	7.7	7.9	8.3	2.7	1.2	3.2	0.1	0.76	39.3	9.5	1.3	0.5	50.6		33.1													
Elsalado----- S92CA-099-009	Ap	0-6	0.75	7.4	7.5	7.7	17.2	14.3	13.7	0.8	4.13	11.3	6.0	1.1	0.4	18.8	0.1	14.0													
	Bw1	6-18	0.41	7.9	7.9	8.4	3.6	2.4	5.7	0.2	1.16	29.2	5.1	0.9	0.3	35.5		13.2													
	Bw2	18-26	0.26	8.1	7.9	8.5	2.9	1.8	5.3	0.2	1.04	35.8	5.0	1.0		41.9		11.7													
	Bk1	26-33	0.24	8.1	8.0	8.6	2.9	2.0	6.5	0.2	1.18	33.7	5.6	1.1	0.2	40.6		11.9													
	Bk2	33-41	0.22	8.1	8.0	8.6	3.4	2.6	8.6	0.4	1.51	34.5	5.9	1.2	0.1	41.7		11.7													
	Bk3	41-48	0.23	8.1	8.1	8.6	3.3	2.7	9.7	0.3	1.61	31.5	6.9	1.5	0.2	40.1		11.6													
	Bk4	48-60	0.22	8.1	8.1	8.5	4.4	3.6	11.1	0.2	1.88	35.1	5.5	1.1	0.2	41.9		11.9													
El Solyo----- S92CA-099-006	Ap	0-10	1.33	7.8	7.6	7.9	9.3	5.2	11.2	0.4	2.41	16.9	6.4	2.1	0.8	26.2		21.1													
	AB	10-17	0.94	7.9	7.8	8.8	3.4	1.9	7.0	0.2	1.22	16.2	6.4	1.8	0.5	24.9	0.4	21.3													
	Bt	17-30	0.40	7.9	7.9	8.3	5.8	3.2	16.4	0.1	2.32	20.8	7.9	3.6	0.4	32.7	0.6	25.2													
	Btk1	30-45	0.28	7.8	7.9	8.2	9.9	5.0	20.6	0.1	3.12	31.1	6.6	4.0	0.3	42.0		21.8													
	Btk2	45-60	0.20	7.8	7.9	8.1	10.4	5.1	19.9		3.17	25.3	6.5	4.0	0.3	36.1	0.1	22.0													
Henneke----- S92CA-099-004	A	0-5	3.61		6.3	7.0						11.0	16.6	0.1	0.6	28.3	6.2	29.2													
	BAt	5-9	1.28		6.5	7.2						5.5	21.4		0.5	27.4	4.7	28.1													
	Bt	9-19	0.97		6.5	7.3						4.9	42.7	0.1	0.5	48.2	5.2	49.1													
	R	19			8.5	9.0																									
Hentine----- S92CA-099-003	A	0-4	2.84		6.5	7.1						8.6	16.8	0.1	0.7	26.2	6.3	25.7													
	Bt1	4-11	1.47		6.7	7.5						6.9	19.0	0.1	0.4	26.4	4.8	27.5													
	Bt2	11-18	0.73		6.8	7.5						3.9	22.7	0.1	0.3	27.0	3.0	26.4													
	R	18			6.8	7.5																									
Vernalis----- S92CA-099-002	Ap	0-10	0.64	7.3	7.0	7.4	5.6	3.8	4.3	0.4	1.31	15.3	7.8	0.8	0.7	24.6	1.6	23.8													
	A	10-20	0.55	7.0	6.8	7.4	3.0	1.9	4.2	0.2	0.92	15.5	7.7	1.1	0.4	24.7	3.0	24.2													
	Bt	20-34	0.31	7.5	7.5	7.8	8.2	4.6	6.2	0.1	1.71	19.1	7.4	1.1	0.3	27.9	1.2	23.9													
	Btk1	34-46	0.20	7.8	7.8	8.1	10.8	3.6	5.3	0.1	1.83	38.5	5.3	0.9	0.2	44.9		22.3													
	Btk2	46-62	0.21	7.8	7.8	8.2	8.3	2.6	4.6	0.1	1.51	43.6	4.9	0.8	0.4	49.7		22.1													
Zacharias----- S92CA-099-001	Ap	0-7	0.96	6.9	6.6	6.9	8.0	5.9	8.3	0.2	2.04	13.8	7.2	1.3	0.4	22.7	2.3	22.1													
	A	7-14	0.45	6.7	6.5	7.1	2.3	1.5	3.9	0.1	0.80	13.6	7.2	1.0	0.3	22.1	1.7	22.1													
	Bt1	14-29	0.18		6.7	7.5						11.5	6.3	0.9	0.1	18.8	1.8	19.2													
	Bt2	29-39	0.11		6.9	7.7						11.2	6.4	0.9	0.2	18.7	0.9	18.4													
	Bt3	39-50	0.10		7.0	7.9						11.7	6.5	1.1	0.2	19.5	2.0	19.1													
	Bt4	50-66	0.06	7.4	7.3	8.0	2.5	1.7	7.9	0.1	1.25	13.8	9.7	2.3	0.2	26.0	2.0	23.5													

Table 22.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Alo-----	Fine, smectitic, thermic Aridic Haploxererts
Arburua-----	Fine-loamy, mixed, superactive, calcareous, thermic Typic Xerorthents
Ayar-----	Fine, smectitic, thermic Typic Haploxererts
Bolfar-----	Fine-loamy, mixed, superactive, calcareous, thermic Cumulic Endoaquolls
Calla-----	Fine-loamy, mixed, superactive, thermic Typic Calcixercepts
Capay-----	Fine, smectitic, thermic Typic Haploxererts
Carbona-----	Fine, smectitic, thermic Vertic Haploxerolls
Carranza-----	Fine-loamy, mixed, superactive, thermic Pachic Haploxerolls
Chaqua-----	Fine-loamy, mixed, superactive, thermic Typic Calcixercepts
Clear Lake-----	Fine, smectitic, thermic Xeric Endoaquerts
Columbia-----	Coarse-loamy, mixed, superactive, nonacid, thermic Oxyaquic Xerofluvents
Contra Costa-----	Fine, mixed, superactive, thermic Mollic Haploxeralfs
Cortina-----	Loamy-skeletal, mixed, superactive, nonacid, thermic Typic Xerofluvents
Damluis-----	Fine, smectitic, thermic Calcic Pachic Argixerolls
Deldota-----	Fine, smectitic, thermic Vertic Haploxerolls
Dello-----	Mixed, thermic Typic Psammaquents
Dosamigos-----	Fine, smectitic, thermic Aquic Haploxerolls
Dospalos-----	Fine, smectitic, calcareous, thermic Vertic Endoaquolls
El Solyo-----	Fine, mixed, superactive, thermic Calcic Haploxerepts
Elsalado-----	Coarse-loamy, mixed, superactive, calcareous, thermic Fluventic Haploxerepts
Franciscan-----	Fine-loamy, mixed, superactive, thermic Typic Argixerolls
Gaviota-----	Loamy, mixed, superactive, nonacid, thermic Lithic Xerorthents
Gonzaga-----	Fine, mixed, superactive, thermic Typic Palexerolls
Henneke-----	Clayey-skeletal, magnesian, thermic Lithic Argixerolls
Hentine-----	Loamy-skeletal, magnesian, thermic Lithic Argixerolls
Honker-----	Fine, mixed, superactive, thermic Mollic Palexeralfs
Hytow-----	Fine, mixed, superactive, thermic Typic Palexeralfs
Merritt-----	Fine-silty, mixed, superactive, thermic Fluvaquentic Haploxerolls
Millsholm-----	Loamy, mixed, superactive, thermic Lithic Haploxerepts
Oneil-----	Fine-silty, mixed, superactive, thermic Calcic Haploxerolls
Oquin-----	Coarse-loamy, mixed, superactive, thermic Calcic Haploxerolls
Orognen-----	Fine, mixed, superactive, thermic Typic Palexeralfs
*Orognen-----	Fine, mixed, superactive, thermic Mollic Palexeralfs
Pedcat-----	Fine, mixed, superactive, thermic Aquic Natrixeralfs
Quinto-----	Loamy, mixed, superactive, thermic Lithic Mollic Haploxeralfs
San Timoteo-----	Coarse-loamy, mixed, superactive, calcareous, thermic Typic Xerorthents
Sehorn-----	Fine, smectitic, thermic Aridic Haploxererts
Stomar-----	Fine, smectitic, thermic Mollic Haploxeralfs
Stonyford-----	Loamy, mixed, superactive, thermic Lithic Haploxeralfs
Vallecitos-----	Clayey, smectitic, thermic Lithic Ruptic-Xerochreptic Haploxeralfs
Vaquero-----	Fine, smectitic, thermic Aridic Haploxererts
Veritas-----	Coarse-loamy, mixed, superactive, thermic Typic Haploxerolls
Vernalis-----	Fine-loamy, mixed, superactive, thermic Calcic Haploxerepts
Wisflat-----	Loamy, mixed, superactive, calcareous, thermic Lithic Xerorthents
Woo-----	Fine-loamy, mixed, thermic Calcic Haploxerolls
Xerofluvents-----	Xerofluvents
Xerorthents-----	Xerorthents
Yokut-----	Loamy-skeletal, mixed, superactive, thermic Typic Haploxeralfs
Zacharias-----	Fine-loamy, mixed, superactive, thermic Typic Haploxerepts



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