United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Colorado State
University and the
Colorado Agricultural
Experiment Station

Soil Survey of Boulder County Area, Colorado

How To Use This Soil Survey

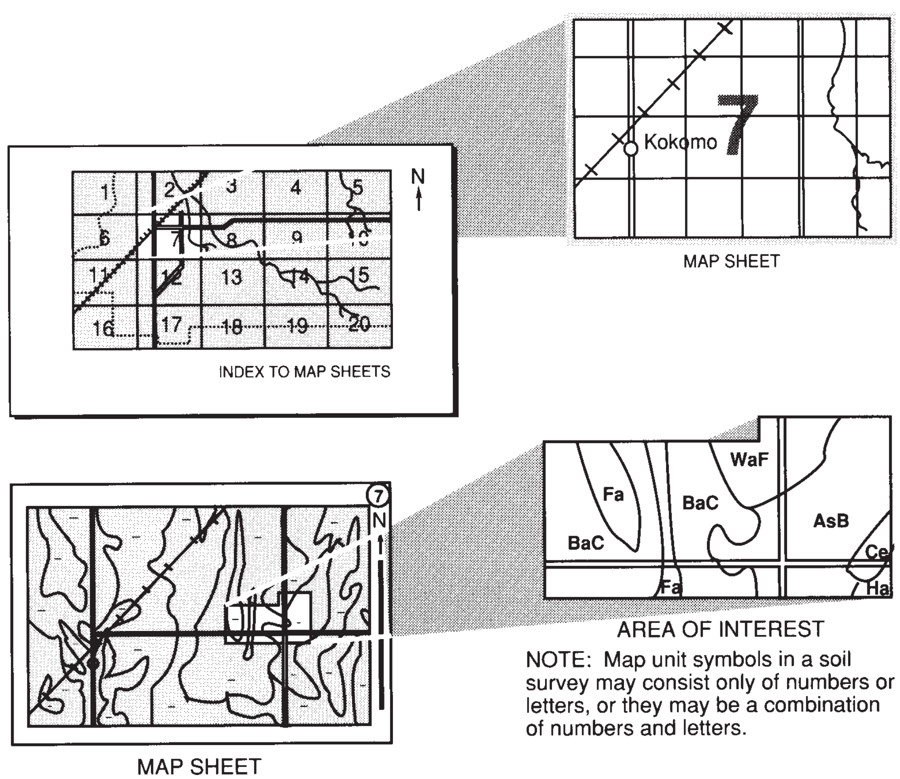
Detailed Soil Maps

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

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

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

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



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

Major fieldwork for this soil survey was done in the period 1960-1967. Soil names and descriptions were approved in 1971. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1971. The original report was published in 1975.

At the request of our Conservation Partners, NRCS staff have enhanced and modernized the original soil survey product. The data tables are new, and the statistical and general information about the survey area have been updated. New color illustrations have also been included. Use the NRCS's Web Soil Survey at http://websoilsurvey.nrcs.usda.gov/app/ for the most current soils information for this or any county.

This survey was made cooperatively by the Natural Resources Conservation Service and the Colorado Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Longmont and Boulder Valley Soil Conservation District.

Cover: A view of Longs Peak with Twin Sisters Peak to the right.

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Issued 2008

Foreword

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

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

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

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

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

Allen Green
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Boulder County Area, Colorado

By Donald C. Moreland and Ronald E. Moreland, Natural Resources Conservation Service

United States Department Of Agriculture, Natural Resources Conservation Service,
in cooperation with the Colorado Agricultural Experiment Station

Boulder County Area is in north-central Colorado. It makes up the eastern part of Boulder County and is about 241,920 acres in size *(Fig. 1).* The eastern part of the survey area is rolling plains and valleys, and most of the acreage is irrigated cropland. The principal crops grown are barley, corn, sugar beets, dry beans, and wheat. Boulder County is second in the state in the number of dairy operations (City of Longmont). Cattle feeding is an important enterprise in this part of the survey area. The western part of the survey area is foothills and mountains. In the past, the acreage has been used for grazing livestock. In recent years, however, much of the survey area has been used for urban and industrial development, and for recreational uses.

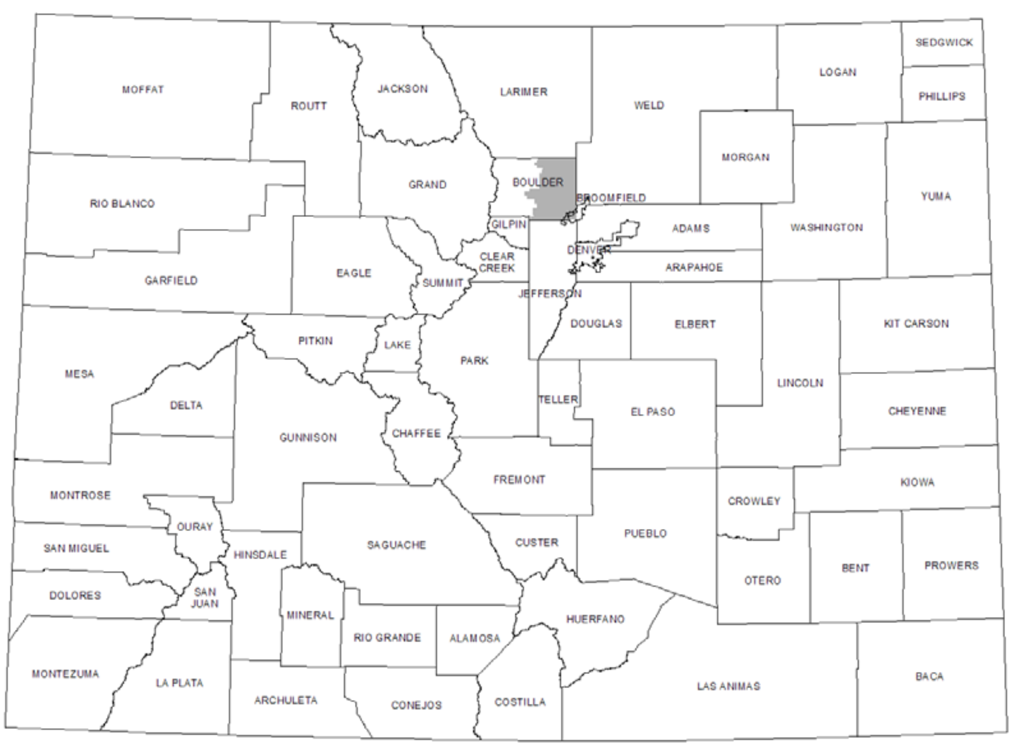

Figure 1.—Location of Boulder County Area in Colorado.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in the Boulder County Area, where they are located, and how they can be used. They observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A *profile* is the sequence of natural layers, or horizons, in a soil; it extends from the surface down to the rock material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. The *soil series* and *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Weld and Nunn, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in natural characteristics.

Soils of one series can differ in texture of their surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Weld loam, 0 to 1 percent slopes, is one of several phases within the Weld series, which in this survey area has a slope range of 0 to 4 percent.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries on aerial photographs. They used photos for their base map because they show woodlands, buildings, field borders, trees, and similar detail that greatly help in drawing boundaries accurately. The soil maps of this survey were prepared from the aerial photographs.

The areas shown on a soil map are called *mapping units.* On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series or of different phases within one series. Two such kinds of mapping units are shown on the map of the Boulder County Area: soil complexes and soil associations.

A *soil complex* consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils joined by a hyphen, for example, Weld-Colby complex, 0 to 3 percent slopes.

An *association* is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map, but are shown instead as one unit because the time and effort needed for mapping them separately cannot be justified. In the Boulder County Area soil survey for example, there is the Colby-Gaynor association.

In most areas surveyed, there are places so rocky, so shallow, or so frequently worked by wind and water that they cannot be classified as soil series. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Rock outcrop or Terrace escarpments, and are called land types rather than soil series.

Only part of the soil survey is done when the soil scientist has named and described the soil series and mapping units, and has shown the location of the mapping units on the soil map. The mass of detailed information he has recorded then needs to be presented in different ways for different groups of users, among them farmers, managers of woodlands, and engineers. To do this efficiently, he consults persons in other fields of work and jointly prepares with them groupings of practical value to different users. Such groupings are the capability classes, subclasses, and units, designed primarily for those interested in producing the short-lived crops and tame pasture; tree suitability groups, for those who need to manage wooded tracts; and the classifications used by engineers who build highways or structures to conserve soil and water.

General Nature of the Area

The Boulder County Area is located along the east flank of the Colorado Front Range in the north-central part of the State. The eastern part of the survey area is within the Colorado Piedmont section of the Great Plains physiographic province, and the western part lies within the Front Range section of the Southern Rocky Mountain province. The elevation of the survey area ranges from about 4,900 feet along the eastern edge, to about 8,200 feet in the southwestern part.

Tributaries of the South Platte River drain the survey area. The major tributaries are the St. Vrain, Left Hand, Boulder, and Coal Creeks. These streams originate in the mountainous part of the survey area and flow through it in an easterly or northeasterly direction.

The principal towns in the survey area are Boulder, Longmont, and Broomfield. When this survey was first published, the most recent data showed that Boulder in 1970 had a population of 66,870; Longmont, 23,200; and Broomfield, 7,261. Census information from 2000 reveals the population growth of the survey area: Boulder, 94,673; Longmont, 71,093; and Broomfield, 38,272 (Dept. of Labor, 2000.) Smaller towns in the survey area include Lafayette, Louisville, and Lyons.

Geology

Alex D. Elkin, geologist, Soil Conservation Service, assisted in the preparation of this section.

The most outstanding physiographic feature of the Boulder County Area is the abrupt wall-like mountain front forming the boundary between the Front Range and the Piedmont area.

The narrow foothills area along the western margins of the Piedmont is characterized by a series of folded and faulted sedimentary strata, the more resistant beds of which form prominent hogback ridges.

The foothills area at the base of the mountain front is characterized by numerous broad, gently sloping interstream surfaces that stand at various step-like levels above modern stream valleys. The high-level geomorphic surfaces usually occur as fan-shaped pediments mantled by coarse alluvial deposits. These deposits lie on erosion surfaces that truncate the titled strata of the foothills belt. Below these pediment surfaces, the modern streams generally occupy relatively wide and flat-floored valleys.

Geological formations ranging from Precambrian to Recent in age occur within the survey area. They consist of Precambrian metamorphic and igneous rocks; sedimentary rocks of Paleozoic and Mesozoic age; a few small bodies of igneous intrusive rock of Tertiary age; and unconsolidated surficial deposits of Quaternary (Pleiocene and Recent) age. The geologic formations present also include Boulder Creek and Silver Plume Granite of Precambrian age.

The most extensive sedimentary formations in the survey area are the Pierre Shale, the Fox Hills Sandstone, and the Laramie Formation. The Pierre Shale crops out just to the east of the foothills area and throughout the northeastern part of the Boulder County Area. The Fox Hills Sandstone and the Laramie Formation crop out in the southeastern part of Boulder County.

Sedimentary formations that are older than the Pierre Shale consist of a series of sandstone and shale beds, the sandstone predominating. These formations crop out mainly as a series of hogback ridges in the relatively narrow foothills area along the mountain front. They include the Fountain Formation, Lyons Sandstone, Lykins Formation, Ralston Creek Formation, Morrison Formation, Dakota Group, Benton Shale, and Niobrara Formation.

The Quaternary deposits in the Boulder County Area are of four principal kinds: alluvium, slope-wash colluvium, eolian silt and sand, and talus and landslide deposits. These surface deposits were laid down during several geomorphic cycles that consisted of downward stream cutting, deposition of alluvium, erosion and deposition by wind, and soil development.

Climate

Prepared from material by J. W. Berry, State Climatologist, National Weather Service; and with data from the National Climate Center.

The Boulder County Area has a mountain climate in the western part and a high plains, continental climate in the eastern part. Variations in temperature are wide. The average annual temperature in the mountainous part of the survey area is lower than in the high plains, and the temperature tends to increase from east to west in the plains part. Average annual precipitation also increases from east to west: in the eastern part of the Boulder County Area, rainfall is light and humidity is low.

Temperature and precipitation data for the mountainous part of the survey area are not available. It can be said, however, that the differences in altitude and exposure create great variations in both temperature and precipitation. In general, temperatures are cooler at higher elevations, and northern exposures are cooler than southern exposures. The average frost-free period ranges from 90 to 110 days, and therefore, much of the mountainous part of the Boulder County Area does not have a growing season of sufficient length to allow for crop maturation. Annual precipitation ranges from about 18 to 24 inches and increases with elevation. A large proportion of the precipitation is likely to be snow at higher elevations.

In the eastern part of the survey area, the climate is modified considerably from that expected of a typical high plains climate because of the nearby mountains in the west. The winds characteristic of the plains are reduced somewhat by the shielding effect of the mountains. There are areas near the mouths of large canyons, however, that are subject to occasional damaging winds. At many times these winds are only local in origin, but they are strong enough to cause damage to buildings, structures, and farmlands. They usually occur in the winter and spring months, and velocities up to and exceeding 100 miles per hour have been reported at Rocky Flats south of Boulder.

Following is a brief discussion of the temperature and precipitation data for the eastern high plains part of the Boulder County Area.

Precipitation.—Precipitation at Longmont and Boulder is shown graphically *(Figs. 2 and 3)*.

Average annual precipitation at Longmont is 14.99 inches; at Boulder, it measures 19.89 inches. Relative humidity is about 30 to 35 percent in the summer months, and about 40 to 50 percent in the winter months. Ordinarily, early morning humidity ranges from 55 to 60 percent in the summer, and from 60 to 70 percent in the winter.

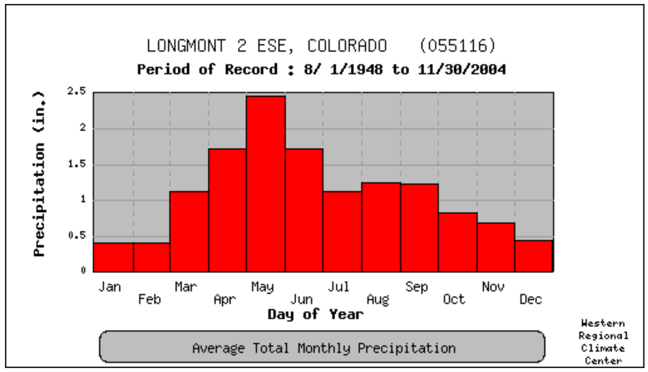

Figure 2.— Average total monthly precipitation at Longmont from 1948-2004.

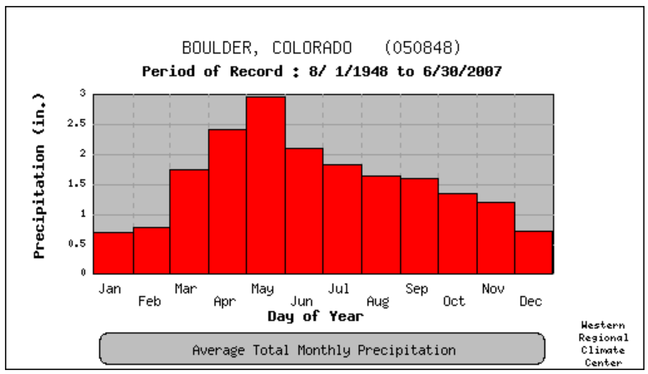

Figure 3.—Average total monthly precipitation at Boulder from 1948-2007.

Periods of drought are frequent, particularly in the eastern part of the survey area. These periods usually occur in fall and winter months. In the summer months, thunderstorm activity originating in or near the mountains is frequent and at times severe, but in general, the storms are less severe than in the eastern part of the survey area.

Temperature.—Winter temperatures are modified by the frequent occurrence of warm downslope winds from the west. The average January temperature in Longmont is 27°F; and in Boulder it is 32.1°F.

In Longmont, the summer temperature reaches 103°F about 2 years in 10; and in Boulder, 99°F about 2 years in 10. The average July temperature at Boulder is 71.9°F, and at Longmont it is 72.1°F. These temperatures are accompanied by low humidity and therefore are more comfortable than might be expected. Also, high daytime temperatures are followed by cool evenings and by nighttime temperatures that usually are below 60°F.

The length of the growing season in Longmont is 120 days and in Boulder it is 128 days. At Longmont, the earliest date of the first killing frost in fall is September 14; at Boulder it is September 18. The latest date of the last killing frost in spring is May 17 at Longmont, and May 13 at Boulder.

Farming

In 1954 the average size farm in the Boulder County Area was about 220 acres; in 1959 it was 320 acres; and in 1964 it was 370 acres. This increase reflected a trend to larger-size farms, and was partly due to mechanization and an increasing ability to use both machinery and time effectively.

However, the average size of farms in Boulder County has fluctuated from 207 acres in 1987, to 211 acres in 1992, to 195 acres in 1997, to 146 acres in 2002. This trend is partly due to rising land prices (2002 Census of Agriculture, USDA).

The irrigated farmland of the survey area is capable of supporting a wide variety of crops. About half the farmland is used for crops; mainly corn, alfalfa, barley, oats, and dry beans and peas. About 35% of the farmland in the survey area is used for pasture grasses (2002 Census of Agriculture, USDA). Vegetable crops such as cabbage, peppers, onions, red beets, pumpkins, cucumbers, and peas are well adapted to the soils of the survey area and are grown on limited acreages.

Most of the corn grown in the survey area is used for silage at the local commercial feedlots, farm feedlots, and dairies. Fresh vegetables find ready markets both locally and in the Denver metropolitan area. Most of the fresh produce is processed at canning factories in nearby locations, and there are facilities for processing meat and dairy products locally as well as in Denver.

A small grain-summer fallow rotation is the main system of farming on the nonirrigated soils. Summer fallowing is necessary to store enough moisture for sustained high yields.

There also are some areas of native grasses that are used for grazing. Cattle have been the main type of livestock on range areas. Increasing numbers of pleasure horses also graze these areas. In addition to cattle and horses, there also are significant numbers of sheep, hogs, and turkeys that use the feed crops of the survey area.

Public Facilities

Transportation facilities.—The Boulder County Area is served by the Burlington Northern Santa Fe Railway. Amtrak passenger train service travels through Boulder County, but does not have a stop; nearby Denver is the passenger rail hub for the area. Parts of Boulder County, including Longmont, currently are served by the RTD light rail and bus systems. U.S. Highway No. 287 traverses the survey area from north to south, and there are several access points to Interstate Highway No. 25, which is a few miles east of the survey area. In addition, there are many miles of well-graded graveled or hard-surfaced county roads and State highways through the survey area, including US 36, a four-lane divided highway between Boulder and Denver. The municipal airports at Boulder and Longmont are capable of handling small- and medium-sized aircraft.

Educational facilities.—Several schools, colleges, and universities are in the Boulder County survey area or within easy driving distance. The University of Colorado is located primarily at Boulder. Colorado State University is at Fort Collins, and the University of Northern Colorado is at Greeley. The University of Denver, Metropolitan State College, and Regis University are located in Denver, and all are within a 50-mile radius of the survey area. There also are several vocational schools nearby.

Trends in soil use

The Boulder County Area is rapidly changing from an intensively farmed irrigated area to an urban area of housing and light industry. Some of the reasons for this change are availability of employment, presence of educational facilities, favorable climate, and proximity to opportunities for summer and winter recreation. Regardless of reasons for this change, there has been increasing demand for soil, water, and other natural resources, and this trend is likely to continue.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Colby silty clay loam, wet, 0 to 3 percent slopes, is a phase of the Colby series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Ascalon-Otero complex, 3 to 5 percent slopes, is an example.

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

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

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The *Glossary* defines many of the terms used in describing the soils or miscellaneous areas.

AcA-Ascalon sandy loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.7 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy

Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 1
Land capability subclass (nonirrigated): 3c

Typical Profile:
0 to 11 inches; sandy loam
11 to 19 inches; sandy clay loam, sandy loam
19 to 60 inches; fine sandy loam, loamy fine sand, sandy loam

Minor Components
Kim and similar soils
Composition: About 6 percent

Otero and similar soils
Composition: About 3 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

AcB-Ascalon sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.7 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy

Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 8 inches; sandy loam
8 to 19 inches; sandy clay loam, sandy loam
19 to 60 inches; sandy loam, fine sandy loam, loamy fine sand

Minor Components
Otero and similar soils
Composition: About 9 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

AcC-Ascalon sandy loam, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.7 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 8 inches; sandy loam
8 to 19 inches; sandy clay loam, sandy loam
19 to 60 inches; fine sandy loam, loamy fine sand, sandy loam

Minor Components
Otero and similar soils
Composition: About 7 percent

Kim and similar soils
Composition: About 2 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

AcD-Ascalon sandy loam, 5 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 5 to 9 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.6 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 5 inches; sandy loam
5 to 16 inches; sandy loam, sandy clay loam
16 to 60 inches; sandy loam, fine sandy loam, loamy fine sand

Minor Components
Olney and similar soils
Composition: About 10 percent

Terry and similar soils
Composition: About 5 percent

Otero and similar soils
Composition: About 4 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

AoB-Ascalon-Otero complex, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Ascalon and similar soils: 60 percent
Otero and similar soils: 30 percent
Minor components: 10 percent

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.6 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush

Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; sandy loam
6 to 18 inches; sandy clay loam, sandy loam
18 to 60 inches; fine sandy loam, loamy fine sand, sandy loam

Otero soils
Landscape: Uplands
Landform: Hills, terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 0 to 3 percent
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.9 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 5 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3c

Typical Profile:
0 to 17 inches; sandy loam
17 to 60 inches; sandy loam, fine sandy loam

Minor Components
Manter and similar soils
Composition: About 5 percent

Kim and similar soils
Composition: About 4 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

AoC-Ascalon-Otero complex, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Ascalon and similar soils: 55 percent
Otero and similar soils: 35 percent
Minor components: 10 percent

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces, ridges
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.6 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 5 inches; sandy loam
5 to 16 inches; sandy clay loam, sandy loam
16 to 60 inches; fine sandy loam, sandy loam, loamy fine sand

Otero soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium over eolian deposits
Slope: 3 to 5 percent
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 5 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3c

Typical Profile:
0 to 10 inches; sandy loam
10 to 60 inches; sandy loam, fine sandy loam

Minor Components
Kim and similar soils
Composition: About 7 percent

Weld and similar soils
Composition: About 2 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

AoD-Ascalon-Otero complex, 5 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Ascalon and similar soils: 50 percent
Otero and similar soils: 35 percent
Minor components: 15 percent

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 5 to 7 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.6 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 6 inches; sandy loam
6 to 17 inches; sandy clay loam, sandy loam
17 to 60 inches; sandy loam, fine sandy loam, loamy fine sand

Otero soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium over eolian deposits
Slope: 5 to 9 percent
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 5 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 8 inches; sandy loam
8 to 60 inches; sandy loam, fine sandy loam

Minor Components
Kim and similar soils
Composition: About 8 percent

Terry and similar soils
Composition: About 5 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

Cascajo and similar soils
Composition: About 1 percent

AoE-Ascalon-Otero complex, 9 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Ascalon and similar soils: 45 percent
Otero and similar soils: 35 percent
Minor components: 20 percent

Component Descriptions

Ascalon soils
Landscape: Uplands
Landform: Terraces
Parent material: Mixed loamy alluvium and/or eolian deposits
Slope: 9 to 12 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 6.6 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 6 inches; sandy loam
6 to 16 inches; sandy loam, sandy clay loam
16 to 60 inches; fine sandy loam, loamy fine sand, sandy loam

Otero soils
Landscape: Uplands
Landform: Terraces
Slope: 12 to 20 percent
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 7.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 5 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: prairie sandreed, big bluestem, blue grama, sand bluestem, little bluestem, western sandcherry, needleandthread, sideoats grama, sand sagebrush
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 12 inches; sandy loam
12 to 60 inches; sandy loam, fine sandy loam

Minor Components

Kim and similar soils
Composition: About 10 percent

Terry and similar soils
Composition: About 5 percent

Cascajo and similar soils
Composition: About 4 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

BaF-Baller stony sandy loam, 9 to 35 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 5500 to 6500 feet (1676 to 1981 meters)
Mean annual precipitation: 16 to 20 inches (406 to 508 millimeters)
Mean annual air temperature: 47 to 51 degrees F. (8.3 to 10.5 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Baller soils

Landscape: Uplands
Landform: Ridges
Parent material: Loamy residuum weathered from sandstone
Slope: 9 to 35 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shallow Foothill
Potential native vegetation: big bluestem, Griffith wheatgrass, little bluestem, switchgrass, yellow Indiangrass, Rocky Mountain juniper, mountain mahogany, ponderosa pine, sideoats grama, twoneedle pinyon, blue grama, needleandthread
Land capability subclass (nonirrigated): 7s

Typical Profile:
0 to 10 inches; very stony sandy loam
10 to 15 inches; very stony sandy loam, very stony fine sandy loam
15 to 19 inches; unweathered bedrock

Minor Components
Rock outcrop and similar soils
Composition: About 10 percent

Paoli and similar soils
Composition: About 2 percent

Hargreave and similar soils
Composition: About 2 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

BP-Borrow pits

Map Unit Setting

Major Land Resource Area: 49

Map Unit Composition

Borrow pits: 95 percent
Minor components: 5 percent

Component Descriptions

Borrow pits
Description: These areas consist of excavated areas that were used for sources of materials such as roadfill, gravel, topsoil, and sand.
Runoff class: Negligible

CaA-Calkins sandy loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Calkins soils
Landform: Flood plains
Parent material: Loamy alluvium
Slope: 0 to 1 percent

Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.1 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 24 to 36 inches
Runoff class: Very low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy Bottomland
Potential native vegetation: sand bluestem, prairie sandreed, switchgrass, yellow Indiangrass, blue grama, western sandcherry, western wheatgrass, sun sedge
Land capability subclass (irrigated): 2w
Land capability subclass (nonirrigated): 3w

Typical Profile:
0 to 14 inches; sandy loam
14 to 60 inches; sandy loam

Minor Components
McClave and similar soils
Composition: About 6 percent

Valmont and similar soils
Composition: About 4 percent

CaB-Calkins sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Calkins soils
Landform: Flood plains
Parent material: Loamy alluvium
Slope: 1 to 3 percent
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 7.1 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 24 to 36 inches
Runoff class: Low

Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy Bottomland
Potential native vegetation: sand bluestem, prairie sandreed, switchgrass, yellow Indiangrass, blue grama, western sandcherry, western wheatgrass, sun sedge
Land capability subclass (irrigated): 3w
Land capability subclass (nonirrigated): 3w

Typical Profile:
0 to 14 inches; sandy loam
14 to 60 inches; sandy loam

Minor Components
McClave and similar soils
Composition: About 6 percent

Valmont and similar soils
Composition: About 6 percent

Nunn and similar soils
Composition: About 3 percent

CoB-Colby silty clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Colby soils
Landscape: Uplands
Landform: Upland slopes
Parent material: Uniform eolian deposits
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains

Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat, needleandthread
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 12 inches; silty clay loam
12 to 43 inches; silty clay loam
43 to 60 inches; clay loam

Minor Components
Weld and similar soils
Composition: About 5 percent

Gaynor and similar soils
Composition: About 3 percent

Aquic Haplustolls and similar soils
Composition: About 2 percent
Landform: Swales

CoC-Colby silty clay loam, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Colby soils
Landscape: Uplands
Landform: Upland slopes
Parent material: Uniform eolian deposits
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat, needleandthread

Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
  0 to 12 inches; silty clay loam
  12 to 43 inches; silty clay loam
  43 to 60 inches; clay loam

Minor Components
Weld and similar soils
  Composition: About 5 percent

Gaynor and similar soils
  Composition: About 4 percent

Aquic Haplustolls and similar soils
  Composition: About 1 percent
  Landform: Swales

CoD-Colby silty clay loam, 5 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Colby soils
Landscape: Uplands
Landform: Upland slopes
Parent material: Uniform eolian deposits
Slope: 5 to 9 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Slopes
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat, needleandthread
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 12 inches; silty clay loam
12 to 43 inches; silty clay loam
43 to 60 inches; clay loam

Minor Components
Gaynor and similar soils
Composition: About 8 percent

Renohill and similar soils
Composition: About 7 percent

Wiley and similar soils
Composition: About 5 percent

CsB-Colby silty clay loam, wet, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Colby soils
Landscape: Uplands
Landform: Valleys
Parent material: Uniform eolian deposits
Slope: 0 to 3 percent
Drainage class: Moderately well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Seasonal high water table depth: About 24 to 48 inches
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat, needleandthread
Land capability subclass (irrigated): 2w
Land capability subclass (nonirrigated): 3c

Typical Profile:
0 to 12 inches; silty clay loam
12 to 40 inches; clay loam, silty clay loam, silt loam
40 to 60 inches; stratified clay loam to silty clay

Minor Components
Weld and similar soils
Composition: About 10 percent

Aquic Haplustolls and similar soils
Composition: About 4 percent
Landform: Swales

Gaynor and similar soils
Composition: About 1 percent

Ct-Colby-Gaynor association

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Colby and similar soils: 55 percent
Gaynor and similar soils: 30 percent
Minor components: 15 percent

Component Descriptions

Colby soils
Landscape: Uplands
Parent material: Uniform eolian deposits
Slope: 5 to 9 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Slopes
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat, needleandthread
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 12 inches; silty clay loam
12 to 43 inches; silty clay loam
43 to 60 inches; clay loam

Gaynor soils
Landscape: Uplands
Parent material: Eolian deposit and/or loamy alluvium
Slope: 5 to 9 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shaly Plains
Potential native vegetation: western wheatgrass, green needlegrass, blue grama, sideoats grama, alkali sacaton, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 6 inches; silty clay loam
6 to 30 inches; silty clay loam
30 to 34 inches; weathered bedrock

Minor Components
Shingle and similar soils
Composition: About 9 percent

Kim and similar soils
Composition: About 3 percent

Cascao and similar soils
Composition: About 2 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

Cu-Colluvial land

Map Unit Setting

Major Land Resource Area: 49
Elevation: 7500 to 9000 feet (2286 to 2743 meters)
Mean annual precipitation: 6 to 10 inches (152 to 254 millimeters)
Mean annual air temperature: 39 to 43 degrees F. (4.0 to 6.0 degrees C.)
Frost-free period: 80 to 100 days

Map Unit Composition

Colluvial land: 80 percent
Minor components: 20 percent

Component Descriptions

Colluvial land

Description: These areas primarily consist of detached rock fragments that accumulate at the bases of slopes and in valleys.
Landform: Long, narrow valleys
Parent material: Colluvium
Slope: 9 to 25 percent
Depth to restrictive feature: 2 to 60 inches to bedrock (lithic)
Drainage class: Excessively drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 0.3 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Land capability subclass (nonirrigated): 7s

Minor Components

Haverson and similar soils
Composition: About 10 percent

Kim and similar soils
Composition: About 7 percent

Otero and similar soils
Composition: About 3 percent

DU-Dumps

Map Unit Setting

Major Land Resource Area: 49

Map Unit Composition

Dumps: 95 percent
Minor components: 5 percent

Component Descriptions

Dumps

Description: These areas were used to dispose of excavated waste.

FcF-Fern Cliff-Allens Park-Rock outcrop complex, 15 to 60 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6300 to 8200 feet (1920 to 2499 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 43 to 47 degrees F. (6.1 to 8.3 degrees C.)
Frost-free period: 80 to 120 days

Map Unit Composition

Fern Cliff and similar soils: 30 percent
Allens Park and similar soils: 30 percent
Rock outcrop: 20 percent
Minor components: 20 percent

Component Descriptions

Fern Cliff soils
Landform: Mountain slopes, fans
Parent material: Mixed loamy alluvium
Slope: 15 to 60 percent
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, ponderosa pine
Other plants: kinnikinnick, Idaho fescue, common juniper, mountain muhly, pine dropseed, true mountain mahogany, Gambel's oak, Utah serviceberry, mountain snowberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
0 to 20 inches; stony sandy loam
20 to 60 inches; stratified stony sandy loam to stony sandy clay loam
60 to 80 inches; very stony sandy loam

Allens Park soils
Landform: Mountain slopes, ridges
Parent material: Loamy colluvium and/or residuum weathered from granite
Slope: 15 to 40 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.7 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Potential native vegetation:
Common trees: Rocky Mountain Douglas-fir, ponderosa pine
Other plants: mountain muhly, Arizona fescue, pine dropseed, sedge, boxleaf myrtle, common juniper, russet buffaloberry
Land capability subclass (nonirrigated): 7e

Typical Profile:
0 to 17 inches; gravelly sandy loam
17 to 26 inches; sandy clay loam, gravelly sandy clay loam
26 to 30 inches; unweathered bedrock

Rock outcrop
Description: These areas consist of surface exposures of bedrock.
Landform: Mountain slopes, cliffs
Slope: 25 to 60 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Available water capacity: About 0.0 inches (very low)
Runoff class: Very high
Salinity maximum: About 0 mmhos/cm (nonsaline)
Land capability subclass (nonirrigated): 8s

Minor Components
Juget and similar soils
Composition: About 10 percent

Peyton and similar soils
Composition: About 10 percent

GaB-Gaynor silty clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Gaynor soils
Landscape: Uplands
Parent material: Loamy alluvium and/or eolian deposits
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shaly Plains
Potential native vegetation: western wheatgrass, green needlegrass, blue grama, sideoats grama, alkali sacaton, buffalograss, fourwing saltbush, winterfat

Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; silty clay loam
6 to 30 inches; silty clay loam
30 to 34 inches; weathered bedrock

Minor Components
Colby and similar soils
Composition: About 9 percent

Samsil and similar soils
Composition: About 6 percent

GaD-Gaynor silty clay loam, 3 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Gaynor soils
Landscape: Uplands
Parent material: Loamy alluvium and/or eolian deposits
Slope: 3 to 9 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shaly Plains
Potential native vegetation: western wheatgrass, green needlegrass, blue grama, sideoats grama, alkali sacaton, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 6 inches; silty clay loam
6 to 30 inches; silty clay loam
30 to 34 inches; weathered bedrock

Minor Components
Renohill and similar soils
Composition: About 8 percent

Samsil and similar soils
Composition: About 5 percent

Colby and similar soils
Composition: About 5 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

Cascao and similar soils
Composition: About 1 percent

GP-Gravel pits and mine dumps

Map Unit Setting

Major Land Resource Area: 49

Map Unit Composition

Gravel pits and mine dumps: 94 percent
Minor components: 6 percent

Component Descriptions

Gravel pits and mine dumps
Description: These areas were used for a combination of excavated gravel deposits and removed waste material.
Slope: 0 to 1 percent
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.2 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very low
Salinity maximum: About 0 mmhos/cm (nonsaline)
Land capability subclass (nonirrigated): 8s

Minor Components
Aquents and similar soils
Composition: About 6 percent
Landform: Marshes

GrF-Goldvale-Rock outcrop complex, 9 to 55 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 5900 to 6700 feet (1798 to 2042 meters)
Mean annual precipitation: 18 to 22 inches (457 to 559 millimeters)

Mean annual air temperature: 43 to 47 degrees F. (6.1 to 8.3 degrees C.)
Frost-free period: 100 to 120 days

Map Unit Composition

Goldvale and similar soils: 55 percent
Rock outcrop: 30 percent
Minor components: 15 percent

Component Descriptions

Goldvale soils
Landform: Smoother, west-facing mountain slopes
Parent material: Loamy alluvium
Slope: 9 to 55 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 6.3 inches (moderate)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Ponderosa Loam
Potential native vegetation: Arizona fescue, Parry's oatgrass, mountain muhly, true mountain mahogany, western wheatgrass, spike fescue, common juniper
Land capability subclass (nonirrigated): 7e

Typical Profile:
0 to 19 inches; stony coarse sandy loam
19 to 25 inches; stony sandy clay loam
25 to 57 inches; stony sandy clay
57 to 75 inches; stony sandy clay loam, stony coarse sandy loam

Rock outcrop
Description: These areas consist of surface exposures of bedrock.
Landform: Mountain slopes, ridges
Slope: 30 to 55 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Available water capacity: About 0.0 inches (very low)
Runoff class: Very high
Salinity maximum: About 0 mmhos/cm (nonsaline)
Land capability subclass (nonirrigated): 8s

Minor Components
Juget and similar soils
Composition: About 10 percent

Valmont and similar soils
Composition: About 5 percent

HaB-Hargreave fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Hargreave soils
Landscape: Uplands
Parent material: Loamy residuum weathered from sandstone
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.8 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, Sandberg bluegrass, fourwing saltbush, winterfat, little bluestem
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3c

Typical Profile:
0 to 8 inches; fine sandy loam
8 to 13 inches; sandy clay loam
13 to 27 inches; fine sandy loam
27 to 31 inches; weathered bedrock

Minor Components
Terry and similar soils
Composition: About 5 percent

Nelson and similar soils
Composition: About 4 percent

Mollic Haplaquepts and similar soils
Composition: About 1 percent
Landform: Swales

HaD-Hargreave fine sandy loam, 3 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Hargreave soils
Landscape: Uplands
Parent material: Loamy residuum weathered from sandstone
Slope: 3 to 9 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.9 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, Sandberg bluegrass, fourwing saltbush, winterfat, little bluestem
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 6 inches; fine sandy loam
6 to 13 inches; sandy clay loam
13 to 27 inches; fine sandy loam
27 to 31 inches; weathered bedrock

Minor Components
Terry and similar soils
Composition: About 8 percent

Nelson and similar soils
Composition: About 6 percent

Mollic Haplaquepts and similar soils
Composition: About 1 percent
Landform: Swales

HeB-Heldt clay, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Heldt soils
Landscape: Uplands
Landform: Irregular shaped areas on terraces
Parent material: Loamy alluvium derived from sedimentary rock
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, Sandberg bluegrass, fourwing saltbush, winterfat, little bluestem
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 8 inches; clay
8 to 20 inches; clay
20 to 60 inches; clay loam

Minor Components
Nunn and similar soils
Composition: About 4 percent

Mollic Haplaquepts and similar soils
Composition: About 2 percent
Landform: Swales

Colby and similar soils
Composition: About 2 percent

Renohill and similar soils
Composition: About 2 percent

HeC-Heldt clay, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Heldt soils
Landscape: Uplands
Landform: Irregular shaped areas on terraces
Parent material: Loamy alluvium derived from sedimentary rock
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, Sandberg bluegrass, fourwing saltbush, winterfat, little bluestem
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 6 inches; clay
6 to 20 inches; clay
20 to 60 inches; clay loam

Minor Components
Renohill and similar soils
Composition: About 6 percent

Ulm and similar soils
Composition: About 6 percent

Colby and similar soils
Composition: About 2 percent

Mollic Haplaquepts and similar soils
Composition: About 1 percent
Landform: Swales

JrF-Juget-Rock outcrop complex, 9 to 55 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6300 to 8200 feet (1920 to 2499 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 43 to 46 degrees F. (6.1 to 7.8 degrees C.)
Frost-free period: 80 to 120 days

Map Unit Composition

Juget and similar soils: 50 percent
Rock outcrop: 30 percent
Minor components: 20 percent

Component Descriptions

Juget soils
Landform: Ridges, mountain slopes
Parent material: Sandy residuum weathered from granite
Slope: 9 to 55 percent
Depth to restrictive feature: 8 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 0.5 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel's oak, Arizona fescue, mountain muhly, common juniper, kinnikinnick, bluegrass, elk sedge, true mountain mahogany
Land capability subclass (nonirrigated): 7s

Typical Profile:
0 to 6 inches; very gravelly sandy loam
6 to 11 inches; very gravelly loamy sand, very gravelly sand, extremely gravelly sand
11 to 15 inches; weathered bedrock

Rock outcrop
Description: These areas consist of surface exposures of bedrock.
Landform: Ridges
Slope: 20 to 55 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Available water capacity: About 0.0 inches (very low)
Runoff class: Very high
Salinity maximum: About 0 mmhos/cm (nonsaline)
Land capability subclass (nonirrigated): 8s

Minor Components
Allens Park and similar soils
Composition: About 10 percent

Peyton and similar soils
Composition: About 7 percent

Pinata and similar soils
Composition: About 3 percent

KuD-Kutch clay loam, 3 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Kutch soils
Landscape: Uplands
Landform: Valley sides
Parent material: Clayey residuum weathered from sedimentary rock
Slope: 3 to 9 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 4.8 inches (low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: High
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey Foothill
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, sideoats grama, fourwing saltbush, little bluestem, winterfat, prairie Junegrass, rubber rabbitbrush
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 7 inches; clay loam
7 to 22 inches; clay
22 to 30 inches; clay
30 to 34 inches; unweathered bedrock

Minor Components
Renohill and similar soils
Composition: About 6 percent

Nunn and similar soils
Composition: About 4 percent

Samsil and similar soils
Composition: About 2 percent

Shingle and similar soils
Composition: About 2 percent

Mollic Haplaquepts and similar soils
Composition: About 1 percent
Landform: Swales

LaE-Laporte very fine sandy loam, 5 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 5200 to 5800 feet (1585 to 1768 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Laporte soils
Landscape: Uplands
Landform: Sides of ridges
Parent material: Calcareous loamy residuum weathered from limestone and shale
Slope: 5 to 20 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 50 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shallow Foothill
Potential native vegetation: Griffith wheatgrass, blue grama, green needlegrass, little bluestem, sideoats grama, true mountain mahogany, Rocky Mountain juniper, ponderosa pine, twoneedle pinyon, needleandthread, fringed sagebrush
Land capability subclass (nonirrigated): 6s

Typical Profile:
0 to 8 inches; very fine sandy loam
8 to 13 inches; loam
13 to 17 inches; weathered bedrock

Minor Components
Fluvaquentic Haplustolls and similar soils
Composition: About 6 percent
Landform: Flood plains

Manvel and similar soils
Composition: About 5 percent

Rock outcrop and similar soils
Composition: About 4 percent

LoB-Longmont clay, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Longmont soils
Landscape: Uplands
Landform: Swales, flood plains
Parent material: Clayey alluvium derived from shale
Slope: 0 to 3 percent
Drainage class: Poorly drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 8.3 inches (moderate)
Shrink-swell potential: About 7.5 percent (high)
Flooding hazard: Occasional
Seasonal high water table depth: About 24 to 30 inches
Runoff class: Low
Calcium carbonate maximum: About 15 percent
Gypsum maximum: About 5 percent
Salinity maximum: About 16 mmhos/cm (moderately saline)
Sodium adsorption ratio maximum: About 20 (moderately sodic)
Ecological site: Salt Meadow
Potential native vegetation: alkali sacaton, switchgrass, western wheatgrass, Nebraska sedge, little bluestem, prairie cordgrass, Nuttall’s alkaligrass, alkali bluegrass, alkali cordgrass, big bluestem, inland saltgrass, rush
Land capability subclass (nonirrigated): 6w

Typical Profile:
0 to 60 inches; clay

Minor Components
Heldt and similar soils
Composition: About 10 percent

Aquolls and similar soils
Composition: About 10 percent
Landform: Terraces

Lv-Loveland soils

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Loveland soils
Landform: Flood plains
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 7.1 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 18 to 36 inches
Runoff class: Low
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Salt Meadow
Potential native vegetation: alkali sacaton, switchgrass, western wheatgrass, Nebraska sedge, little bluestem, prairie cordgrass, Nuttall’s alkaligrass, alkali bluegrass, alkali cordgrass, big bluestem, inland saltgrass, rush
Land capability subclass (irrigated): 3w
Land capability subclass (nonirrigated): 3w

Typical Profile:
0 to 11 inches; clay loam
11 to 30 inches; clay loam, silty clay loam, loam
30 to 60 inches; very gravelly sand, gravelly sand, gravelly coarse sand

Minor Components

Aquolls and similar soils
Composition: About 10 percent
Landform: Flood plains

McClave and similar soils
Composition: About 3 percent

Niwot and similar soils
Composition: About 2 percent

Ma-Made land

Map Unit Setting

Major Land Resource Area: 67

Map Unit Composition

Made land: 100 percent
Minor components:

Component Descriptions

Made land
Description: These areas were created by the activities of man such as cut and fill operations, disposed of waste material, and other urban activities.
Slope: 0 to 1 percent
Slowest permeability: 0.0 to .001 in/hr (impermeable)
Available water capacity: About 3.5 inches (low)
Shrink-swell potential: About 7.5 percent (high)
Seasonal high water table depth: About 0 to 0 inches
Runoff class: Very high
Salinity maximum: About 4 mmhos/cm (very slightly saline)
Land capability subclass (nonirrigated): 8w

MdA-Manter sandy loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Manter soils
Landscape: Uplands
Landform: Terraces
Parent material: Loamy eolian deposits and/or outwash

Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.9 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: blue grama, prairie sandreed, little bluestem, sand bluestem, switchgrass, western sandcherry, yellow Indiangrass, sand dropseed
Land capability subclass (irrigated): 2s
Land capability subclass (nonirrigated): 3s

Typical Profile:
0 to 6 inches; sandy loam
6 to 16 inches; fine sandy loam, sandy loam
16 to 60 inches; sandy loam, loamy sand, loamy fine sand

Minor Components
Calkins and similar soils
Composition: About 10 percent

Ascalon and similar soils
Composition: About 5 percent

MdB-Manter sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Manter soils
Landscape: Uplands
Landform: Terraces
Parent material: Loamy eolian deposits and/or outwash
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.9 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent

Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: blue grama, prairie sandreed, little bluestem, sand bluestem, switchgrass, western sandcherry, yellow Indiangrass, sand dropseed
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; sandy loam
6 to 16 inches; sandy loam, fine sandy loam
16 to 60 inches; loamy fine sand, sandy loam, loamy sand

Minor Components
Calkins and similar soils
Composition: About 7 percent

Ascalon and similar soils
Composition: About 6 percent

Aquic Haplustolls and similar soils
Composition: About 2 percent
Landform: Swales

MdD-Manter sandy loam, 3 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Manter soils
Landscape: Uplands
Landform: Terraces
Parent material: Loamy eolian deposits and/or outwash
Slope: 3 to 9 percent
Drainage class: Well drained
Slowest permeability: 2.0 to 6.0 in/hr (moderately rapid)
Available water capacity: About 6.8 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)

Ecological site: Sandy
Potential native vegetation: blue grama, prairie sandreed, little bluestem, sand bluestem, switchgrass, western sandcherry, yellow Indiangrass, sand dropseed
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 5 inches; sandy loam
5 to 14 inches; sandy loam, fine sandy loam
14 to 60 inches; loamy fine sand, loamy sand, sandy loam

Minor Components
Ascalon and similar soils
Composition: About 12 percent

Otero and similar soils
Composition: About 2 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

Me-Manvel loam

Map Unit Setting

Major Land Resource Area: 67
Elevation: 5100 to 5600 feet (1554 to 1707 meters)
Mean annual precipitation: 14 to 17 inches (356 to 432 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Manvel soils
Landscape: Uplands
Landform: Fans
Parent material: Calcareous loamy alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.4 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 40 percent
Gypsum maximum: About 5 percent
Salinity maximum: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio maximum: About 5 (slightly sodic)
Ecological site: Sandy
Potential native vegetation: blue grama, winterfat, western wheatgrass, fourwing saltbush, green needlegrass

Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 6 inches; loam
6 to 60 inches; silt loam, silty clay loam, loam

Minor Components
Laporte and similar soils
Composition: About 6 percent

Nelson and similar soils
Composition: About 6 percent

Mollic Halaquepts and similar soils
Composition: About 3 percent
Landform: Swales

Mm-McClave clay loam

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

McClave soils
Landform: Flood plains
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 10.8 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 18 to 36 inches
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Salt Meadow
Potential native vegetation: alkali sacaton, switchgrass, Nebraska sedge, western wheatgrass, Baltic rush, big bluestem, little bluestem, yellow Indiangrass, alkali cordgrass, inland saltgrass, prairie cordgrass
Land capability subclass (irrigated): 3w
Land capability subclass (nonirrigated): 3w

Typical Profile:
0 to 19 inches; clay loam
19 to 60 inches; clay loam, loam, sandy clay loam

Minor Components
Calkins and similar soils
Composition: About 11 percent

Aquolls and similar soils
Composition: About 4 percent
Landform: Terraces

NdD-Nederland very cobbly sandy loam, 1 to 12 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 5500 to 6500 feet (1676 to 1981 meters)
Mean annual precipitation: 15 to 20 inches (381 to 508 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nederland soils
Landform: Old, high alluvial fans, terraces
Parent material: Cobbly loamy alluvium
Slope: 1 to 12 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.8 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Cobbly Foothills
Potential native vegetation: big bluestem, yellow Indiangrass, mountain muhly, switchgrass, little bluestem, blue grama, sideoats grama, western wheatgrass, prairie Junegrass
Land capability subclass (nonirrigated): 6s

Typical Profile:
0 to 7 inches; very cobbly sandy loam
7 to 20 inches; very cobbly sandy clay loam
20 to 60 inches; very cobbly sandy loam

Minor Components
Valmont and similar soils
Composition: About 20 percent

Nh-Niwot soils

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Niwot soils
Landform: Flood plains
Parent material: Loamy over sandy and gravelly alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 4.4 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Flooding hazard: Occasional
Seasonal high water table depth: About 18 to 36 inches
Runoff class: Low
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Wet Meadow
Potential native vegetation: switchgrass, big bluestem, prairie cordgrass, Nebraska sedge, western wheatgrass, yellow Indiangrass, Canada wildrye, Baltic rush
Land capability subclass (irrigated): 4w
Land capability subclass (nonirrigated): 5w

Typical Profile:
0 to 14 inches; loam
14 to 60 inches; gravelly sand

Minor Components
Loveland and similar soils
Composition: About 10 percent

Nunn and similar soils
Composition: About 4 percent

Aquolls and similar soils
Composition: About 1 percent
Landform: Flood plains

NnA-Nunn sandy clay loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nunn soils
Landform: Valley sides, terraces
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 2s
Land capability subclass (nonirrigated): 3s

Typical Profile:
0 to 10 inches; sandy clay loam
10 to 16 inches; clay
16 to 60 inches; clay loam

Minor Components
Mollic Halaquepts and similar soils
Composition: About 6 percent
Landform: Swales

Kim and similar soils
Composition: About 2 percent

Ascalon and similar soils
Composition: About 2 percent

NnB-Nunn sandy clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nunn soils
Landform: Valley sides, terraces
Parent material: Loamy alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.8 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 10 inches; sandy clay loam
10 to 14 inches; clay
14 to 60 inches; clay loam

Minor Components
Weld and similar soils
Composition: About 8 percent

Ascalon and similar soils
Composition: About 5 percent

Mollic Halaquepts and similar soils
Composition: About 2 percent
Landform: Swales

NuA-Nunn clay loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nunn soils
Landform: Terraces, valley sides
Parent material: Loamy alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Low
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 2s
Land capability subclass (nonirrigated): 3s

Typical Profile:
0 to 10 inches; clay loam
10 to 18 inches; clay
18 to 30 inches; clay
30 to 60 inches; clay loam

Minor Components
Heldt and similar soils
Composition: About 6 percent

Mollic Halaquepts and similar soils
Composition: About 2 percent
Landform: Swales

Limon and similar soils
Composition: About 2 percent

NuB-Nunn clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nunn soils
Landform: Valley sides, terraces
Parent material: Loamy alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 10 inches; clay loam
10 to 18 inches; clay
18 to 30 inches; clay
30 to 60 inches; clay loam

Minor Components
Valmont and similar soils
Composition: About 8 percent

Kim and similar soils
Composition: About 5 percent

Mollic Halaquepts and similar soils
Composition: About 2 percent
Landform: Swales

NuC-Nunn clay loam, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nunn soils
Landform: Valley sides, terraces
Parent material: Loamy alluvium
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.7 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 10 inches; clay loam
10 to 22 inches; clay
22 to 60 inches; clay loam

Minor Components
Renohill and similar soils
Composition: About 8 percent

Kim and similar soils
Composition: About 3 percent

Ulm and similar soils
Composition: About 3 percent

Mollic Halaquepts and similar soils
Composition: About 1 percent
Landform: Swales

NuD-Nunn clay loam, 5 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Nunn soils
Landform: Terraces, valley sides
Parent material: Loamy alluvium
Slope: 5 to 9 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 11.0 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 8 inches; clay loam
8 to 14 inches; clay
14 to 60 inches; clay loam

Minor Components
Kutch and similar soils
Composition: About 8 percent

Kim and similar soils
Composition: About 6 percent

Mollic Halaquepts and similar soils
Composition: About 1 percent
Landform: Swales

Nv-Nunn-Kim complex

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Nunn and similar soils: 50 percent
Kim and similar soils: 35 percent
Minor components: 15 percent

Component Descriptions

Nunn soils
Landform: Valley sides, terraces
Parent material: Loamy alluvium
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: Medium
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 10 inches; clay loam
10 to 18 inches; clay
18 to 30 inches; clay
30 to 60 inches; clay loam

Kim soils
Landform: Less smooth valley sides, terraces
Parent material: Loamy alluvium
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 9.7 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 4 mmhos/cm (very slightly saline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains

Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, winterfat
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 11 inches; clay loam
11 to 60 inches; loam, clay loam, sandy clay loam

Minor Components
Limon and similar soils
Composition: About 9 percent

Ulm and similar soils
Composition: About 5 percent

Mollic Haplaquepts and similar soils
Composition: About 1 percent
Landform: Swales

PgE-Peyton-Juget very gravelly loamy sands, 5 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 5800 to 7500 feet (1768 to 2286 meters)
Mean annual precipitation: 18 to 24 inches (457 to 610 millimeters)
Mean annual air temperature: 44 to 48 degrees F. (6.7 to 8.9 degrees C.)
Frost-free period: 80 to 120 days

Map Unit Composition

Peyton and similar soils: 65 percent
Juget and similar soils: 20 percent
Minor components: 15 percent

Component Descriptions

Peyton soils
Landform: Valley sides, hills
Position on landform: Backslopes
Parent material: Locally transported loamy and/or sandy slope alluvium
Slope: 5 to 20 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 5.2 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Park

Potential native vegetation: Arizona fescue, Parry's oatgrass, mountain muhly, blue grama, little bluestem, prairie Junegrass, western wheatgrass, needleandthread
Land capability subclass (nonirrigated): 6s

Typical Profile:
0 to 11 inches; very gravelly loamy sand
11 to 30 inches; gravelly sandy clay loam
30 to 43 inches; gravelly coarse sandy loam
43 to 60 inches; gravelly sandy loam

Juget soils
Landform: Ridges, mountain slopes
Parent material: Sandy residuum weathered from granite
Slope: 6 to 20 percent
Depth to restrictive feature: 8 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 0.4 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Gambel's oak, Arizona fescue, mountain muhly, common juniper, kinnikinnick, bluegrass, elk sedge, true mountain mahogany
Land capability subclass (nonirrigated): 7s

Typical Profile:
0 to 6 inches; very gravelly loamy coarse sand
6 to 11 inches; very gravelly loamy sand, very gravelly sand, extremely gravelly sand
11 to 15 inches; weathered bedrock

Minor Components
Allens Park and similar soils
Composition: About 9 percent

Breece and similar soils
Composition: About 6 percent

PLY-Playas

Map Unit Setting

Major Land Resource Area: 67

Map Unit Composition

Playas: 95 percent
Minor components: 5 percent

Component Descriptions

Playas
Description: These are closed depressions that may intermittently hold water.
Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Runoff class: Very low

PrF-Pinata-Rock outcrop complex, 5 to 55 percent slopes

Map Unit Setting

Major Land Resource Area: 48A
Elevation: 6000 to 7000 feet (1829 to 2134 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 47 to 51 degrees F. (8.3 to 10.5 degrees C.)
Frost-free period: 100 to 130 days

Map Unit Composition

Pinata and similar soils: 45 percent
Rock outcrop: 35 percent
Minor components: 20 percent

Component Descriptions

Pinata soils
Landform: Ridges, mountain slopes
Parent material: Stony sandy clayey colluvium over residuum weathered from sandstone and shale
Slope: 5 to 55 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 4.5 percent (moderate)
Runoff class: High
Calcium carbonate maximum: None
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Potential native vegetation:
Common trees: ponderosa pine
Other plants: Arizona fescue, mountain muhly, Gambel's oak, pine dropseed, western wheatgrass, Rocky Mountain juniper, mountain mahogany, prairie Junegrass, twoneedle pinyon
Land capability subclass (nonirrigated): 7s

Typical Profile:
0 to 12 inches; very stony loamy fine sand
12 to 32 inches; very stony clay
32 to 36 inches; unweathered bedrock

Rock outcrop
Description: These areas consist of surface exposures of bedrock.
Landform: Steeper mountain slopes
Slope: 30 to 55 percent

Depth to restrictive feature: 0 inches to bedrock (lithic)
Available water capacity: About 0.0 inches (very low)
Runoff class: Very high
Salinity maximum: About 0 mmhos/cm (nonsaline)
Land capability subclass (nonirrigated): 8s

Minor Components
Hargreave and similar soils
Composition: About 8 percent

Terry and similar soils
Composition: About 7 percent

Baller and similar soils
Composition: About 3 percent

Peyton and similar soils
Composition: About 2 percent

ReD-Renohill loam, 3 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Renohill soils
Landscape: Uplands
Landform: Hills, ridges
Parent material: Loamy slope alluvium derived from sandstone and shale
Slope: 3 to 9 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 3.4 inches (low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: High
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, winterfat, sun sedge
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 5 inches; loam
5 to 15 inches; silty clay
15 to 20 inches; silty clay loam
20 to 24 inches; unweathered bedrock

Minor Components
Ulm and similar soils
Composition: About 7 percent

Samsil and similar soils
Composition: About 4 percent

Gaynor and similar soils
Composition: About 4 percent

RnB-Renohill silty clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Renohill soils
Landscape: Uplands
Landform: Hills, ridges
Parent material: Loamy slope alluvium derived from sandstone and shale
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.4 inches (low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: High
Calcium carbonate maximum: About 5 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, winterfat, sun sedge
Land capability subclass (irrigated): 3s
Land capability subclass (nonirrigated): 3c

Typical Profile:
0 to 9 inches; silty clay loam
9 to 32 inches; silty clay
32 to 36 inches; unweathered bedrock

Minor Components
Heldt and similar soils
Composition: About 7 percent

Gaynor and similar soils
Composition: About 4 percent

Samsil and similar soils
Composition: About 3 percent

Typic Natraquolls and similar soils
Composition: About 1 percent
Landform: Swales

RnD-Renohill silty clay loam, 3 to 9 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Renohill soils
Landscape: Uplands
Landform: Ridges, hills
Parent material: Loamy slope alluvium derived from sandstone and shale
Slope: 3 to 9 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.5 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, winterfat, sun sedge
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 7 inches; silty clay loam
7 to 12 inches; silty clay
12 to 30 inches; silty clay loam
30 to 34 inches; unweathered bedrock

Minor Components
Samsil and similar soils
Composition: About 9 percent

Gaynor and similar soils
Composition: About 6 percent

Ro-Rock outcrop

Map Unit Setting

Major Land Resource Area: 48A

Map Unit Composition

Rock outcrop: 100 percent
Minor components:

Component Descriptions

Rock outcrop
Description: These areas consist of surface exposures of bedrock.
Landform: Steep cliffs, mountain slopes
Slope: 20 to 95 percent
Depth to restrictive feature: 0 inches to bedrock (lithic)
Available water capacity: About 0.0 inches (very low)
Runoff class: Very high
Salinity maximum: About 0 mmhos/cm (nonsaline)
Land capability subclass (nonirrigated): 8s

SaD-Samsil clay, 3 to 12 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Samsil soils
Landscape: Uplands
Landform: Ridges, hills
Parent material: Residuum weathered from clayey shale
Slope: 3 to 12 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: About 2 percent
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 1 (slightly sodic)
Ecological site: Shaly Foothill
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (nonirrigated): 6s

Typical Profile:
0 to 3 inches; clay
3 to 12 inches; clay, silty clay
12 to 16 inches; weathered bedrock

Minor Components
Renohill and similar soils
Composition: About 10 percent

Shingle and similar soils
Composition: About 5 percent

SeE-Samsil-Shingle complex, 5 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Samsil and similar soils: 40 percent
Shingle and similar soils: 40 percent
Minor components: 15 percent

Component Descriptions

Samsil soils
Landscape: Uplands
Landform: Ridges, hills
Parent material: Residuum weathered from clayey shale
Slope: 5 to 25 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 1.9 inches (very low)
Shrink-swell potential: About 7.5 percent (high)
Runoff class: Very high

Calcium carbonate maximum: About 10 percent
Gypsum maximum: About 2 percent
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 1 (slightly sodic)
Ecological site: Shaly Foothill
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, buffalograss, fourwing saltbush, winterfat
Land capability subclass (nonirrigated): 6e

Typical Profile:
0 to 3 inches; clay
3 to 12 inches; clay, silty clay
12 to 16 inches; weathered bedrock

Shingle soils
Landscape: Uplands
Landform: Hills, ridges
Parent material: Loamy residuum weathered from sandstone and shale
Slope: 5 to 25 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: 0.6 to 2.0 in/hr (moderate)
Available water capacity: About 2.2 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shaly Foothill
Potential native vegetation: western wheatgrass, green needlegrass, blue grama, little bluestem, sideoats grama, fourwing saltbush, winterfat
Land capability subclass (nonirrigated): 6s

Typical Profile:
0 to 4 inches; loam
4 to 13 inches; silt loam, loam
13 to 17 inches; weathered bedrock

Minor Components
Renohill and similar soils
Composition: About 6 percent

Kutch and similar soils
Composition: About 5 percent

Gaynor and similar soils
Composition: About 3 percent

Typic Haplaquepts and similar soils
Composition: About 1 percent
Landform: Swales

SgE-Shingle-Gaynor complex, 3 to 20 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Shingle and similar soils: 50 percent
Gaynor and similar soils: 40 percent
Minor components: 10 percent

Component Descriptions

Shingle soils
Landscape: Uplands
Landform: Hillslopes, ridges
Parent material: Calcareous loamy residuum weathered from sandstone and shale
Slope: 3 to 20 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 2.3 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: About 15 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Shaly Foothill
Potential native vegetation: western wheatgrass, green needlegrass, blue grama, little bluestem, sideoats grama, fourwing saltbush, winterfat
Land capability subclass (nonirrigated): 6s

Typical Profile:
0 to 4 inches; clay loam
4 to 13 inches; silt loam, loam
13 to 17 inches; weathered bedrock

Gaynor soils
Landscape: Uplands
Landform: Hillslopes
Position on landform: Footslopes
Parent material: Loamy alluvium and/or eolian deposits
Slope: 3 to 20 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None

Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey
Potential native vegetation: western wheatgrass, green needlegrass, blue grama, buffalograss
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 6 inches; silty clay loam
6 to 30 inches; silty clay loam
30 to 34 inches; weathered bedrock

Minor Components
Renohill and similar soils
Composition: About 4 percent

Samsil and similar soils
Composition: About 3 percent

Colby and similar soils
Composition: About 2 percent

Mollic Haplaquents and similar soils
Composition: About 1 percent
Landform: Swales

SmF-Sixmile stony loam, 10 to 50 percent slopes

Map Unit Setting

Major Land Resource Area: 49
Elevation: 5800 to 6600 feet (1768 to 2012 meters)
Mean annual precipitation: 14 to 18 inches (356 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 120 to 140 days

Map Unit Composition

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

Component Descriptions

Sixmile soils
Landscape: Uplands
Landform: Ridges, hillslopes
Position on landform: Backslopes
Parent material: Loamy residuum weathered from calcareous shale
Slope: 10 to 50 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 3.6 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High

Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Rocky Foothills
Potential native vegetation: big bluestem, switchgrass, Griffith wheatgrass, blue grama, yellow Indiangrass, green needlegrass, western wheatgrass
Land capability subclass (nonirrigated): 7e

Typical Profile:
0 to 4 inches; stony loam
4 to 30 inches; clay loam
30 to 34 inches; weathered bedrock

Minor Components
Rock outcrop and similar soils
Composition: About 10 percent

Hargreave and similar soils
Composition: About 10 percent

Te-Terrace escarpments

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4400 to 5500 feet (1341 to 1676 meters)
Mean annual precipitation: 10 to 16 inches (254 to 406 millimeters)
Mean annual air temperature: 46 to 54 degrees F. (8.0 to 12.0 degrees C.)
Frost-free period: 120 to 160 days

Map Unit Composition

Terrace escarpments and similar soils: 100 percent
Minor components:

Component Descriptions

Terrace escarpments soils
Landform: Fan remnants, terraces
Position on landform: Backslopes, shoulders
Parent material: Cobbly and stony colluvium over sandstone and shale
Slope: 12 to 60 percent
Drainage class: Excessively drained
Slowest permeability: 6.0 to 20 in/hr (rapid)
Available water capacity: About 1.8 inches (very low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Very high
Calcium carbonate maximum: About 5 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Land capability subclass (nonirrigated): 7s

Typical Profile:
0 to 6 inches; gravelly sand
6 to 60 inches; gravelly sand, very gravelly sand, gravelly coarse sand

VaB-Valmont clay loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Valmont soils
Landform: Terraces, fan remnants
Parent material: Gravelly and cobbly loamy alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 7.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey Foothill
Potential native vegetation: western wheatgrass, green needlegrass, Sandberg bluegrass, big bluestem, switchgrass, blue grama, fourwing saltbush, needleandthread
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3s

Typical Profile:
0 to 9 inches; clay loam
9 to 29 inches; clay loam, clay
29 to 60 inches; very gravelly loam, very gravelly sandy loam

Minor Components
Nunn and similar soils
Composition: About 8 percent

Fluventic Haplaquolls and similar soils
Composition: About 4 percent
Landform: Terraces

Heldt and similar soils
Composition: About 3 percent

VaC-Valmont clay loam, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Valmont soils
Landform: Fan remnants, terraces
Parent material: Gravelly and cobbly loamy alluvium
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 6.5 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Clayey Foothill
Potential native vegetation: western wheatgrass, green needlegrass, Sandberg bluegrass, big bluestem, switchgrass, blue grama, fourwing saltbush, needleandthread
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 7 inches; clay loam
7 to 24 inches; clay loam, clay
24 to 60 inches; very gravelly loam, very gravelly sandy loam

Minor Components
Nunn and similar soils
Composition: About 8 percent

Heldt and similar soils
Composition: About 5 percent

Fluventic Haplaquolls and similar soils
Composition: About 2 percent
Landform: Flood plains

VcC-Valmont cobbly clay loam, 1 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Valmont and similar soils: 100 percent
Minor components:

Component Descriptions

Valmont soils
Landform: Terraces, fan remnants
Parent material: Gravelly and cobbly loamy alluvium
Slope: 1 to 5 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 6.0 inches (moderate)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Cobbly Foothills
Potential native vegetation: big bluestem, yellow Indiangrass, mountain muhly, switchgrass, blue grama, green needlegrass, little bluestem, sideoats grama, western wheatgrass, needleandthread
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 8 inches; cobbly clay loam
8 to 22 inches; clay loam, clay
22 to 60 inches; very gravelly loam, very gravelly sandy loam

VcE-Valmont cobbly clay loam, 5 to 25 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Valmont soils
Landform: Side slopes on terraces
Parent material: Gravelly and cobbly loamy alluvium
Slope: 5 to 10 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 5.7 inches (low)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Cobbly Foothills
Potential native vegetation: big bluestem, yellow Indiangrass, mountain muhly, switchgrass, blue grama, green needlegrass, little bluestem, sideoats grama, western wheatgrass, needleandthread
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 6 inches; cobbly clay loam
6 to 18 inches; clay loam, clay
18 to 60 inches; very gravelly loam, very gravelly sandy loam

Minor Components
Dacono and similar soils
Composition: About 9 percent

Fluventic Haplaquolls and similar soils
Composition: About 1 percent
Landform: Flood plains

W-Water

Map Unit Composition

Water: 95 percent
Minor components: 5 percent

Component Descriptions

Water
Description: These areas consist of impoundments of water such as reservoirs, lakes, and ponds and running water such as streams and creeks.

Minor Components
Aquolls and similar soils
Composition: About 5 percent
Landform: Marshes

WdB-Weld loamy sand, 1 to 4 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Weld soils
Landscape: Uplands
Parent material: Loamy eolian deposits
Slope: 1 to 4 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 9.3 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Sandy
Potential native vegetation: blue grama, big bluestem, needleandthread, switchgrass, western wheatgrass, green needlegrass, sedge, sideoats grama, yellow Indiangrass
Land capability subclass (irrigated): 3e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 12 inches; loamy sand
12 to 31 inches; clay loam, silty clay, silty clay loam
31 to 60 inches; silt loam, loam

Minor Components
Ascalon and similar soils
Composition: About 10 percent

WeB-Weld fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Weld soils
Landscape: Uplands
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 10.4 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sedge, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; fine sandy loam
6 to 18 inches; clay loam, silty clay, silty clay loam
18 to 60 inches; silt loam, loam

Minor Components
Colby and similar soils
Composition: About 5 percent

Wiley and similar soils
Composition: About 5 percent

WIA-Weld loam, 0 to 1 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Weld soils
Landscape: Uplands
Parent material: Loamy eolian deposits

Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 9.5 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Low
Calcium carbonate maximum: About 6 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sedge, winterfat
Land capability subclass (irrigated): 2s
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; loam
6 to 18 inches; silty clay loam, silty clay, clay
18 to 24 inches; silt loam, loam, silty clay loam
24 to 60 inches; silt loam, loam, sandy loam

Minor Components
Wiley and similar soils
Composition: About 5 percent

Colby and similar soils
Composition: About 5 percent

Ascalon and similar soils
Composition: About 4 percent

Aquic Haplustolls and similar soils
Composition: About 1 percent
Landform: Swales

WIB-Weld loam, 1 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

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

Component Descriptions

Weld soils
Landscape: Uplands
Parent material: Loamy eolian deposits

Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 9.5 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 6 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sedge, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; loam
6 to 18 inches; silty clay loam, silty clay, clay
18 to 24 inches; silt loam, loam, silty clay loam
24 to 60 inches; silt loam, loam, sandy loam

Minor Components
Wiley and similar soils
Composition: About 10 percent

Colby and similar soils
Composition: About 5 percent

WoB-Weld-Colby complex, 0 to 3 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Weld and similar soils: 55 percent
Colby and similar soils: 30 percent
Minor components: 15 percent

Component Descriptions

Weld soils
Landscape: Uplands
Parent material: Loamy eolian deposits
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 9.5 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium

Calcium carbonate maximum: About 6 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sedge, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 3e

Typical Profile:
0 to 6 inches; loam
6 to 18 inches; silty clay loam, silty clay, clay
18 to 24 inches; silt loam, loam, silty clay loam
24 to 60 inches; silt loam, loam, sandy loam

Colby soils
Landscape: Uplands
Parent material: Loamy eolian deposits
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: Medium
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat
Land capability subclass (irrigated): 2e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 12 inches; silty clay loam
12 to 43 inches; silty clay loam
43 to 60 inches; clay loam

Minor Components
Wiley and similar soils
Composition: About 15 percent

WoC-Weld-Colby complex, 3 to 5 percent slopes

Map Unit Setting

Major Land Resource Area: 67
Elevation: 4900 to 5500 feet (1494 to 1676 meters)
Mean annual precipitation: 12 to 18 inches (305 to 457 millimeters)
Mean annual air temperature: 48 to 52 degrees F. (8.9 to 11.1 degrees C.)
Frost-free period: 140 to 155 days

Map Unit Composition

Weld and similar soils: 50 percent
Colby and similar soils: 35 percent
Minor components: 15 percent

Component Descriptions

Weld soils
Landscape: Uplands
Parent material: Loamy eolian deposits
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: .06 to 0.2 in/hr (slow)
Available water capacity: About 9.4 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 6 percent
Gypsum maximum: None
Salinity maximum: About 2 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, winterfat, sun sedge
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 5 inches; loam
5 to 12 inches; silty clay loam, silty clay, clay
12 to 24 inches; silt loam, loam, silty clay loam
24 to 60 inches; silt loam, loam, sandy loam

Colby soils
Landscape: Uplands
Parent material: Loamy eolian deposits
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: 0.2 to 0.6 in/hr (moderately slow)
Available water capacity: About 11.2 inches (high)
Shrink-swell potential: About 1.5 percent (low)
Runoff class: High
Calcium carbonate maximum: About 10 percent
Gypsum maximum: None
Salinity maximum: About 0 mmhos/cm (nonsaline)
Sodium adsorption ratio maximum: About 0 (nonsodic)
Ecological site: Loamy Plains
Potential native vegetation: western wheatgrass, blue grama, green needlegrass, fourwing saltbush, sun sedge, winterfat
Land capability subclass (irrigated): 4e
Land capability subclass (nonirrigated): 4e

Typical Profile:
0 to 12 inches; silty clay loam
12 to 43 inches; silty clay loam
43 to 60 inches; clay loam

Minor Components

Wiley and similar soils

Composition: About 10 percent

Ascalon and similar soils

Composition: About 5 percent

Figure 4.—Center pivot sprinkler irrigation in Boulder County.

Figure 5.—Stripcropping in the Boulder County Area, on Ascalon-Otero complex, 3 to 5 percent slopes.

Figure 6.—Nederland very cobbly sandy loam, near Table Mountain.

Figure 7.—Irrigated farming on Nunn sandy clay loam, near Niwot.

Figure 8.—Valmont cobbly loam and clay loam, near Table Mountain.

Use and Management of Soils

This section discusses general management of irrigated and nonirrigated soils, and cropping systems. The system of capability classification used by the Natural Resources Conservation Service is explained, and management by capability groups is discussed. Tables give predicted yields of the principal irrigated and nonirrigated crops. Suggestions for the use and management of soils for native grassland, woodland and tree planting, recreation, and wildlife are included in this section. Also discussed are engineering and urban uses of the soils.

Management of Irrigated Soils

The first part of this section gives general information about irrigation methods and crops and cropping practices in the Boulder Area; the second part discusses the irrigated capability units in the Area; and the third gives predicted average acre yields for the principal irrigated crops under a high level of management.

In 1968 about 68,000 acres in the Boulder Area was irrigated. The irrigated areas are mainly in the eastern part of the survey area, although a few areas of meadowland are irrigated in the foothill and mountainous part. Most of the irrigation and domestic water for the Area is taken from two main sources: the various streams in the Area and their storage reservoirs. The main streams are the Boulder and South Boulder Creeks, and the Left Hand and St. Vrain Creeks. Most of the water from the creeks is stored in reservoirs during spring runoff and released for irrigation as needed. Highland Reservoir No 2 has a storage capacity of 3,765 acre-feet; Foothills Reservoir, 4,345 acre-feet; Base Line Lake, 5,300 acre-feet; Marshall Lake, 10,258 acre-feet; and Left Hand Valley Reservoir, 3,800 acre-feet. There also are numerous smaller lakes and reservoirs.

In addition to these sources of water, the Colorado Big Thompson Transmountain Diversion Project serves much of the Area. The Diversion Project supplies supplemental water and, in most years, ensures a supply of late-season irrigation water.

A few areas obtain water from wells, but the number of wells in the Boulder Area is limited. Additional information about the wells and about the chemical analysis of the water can be obtained from the U.S. Geological Survey (Jenkins, 1961).

Irrigation methods

The five principal methods of irrigating the soils in the Area are by furrows, borders, controlled flooding, sprinklers, and corrugations.

Furrow irrigation is used where row crops are grown. When this method is used, the water is taken from ditches by siphon tubes, by gated pipe, or by cuts in the ditchbank, and is applied in the furrows between the rows of plants. On sloping soils, the use of contour furrows helps to control erosion by carrying water across the slope. On nearly level soils, the furrows are straight.

Border irrigation is used on nearly level fields that are planted to close-growing crops. When this method is used, the water flows down a narrow strip between the ridges, and the water soaks into the soil as it advances. Uniform grades are necessary, however, to ensure an even distribution of water and to prevent ponding.

Controlled flooding is used on close-growing crops. Water is flooded down the slope between closely spaced field ditches.

Sprinkler irrigation is used in the Area mainly where slopes are steep or uneven. Sprinklers are an advantage in establishing pasture crops and in preemergence irrigation of certain crops. With this method of irrigating, however, water losses resulting from evaporation may be higher than with other methods of irrigation, and wind drift may cause uneven application of water.

Corrugation irrigation is useful on fields that do not have uniform grades. Corrugations are used mainly on fields growing close-drilled or broadcast crops.

Irrigation practices

If plants are to receive the amount of moisture they need, water must be applied efficiently. Irrigation is inefficient when water is allowed to penetrate below the root zone. This water is lost when runoff occurs at the end of the field, or when it escapes through seepage and in ditches. Water seeps down below the root zone if the irrigation runs are too long or if the water is allowed to run too long on the same set. Also, if the runs are too long or if the amount of water used is too small for the length of the run, the soils at the upper end of the run will likely be wet below the root zone before the soils at the lower end have received enough water. This is especially likely in sandy soils or in soils that have a root zone that is shallow over sand. Wetting the soil below the root zone has little value and is likely to create drainage problems.

A good irrigation system is one that enables the farmer to apply the needed amount of moisture to the soil with little waste. The amount of moisture that can be retained by the soil depends largely upon the texture and thickness of the soil. Generally, loamy sands and fine sands hold about 0.05 to 0.08 inches of water per inch of soil depth; sandy loams, about 0.11 to 0.13 inches per inch; loam or silt loam, about 0.16 to 0.18 inches per inch; clay loam about 0.19 to 0.21 inches per inch; and clays, about 0.14 to 0.17 inches per inch. In order to obtain a maximum rate of growth, an irrigation system that uses not more than one-half of the available moisture capacity at the root zone is necessary.

Irrigation in such a manner as to obtain high production without waste of either water or soil requires the knowledge of certain fundamental management practices. These practices can mean saving in water, control of erosion, higher crop yields, lower labor costs, and continued production. In the Boulder Area, the following practices are used.

Land leveling.—The farmer who irrigates his soils needs to be able to apply water uniformly and to conserve water and labor. Land leveling helps to do these things, and it is necessary if border irrigation is used. Most land leveling is done in areas that are already nearly level, for in such areas less soil material must be moved for good results. Where land leveling is to be done, the kinds of soils, the relief, and the general topography must all be considered.

Drainage.—Many of the soils of the Area need to be drained if they are to be cropped to their fullest potential. Both tile and open drains are used. Once drained, many of the soils need to be leached of excessive accumulations of salts. In most cases, applying excessive amounts of irrigation water can do leaching, but on some soils, chemical amendments may be helpful. Growing salt-tolerant crops, such as barley or sugar beets, may be necessary until leaching is accomplished.

Erosion control.—Control of erosion is always important on irrigated soils. Planting the steeper slopes to close-growing crops, irrigating on the contour across the slope, and careful applications of irrigation water are methods that help to prevent excessive erosion. Installations of pipeline or concrete-lined ditches also are helpful in preventing excessive ditch erosion and thus in conserving water.

Figure 9.—Caldwell Mountain provides a spectacular background for this farm.

Crops and cropping practices

The main irrigated crops in the Area are alfalfa, corn, sugar beets, small grain, dry beans, and pasture grasses. The length of the frost-free season, 140 to 155 days, permits three cuttings of alfalfa and allows for the maturation of selected varieties of corn. In recent years the acreage of dry beans has increased and the acreage of sugar beets has decreased. These acreages vary somewhat according to demand of the crop and to the labor supply. Vegetable crops such as sweet corn, tomatoes, cucumbers, cabbage, onions, peppers, peas, pumpkins, and red beets also are well adapted to the Area and are grown on limited acreages.

A good cropping system includes a sequence of crops that helps to maintain soil tilth and fertility, and to control insects, diseases, and weeds. A suitable sequence includes alfalfa or another soil-building crop. A system of fertilizing also is necessary for producing continued high yields. Fertilizer should be applied according to soil tests. In areas that have been leveled with deep cuts, applications of manure are particularly helpful in restoring tilth and fertility.

Capability groups of soils

Capability classification is the grouping of soils to show, in a general way, their suitability for most kinds of farming. It is a practical classification based on the limitations of the soils, the risk of damage when they are used, and the way they respond to treatment. The soils are classified according to degree and kind of permanent limitation, but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soils; and without consideration of possible but unlikely major reclamation projects (USDA-SCS, 1961).

In the capability system, all the soils are grouped at three levels: the capability class, the subclass, and the unit. These are discussed in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. Classes are defined as follows:

Class I soils have few limitations that restrict their use.
Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.
Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.
Class IV soils have very severe limitations that restrict the choice of plants, require very careful management, or both.
Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover.
Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover.
Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.
Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitations is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only subclasses identified by *w, s*, and *c*, because the soils in it are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Capability units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding Arabic numerals to the subclass symbol, for example, *IIw-2* or *IIIe-3*. Thus in one symbol, the Roman numeral designates the capability class, or degree of limitations; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit.

In the following pages the capability units in the Boulder Area are described and suggestions for the use and management of the soils are given. Soils used for irrigation farming are classified into irrigated capability units and are shown first. The nonirrigated capability units follow them.

Capability Unit I (Irrigated)

This unit consists of deep, well-drained soils of the Ascalon and Nunn series. These soils have a sandy loam and sandy clay loam surface layer and a sandy clay loam and clay subsoil. Slopes are 0 to 1 percent. Permeability is moderate to moderately slow. Runoff is slow, and the erosion hazard is slight. Available water capacity is high. The effective rooting depth is 60 inches or more.

The soils in this capability unit are suited to all of the irrigated crops grown in the Area. A suitable cropping system is alfalfa for 3 or 4 years, followed by corn, sugar beets, and small grain. Vegetables can be substituted for either corn or sugar beets in the rotation. Leaving stubble or other crop residue on the surface helps to maintain tilth and to protect these soils from possible damage caused by soil blowing during windy periods in spring. If the soils are left bare for long periods during spring, a cloddy or ridged surface helps to minimize wind damage.

Nearly all of the irrigation methods commonly used are suitable. Border, corrugation, or sprinkler irrigations are suited to alfalfa and small grain. Corrugations and controlled flooding are suited to pasture and to fields that must be irrigated with a short supply of water. Furrow or sprinkler irrigation is well adapted for row crops. The irrigation runs can be relatively long.

Corn, sugar beets, and small grain respond well to applications of nitrogen fertilizer, and sugar beets and alfalfa respond to phosphorus fertilizers.

These soils are suitable for irrigated pasture.

Capability Unit IIe-1 (Irrigated)

This capability unit consists of deep, well-drained soils of the Colby, Kim, Manvel, Nunn, and Weld series. These soils have a loam, silty clay loam, or clay loam surface layer. The subsoil or underlying layer is loam, sandy clay loam, silty clay loam, clay loam, or clay. Slopes are 1 to 3 percent. Permeability is moderate to slow. Runoff is medium, and the erosion hazard is moderate. Available water capacity is high. The effective rooting depth is 40 to 60 inches or more. A few small areas have a seasonal high water table at a depth of 3 to 5 feet.

The soils in this capability unit are suited to all of the irrigated crops of the Area. A systematic crop rotation should be followed in order to maintain soil tilth. A suitable cropping system is alfalfa 3 or 4 years, followed by corn, sugar beets, and small grain. Vegetable crops can be substituted for corn or sugar beets in the rotation. To minimize erosion losses and to maintain soil tilth, row crops should be limited to no more than 3 consecutive years. Use of high residue crops, such as a small grain and occasionally a green-manure crop helps to increase intake of water and to improve tilth, so that these soils can be worked more easily. The clay loam soils of this unit are easier to work in the spring if they are plowed in the fall.

Nearly all of the methods of irrigating commonly used are suitable. Border ditches will erode on these slopes, however, and are not recommended. Sprinklers can be used on all of the crops grown. Borders, corrugations, and controlled flooding between contour ditches can be used for irrigating alfalfa and small grain. Row crops can be irrigated by furrows and contour furrows. Irrigating with a small head of water and shortening the length of irrigation runs help to control erosion on the more sloping soils. In order to reduce excessive ditch cutting, all supply ditches should have a drop structure if they run down the slope.

Crops grown on soils of this unit respond well to applications of fertilizer containing nitrogen and phosphorus.

These soils are suited to irrigated pasture.

Capability Unit IIe-2 (Irrigated)

This unit consists of deep, well-drained soils of the Ascalon, Nunn, Otero, and Weld series. These soils have a fine sandy loam, sandy loam, or sandy clay loam surface layer and a subsoil or underlying layer of sandy loam, sandy clay loam, clay loam, or clay. Slopes are 0 to 3 percent. Permeability is slow to moderately rapid.

Runoff is slow to medium, and the erosion hazard is slight to moderate. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

The soils in this capability unit are suited to all of the irrigated crops of the Area, but they must have an adequate supply of water. The soils should be leveled to a uniform grade to facilitate proper management of irrigation water. A suitable cropping system is alfalfa for 3 or 4 years, followed by corn or sugar beets, and then small grain for 2 years. Vegetable crops can be substituted for corn or sugar beets in the rotation. Areas exposed to strong winds can be protected by leaving stubble on the ground or by leaving the surface rough or ridged.

Nearly all of the irrigation methods commonly used are suitable. Border ditches are not suitable for some crops because the ditches erode on these slopes. Sprinklers can be used on all of the crops grown. Borders, corrugations, and controlled flooding between contour ditches can be used for irrigating alfalfa and small grain. Corn and sugar beets can be irrigated by furrows and contour furrows. Irrigation heads should be small and the runs relatively short, so that erosion is controlled and the penetration of water is improved.

Crops grown on soils of this unit respond well to applications of fertilizer containing nitrogen and phosphorus.

These soils are suited to irrigated pasture.

Capability Unit IIs-1 (Irrigated)

This unit consists of deep, well-drained soils of the Nunn and Weld series. These soils have a clay loam and loam surface layer and a clay subsoil. Slopes are 0 to 1 percent. Permeability is slow. Runoff is slow, and the erosion hazard is slight. Available water capacity is high. The effective rooting depth is 60 inches or more.

The soils in this capability unit are suited to all of the irrigated crops of the Area. A suitable cropping system is alfalfa for 3 or 4 years, followed by corn, sugar beets, small grain, and then alfalfa seeded with a small grain as a nurse crop. Vegetable crops can be substituted for corn or sugar beets in the rotation.

These soils are easier to work down for seedbed preparation if they are plowed in the fall. Occasional subsoiling when the ground is dry will temporarily open the soil to air, water, and plant roots. If intensive row cropping is planned, barnyard manure or a green-manure crop should be plowed under in order to maintain the rate of water intake and to improve soil tilth.

Suitable methods of irrigation are borders, corrugations, contour ditches, furrows, and sprinklers. The irrigation runs can be long because of the slow permeability. Where irrigation runs can be short, small heads of water can be used to wet the root zone and lengthen time between irrigations.

Crops grown on these soils respond to fertilizer containing nitrogen and phosphorus. Use of crop residue helps to improve tilth, so that these soils can be worked more easily.

These soils are suited to irrigated pasture.

Capability Unit IIw-1 (Irrigated)

This unit consists of deep, somewhat poorly drained soils of the Colby and McClave series. These soils have a clay loam and silty clay loam surface layer and a clay loam and silty clay loam underlying layer. Slopes are 0 to 3 percent. Permeability is moderate. Runoff is slow to medium, and the erosion hazard is slight to moderate. Available water capacity is high. The effective rooting depth is 60 inches or more. A seasonal fluctuating water table is at a depth between 2 and 4 feet.

The soils in this capability unit are suited to most of the irrigated crops of the Area. Salt-tolerant crops, such as barley and sugar beets, are especially suitable; and salt-sensitive crops, such as potatoes and onions, are unsuitable. To maintain maximum crop production, the soils should be drained. Even if they are not drained, they can be used for crops, but the water table should be maintained at a nearly constant level. Unless the water table is controlled, yields and life of perennial crops, such as alfalfa, will be less.

Irrigating with relatively short runs is necessary to prevent overirrigation. Frequent, light irrigations minimize the accumulation of salts.

Crops grown on soils of this unit respond well to fertilizer containing nitrogen and phosphorus.

These soils are well suited to irrigated pasture. Salt-tolerant and water-tolerant grasses should be planted. Tall wheatgrass and tall fescue are both good pasture grasses. Yellowblossom sweetclover adds to the value of the forage. Nitrogen fertilizer increases vigor of the grasses. Good management of pasture is necessary.

Capability Unit IIw-2 (Irrigated)

This unit consists of deep, somewhat poorly drained soils of the Calkins series. These soils have a surface layer and underlying layer of sandy loam. Slopes are 0 to 3 percent. Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight to moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more. A seasonal high water table is between a depth of 2 to 4 feet.

The soils of this capability unit are suited to most of the irrigated crops of the Area. Water-tolerant crops are especially well suited.

To maintain maximum crop production, the soils need to be drained. Where they are not drained, they can be used for crops if the water table is kept at a nearly constant level. Unless the water table is controlled, yields and life of alfalfa and similar perennial crops are less. Since these soils have a moderate available water capacity, the water table can be beneficial. Crop residue left on the surface during the windy spring months helps to control soil blowing and to increase the organic matter content of the soil.

Irrigating with relatively short runs helps to prevent overirrigation and the resulting extreme fluctuation in the water table. Frequent, light irrigations are necessary.

These soils are suited to irrigated pasture. Water-tolerant grasses, such as tall wheatgrass, tall fescue, or slender wheatgrass, are good in pastures. The addition of Alsike clover or alfalfa increases value of the forage. Nitrogen fertilizer increases vigor of the grasses. Good management of pasture is necessary.

Capability Unit IIIe-1 (Irrigated)

The one soil in this unit, Heldt clay, 0 to 3 percent slopes, is deep and moderately well drained. It has a clay surface layer and subsoil. Slopes are 0 to 3 percent. Permeability is slow. Runoff is medium to rapid, and the erosion hazard is moderate. Available water capacity is high. The effective rooting depth is 60 inches or more.

This soil is used for irrigated crops. Its low rate of water intake and the hazard of erosion make intensive row cropping hazardous. Row crops should be limited to no more than 2 years in the crop rotation. If alfalfa and small grain are included in the rotation, they provide protection from erosion and help to maintain soil tilth. Where row crops are grown, the soil should be leveled and the rows slanted across the slope. Irrigating row crops can be difficult because the head of water must be kept small, and thus it takes a long time to wet the ground. Keeping the number of tillage operations to a minimum helps to prevent loss of organic matter content and to maintain a protective soil cover.

Generally, border and sprinkler methods of irrigation are not suitable. Contour ditches and corrugations can be used for irrigating crops drilled in closely spaced rows and for pasture. Row crops can be irrigated by furrows and contour furrows. In order to reduce excessive ditch cutting, all supply ditches that run down the slope should have a drop structure.

Crops grown on this soil respond to fertilizer containing nitrogen and phosphorus. Use of plant residue helps to improve the tilth so that the soil can be worked more easily. Feedlot manure is especially good because it provides organic matter and plant nutrients.

This soil is suited to pasture. Pastures can be grazed or cut over for hay. Smooth bromegrass and orchardgrass are suitable pasture grasses. The addition of Alsike clover or alfalfa increases the value of the forage.

Capability Unit IIIe-2 (Irrigated)

This unit consists of deep, well-drained soils of the Colby, Nunn, Valmont, and Weld series. These soils have a silty clay loam or clay loam surface layer and a silty clay loam, clay loam, or clay subsoil or underlying layer. Slopes are 3 to 5 percent. Permeability is moderate to slow. Runoff is medium to rapid, and the erosion hazard is moderate to high. Available water capacity is high. The effective rooting depth is 60 inches or more.

Included in this unit is Weld fine sandy loam that is mapped as part of the Weld-Colby complex, 3 to 5 percent slopes. Use and management practices are similar to those for the other soils in the unit.

The soils of this capability unit are suited to most of the irrigated crops of the Area. They are too steep for continuous vegetable cropping. If alfalfa and small grain are included in the rotation, they provide protection from erosion and help to maintain soil tilth. Row crops should be limited to no more than 2 years in the rotation.

Border irrigation is not suitable. Sprinklers are suited to all of the crops grown. The soils should be smoothed to remove excessive side slopes. Closely spaced contour ditches allow controlled flooding of such drill crops as small grain or alfalfa. Row crops can be irrigated by contour furrows. The irrigation runs should be relatively short so that erosion is minimized.

Crops grown on soils of this unit respond well to fertilizer containing nitrogen and phosphorus.

These soils are well suited to pasture, and if they are well managed, the hazard of erosion can be minimized. Smooth bromegrass and orchardgrass are suitable pasture grasses. The addition of alfalfa or Alsike clover increases the value of the forage.

Capability Unit IIIe-3 (Irrigated)

The one soil of this capability unit in the Boulder Area, Valmont clay loam, 1 to 3 percent slopes, is deep and well drained. It has a clay loam surface layer and a clay loam and clay subsoil. The underlying material is very gravelly or cobbly loam. Permeability is moderately slow. Runoff is medium, and the erosion hazard is moderate. Available water capacity is moderate. The effective rooting depth is 60 inches or more.

This soil is suited to most of the irrigated crops of the Area. Corn, alfalfa, and small grain are the main crops. If alfalfa is in the crop rotation for 3 or 4 years and small grain for 1 year, protection from erosion is provided and soil tilth is maintained. Row crops should be limited to no more than 2 years in the rotation. If row crops are grown, the soil should be leveled and the furrows angled across the slope.

Borders, corrugations, contour ditches, and sprinklers can be used for irrigating close-growing crops. Row and vegetable crops can be irrigated by furrows, contour furrows, and sprinklers. Irrigation heads should be small and the length of irrigation runs short, so that penetration of water is improved. Because of the limited available water capacity, frequent irrigations are necessary. Leveling to remove the surface irregularities and to facilitate control of irrigation water must be restricted to cuts less than 1-$^1/_2$ feet deep. The underlying very gravelly soil material may be exposed if cuts exceed this depth, and this may result in a substantial reduction in the available water capacity.

Crops grown on the soil of this unit respond well to application of fertilizer containing nitrogen and phosphorus. Soil tilth and fertility can be maintained by applying manure at least once during each crop rotation.

These soils are well suited to permanent grass for pasture or hay. Smooth bromegrass and orchardgrass are suitable pasture grasses. The addition of Alsike clover or alfalfa will increase the value of the forage. In order to maintain production, pastures should be rotated and grazing should be limited so that a minimum of 3 inches of stubble is left on the soil.

Capability Unit IIIe-4 (Irrigated)

This capability unit consists of deep, well drained soils of the Manter series. These soils have a surface layer and subsoil of sandy loam and an underlying layer of loamy sand. Slopes range from 0 to 3 percent. Permeability is moderately rapid. Runoff is slow to medium. The hazard of water erosion is moderate to slight, and the hazard of soil blowing is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more. Some areas have a seasonal high water table within a depth of 3 feet.

These soils are suited to most of the crops commonly grown in the Area; however, the amount of irrigation water available late in the cropping season may not be adequate for vegetable crops, such as potatoes, beets, and onions. A suitable cropping system is alfalfa for 3 or 4 years, followed by corn and small grain. Vegetable crops can be substituted for corn in the rotation. Unless the soil is leveled and rows slated across the slope, row crops should be limited to no more than 2 years in the cropping rotation.

Border, contour ditches, and sprinklers can be used for irrigating close-growing crops. Row crops can be irrigated by furrows, contour furrows, and sprinklers. Because erosion is a hazard, irrigation runs should be short and irrigation heads small. Some shallow-rooted crops need irrigation as often as once a week.

Windbreaks should be established to help control soil blowing. Fields should not be bare during December through February, and crop residue should be left on the surface in order to minimize soil losses caused by soil blowing.

Grain crops grown on these soils respond to applications of nitrogen fertilizer. Hay and pasture crops respond to applications of phosphorus fertilizer. Use of manure provides organic matter and plant nutrients, helps to increase intake of water, and improves tilth so that these soils can be worked more easily.

These soils are suited to irrigated pasture. Smooth bromegrass and orchardgrass are suitable pasture grasses. The addition of alfalfa or Alsike clover increases the value of the forage. In order to maintain production, pastures should be rotated and grazing should be limited so that a minimum of 4 inches of stubble is left on the soil. With good management and use of fertilizer, grass-legume mixtures can be used indefinitely for pasture or hay.

Capability Unit IIIe-5 (Irrigated)

The one soil in this capability unit in the Boulder Area, Weld loamy sand, 1 to 4 percent slopes, is deep and well drained. It has a loamy sand surface layer and a clay and clay loam subsoil. Permeability is slow. Runoff is slow, and the hazard of soil blowing is high. Available water capacity is high. The effective rooting depth is 60 inches or more.

This soil is used for irrigated crops. Corn, alfalfa, and small grain are the main crops. A suitable cropping system is alfalfa for 3 or 4 years, followed by corn and a small grain. Row crops should be grown only if crop residue is left on the ground during the windy period in winter and spring, or if a winter cover crop is established to protect the soil from blowing.

Sprinklers are the most effective method of irrigating this soil. The sprinklers should be self- powered or easily removed because frequent irrigations are required.

Crops grown on this soil respond to fertilizer containing nitrogen and phosphorus. Use of crop residue and manure helps to improve tilth.

This soil is well suited to permanent grass for pasture or hay. Smooth bromegrass and orchardgrass are suitable grasses. The addition of alfalfa or Alsike clover increases value of the forage. On the more nearly level areas, borders can be used for irrigating hay and pasture. Irrigation runs should be short. Frequent, light irrigations are necessary. To maintain production, pastures should be rotated and grazing limited so that a minimum of 4 inches of stubble is left on the soil. With good management and use of fertilizer, pastures can be very productive.

Capability Unit IIIe-6 (Irrigated)

This unit consists of deep, well-drained soils of the Ascalon, Manter, and Otero series. These soils have a sandy loam surface layer and a sandy loam or sandy clay loam subsoil or underlying layer. Slopes are 3 to 9 percent. Permeability is moderate to moderately rapid. Runoff is medium to rapid, and the erosion hazard is moderate or high. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

The soils of this capability unit are used for irrigated crops. Their slopes, however, are strong enough that row or vegetable crops should be planted only if alfalfa and small grain are used in the rotation to help reduce soil washing and soil blowing. Row crops should be limited to no more than 2 years in the rotation. Keeping tillage to a minimum helps to reduce soil washing and blowing.

Flooding from contour ditches and sprinkling are suitable methods for irrigating drilled crops and pasture. Row crops can be irrigated by furrows, contour furrows, or sprinklers. Furrows should be angled across the slope to reduce the hazard of erosion. Irrigating with a small head of water and shortening the length of irrigation runs are ways to improve control of erosion.

These soils are well suited to permanent grass for hay or pasture. Smooth bromegrass, orchardgrass, or tall fescues are suitable grasses. The addition of Alsike clover or alfalfa increases value of the forage. To maintain production, frequent irrigations and applications of fertilizer containing nitrogen and phosphorus are necessary.

Capability Unit IIIe-9 (Irrigated)

The one soil in this unit in the Area, Hargreave fine sandy loam, 1 to 3 percent slopes, is moderately deep and well drained. It has a surface layer of fine sandy loam and a subsoil of fine sandy clay loam. Permeability is moderate. Runoff is slow to medium, and the erosion hazard is moderate. Available water capacity is low to moderate. The effective rooting depth is between 20 and 40 inches.

This soil is used for crops and pasture. It is suited to limited cropping. A suitable cropping system is alfalfa followed by small grain. Where row crops are grown, they should be limited to no more than 2 years in the rotation, or rows should be slanted across the slope.

Most methods of irrigation are suitable, but irrigation runs should be short enough to avoid waterlogging the soil. Frequent, light irrigations are necessary.

This soil is best suited to permanent pasture. Brome, orchard, and fescue are suitable grasses. The addition of clover or alfalfa improves the value of the forage.

Rotating grazing and limited grazing are ways to maintain and improve the plant cover and help to control erosion. Use of fertilizer improves yields.

Capability Unit IIIw-1 (Irrigated)

This unit consists of deep, somewhat poorly drained soils of the Loveland series. These soils have a clay loam or sandy clay loam surface layer. The underlying layer is a sandy clay loam, clay loam, or loam that is 20 to 40 inches deep over gravelly sand. Slopes are 0 to 1 percent. Permeability is moderate. Runoff is slow, and the erosion hazard is slight. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more. A seasonal high water table is at a depth of 2 to 4 feet.

These soils can be used for irrigated crops. Yields, however, are lowered by the poor drainage. Salt-tolerant crops, such as barley and sugar beets, are especially well suited.

Irrigation systems should be designed to avoid overirrigation. The irrigation runs should be short. Frequent, light irrigations help to minimize accumulation of salts and to prevent the excessive fluctuation in the water table that can be harmful to plants.

These soils are suited to pasture. Tall fescue, slender wheatgrass, or tall wheatgrass are suitable grasses. The addition of strawberry clover, yellowblossom sweetclover, or Alsike clover increases the value of the forage. Proper management of pasture is necessary for sustained high yields.

Capability Unit IVe-1 (Irrigated)

This unit consists of deep and moderately deep, moderately well drained and well drained soils of the Colby, Gaynor, Heldt, Kutch, Nunn, and Renohill series. These soils have a silty clay loam, clay loam, or clay surface layer. The subsoil or underlying layer is silty clay loam, clay loam, silty clay, or clay. Some of the soils are underlain by bedrock. Slopes are 3 to 9 percent. Permeability is moderate to slow. Runoff is medium to rapid, and the erosion hazard is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 20 to 60 inches or more.

The soils of this capability unit are suited to limited cropping. Intensive cropping is hazardous because erosion is a hazard. Alfalfa and small grain are the main crops, but corn and sugar beets also are grown. Row crops should be limited to no more than 1 year in the rotation. A suitable cropping systems is alfalfa for 3 or 4 years, followed by corn, small grain for 2 years, and alfalfa that is seeded with a nurse crop for small grain. Alfalfa for 3 or 4 years, followed by small grain for 2 years, is also a suitable cropping system. Suitable irrigation methods are limited. Sprinklers or closely spaced contour ditches are used for drilled crops. Row crops can be irrigated by contour furrows or sprinklers.

Seeding these soils to permanent grasses for pasture or hay is the best method of protecting them from erosion, and often this is the most profitable use. Smooth bromegrass and orchardgrass are suitable grasses. The addition of alfalfa or Alsike clover increases the value of the forage. Pastures should be rotated and grazing limited, so that a 4-inch stubble is left. Adequate water and sufficient fertilizer are needed to maintain vigorous pasture that protects the soils from erosion. Permanent contour ditches or sprinklers can be used for pasture, so that irrigation is less costly than for field crops.

Soil tilth and fertility can be maintained by applying manure. Use of commercial fertilizer helps to promote growth of the vegetation so necessary in reducing the hazard of erosion.

Capability Unit IVe-2 (Irrigated)

The one soil of this capability unit in the Boulder County Area, Hargreave fine sandy loam, 3 to 9 percent slopes, is moderately deep and well drained. This soil has a surface layer of fine sandy loam and a subsoil of fine sandy loam and sandy clay loam that is underlain by sandstone. Permeability is moderate. Runoff is slow to rapid, and the erosion hazard is moderate to high. Available water capacity is low to moderate. The effective rooting depth is 20 to 40 inches.

This soil is suited to limited cropping. A suitable cropping system is alfalfa for 3 or 4 years and small grain for 1 or 2 years. If row or vegetable crops are grown, they should be limited to no more than 2 years in the cropping sequence. Where row or vegetable crops are grown, the rows should be slanted across the slope.

Suitable methods for irrigating this soil are limited. Closely spaced contour furrows or sprinkling are the most suitable. Frequent, light irrigations are necessary because the available water capacity is limited. Light irrigations minimize the possibility of perching water on the underlying sandstone.

This soil is best suited to permanent pasture. Smooth bromegrass and orchardgrass are suitable grasses. The addition of Alsike clover or alfalfa increases the value of the forage. Pastures should be rotated and grazing limited, so that a minimum of 3 inches of stubble is left on the soil. Application of fertilizer containing nitrogen and phosphorus is necessary for high yields, as is adequate water.

Capability Unit IVe-3 (Irrigated)

This unit consists of deep, well-drained soils of the Ascalon and Otero series. These soils have a sandy loam surface layer and a subsoil or an underlying layer of sandy loam or sandy clay loam. Slopes are 5 to 9 percent. Permeability is moderate or moderately rapid. Runoff is rapid, and the erosion hazard is high. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

The soils of this capability unit are suited to some of the crops commonly grown in the Area. A suitable cropping system is alfalfa for 3 or 4 years rotated with small grain for 2 years. Row cropping should be limited, and if row crops are grown, the furrows should be angled across the slope.

Suitable methods for irrigating are limited. Closely spaced contour furrows and sprinkling are the most suitable. Extreme care must be taken in irrigating in order to minimize the losses resulting from erosion.

Seeding these soils to permanent grasses for pasture or hay is the best method of protecting them from erosion. Smooth bromegrass and orchardgrass are suitable grasses. The addition of alfalfa or Alsike clover increases the value of the forage. Pastures should be rotated, and grazing limited, to allow vigorous plant growth and reduce the hazard of erosion. Adequate water and fertilizer are needed to maintain vigorous pasture that can protect the soils from erosion.

Capability Unit IVs-1 (Irrigated)

This unit consists of moderately deep, well-drained soils of the Gaynor and Renohill series. These soils have a silty clay loam surface layer. The subsoil or underlying layer is a silty clay loam or silty clay that is underlain by bedrock. Slopes are 1 to 3 percent. Permeability is moderate to slow. Runoff is medium, and the erosion hazard is moderate. Available water capacity is moderate to high. The effective rooting depth is 20 to 40 inches.

The soils of this capability unit are suited to limited cropping. A suitable cropping system is alfalfa for 3 or 4 years or longer, corn or small grain for 2 years, and a row crop. Intensive row or vegetable cropping is hazardous because of the hazard of erosion and the depth to bedrock.

Use of plant residue improves tilth so that the soils can be worked more easily. Feedlot manure is especially good because it provides organic matter and plant nutrients.

Most methods of irrigation are suited to these soils, but irrigation runs should be short enough to avoid both overirrigation and waterlogging of the soils. Frequent, light irrigations are necessary.

These soils are suited to permanent grass for hay or pasture. Tall wheatgrass and smooth bromegrass are suitable. The addition of Alsike clover or alfalfa increases the value of the forage. Pastures need intensive management to maintain plant vigor. Pastures should be rotated and grazing limited, so that a minimum of 3 inches of stubble is left on the soil. Commercial fertilizer adds to the amount and value of the forage produced. With adequate water and good management, planting these soils to pasture or hay will improve their tilth.

Capability Unit IVw-1 (Irrigated)

This unit consists of deep, somewhat poorly drained soils of the Niwot series. These soils have a surface layer of loam, sandy clay loam, or clay loam that is 10 to 20 inches deep over gravelly sand. Slopes are 0 to 1 percent. Permeability is moderate. Runoff is slow, and the erosion hazard is slight. Available water capacity is low or moderate. The effective rooting depth is 60 inches or more. A seasonal high water table is at a depth of $^1/_2$ to 1-$^1/_2$ feet.

Included in this unit is Made land that is composed of waste material from sugar factories. Some areas have been seeded to grass and are irrigated. Made land is not suited to dryland cropping and should remain under a permanent cover of grass.

The soils of this capability unit are suited to very limited cropping. Water-tolerant crops are especially suitable. Because they are droughty, it is not practical to drain these soils. Frequent, light irrigations minimize accumulations of salts. Leveling that requires deep cuts is not suitable because it exposes the underlying droughty gravelly sand. Some smoothing is helpful in controlling flow of irrigation water.

These soils are best suited to permanent grasses for hay or pasture. Tall wheatgrass, tall fescue, or yellowblossom sweetclover are suitable for pasture. Pastures should be rotated and grazing limited so that a minimum of 3 inches of growth is left on the soil. When high water is flowing in stream channels, protection of streambanks is necessary to avoid erosion. Commercial fertilizer improves the amount and value of the forage produced.

Capability Unit Vs-1 (Irrigated)

The one soil in this capability unit in the Boulder County Area, Valmont cobbly clay loam, 1 to 5 percent slopes, is deep and well drained. This soil has a cobbly clay loam surface layer and a subsoil of clay or clay loam that is 20 to 40 inches deep over very gravelly or cobbly materials. Permeability is moderate. Runoff is medium, and the erosion hazard is slight to moderate. Available water capacity is moderate. The effective rooting depth is 20 to 40 inches.

The soil of this capability unit is used mainly for irrigated pasture because it is too cobbly for continuous cultivation. It is best used for permanent pasture for hay or grass. Smooth bromegrass, tall wheatgrass, and orchardgrass are suitable grasses. The addition of alfalfa or Alsike clover adds to the value of the forage. Seeding this soil is difficult because the cobbles can break up the seeder. Broadcast seeding and dragging to cover the seed is sometimes successful.

Irrigation can be difficult because the available water supply is limited and frequent irrigations are needed. Often, this soil is irrigated with tail or waste water, and when water is scarce, it is not irrigated at all. Suitable methods of irrigation are sprinkling and flooding from contour ditches. Erosion is not a serious hazard on this soil.

Pastures should be rotated and grazing limited so that a minimum of 3 inches of stubble is left on the soil. Commercial fertilizers increase the amount and value of the forage produced, but fertilizing should be based on the available water supply.

Management of Nonirrigated Soils

About 25,000 acres in the Boulder Area is dry cropland. Most of this is in small acreages scattered throughout the eastern part. In the main dry-farmed area the mean annual precipitation ranges from 12 to 18 inches, but it is as high as 24 inches in the mountains. The frost-free period in the main dry-farmed areas is 140 to 155 days, which is more than enough to mature winter grain. It is as low as 80 days in the mountains. Included in the acreages used mainly for dryland crops are areas that can be irrigated in years when water is plentiful.

Since most of the Boulder Area receives limited precipitation, a system of summer fallow is used on dryland soils to store moisture during the fallow period and make it available for crops during the following year. In the fallow period, weeds and volunteer crops are destroyed by sweeps or other machines that leave part of the stubble on the surface. This stubble helps to keep the soils from crusting and reduces erosion. Minimum tillage also helps to keep crop residues on the surface where they protect the soils from blowing and water erosion.

Stripcropping helps to reduce erosion. The strips are of varying width, according to the kind of soil. These strips are usually at right angles to the direction of the prevailing strong wind, which is mostly west-east or east-west. Contour stripcropping is another way of conserving winter moisture.

If there is not enough stubble to protect the soil from blowing, emergency tillage may be necessary. In this practice, implements are used that bring clods to the surface. The rough surface helps to reduce losses by blowing soil.

The main cropping system on dryland is one in which winter wheat is alternated with summer fallow. The fields are cropped mostly in strips that alternate with strips that are stubble-mulch fallowed.

Grassed waterways are used effectively to carry excess surface runoff.

Capability Unit IIIe-7 (Nonirrigated)

This unit consists of deep, well-drained soils of the Nunn, Valmont, Weld, and Colby series. Most of these soils have a fine sandy loam to clay loam surface layer and a silty clay loam or clay subsoil. Slopes are 3 to 5 percent. Permeability is slow to moderate. Runoff is rapid, and the erosion hazard is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

These soils are used mainly as dry cropland. A suitable cropping system is wheat-summer fallow. The stubble should be left standing through winter and spring to help reduce soil blowing and water erosion. Stubble-mulch tillage helps to reduce erosion and to collect snow. Stripcropping at right angles to the direction of prevailing wind reduces soil blowing.

These soils are suited to grass for pasture. Crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and Russian wildrye are suitable pasture grasses. To ensure a full and vigorous stand of grasses, grazing should be limited until the grass has become established.

Capability Unit IIIe-8 (Nonirrigated)

This unit consists of deep or moderately deep, well-drained soils of the Ascalon, Hargreave, Manter, Otero, and Weld series. The soils have a sandy loam and fine sandy loam surface layer and a subsoil or underlying layer of sandy loam, sandy clay loam, or clay. Slopes are 0 to 3 percent. Permeability is slow to moderately rapid. Runoff is slow to medium, the hazard of water erosion is slight to moderate, and the hazard of soil blowing is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

These soils are used mainly as dry cropland, although a few areas are in pasture. Wheat is the main crop, but other small grains also are grown. Because of the limited precipitation, a system of summer fallow is necessary for maintaining yields. During fallow periods, it is important to keep plant residues on the surface to aid in controlling soil blowing.

If there is sufficient moisture, the use of nitrogen fertilizer increases vigor of the crops.

Crested wheatgrass, pubescent wheatgrass, intermediate wheatgrass, and Russian wildrye are well adapted grasses suitable for planting. Planting in grain stubble helps to conserve moisture and reduces soil blowing. To ensure a full and vigorous stand, newly seeded areas should not be grazed during the first growing season. After the stand has been established, grazing should be limited so that a minimum of 3 inches of stubble is left on the soil.

Natural drainageways can be protected from water erosion by planting grass.

Capability Unit IIIs-1 (Nonirrigated)

This unit consists of deep, well-drained soils of the Nunn and Valmont series. These soils have a clay loam surface layer and a clay or clay loam subsoil. Slopes are 1 to 3 percent. Permeability is moderate to slow. Runoff is medium, and the erosion hazard is moderate. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

These soils are used mainly as dry cropland and pasture. Wheat is the main crop, but other small grains also are grown. A system of summer fallow is used to store moisture during the fallow period and make it available for crops during the following year. Stubble mulching is helpful in reducing erosion, in maintaining the content of organic matter, and in improving tilth. Terracing and stripcropping also help to control erosion.

Some areas of these soils are used as range. Russian wildrye, crested and wheatgrass, pubescent wheatgrass, and intermediate wheatgrass are adapted grasses suitable for seeding. To ensure a full and vigorous stand, newly seeded areas should not be grazed during the first growing season. After the stand has been established, grazing should be limited so that a minimum of 3 inches of stubble is left on the soil. No more than one-half of the current year’s growth of grasses should be grazed.

Capability Unit IIIe-1 (Nonirrigated)

This unit consists of deep, well-drained soils of the Weld and Colby series. These soils have a loam or silty clay loam surface layer, and a silty clay loam, clay loam, or clay subsoil or underlying layer. Slopes are 0 to 3 percent. Permeability is moderate to slow. Runoff is slow to medium, and the erosion hazard is slight to moderate. Available water capacity is high. The effective rooting depth is 60 inches or more.

These soils are used mainly as dry cropland. Wheat is the main crop, but other small grains also are grown. The major management problem is conservation of moisture. Wheat-summer fallow is the main cropping system. During the fallow period, weeds can be destroyed by using chisels and sweeps that leave part of the stubble on the surface. The weed stubble protects the soil from blowing and from water erosion. Stubble mulching is helpful in conserving moisture and reducing the hazard of erosion. Terraces and contour stripcropping also help to control erosion.

An alternate use for the soils of this unit is as pasture. Russian wildrye, crested wheatgrass, pubescent wheatgrass, and intermediate wheatgrass are suitable grasses. Proper management of pasture is necessary to obtain and maintain a stand.

Capability Unit IVe-4 (Nonirrigated)

This unit consists of deep and moderately deep, well drained and moderately well drained soils of the Colby, Gaynor, Heldt, Manvel, or Renohill series. These soils have a surface layer and subsoil or underlying layer of loam, silty clay loam, or clay. Slopes range from 0 to 3 percent. Permeability is moderate to slow. Runoff is medium to rapid, and the erosion hazard is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 20 to 60 inches or more.

These soils are used mainly as dry cropland and pasture. Because of the erosion hazard and the slow rate of water intake, these soils are suitable for only limited cropping. Wheat is the main crop, but other small grains also are grown. Wheat-summer fallow is the main cropping system. During the fallow period, weeds can be destroyed by using chisels and sweeps that leave part of the stubble on the surface. Leaving stubble on the soil through winter and spring helps to trap snow and to control soil blowing. Stripcropping also helps to control erosion, especially soil blowing.

These soils are well suited to pasture. Where they are in native grasses, they should remain so and not be plowed and reseeded. Where they are to be seeded to grass, grasses suitable for seeding are crested wheatgrass, intermediate wheatgrass, pubescent wheatgrass, and Russian wildrye. Where the soils are seeded, planting in stubble will increase the survival rate of seedlings and help to control erosion. In order to ensure the establishment of the stand, grazing should not be allowed during the first year. Proper grazing practices are necessary.

Capability Unit IVe-7 (Nonirrigated)

This unit consists of deep, well-drained soils of the Ascalon, Manter, and Otero series. These soils have a sandy loam surface layer and a sandy loam or sandy clay loam subsoil or underlying layer. Slopes are 3 to 9 percent. Permeability is moderate and moderately rapid. Runoff is medium to rapid, and the erosion hazard is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 60 inches or more.

These soils are used as dry cropland and pasture. Wheat is the main crop, but other small grains also are grown. Wheat-summer fallow is the main cropping system. Stubble mulching and stripcropping are helpful in reducing erosion. Terracing and contour farming help to control soil blowing and water erosion.

These soils are well suited to grasses. Where they are in native grass, they should remain so. Russian wildrye, crested wheatgrass, intermediate wheatgrass, and pubescent wheatgrass are adapted grasses suitable for seeding. Planting in stubble helps to conserve moisture, control erosion, and increase the content of organic matter.

Capability Unit IVe-9 (Nonirrigated)

The one soil in this unit in the Area, Weld loamy sand, 1 to 4 percent slopes, is deep and well drained. It has a surface layer of loamy sand and a subsoil of clay or clay loam. Permeability is slow. Runoff is slow, and the erosion hazard is high. Soil blowing is the greatest hazard. Available water capacity is high. The effective rooting depth is 60 inches or more.

This soil is used as dry cropland and pasture. It is suited to limited cropping. Wheat is the main crop, but other small grain also is grown. Wheat-summer fallow is the main cropping system. Stubble mulching and management of crop residue are necessary to help to control erosion and soil blowing. The soil should not be left bare for long periods because the hazard of soil blowing is high. If emergency tillage is necessary, the clayey subsoil material should be brought to the surface.

This soil is suited to permanent grass pasture. Russian wildrye, crested wheatgrass, intermediate wheatgrass, and pubescent wheatgrass are well adapted grasses that can be seeded. Seeding in the stubble helps to control soil blowing. To ensure a full and vigorous stand, newly seeded pasture should not be grazed during the first growing season.

Capability Unit VIe-1 (Nonirrigated)

This unit consists of deep and moderately deep, well drained and moderately well drained soils of the Colby, Gaynor, Heldt, Kutch, Nunn, and Renohill series. These soils have a surface layer and subsoil or underlying layer of silty clay loam, clay loam, or clay. Slopes are 3 to 9 percent. Permeability is moderate to slow. Runoff is medium to rapid, and the erosion hazard is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 20 to 60 inches or more.

These soils are used as dry cropland, pasture, and range. They are best used as pasture. Because of their slope, these soils are difficult to work. They do not take in water readily, and this results in excessive losses through erosion. Where these soils are now farmed, they should be seeded back to grass. Blue grama and the needlegrasses are native. Russian wildrye, crested wheatgrass, pubescent wheatgrass, and intermediate wheatgrass are adapted species. Smooth bromegrass does well, but only in areas that receive extra moisture as runoff from higher-lying soils.

Proper management of pasture is necessary. Grazing should be limited so that no more than half of the current year's growth is grazed. To ensure a full and vigorous stand, newly seeded grasses should not be grazed during the first growing season. After the stand has been established, grazing should be limited so that a minimum of 3 inches of stubble is left on the soil.

Capability Unit VIe-2 (Nonirrigated)

This unit consists of deep and moderately deep, well drained soils of the Ascalon, Hargreave, and Otero series. These soils have a sandy loam or fine sandy loam surface layer. The subsoil or underlying layer is sandy loam, sandy clay loam, or fine sandy clay loam. Slopes are 3 to 20 percent. Permeability is moderate to moderately rapid. Runoff is medium to rapid, and the erosion hazard is moderate to high. Available water capacity is moderate to high. The effective rooting depth is 20 to 60 inches or more.

These soils are used as dry cropland, pasture, or range. Because of their slope, continued tillage of these soils results in excessive erosion. These soils are best used as pasture or range. Big bluestem, little bluestem, switchgrass, Indiangrass, and sideoats grama are native grasses. Those areas that now support crops or depleted stands of native grasses can be planted to introduced grasses. Russian wildrye, crested wheatgrass, pubescent wheatgrass, and intermediate wheatgrass are well adapted species.

Proper management of pasture is necessary. Grazing should be limited so that no more than half of the current year's growth is grazed. To ensure a full and vigorous stand, newly seeded grasses should not be grazed during the first growing season. After the stand has been established, grazing should be limited so that a minimum of 3 inches of stubble is left on the soil.

Capability Unit VIe-3 (Nonirrigated)

This unit consists of shallow and moderately deep, well-drained soils of the Laporte, Gaynor, Renohill, Samsil, and Shingle series. These soils have a very fine sandy loam, loam, silty clay loam, or clay surface layer. The underlying layer is loam, silty clay loam, or clay. Slopes are 3 to 25 percent. Permeability is moderate to slow.

Runoff is medium to rapid, and the erosion hazard is high. Available water capacity is low to moderate. The effective rooting depth is 10 to 40 inches.

These soils are used as dry cropland, pasture, or range. Ordinarily they are best used as permanent pasture or range. The needlegrasses, western wheatgrass, and needleandthread are suitable grasses. If these soils are in native range, they should be plowed only to reestablish stands of grass that have become depleted. To improve yield and quality of forage, range should be rotated and grazing deferred so that no more than half of the current year's growth is removed.

Where these soils are seeded to pasture, planting should be in early spring or fall when there is adequate moisture. Russian wildrye, crested wheatgrass, and intermediate wheatgrass are well adapted species. To ensure a full and vigorous stand, newly seeded grasses should not be grazed during the first growing season. Grazing should be limited so that a minimum of 3 inches of stubble is left on the soil.

Capability Unit VIw-1 (Nonirrigated)

The one soil in this unit, Longmont clay, 0 to 3 percent slopes, is deep and poorly drained. It has a surface layer and underlying layer of clay. Permeability is slow. Runoff is slow, and the erosion hazard is slight. Available water capacity is high. The effective rooting depth is 12 to 14 inches or more, and the seasonal high water table is at a depth of between 1 and 2 feet.

This soil is best suited to pasture. Where the pasture is in excellent condition, the dominant grasses are switchgrass, alkali sacaton, and western wheatgrass. Good management of pasture is necessary. When the soil is extremely wet, grazing should be limited to avoid compaction and trampling out the grass. To maintain the vigor of the grasses, no more than half of the current year's growth should be grazed.

Reseeding this soil is difficult because it seldom is dry enough to cultivate and is hard to work. Areas that are sufficiently dry can be disked and seeded. Tall wheatgrass and tall fescue are adapted grasses suitable for seeding. Grazing should not be allowed until the grass is well established.

Capability Unit VIw-2 (Nonirrigated)

The one soil in this unit in the Boulder County Area, Niwot soils, is deep and somewhat poorly drained. It has a surface layer of loam or clay loam that is shallow over an underlying layer of sand or gravel. Slopes are 0 to 1 percent. Permeability is moderate. Runoff is slow, and the erosion hazard is slight. Available water capacity is low to moderate. The effective rooting depth is 60 inches or more, and the seasonal high water table is between a depth of 6 and 18 inches.

These soils are used mainly for pasture. They are best suited to permanent vegetation. The dominant pasture grasses are Indiangrass, switchgrass, big bluestem, and little bluestem. Intermediate wheatgrass, tall wheatgrass, and tall fescue are adapted grasses suitable for seeding. Where these soils are seeded, planting in stubble early in spring or in fall increases the survival rate of seedlings and helps to produce a vigorous stand. To maintain the vigor of the grasses, no more than half of the current year's growth should be grazed.

Capability Unit VIIe-1 (Nonirrigated)

This unit consists of deep and moderately deep, well-drained soils of the Allens Park, Fern Cliff, Goldvale, and Pinata series. These soils have a stony coarse loamy sand, loamy sand, sandy loam, or gravelly sandy loam surface layer. The subsoil or underlying layer is gravelly sandy loam, sandy loam, gravelly sandy clay loam, sandy clay loam, or sandy clay. Slopes are 5 to 60 percent. Permeability is slow to moderately rapid. Runoff is medium to rapid, and the erosion hazard is high. Available water capacity is low to high. The effective rooting depth is 20 to 60 inches or more.

These soils are used mainly as woodland. They also are used as a habitat for wildlife. Proper management of both the timber and understory helps to reduce possible erosion. Wooded areas should be protected from fire and insects and from plant diseases. Thinning of timber improves the quality and quantity of trees.

A few areas of the woodland are used for grazing of the understory vegetation. No more than half of the current year's growth of vegetation should be grazed. Where grazing is properly managed, such grasses as Arizona fescue, mountain muhly, and pine dropseed increase. Seeding of grasses is not practical because of the slope, rock outcrop, and the amount of trees and stones.

Capability Unit VIIs-1 (Nonirrigated)

This unit consists of shallow to deep, well-drained soils of the Baller, Juget, Nederland, Peyton, Sixmile, and Valmont series, and of Terrace escarpments and Colluvial land. These soils have a very cobbly sandy loam, very stony loamy sand, very gravelly loamy sand, stony fine sandy loam, very gravelly sandy loam, stony loam, or cobbly clay loam surface layer. The subsoil is very gravelly loamy sand, stony fine sandy loam, very cobbly sandy clay loam, very stony clay, clay, or clay loam. Depth to bedrock ranges from 10 to 60 inches or more. Slopes are 1 to 55 percent. Permeability is moderately slow to rapid. Runoff is slow to rapid, and the erosion hazard is slight to high. Available water capacity is low to high. The effective rooting depth is 10 to 60 inches or more.

These soils are used as range and as habitat for wildlife. They are suited to permanent vegetation. Suitable grasses are big bluestem, little bluestem, needlegrass, and sideoats grama. Proper management of range is necessary. To maintain the vigor of the grasses and to reduce erosion, no more than half of the current year's growth should be grazed. Reseeding these soils is difficult, and in some places impossible, because of the slope and rock outcrops, and the amount of stones, cobblestones, and gravel.

Capability Unit VIIIs-1 (Nonirrigated)

In this capability unit are Rock outcrop and Made land.

Rock outcrop consists of areas of bare or nearly bare rock and adjacent areas of very shallow soil material that has little or no agricultural value. Since most areas of Rock outcrop have little soil, runoff is very rapid and causes erosion of nearby soils. Most areas of Rock outcrop are in the mountains and provide a habitat for wildlife. Some areas are parks where there are trails and opportunities for nature studies, hiking, and climbing. These areas also are used for watershed purposes. Areas of Rock outcrop should be protected to maintain what little vegetation is present. Trails should be constructed and maintained so that water from runoff does not concentrate. This practice helps to control erosion on adjacent soils.

Made land consists of refuse from sugar mills. Unless water is available for both irrigation and leaching of salts, this land is barren.

Native Grassland

By T. K. Eaman, Range Conservationist, Natural Resources Conservation Service.

In the Boulder Area, about 15 percent of the total acreage is covered with grass. The total area now grazed is small, compared to the extensive areas once grazed in the early days of Colorado history. The decrease is partly the result of converting grassland to irrigated cropland, or to use for homes, industry, and recreation.

Soils of the Boulder Area are suited to many kinds of native grasses, shrubs, and other forage plants, but individual soils of the Area differ in their suitability for specific kinds of plants. The names of important plant species suited to the individual soils in the Area are given in the section of this survey where capability units are described.

Where plants are used for grazing, they need to be managed in a way that improves quality and quantity of the desired forage and that produces enough residue to protect the soils and preserve moisture. Important in range management is the ability to recognize the main forage plants; to be aware of the approximate yield per acre of such plants; and to be aware of the number of livestock any given area can support. For most grasses, a proper rate of grazing is one that allows not more than 50 percent, by weight, of the season's growth to be grazed.

In the Boulder Area, other good management practices include deferred grazing, reseeding to adapted plants, and protecting areas from fire, traffic, and other kinds of disturbances.

Deferred grazing consists of resting pasture or rangeland during the growing season. This increases the vigor of the plants, permits the desired plants to reproduce naturally by seed, and builds up a reserve of forage. When this practice is used, along with the other practices suggested, the maximum amount of forage is produced and livestock makes the greatest gains.

In addition to their value for grazing for domestic livestock, native grasses protect soils from blowing by wind and from erosion by water. Streams and lakes are kept clean when the watersheds above them have a good plant cover. Finally, there is the natural beauty contributed by grassland to the Boulder Area.

Woodland and Tree Planting

By W.S. Swenson, Woodland Conservationist, Natural Resources Conservation Service.

Native woodland in the Boulder Area is in a transitional zone between the plains and the mountains. Largely it is fringe forest growing at lower elevation and in a drier climate than the true forest. Practically all this woodland is in the Rock outcrop-Juget-Baller association.

The dominant species is ponderosa pine, which grows mainly on the Goldvale, Pinata, Juget, Fern Cliff, and Allens Park soils. A narrow fringe of pinyon pine and Rocky Mountain juniper grows mainly on Baller stony sandy loam, 9 to 35 percent slopes. Around Gold Hill and at elevations of above 8,000 feet there are some Douglas-firs and lodgepole pines. In some places these two species grow separately, but in other places they are in mixed stands. These two species grow mainly on Fern Cliff and Allens Park soils.

Douglas-fir is usually considered the climax, or original, forest type of the Area. Lodgepole pine is normally considered a "fire type," meaning it comes in following fire or heavy clearing of the climax species. Because of heavy cutting during the boom days of mining, much of the original Douglas-fir forest had been cut over or burned before 1900. The present stands of lodgepole pine came in after cutting. In all, there is less than 2,000 acres of the Douglas-fir and lodgepole pine type of woodland in the survey area.

Most of the forested land in the Boulder Area is used for homesites, rather than for wood production, grazing, or watershed. Both year-round homes and summer homes in the woods are growing in popularity in the Area. It is anticipated that practically all of the wooded areas outside of Roosevelt National Forest and in private ownership eventually will be used for homesites and recreation.

Considering the soils the trees grow on, they are best protected from erosion and deterioration when kept under tree cover. Trees also enhance the value of these soils for homesites, recreation uses, watershed, and wildlife habitat, and for that reason should be protected.

Management of native woodlands

Ponderosa pine, which makes up the bulk of the forest cover in the survey area, is a slow-growing tree. A tree at 10 years of age is ordinarily between 35 and 50 feet in height and 6 to 9.4 inches in diameter. At that rate of growth, a tree reaches sawlog size (10 inches in diameter, breast height) in 160 to 200 years. Stands of timber with such slow growth are considered noncommercial for wood crops. The stands should managed, however, so that they will continue to grow and reproduce.

The major management needs are protection from fire, insects, and disease and destructive cutting and grazing. The major insect damage is caused by the Rocky Mountain bark beetle, which kills trees by girdling under the bark. The major disease of ponderosa pine in the Area is dwarf-mistletoe. The mistletoe is a parasitic growth that gradually weakens the tree, slows its growth, and deforms it. Eventually the tree may be killed.

To prevent destructive logging and improve the stand, it is necessary to practice selective cutting. Only trees that are overmature, diseased, deformed, or that interfere with the growth of better trees are cut. If posts or poles are cut, they are never taken in a clear-cutting operation. Rather, they are harvested as part of a thinning that leaves a stand of good trees, well spaced on the ground.

Tree suitability groups

In the Boulder County Area, trees and shrubs have been planted both for protection and for beautification for some time. These plantings help to protect soils from winds strong enough to damage crops; minimize evaporation of moisture from the soil; help to control soil blowing; provide habitat for insect-eating birds and other wildlife; provide protection for streambanks and watersheds; and add to the general beauty of the Area.

East of the foothills, trees ordinarily require more moisture than is provided by natural precipitation, and supplementary water therefore is needed. Irrigation, diversion of runoff from other areas, summer fallow, and continuous clean cultivation of certain soils are methods of supplementing the supply of moisture.

Soils of the Boulder County Area have been placed in tree suitability groups to show their suitability for growing trees and shrubs. The soils in one group have the capacity to produce the same kinds of trees at about the same rate of growth.

Tree Suitability Group 1

This group consists of soils of the Fern Cliff and Allens Park series. These are deep to moderately deep, strongly sloping to very steep, moderately coarse textured soils. They contain varying amounts of stone and are slow to warm up in the spring. The trees growing in this area are mainly ponderosa pine, Douglas-fir, or lodgepole pine. Planting is seldom, if ever, needed.

Tree Suitability Group 2

This group consists of soils suitable for native timber that are now covered in brush or that support only scattered trees. These soils are members of the Goldvale, Juget, and Peyton series. They are shallow to moderately deep, strongly sloping to steep, and moderately coarse or coarse textured. They warm slowly in spring. In most areas tree and shrub plantings can survive without supplemental moisture.

The following trees and shrubs are among those suitable for planting on soils of this group.

Pinyon pine
Ponderosa pine
Rocky Mountain juniper

White fir
Austrian pine
Blue spruce (in moist areas)
Mountain mahogany
Skunkbush sumac
Chokecherry
Buffaloberry

Tree Suitability Group 3

This group consists mainly of deep and moderately deep, nearly level to moderately sloping, well-drained fine sandy loams to silty clay loams. These soils are members of the Colby, Gaynor, Kim, Kutch, Manvel, Nunn, Renohill, Valmont, and Weld series. In most areas supplemental moisture is needed, and it can be obtained by irrigation or by diverting runoff from adjacent areas.

The following are among the trees and shrubs suitable for planting on the soils of this group.

Ponderosa pine
Siberian peashrub
Austrian pine
Chokecherry
Rocky Mountain juniper
American plum
White fir
Honeysuckle
Blue spruce
Lilac
Siberian elm
Spirea
Green ash
Skunkbush sumac
Honeylocust
Hackberry

Tree Suitability Group 4

This group consists mainly of deep and moderately deep, nearly level to moderately steep, well-drained sandy loams or loamy sands. These soils are members of the Ascalon, Hargreave, Manter, Otero, and Weld series. Supplemental water is required in most areas.

The following trees and shrubs are among those suitable for the soils of this group.

Ponderosa pine
Hackberry
Austrian pine
Honeysuckle
Rocky Mountain juniper
Sand cherry
White fir
Chokecherry
Blue spruce
Lilac
Siberian elm

Siberian peashrub
Green ash
American plum
Honeylocust

Tree Suitability Group 5

This group consists of soils of the Calkins, Loveland, and McClave series. These are nearly level, deep soils that vary in texture. A water table is within the reach of tree roots; it does not fluctuate greatly; and seldom, if ever, reaches the surface. These soils are neither highly alkaline nor highly saline. In some areas, cottonwood trees or willows are already present.

The following trees and shrubs are among those suitable for the soils of this group.

Cottonless cottonwood
Blue spruce
Carolina poplar
Chokecherry
Golden willow
Buffaloberry
Weeping willow
White willow

Tree Suitability Group 6

This group consists of soils of the Baller, Heldt, Gaynor, Laporte, Longmont, Nederland, Niwot, Pinata, Samsil, Shingle, Sixmile and Valmont series; and Colby silty clay loam, wet, 0 to 3 percent slopes; Renohill loam, 3 to 9 percent slopes; Colluvial land; and Terrace escarpments. These soils are not suited to planting. They are shallow to bedrock; strongly sloping, poorly drained or aerated; excessively saline or alkaline, or cobbly, stony, gravelly, sandy, or very clayey.

Wildlife

By Eldie W. Mustard, Biologist, Natural Resources Conservation Service.

Many kinds of wildlife are in the Boulder Area because it has plains, foothills, and mountainous terrain that provide diverse habitat. Activities of humans, primarily those associated with farming, have created additional types of habitat. The principal wildlife species in the Area are elk, deer, bear, cottontail rabbit, jackrabbit, dusky grouse, mourning dove, ring-necked pheasant, and various species of waterfowl.

Each kind of wildlife prefers a certain kind of habitat, where it can feed, rest, sleep, breed, and rear young. This habitat, in turn, is dependent upon such factors as soil characteristics, topography, vegetation, availability of marshes, and land use.

In the Boulder County Area, increasing human population and changes in land use have served to eliminate habitats needed by some kinds of wildlife. Wildlife that could not adapt has disappeared. Deer, elk, antelope, bison, and wild turkeys were once present in large numbers but are now absent or occupy a greatly reduced range. Deer and elk still occupy parts of the Rock outcrop-Juget-Baller association, but bison and antelope do not.

Farming is detrimental to some kinds of wildlife but beneficial to others. The ring-necked pheasant finds habitat in fields farmed for small grain. The farming that creates this habitat also acts to limit numbers of pheasants. Intensive farming, burning of ditchbanks and fence rows, and haying are some practices that hold down the number of pheasants. Waterfowl and mourning doves also use grainfields for food and are measurably benefited.

Figure 10.—Irrigated barley on Weld loam is shown in the foreground.

Irrigation, especially the water reservoirs, aids waterfowl by providing areas where they can rest and from which they can fly to surrounding dryland and irrigated grainfields to eat.

Encroachment by civilization progressively reduces big game hunting opportunities in the Rock outcrop-Juget-Baller association. Establishment of homesites causes irreplaceable habitat losses.

Improving habitat can increase small game hunting. This can be done to best advantage where small grains are grown, notably on the Weld-Colby, the Ascalon-Nunn-Manter, and the Nunn-Heldt soil associations. Some of the practices needed are creation of undisturbed permanent nesting areas, improvement of cover by planting windbreaks or similar shelter, and either ceasing or greatly reducing burning along fences and ditches.

Waterfowl hunting can be improved by building dikes in fields where Japanese millet, barley, or a similar grain crop is grown. The field is flooded in the fall with a few inches of water. Mallards, pintails, teals, and other puddle ducks prefer to take their food under water, and a flooded field of grain therefore is a high-quality area for duck hunting.

Stream fishing for trout is provided through the stocking program of the Colorado Game, Fish, and Parks Department. The most important streams, in the Niwot-Loveland-Calkins soil association, are the Boulder and South Boulder Creeks, St. Vrain and South St. Vrain Creeks, and Left Hand Creek. Some gravel pits, mainly in the Niwot-Loveland-Calkins association, furnish a variety of fishing, including warm water fishing. Irrigation reservoirs, subject to heavy drawdowns, also provide some fishing to the Boulder County Area.

Formation and Classification of the Soils

In this section the factors that affect the formation of the soils in the Boulder County Area are discussed and the major processes of soil formation are described. Finally, the classification of the soils in the taxonomic system is given and the character of each group of soils in the categories above the soil family level is briefly described.

Factors of Soil Formation

By Arvad J. Cline, senior soil correlator, Natural Resources Conservation Service

Soil is a natural dynamic body at the surface of the earth that has characteristics resulting from the actions of the forces of the environment upon parent materials over a period of time. The character of the soil in any landscape differs from place to place, depending upon the nature and intensity of the factors that controlled its development.

Five major factors are recognized as being influential in the development of the soil in its virgin state at any specific location. Briefly stated, these five are *climate, biological activity, time, relief*, and *parent material*. All of these factors are highly complex. There are many kinds of climate and many combinations of biological forces. Parent materials vary widely in physical, chemical, and mineralogical properties, and there are great differences in the length of time that they have been subjected to the effects of climate and biological activity.

Although the five factors just discussed have been traditionally accepted as those that influence soil development, a sixth factor—humans and their activities—could be added to the list. Human activities directly alter the character of the soil by cultivation, fertilization, irrigation, drainage, or by removal of parts of the soil. The soil is altered indirectly by controlling water movement or vegetative cover. Human activity sometimes is destructive or detrimental to soil health.

The history of the development of soil characteristics and the study of the interaction of the formative forces is called *soil genesis*. The characteristics themselves constitute the soil's morphology. Thus, the color of the soil is one feature of soil morphology; the reason that such a color developed is part of the soil's genesis.

It is impossible to precisely reconstruct the history of a soil's development from the limited data available at any one location. To do so, it would be necessary to observe the soil and its environment throughout the entire period of the development, which for most soils is at least several thousand years. Since this is impossible, reconstruction of the soil's genesis must be based on interpretations. These are drawn from the soil's morphology and our accumulated knowledge of how such morphology could most logically have developed.

The system of soil classification used in the United States is based on properties of the soil that can be observed or measured. The soil properties are used to group similar soils or to separate those that are dissimilar. (ASTM, 2001.) Selection of the kinds and magnitudes of properties that are to be considered as definitive between soils is guided by our understanding of soil genesis. Thus, the two are closely interrelated and both are essential to a good classification system. (USDA, 1999.)

The following sections contain a general evaluation of the factors that influence soil development in the Boulder County Area, and the manner in which soil morphology has been used to group the soils into the units of classification is outlined.

Climate

The *climate* of the Boulder County Area is of a semiarid, continental type. Winters are cold and dry, and summers are cool and relatively dry. Mean annual air temperature from measurements at the Longmont weather station is 48.1° F., and mean summer air temperature is 68.4° F. Elevation within the survey area is lowest at the eastern border of the county and increases to the west. Air temperature and annual precipitation conform to the same pattern: the climate is increasingly cooler and more moist as elevation increases. Precipitation at the Longmont station is about 12 inches per year, but along the front of the foothills it averages about 18 inches a year.

Eleven sites in the Boulder County Area were selected for soil temperature measurements. These measurements yield a somewhat better evaluation of soil climate than do interpretations based on air temperature. These sites ranged in elevation from 5,230 feet to 8,120 feet. Mean annual soil temperatures calculated from measurements at a depth of 20 inches ranged from 53.1° F at 5,230 feet elevation to 44.4° F at 8,120 feet. Because of local site factors, such as moisture, aspect, and vegetative cover, it is not possible to establish a precise covariant relationship existing between soil temperature and elevation; however, the decrease in mean annual soil temperature with a rise in elevation is consistent, and this decrease is about 0.3 ° F for each 100 feet of increase in elevation.

Mean summer soil temperature was less consistent than mean annual soil temperature. The mean summer temperature ranges from 70.2° F at 5,230 feet elevation to 57.0° F at 8,120 feet. This is an average decrease of about 0.4° F for each 100 feet rise in elevation.

The Boulder County Area receives its greatest precipitation during spring and summer. Fall and winter are comparatively dry, and total precipitation during the months of December through February averages only 2.0 inches.

Precise soil moisture data are not available for the Area, but a general picture of soil moisture fluctuation can be obtained from a comparison of the precipitation and evapotranspiration. In December, precipitation exceeds losses from evapotranspiration, and some moisture is stored within the soil. This condition continues through winter and into late April or early May, when evapotranspiration rates start to increase rapidly. In spite of the increased precipitation during spring and summer, evapotranspiration exceeds the amount of moisture received as rain, and by mid or late July the soils are dry except for relatively brief periods following summer rain.

The effect of climate on soil development in the Boulder County Area can only be approximated by inference from our present knowledge of climate variations. Recorded weather data for the Area characterize only the last 50 to 60 years, but the development of many of the soils of the Area have required thousands of years. We cannot assume, therefore, that the recorded data represent the climate for all, or even a major part, of the time that a particular soil was developing. It is possible, though, to draw certain parallels between general characteristics of the climate and the characteristics of the soils of the Area.

The amount of water available and the distribution of supplies of soil moisture relative to soil temperature and the periods of maximum biological activity are of prime importance to soil genesis. The combination of these factors plays a major role in the accumulation of organic matter in soil, in the physical movement of substances in suspension or solution, and in controlling the rate of chemical processes. Based upon our present knowledge of these combinations of factors, as applied to the Boulder County Area soils, we can conclude that for a considerable period of the soils' history, the climate in the Area was more moist than the recorded present precipitation at the Longmont station indicates.

The depth to which water moves down through the soil is often more significant to our evaluation of soil genesis than is the amount of yearly precipitation. In areas of higher elevation within the survey area the amount of yearly precipitation is greater and the evapotranspiration rate is less than in areas of lower elevation. Therefore, a somewhat greater volume of soil moisture is available for leaching processes at higher elevations, and the soils of the Allens Park, Fern Cliff, and Goldvale series are leached of lime.

The relationship between temperature and soil genesis is more obscure, perhaps because the differences in soil temperature within the survey area are smaller, relatively, than the differences in soil moisture. Mainly, temperature is most noticeable in its control of biologic activity and its impact on physical soil properties.

The temperature commonly accepted as the separation mark between periods of low biotic activity and those of high biotic activity is 40° F. At the lowest elevations on soils of the Weld and Nunn series, the period that the soil temperature at a depth of 20 inches exceeds 41° F is about 249 days, and the soils are rarely below 32° F during the rest of the year. At the higher elevations on soils of the Fern Cliff series, the period that the soil temperature at a depth of 20 inches exceeds 41° F is about 180 days, and the soils are at or slightly below 32° F for about 70 of the remaining days. The period in which genetic forces dependent upon high temperature are most effective are shorter for higher elevations than for lower ones.

Physical changes in the soil that result from freezing and thawing influence soil morphology and genesis. Certain forms of soil structure are enhanced by freezing and thawing, and these in turn influence permeability, aeration, and resistance to erosion. Horizons that are frozen during the winter months affect moisture distribution and intake. All of these factors should be more active at the higher elevations than at the lower, unless the soil is insulated by a snowpack.

Mean annual soil temperature more or less than 47° F is a criterion for separating some soils of the Boulder County Area at the suborder level in the soil classification system. This parameter has not been directly related to other soil properties in the Area, but it does have a pronounced effect on cropping patterns and crop potentials because it largely determines planting dates, maturing dates, and rates of growth.

Biological activity

Biological activity that affects soil genesis in the Boulder County Area can be divided into three major classes: common plants; burrowing animals, worms, and insects; and micro-organisms. All of these factors affect the development of soils, but each works in different ways.

The natural vegetation of the area, as well as the vegetative changes introduced by human activities, have profoundly affected soil development. These effects, however, cannot be entirely divorced from the effects of the activities of animal and insect life or those of micro-organisms. At any location, an interdependence exists among all three of the classes of life forms, and it is the composite of their activities and natures that has controlled soil genesis.

Two major kinds of native vegetation can be identified in the Boulder County Area, and the line of demarcation between them is comparatively sharp. The plains area to the east of the foothills is almost entirely grassland, having only scattered growths of cottonwood and similar trees that act as windbreaks for farmsteads or that grow along the drainageways and the irrigation canals. The foothill area in the western part of the survey area has scattered clumps of trees, but is dominantly brush and grass. Trees grow on the north-facing slopes of the foothills, and stands of timber cover the mountain slopes.

The two different types of vegetation, grass and timber, have had a pronounced effect on soil development. Where landscapes are predominantly grassland of sufficient age, the soils usually have dark-colored, neutral to mildly alkaline surface horizons that have more than 1 percent organic matter. Such horizons may include the A1 and part of the B2 horizons. The dark colors and high contents of organic matter of these horizons are the result of the partial decomposition of relatively large yearly additions of organic matter to the soil by the above-ground parts and the extensive root systems of the grass. The Nunn series is a typical grassland soil that has an A1 horizon 10 inches thick and a B2 horizon 8 inches thick, both of which are dark in color.

Where landscapes have been covered by good growths of timber for sufficient periods of time, the soils have a surface horizon that consists of undecomposed or partially decomposed organic horizons; very thin, dark-colored A1 horizons; and thick, light-colored, eluvial A2 horizons. In the Boulder County Area, the A1 and A2 horizons generally are slightly acid to neutral in reaction, but the O horizon may be somewhat more acid. Soils such as Fern Cliff also have a relatively thick A&B horizon of silicate clay accumulation. The genesis of this A&B horizon is not clearly understood, but it appears to be part of the B2t horizon that is in the process of converting to an A2 horizon. The consistent occurrence of the A&B horizon and its character have prompted some soil scientists to propose that it represents a major shift in vegetation within the soil's genetic history from grassland to forest, with a corresponding alteration of a typical grassland soil to a typical forested soil.

In the foothill areas the relationships previously outlined between vegetative cover and kind of soil are those most commonly found; however, exceptions do occur. Forests are not rapidly replaced once they have been destroyed. In the early history of the western states, part of the original timber was destroyed by fire; by clearing for fields; or by cutting for lumber, fenceposts, and firewood, braces for mines, or railroad ties. In consequence, it is not unusual to find types of soil indicative of timber cover in areas that are now grassland.

The effect of burrowing animals and insect life on soil development in the Boulder County Area is not as easily demonstrated, and their major points of activity are apt to be localized. Rodent activity is apt to be destructive to soil horizonation, but it is also apt to be short-lived. The common prairie dog has been nearly eradicated from this Area, but some areas of soil mixing within old prairie dog towns can still be found in grassed areas.

The action of insects and worms is more general and more constant. Large numbers of these creatures thrive in the soils of the Boulder County Area. Some selectivity is shown by various kinds of insects for particular kinds of soils, and generally, such selectivity can be related to type of vegetation, moisture supply, texture, and soil reaction.

Little is known precisely about the microbiology of the Area. The micro-organisms are particularly sensitive to soil reaction and aeration. Consequently, types differ between grasslands and forests, and between well-drained and poorly drained sites. A symbiotic relationship between micro-organisms and certain types of plants exists in soils of good drainage throughout the Area. Anaerobic types prevail in the more poorly drained soils, while molds and fungus that are tolerant of acidity are found under heavier stands of timber.

Time

Time refers to the length of time the other soil-forming factors have been active. In most situations, thousands of years are required for the development of well-expressed horizons below the surface layer. The older soils in the Area generally have clearly expressed A and B horizons and horizons where calcium carbonate has accumulated. Soils thought to be young have weakly expressed horizons, and in most places they lack a B horizon. The chronological age of the soil at a particular location is not easily assessed, however, and the age of the soil usually can be stated only in relative terms based on studies of soil morphology and geomorphology.

Precise data on the chronological age of the soils of the Boulder County Area are lacking, and therefore the landscapes have been grouped into three general age groups.

The youngest landscapes are the flood plains, low terraces, and recent alluvial fans that are forming in and along the sides of major drainage channels. These are very young sediments, and in many instances, deposition of sediments is still taking place on these landscapes. They are so youthful that soil development has not had time to produce distinct horizonations other than a darkening and enrichment of the surface horizon by the addition of organic matter. Soils of the Loveland series are representative of this age group.

The second group includes the broad interstream divides or terrace levels that have originated as fans at the base of the Rocky Mountains, as old eolian deposits, or as terrace systems along old drainage courses. These landscapes as they exist today are remnants of previously more extensive deposits that have been cut by modern drainage systems and partly eroded away. Most of the soils have distinct B horizons of silicate clay accumulation, and where the parent material contained carbonates, they have a continuous horizon of secondary carbonate accumulation. Soils of the Nunn series are representative of this age group.

Some landscapes of this second general age group are thought to be much older than others. Paleosols having distinct B horizons of clay accumulation have been found 5 to 15 feet below the present land surfaces, on which the modern soils also have distinct horizons of clay accumulation. Two periods of soil formation, separated by a period of sediment deposition, have occurred in these areas. The age of the modern soil obviously is much younger than the time since the buried paleosol started to develop. On the other hand, it is thought that the sediments overlying the paleosols did not cover some landscapes of this second general age group. In this latter situation, if the land surface has not been strongly eroded, the total time available for soil formation could be the sum of the time necessary to form the buried paleosol, the time required for deposition of the sediments overlying the paleosol, and the time required to form the modern soil in the sediments overlying the paleosol. It is believed that landscapes dominated by soils of the Weld series are of this nature.

The third group of landscapes includes those areas in which soil parent materials have weathered more or less in place from bedrock. The ages of such landscapes are known with even less certainty than those of the second general group, but they clearly may be very old or very young. That some of these landscapes may be very old is indicated by the presence of some small areas of extremely thick Boralfs in the foothills. Areas of these soils are too small to map but they are of interest because the base of the horizon of silicate clay accumulation (B2t horizon) commonly is more than 10 feet below the surface. At the young end of the range are landscapes in which the soils have thin or weakly expressed horizons, such as soils of the Sixmile and Baller series.

Relief

In the Boulder County Area, soil genesis is affected by *relief*, mainly as a result of the control of soil moisture by landform or slope gradient. The steepness of the slope, its position relative to other kinds of soils, and the shape of the surface of the soil all affect supplies of soil moisture, and subsequently the genesis of the soils.

Steeply sloping areas lose much of the yearly moisture supply, and may erode each year as well. Usually such erosion is not rapid enough to be readily noticeable in a given year, but over a long period of time it can remove enough soil to prevent distinct soil horizons from forming. The shallow soils of the Samsil and Shingle series are examples.

Concave areas that tend to concentrate runoff, or areas that receive additional runoff from higher-lying areas, tend to develop thick soil profiles. Color, content of organic matter, and the thickness of a dark-colored A horizon are particularly related to slope and landform. Soil particles that are carried in suspension by runoff water coming from adjacent areas tend to settle out in concave areas where velocity of flow decreases. Thus the thickening of a dark-colored surface horizon in such soils as Calkins and McClave is as much the result of the deposition of eroded material from the adjacent soils as it is the increased plant growth resulting from a more plentiful moisture supply.

In the foothill areas, slope aspect is often the controlling factor in the kind of vegetation that can grow, and this affects the kind of soil that develops. Mean annual soil temperature is 2 to 4 degrees colder on northern slopes than on southern slopes. Equally important is the larger accumulation of snow on the northern slopes of the Area, and its persistence in spring. Summer precipitation is more effective on the northern slopes because of lower evapotranspiration. As a result of all these factors, north-facing slopes frequently are timbered, but south-facing slopes are not.

The effect of relief on the control of wind direction and velocity is local and cannot be readily expressed in general terms applicable to the entire Boulder County Area. The predominant wind direction in this Area is from the west, northwest, and southwest; therefore, eastern, northeastern, and southeastern slopes are slightly less subject to drying and less susceptible to wind erosion.

Parent material

A wide variety of *parent materials* are available for soil formation in the Boulder County Area. The chemical, physical, and mineralogical characteristics of these parent materials determine their influence upon the development and properties of the soil. Some general observations about characteristics of the parent materials can be made, but the observations are general in nature and do not adequately characterize the parent materials at any specific location.

Alluvial sediments.—Young deposits along stream bottoms are extremely variable in physical, chemical, and mineralogical properties. The most distinguishing properties of alluvial sediments are stratification and lack of uniformity.

Deposits left by drainage systems older than the present system vary in physical, chemical, and mineralogical properties from location to location, but they generally are uniform in any one location. These deposits are loamy in the upper part of the profile, and overlie beds of sand and gravel.

Deposits of Pleistocene age are of mixed mineralogy and contain calcium carbonate. These deposits dominantly are loams and clay loams that have gravel and cobbles throughout the profile.

Soils on alluvial sediments are as young as the Calkins soils and as old and mature as the Valmont soils.

Eolian deposits.—These wind deposits differ from place to place in their mineralogical composition but are relatively uniform in chemical and physical properties. Textures dominantly are loam, silt loam, or sandy loam. Most of these deposits contained calcium carbonate when first laid down. Soils of the Weld and Colby series are representative of soils in eolian deposits.

Olive and gray sedimentary rocks.—Soil parent material from these rocks weathered in place or were locally transported. They vary in texture but dominantly are loam, clay loam, or clay. Hues dominantly are 10YR or yellower. In most places the materials are calcareous, and they commonly contain gypsum or salts of sodium.

Soils of the Samsil, Renohill, and Hargreave series are representative of soils weathered from these rocks.

Red sedimentary rocks.—Soil parent material from these rocks include those weathered in place and those that have been transported, but which retain most of the distinguishing characteristics of the materials weathered in place. Textures dominantly are loam and sandy loam. Hues range from 5YR to 10R. Most of the materials contain significant amounts of calcium and magnesium salts that are readily soluble in water, but materials weathered from red arkosic sandstone are free of both lime and salts. Soils of the Nederland, Pinata, and Sixmile series are representative of soils in materials weathered from these rocks.

Crystalline rocks.—Soil parent materials from these rocks have weathered in place or have been transported short distances. Materials weathered from granite usually are coarse textured or moderately coarse textured, are noncalcareous, and contain a large proportion of medium and coarse angular sand and fine or very fine gravel. Soils of the Juget series formed in these materials. Materials weathered from gneiss and schist are medium textured or moderately fine textured, are noncalcareous, and contain moderate amounts of mica. Soils of the Fern Cliff series formed in materials weathered from gneiss and schist.

Classification of the Soils

In the taxonomic system of soil classification used in the Boulder County Area, the soils are placed in various classes on the basis of similarity of their properties. All the soils in any one class have certain morphological characteristics in common that distinguish those soils from all others. These are called differentiating characteristics.

Six levels of generalization (categories) are used in the soil classification system. From the highest to the lowest level of generalization each succeeding category contains more classes and the classes are more narrowly defined. The categories are identified, from top to bottom, as *orders, suborders, great groups, subgroups, families*, and *series*. For purposes requiring the most detailed information about soils, the soil series are the most useful taxonomic classes. For less detailed purposes, the families or the subgroups may be adequate and more easily used. For still more general uses of soil information, such as comparison of the soils in the Boulder County Area with those in other areas, the great groups, suborders, or orders may be the best levels of generalization.

Table 21 shows the classification of each soil series of the Boulder County Area by family, subgroup, and order. The categories and the classes of the system that are represented by soils in this survey are described in the paragraphs that follow.

Orders, suborders, and *great groups* are classes based on relatively broad sets of differentiating criteria designed principally to bring together soils of similar horizonation, similar genesis, and similar environment. They are broad groupings and are most useful in showing general soil differences within the survey, in understanding the basic genetic processes active in the Area, and in relating soils of the survey area to other soils of the world. Their value for designing specific management practices is limited, but phases of these classes can be useful for county, state, or national planning.

The five orders represented in the Boulder County Area, and the suborder and great group subdivisions within each are briefly discussed in the following paragraphs.

Entisols—These are the soils of the Area that are so young they have not had time to develop distinct genetic horizons. They have only slight darkening of the surface horizon or an irregular accumulation of soluble salts. There may be considerable physical or chemical difference between strata of these soils, but the differences are inherited from the parent material and are not the result of soil development. The common characteristic of Entisols is a lack of distinguishing genetic horizons.

In the Boulder County Area, the only suborder of Entisols is the Orthents. These are well-drained soils that have textures finer than loamy fine sand, and that have an organic matter content that is greatest in the surface horizon and that decreases regularly with depth. The only great group of Orthents represented in the Boulder County Area is the Torriorthents. These are the Orthents of dry areas where supplies of soil moisture are limited.

Inceptisols—These are young soils that have more horizon development than the Entisols. In the Boulder County Area, they are poorly drained soils. Their subsoil has been partly altered by the weathering and segregation of iron compounds under conditions of a fluctuating water table, and they have a consistent accumulation of exchangeable sodium in their surface horizon.

In the Boulder County Area, this order is represented by the Aquepts at the suborder level, and the Halaquepts at the great group level. The Aquepts are the poorly drained Inceptisols. The Halaquepts are the Aquepts that have an accumulation of detrimental amounts of sodium in their surface horizon.

Aridisols—The Aridisols are the light-colored, well-drained soils of arid and semiarid regions that have been in place long enough to have developed distinct genetic horizons. Although they are primarily soils of grasslands, the decomposition of organic matter in the soil has more or less equaled the yearly additions. In consequence, they have not developed the dark surface horizons that characterize the Mollisols. In the Boulder County Area these soils may be associated with Mollisols, but they generally occupy those parts of the landscape where runoff or texture has restricted entry of moisture into the soil.

The two suborders of the Aridisols are the Orthids and Argids. Both are represented in the Boulder County Area. Orthids are those Aridisols that lack in illuvial accumulation of silicate clay in the B horizon. The only great group of Orthids represented in the Area is Camborthids. These are Orthids that have a B2 horizon showing alteration but not illuivation.

The Argids are those Aridisols that have a B2 horizon of illuviated silicate clay. In the Boulder Area, the Haplargid is the only representative of this suborder.

Mollisols—The Mollisols are soils of humid to subhumid regions that are characterized by thick, dark-colored, friable surface horizons in which plentiful supplies of organic matter have accumulated. This accumulation is the result of the partial decomposition, in the presence of a predominance of bivalent cations, of relatively large yearly additions of plant materials to the surface horizon. The common characteristic of Mollisols is the darkened, friable, base-rich surface horizon that soil scientists refer to as a mollic epipedon.

Three suborders of Mollisols are represented in the Area. The Ustolls are the well-drained Mollisols that are in the warmer parts of the Area generally below elevations of about 7,500 feet. They have mean annual soil temperatures that are warmer than 47° F. The Borolls are the well-drained Mollisols that are in the colder parts of the survey area above an elevation of 7,500 feet. Their mean annual soil temperature is less than 47° F, but their mean summer soil temperature is warmer than 50° F. Aquolls are the poorly drained Mollisols that are saturated with water for a significant part of each year.

Haplustolls, Argiustols, and Paleustolls are all subdivisions of Ustolls represented in the Boulder County Area. Briefly stated, the Haplustolls are Ustolls that lack a horizon of silicate clay accumulation. Argiustolls contain a horizon of silicate clay accumulation that shows gradual increase of clay at its upper margin. Paleustolls contain a horizon of clay accumulation that has abrupt and relatively great increase in clay at the upper boundary.

In the Boulder County Area the Borolls are subdivided into Haploborolls and Argiborolls. The Haploborolls lack a horizon of silicate clay accumulation. The Argiborolls have a genetic horizon of silicate clay accumulation.

Alfisols—The Alfisols are light-colored soils of humid to subhumid areas that have a horizon of silicate clay accumulation and are more than 35 percent base saturated. In the Boulder County Area they are represented by the timbered soils.

The Boralfs are the only suborder of Alfisols represented in the Area. These are Alfisols having a mean annual soil temperature of less than 47° F. Eutroboralfs are the only representatives of the Boralfs present in the survey. They are Boralfs that are more than 60 percent base saturated.

Series, families, and *subgroups* are the most detailed categories of the taxonomic classification system. The *series* is the most detailed, and differences between classes at this level are drawn on properties such as color, structure, texture, reaction, consistence and thickness of individual soil horizons. The soil series provides the maximum amount of information about the soil and has the greatest use of determining correct soil use and management practices.

Families are groups of soil series within subgroups. Soils in a family have similar chemical and physical properties that affect their responses to management and manipulation for use. They are groups of series and are less homogeneous than the series themselves. Nevertheless, the response of phases of soils in a family are nearly enough the same to meet many needs for practical interpretation of such responses.

Like the orders, suborders, and great groups, the *subgroups* are strongly biased toward soil genesis. They are the category having a strong genetic bias and are an important category for serious students of soil genesis and classification, as well as being of importance for broad planning of soil use. A brief description of the major characteristics of the soils in each of the subgroups recognized in this study follows. The *Detailed Soil Map Units* section of this survey provides comprehensive descriptions of each soil in the Boulder County Area.

Ustic Torriorthents—Soils of the Colby, Gaynor, Kim, Manvel, Otero, Samsil, Shingle, and Sixmile series are all representatives of this subgroup. These are moderately coarse textured to fine textured, well-drained or moderately well-drained soils of grasslands. They are characterized by a light-colored A horizon and are calcareous throughout the profile. Depth to bedrock in this group of soils ranges from 10 to more than 60 inches. The content of organic carbon decreases regularly with depth. Mean annual soil temperature is warmer than 47° F., and mean summer soil temperature is warmer than 59° F.

Aeric Halaquepts—Soils of the Longmont series are the only representatives of this subgroup. These are fine textured, poorly and somewhat poorly drained soils of grasslands. They are characterized by a light-colored, very strongly alkaline A horizon that contains more than 15 percent exchangeable sodium. The strongly mottled C horizon contains some visible evidence of salt accumulation. The content of exchangeable sodium exceeds 15 percent in the surface horizon but decreases with depth. Mean annual soil temperature is more than 47° F, and mean summer soil temperature is more than 59° F.

Ustertic Camborthids—Soils of the Heldt series are the only representatives of this subgroup. These are fine textured, well-drained, grassland soils. They are characterized by a light-colored, calcareous A horizon; a B2 horizon showing evidence of alternating in the form of higher chroma and moderate grade of structure; and a fine textured C horizon. There are horizons of secondary carbonate accumulation. Mean annual soil temperature is more than 47° F, and mean summer soil temperature is more than 59° F.

Ustollic Haplargids—Soils of the Renohill series are the only representatives of this subgroup. These are well-drained grassland soils. They are characterized by a thin, dark-colored A horizon; a fine textured B2t horizon; and a calcareous C horizon that has subhorizons of secondary carbonate accumulation. Mean annual soil temperature is warmer 47° F, and mean summer soil temperature is warmer than 59° F.

Typic Haplaquolls—Soils of the Loveland and Niwot series are the representatives of this subgroup. These are medium textured to moderately fine textured, poorly drained meadow soils that overlie beds of sand and gravel. They are characterized by a dark-colored, calcareous to noncalcareous A horizon, and a strongly mottled C horizon. An unconformable sand and gravel IIC horizon is between depths of 10 and 40 inches. The content of organic carbon in the surface horizon is about 0.8 percent. Mean annual soil temperature is more than 47° F, and mean summer soil temperature is more than 59° F.

Cumulic Haplaquolls—Soils of the Calkins and McClave series are representatives of this subgroup. These are moderately coarse textured to moderately fine textured, poorly drained and somewhat poorly drained meadow soils. They are characterized by a thick dark-colored A horizon that is mottled in the lower part. The content of organic carbon is above about 0.8 percent in the A horizon, which exceeds 24 inches in thickness. Mean annual soil temperature is warmer than 47° F, and mean summer soil temperature is warmer than 59° F.

Lithic Haplustolls—Soils of the Laporte series are representatives of this subgroup. These are moderately coarse textured to moderately fine textured, well-drained, grassland soils. They are characterized by a dark-colored A horizon and a light-colored, moderately coarse textured to moderately fine textured, calcareous C horizon that rests on bedrock at a depth less than 20 inches. Mean annual soil temperature is warmer than 47° F, and mean summer soil temperature is warmer than 59° F.

Aridic Argiustolls—Soils of the Ascalon, Hargreave, Manter, Nederland, Nunn, and Valmont series are all representatives of this subgroup. These are moderately coarse textured to fine textured, well-drained, grassland soils. They are characterized by a dark-colored A horizon; a B2t horizon; and a C horizon that contains subhorizons of secondary carbonate accumulation. Dark-colored mollic epipedons are less than 20 inches in thickness. Mean annual soil temperature is warmer than 47° F, and mean summer soil temperature is warmer than 59° F.

Torrertic Argiustolls—The soils of the Kutch series are the only representatives of this subgroup. These are fine textured, well-drained, grassland soils. They are characterized by a dark-colored A horizon; a fine textured B2t horizon; and a fine textured, calcareous C horizon that contains subhorizons of secondary carbonate accumulation. These soils have a high shrink-swell potential, develop wide cracks when dry, and are subject to some heaving when moist. Dark-colored mollic epipedons are less than 20 inches in thickness. Mean annual soil temperature is warmer than 47° F, and mean summer soil temperature is warmer than 59° F.

Aridic Paleustolls—The soils of the Weld series are the only representatives of this subgroup. These are fine textured, well-drained grassland soils. They are characterized by a dark-colored A horizon; a fine textured B2t horizon; and a medium textured, calcareous C horizon that has subhorizons of secondary carbonate accumulation. These soils have a large and abrupt change in the content of clay between the A and the upper part of the B2t horizon. Dark-colored mollic epipedons are less than 20 inches thick. Mean annual soil temperature is warmer than 47° F, and mean summer soil temperature is more than 59° F.

Lithic Haploborolls—Soils of the Juget series are the only representatives of this subgroup. These are coarse textured, excessively drained soils that support mixed vegetation of grass and trees. They are characterized by a dark-colored A horizon and a coarse textured C horizon. They overlie bedrock, which is at a depth of less than 20 inches. Mean annual soil temperature is less than 47° F, but mean summer soil temperature is warmer than 59° F.

Aridic Argiborolls—Soils of the Peyton series are the only representatives of this subgroup. They are moderately fine textured, well-drained, grassland soils. They are characterized by a moderately dark colored A horizon; a B2t horizon; and a moderately coarse textured, noncalcareous C horizon. Dark-colored mollic epipedons are less than 16 inches thick. Mean annual soil temperature is colder than 47° F, but mean summer soil temperature is warmer than 59° F.

Typic Eutroboralfs—Soils of the Allens Park, Goldvale, and Pinata series are all representatives of this subgroup. These are medium textured to fine textured, well-drained, timbered soils. They are characterized by a light-colored A1 horizon; a moderately thick, light-colored, eluvial A2 horizon; a continuous transitional A and B horizon; and a continuous B2t horizon. Base saturation exceeds 60 percent. Mean annual soil temperature is less than 47° F, and mean summer soil temperature is more than 59° F.

Psammentic Eutroboralfs—Soils of the Fern Cliff series are the only representative of this subgroup in the survey area. These are moderately coarse textured, well-drained, timbered soils. They are characterized by a light-colored A1 horizon; a moderately thick, light-colored eluvial A2 horizon; and a B2t horizon in which the clay is accumulating in discontinuous lenses and seams in a coarser textured matrix. Mean annual soil temperature is less than 47° F, but mean summer soil temperature is more than 59° F.

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Glossary

Aggregate. Many fine particles held in a single mass or cluster, such as a clod, crumb, block, or prism.

Alkali soil. Generally, a highly alkaline soil. Specifically, an alkali soil has so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that the growth of most crop plants is reduced.

Alluvium. Fine material, such as sand, silt, or clay, which has been deposited on land by streams.

Available water 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 capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Calcareous soil. A soil containing enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Chiseling. Breaking or loosening subsoil with a chisel cultivator or chisel plow.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeters 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. (See also **Sand**, **Silt**, and **Texture**.)

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: Clay coat, clay skin.

Cobble. A rounded or partially rounded fragment of rock ranging from 3 to 10 inches in diameter.

Colluvium (colluvial material). A mixture of soil material and coarser material moved mainly by gravitation, creep, and local wash and deposited at the foot of slopes.

Concretions. Hard grains, pellets, or nodules of various sizes, shapes, and colors consisting of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent; will not together hold together in a mass.

Friable.—When moist, crushes easily under gentle to moderate pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure, but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material; tends to stretch somewhat and pull apart, rather than pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Fallow. Cropland left idle in order to restore productivity, mainly through accumulation of water, nutrients, or both. The soil ordinarily is tilled for at least one growing season to control weeds and to aid in the decomposition of plant residues.

Gravel. A rounded or angular fragment as large as 3 inches in diameter.

Green manure (agronomy). A crop grown for the purpose of being turned under in an early stage of maturity or soon after maturity for soil improvement.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes.

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.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Mottling, soil. Irregular marking with spots of different colors that varies in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common*, and *many*; size—*fine, medium*, and *coarse*; and contrast—*faint, distinct*, and *prominent*. The size measurements are these: *fine*, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium*, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Nurse crop. A companion crop grown to protect some other crop sown with it; for example, a small grain is sometimes seeded as a nurse crop with clover.

Parent material. The horizon of weathered rock or partly weathered soil material from which a soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables a soil to allow water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid*, and *rapid*.

pH. See **Reaction, soil**.

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

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words, the degrees of acidity or alkalinity are expressed thus:

Extremely acid	pH below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

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

Runoff. Surface drainage of rainfall or melted snow.

Salinity. The terms used to indicate salinity of the soils are based on the electrical conductivity of saturated soil extract as expressed in millimhos per centimeter at 25o C.

None	Less than 2.0
Slight	2.0 to 4.0
Moderate	4.0 to 8.0
High	8.0 to 16.0
Very high	More than 16.0

Sand. As a soil separate, individual rock or mineral fragments 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

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 textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate, and living matter acting upon parent material, as conditioned by relief over periods of time.

Soil blowing. Erosion caused by wind.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Stone. Rock fragments larger than 10 inches in diameter, if rounded, and larger than 15 inches along the longer axis, if flat.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. 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 (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Stubble mulch. Stubble or other crop residues left on the soil, or partly worked into the soil, to provide protection 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.

Stubble-mulch tillage. A method of tillage that loosens the subsoil and eradicates weeds by using subtillage sweeps, but leaves the crop stubble generally undisturbed.

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

Substratum. Any layer lying beneath the solum, or true soil; the C or D horizon.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, in most places about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow.

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 as follows: *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*." (See also, **Clay**, **Sand**, and **Silt**.)

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Tables

Table 1.--Temperature and precipitation

TAPS Station: Boulder, CO
1971-2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (Inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	44.7	19.5	32.1	69	-10	45	0.70	0.22	1.19	2	11.0
February	48.3	23.2	35.8	72	-8	70	0.76	0.28	1.16	2	9.9
March	55.1	28.7	41.9	76	3	149	1.79	0.85	2.53	4	15.9
April	62.2	35.1	48.7	84	12	287	2.76	1.43	4.06	5	12.0
May	71.3	43.3	57.3	89	28	537	2.92	1.30	4.25	6	1.1
June	81.8	51.8	66.8	97	38	803	1.99	0.83	2.99	4	0.0
July	86.8	56.9	71.9	99	46	987	1.95	1.02	2.79	4	0.0
August	84.9	56.0	70.5	97	45	942	1.66	0.52	2.77	4	0.0
September	76.7	47.6	62.2	93	26	665	1.82	0.66	2.99	4	2.3
October	66.2	37.9	52.1	85	16	386	1.30	0.52	2.05	3	4.5
November	51.8	27.2	39.5	75	1	124	1.46	0.50	2.45	3	16.1
December	46.2	21.8	34.0	69	-7	60	0.78	0.29	1.25	2	12.0
Yearly:											
Average	64.7	37.4	51.0	---	---	---	----	----	----	---	---
Extreme	101	-24	---	100	-15	---	----	----	----	---	---
Total	---	---	---	---	---	5054	19.89	15.18	21.97	43	84.8

Average # of days per year with at least 1 inch of snow on the ground: 44

Table 1.--Temperature and precipitation--continued

TAPS Station: Gross Reservoir, CO
1978-2000

Month	Temperature (Degrees F.)						Precipitation (Inches)				
				2 yrs in 10 will have				2 yrs in 10 will have			
	avg daily max	avg daily min	avg	max temp. >than	min temp. <than	avg # of grow deg days*	avg	less than	more than	avg # of days w/.1 or more	avg total snow fall
January	---	---	---	0	0	0	0.75	0.32	1.19	2	12.0
February	---	---	---	0	0	0	0.77	0.25	1.24	2	11.6
March	---	---	---	0	0	0	2.30	1.00	3.40	5	25.0
April	---	---	---	0	0	0	2.74	1.22	4.02	5	22.7
May	---	---	---	0	0	0	3.33	1.64	4.95	7	5.0
June	74.2	40.1	57.2	0	0	520	2.31	1.10	3.56	5	0.1
July	83.4	47.1	65.2	0	0	782	2.15	1.20	2.97	5	0.0
August	77.9	42.2	60.1	0	0	622	2.15	1.00	3.14	5	0.0
September	74.9	38.5	56.7	88	22	504	1.68	0.76	2.60	4	2.1
October	61.3	29.3	45.3	0	0	206	1.20	0.41	1.90	3	6.9
November	---	---	---	0	0	0	1.29	0.50	1.96	3	16.7
December	---	---	---	0	0	0	0.88	0.27	1.50	2	14.3
Yearly:											
Average	31.0	16.4	23.7	---	---	---	----	----	----	---	---
Extreme	92	19	---	0	0	---	----	----	----	---	---
Total	---	---	---	---	---	2634	21.55	17.32	25.07	48	116.2

Average # of days per year with at least 1 inch of snow on the ground: 85

Table 1.--Temperature and precipitation--continued

TAPS Station: Longmont 2 ESE, CO
1971-2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (Inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	42.1	12.0	27.0	69	-16	14	0.42	0.13	0.70	1	5.0
February	46.5	17.1	31.8	72	-13	35	0.37	0.14	0.55	1	3.4
March	54.4	24.3	39.3	79	-1	110	1.21	0.50	1.77	3	4.7
April	62.2	31.8	47.0	85	11	254	2.01	0.88	3.11	4	4.5
May	72.0	42.1	57.0	92	26	530	2.41	0.91	3.82	5	0.5
June	83.0	50.6	66.8	100	37	803	1.64	0.41	3.04	3	0.0
July	88.8	55.3	72.1	103	45	991	1.11	0.50	1.69	3	0.0
August	86.9	53.4	70.2	100	43	934	1.39	0.45	2.30	3	0.0
September	78.3	44.1	61.2	97	25	636	1.38	0.41	2.34	3	0.7
October	66.8	32.5	49.6	88	13	321	1.65	0.19	1.64	2	0.9
November	51.2	21.5	36.4	77	-3	79	0.83	0.20	1.45	2	5.4
December	43.7	13.5	28.6	69	-17	21	0.57	0.14	0.91	1	7.1
Yearly:											
Average	64.7	33.2	48.9	---	---	---	----	----	----	---	---
Extreme	106	-31	---	103	-22	---	----	----	----	---	---
Total	---	---	---	---	---	4727	14.99	11.25	17.54	31	32.2

Average # of days per year with at least 1 inch of snow on the ground: 20

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 40.0 deg. F)

Table 2.—Freeze dates in spring and fall

FROST Station: Boulder, CO
1961-1990

Probability	Temperature: 24°F or lower	Temperature: 28°F or lower	Temperature: 32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than—	April 24	May 4	May 13
2 years in 10 later than—	April 18	April 28	May 9
5 years in 10 later than—	April 6	April 18	May 1
First freezing temperature in fall:			
1 yr. in 10 earlier than—	October 4	September 27	September 18
2 yrs. in 10 earlier than—	October 12	October 3	September 24
5 yrs. in 10 earlier than—	October 26	October 15	October 5

FROST Station: Longmont, CO
1961-1990

Probability	Temperature: 24°F or lower	Temperature: 28°F or lower	Temperature: 32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than—	April 28	May 7	May 17
2 years in 10 later than—	April 23	May 2	May 12
5 years in 10 later than—	April 13	April 23	May 4
First freezing temperature in fall:			
1 yr. in 10 earlier than—	October 4	September 25	September 14
2 yrs. in 10 earlier than—	October 9	September 30	September 19
5 yrs. in 10 earlier than—	October 20	October 10	September 29

Table 3.--Growing season

GROWTH Station: BOULDER, CO 0848
1971-2000

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	168	151	131
8 years in 10	177	158	138
5 years in 10	195	172	150
2 years in 10	213	186	162
1 year in 10	222	193	169

GROWTH Station: LONGMONT 2 ESE, CO 5116
1971-2000

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	159	143	125
8 years in 10	167	151	132
5 years in 10	182	166	145
2 years in 10	197	181	158
1 year in 10	204	189	164

Table 4.--Acreage and proportionate extent of the soils

Map symbol	Soil name	Acres	Percent
AcA	Ascalon sandy loam, 0 to 1 percent slopes	1,300	0.5
AcB	Ascalon sandy loam, 1 to 3 percent slopes	11,000	4.5
AcC	Ascalon sandy loam, 3 to 5 percent slopes	4,800	2.0
AcD	Ascalon sandy loam, 5 to 9 percent slopes	900	0.4
AoB	Ascalon-Otero complex, 0 to 3 percent slopes	1,200	0.5
AoC	Ascalon-Otero complex, 3 to 5 percent slopes	2,600	1.1
AoD	Ascalon-Otero complex, 5 to 9 percent slopes	2,400	1.0
AoE	Ascalon-Otero complex, 9 to 20 percent slopes	1,700	0.7
BaF	Baller stony sandy loam, 9 to 35 percent slopes	7,700	3.2
BP	Borrow Pits	19	*
CaA	Calkins sandy loam, 0 to 1 percent slopes	1,600	0.7
CaB	Calkins sandy loam, 1 to 3 percent slopes	1,700	0.7
CoB	Colby silty clay loam, 1 to 3 percent slopes	4,300	1.8
CoC	Colby silty clay loam, 3 to 5 percent slopes	2,200	0.9
CoD	Colby silty clay loam, 5 to 9 percent slopes	1,000	0.4
CsB	Colby silty clay loam, wet, 0 to 3 percent slopes	600	0.2
Ct	Colby-Gaynor association	1,100	0.5
Cu	Colluvial land	5,800	2.4
DU	Dumps	35	*
FcF	Fern Cliff-Allens Park-Rock outcrop complex, 15 to 60 percent slopes	12,700	5.2
GaB	Gaynor silty clay loam, 1 to 3 percent slopes	400	0.2
GaD	Gaynor silty clay loam, 3 to 9 percent slopes	900	0.4
GP	Gravel pits and Mine dumps	700	0.3
GrF	Goldvale-Rock outcrop complex, 9 to 55 percent slopes	2,900	1.2
HaB	Hargreave fine sandy loam, 1 to 3 percent slopes	1,100	0.5
HaD	Hargreave fine sandy loam, 3 to 9 percent slopes	900	0.4
HeB	Heldt clay, 0 to 3 percent slopes	4,700	1.9
HeC	Heldt clay, 3 to 5 percent slopes	2,000	0.8
JrF	Juget-Rock outcrop complex, 9 to 55 percent slopes	21,310	8.8
KuD	Kutch clay loam, 3 to 9 percent slopes	2,600	1.1
LaE	Laporte very fine sandy loam, 5 to 20 percent slopes	1,200	0.5
LoB	Longmont clay, 0 to 3 percent slopes	2,800	1.2
Lv	Loveland soils	4,500	1.9
Ma	Made land	200	*
MdA	Manter sandy loam, 0 to 1 percent slopes	400	0.2
MdB	Manter sandy loam, 1 to 3 percent slopes	2,100	0.9
MdD	Manter sandy loam, 3 to 9 percent slopes	1,000	0.4
Me	Manvel loam	2,100	0.9
Mm	McClave clay loam	2,300	0.9
NdD	Nederland very cobbly sandy loam, 1 to 12 percent slopes	11,700	4.8
Nh	Niwot soils	9,100	3.7
NnA	Nunn sandy clay loam, 0 to 1 percent slopes	1,700	0.7
NnB	Nunn sandy clay loam, 1 to 3 percent slopes	3,400	1.4
NuA	Nunn clay loam, 0 to 1 percent slopes	6,800	2.8
NuB	Nunn clay loam, 1 to 3 percent slopes	15,880	6.5

See footnote at end of table.

Table 4.--Acreage and proportionate extent of the soils--Continued

Map symbol	Soil name	Acres	Percent
NuC	Nunn clay loam, 3 to 5 percent slopes	5,300	2.2
NuD	Nunn clay loam, 5 to 9 percent slopes	1,100	0.5
Nv	Nunn-Kim complex	2,600	1.1
PgE	Peyton-Juget very gravelly loamy sands, 5 to 20 percent slopes	2,300	0.9
PLY	Playas	36	*
PrF	Pinata-Rock outcrop complex, 5 to 55 percent slopes	5,200	2.1
ReD	Renohill loam, 3 to 9 percent slopes	1,300	0.5
RnB	Renohill silty clay loam, 1 to 3 percent slopes	1,100	0.5
RnD	Renohill silty clay loam, 3 to 9 percent slopes	2,200	0.9
Ro	Rock outcrop	6,500	2.7
SaD	Samsil clay, 3 to 12 percent slopes	2,600	1.1
SeE	Samsil-Shingle complex, 5 to 25 percent slopes	5,800	2.4
SgE	Shingle-Gaynor complex, 3 to 20 percent slopes	1,100	0.5
SmF	Sixmile stony loam, 10 to 50 percent slopes	3,100	1.3
Te	Terrace escarpments	8,300	3.4
VaB	Valmont clay loam, 1 to 3 percent slopes	5,200	2.1
VaC	Valmont clay loam, 3 to 5 percent slopes	1,200	0.5
VcC	Valmont cobbly clay loam, 1 to 5 percent slopes	5,500	2.3
VcE	Valmont cobbly clay loam, 5 to 25 percent slopes	1,600	0.7
W	Water	5,900	2.4
WdB	Weld loamy sand, 1 to 4 percent slopes	220	*
WeB	Weld fine sandy loam, 1 to 3 percent slopes	1,400	0.6
WlA	Weld loam, 0 to 1 percent slopes	500	0.2
WlB	Weld loam, 1 to 3 percent slopes	3,400	1.4
WoB	Weld-Colby complex, 0 to 3 percent slopes	1,900	0.8
WoC	Weld-Colby complex, 3 to 5 percent slopes	500	0.2
	Total	243,200	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. 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.)

Map symbol and soil name	Land capability		Alfalfa hay		Barley		Corn	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
AcA:								
Ascalon	3c	1	---	5.50	---	---	---	140.00
AcB:								
Ascalon	3e	2e	1.50	5.00	35.00	70.00	24.00	140.00
AcC:								
Ascalon	3e	3e	1.50	4.00	30.00	80.00	24.00	125.00
AcD:								
Ascalon	4e	4e	1.50	4.00	25.00	60.00	24.00	125.00
AoB:								
Ascalon	3e	2e	1.50	5.00	35.00	70.00	24.00	140.00
Otero	3c	3e	---	5.00	---	---	---	110.00
AoC:								
Ascalon	3e	3e	1.50	4.00	30.00	80.00	24.00	125.00
Otero	3c	3e	---	3.50	---	---	---	90.00
AoD:								
Ascalon	4e	4e	1.50	4.00	25.00	60.00	24.00	125.00
Otero	4e	4e	---	2.50	---	---	---	100.00
AoE:								
Ascalon	6e	---	---	---	---	---	---	---
Otero	6e	---	---	---	---	---	---	---
BaF:								
Baller	7s	---	---	---	---	---	---	---
BP:								
Borrow pits	---	---	---	---	---	---	---	---
CaA:								
Calkins	3w	2w	---	4.00	---	80.00	---	100.00

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Barley N	Barley I	Corn N	Corn I
			Tons	Tons	Bu	Bu	Bu	Bu
CaB:								
Calkins	3w	3w	---	4.00	---	75.00	---	100.00
CoB:								
Colby	4e	2e	---	4.00	---	---	---	120.00
CoC:								
Colby	4e	4e	---	3.00	---	---	---	90.00
CoD:								
Colby	6e	---	---	---	---	---	---	---
CsB:								
Colby Variant	3c	2w	---	5.00	---	---	---	117.00
Ct:								
Colby	6e	---	---	---	---	---	---	---
Gaynor	4e	4e	---	---	---	---	---	---
Cu:								
Colluvial land	7s	---	---	---	---	---	---	---
DU:								
Dumps	---	---	---	---	---	---	---	---
FcF:								
Fern Cliff	7e	---	---	---	---	---	---	---
Allens Park	7e	---	---	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---	---
GaB:								
Gaynor	3e	3e	---	4.00	---	---	---	---
GaD:								
Gaynor	4e	4e	---	---	---	---	---	---
GP:								
Gravel pits and Mine dumps	8s	---	---	---	---	---	---	---
GrF:								
Goldvale	7e	---	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Barley		Corn	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
GrF:								
Rock outcrop	8s	---	---	---	---	---	---	---
HaB:								
Hargreave	3c	3e	---	4.50	20.00	85.00	---	90.00
HaD:								
Hargreave	4e	4e	---	4.00	---	65.00	---	75.00
HeB:								
Heldt	4e	3e	---	5.00	25.00	85.00	---	105.00
HeC:								
Heldt	6e	4e	---	3.50	21.00	75.00	---	---
JrF:								
Juget	7s	---	---	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---	---
KuD:								
Kutch	4e	4e	---	4.00	---	55.00	---	70.00
LaE:								
Laporte	6s	---	---	---	---	---	---	---
LoB:								
Longmont	6w	---	---	---	---	---	---	---
Lv:								
Loveland	3w	3w	---	4.50	---	---	---	100.00
Ma:								
Made land	8w	---	---	---	---	---	---	---
MdA:								
Manter	3s	2s	---	6.00	35.00	80.00	---	130.00
MdB:								
Manter	3e	3e	---	5.50	35.00	75.00	---	130.00
MdD:								
Manter	4e	4e	---	4.50	20.00	70.00	---	105.00
Me:								
Manvel	6e	2e	---	4.50	---	---	---	90.00

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Barley N	Barley I	Corn N	Corn I
			Tons	Tons	Bu	Bu	Bu	Bu
Mm:								
McClave	3w	3w	---	5.00	---	80.00	---	100.00
NdD:								
Nederland	6s	---	---	---	---	---	---	---
Nh:								
Niwot	5w	4w	---	---	---	---	---	---
NnA:								
Nunn	3s	2s	---	6.00	---	90.00	---	125.00
NnB:								
Nunn	3e	2e	---	6.00	---	90.00	---	120.00
NuA:								
Nunn	3s	2s	---	5.50	---	90.00	---	120.00
NuB:								
Nunn	3e	2e	---	5.50	20.00	90.00	---	110.00
NuC:								
Nunn	3e	3e	---	4.00	19.00	75.00	---	90.00
NuD:								
Nunn	4e	4e	---	3.50	---	65.00	---	---
Nv:								
Nunn	3e	2e	---	5.50	20.00	90.00	---	110.00
Kim	4e	3e	---	5.00	---	80.00	---	100.00
PgE:								
Peyton	6s	---	---	---	---	---	---	---
Juget	7s	---	---	---	---	---	---	---
PLY:								
Playas	---	---	---	---	---	---	---	---
PrF:								
Pinata	7s	---	---	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Barley		Corn	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
ReD:								
Renohill----------------	6e	---	---	---	---	---	---	---
RnB:								
Renohill----------------	3c	3s	---	4.00	16.00	85.00	---	90.00
RnD:								
Renohill----------------	4e	4e	---	4.00	---	70.00	---	70.00
Ro:								
Rock outcrop------------	8s	---	---	---	---	---	---	---
SaD:								
Samsil------------------	6s	---	---	---	---	---	---	---
SeE:								
Samsil------------------	6e	---	---	---	---	---	---	---
Shingle-----------------	6s	---	---	---	---	---	---	---
SgE:								
Shingle-----------------	6s	---	---	---	---	---	---	---
Gaynor------------------	4e	4e	---	---	---	---	---	---
SmF:								
Sixmile-----------------	7e	---	---	---	---	---	---	---
Te:								
Terrace escarpments-----	7s	---	---	---	---	---	---	---
VaB:								
Valmont-----------------	3s	2e	---	4.00	25.00	60.00	---	100.00
VaC:								
Valmont-----------------	3e	3e	---	3.50	22.00	50.00	---	---
VcC:								
Valmont-----------------	3e	3e	---	3.50	22.00	50.00	---	---
VcE:								
Valmont-----------------	4e	4e	---	---	---	---	---	---
W:								
Water-------------------	---	---	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay		Barley		Corn	
	N	I	N	I	N	I	N	I
			Tons	Tons	Bu	Bu	Bu	Bu
WdB:								
Weld	4e	3e	---	5.00	---	---	40.00	133.00
WeB:								
Weld	3e	2e	---	5.50	---	---	46.00	140.00
WlA:								
Weld	3e	2s	---	6.00	---	---	---	155.00
WlB:								
Weld	3e	2e	1.50	5.50	---	---	60.00	155.00
WoB:								
Weld	3e	2e	1.50	5.50	---	---	60.00	155.00
Colby	4e	2e	---	4.00	---	---	---	120.00
WoC:								
Weld	4e	4e	---	4.00	---	---	---	130.00
Colby	4e	4e	---	3.00	---	---	---	90.00

Table 6.--Rangeland productivity

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb./acre	Lb./acre	Lb./acre
AcA:				
Ascalon	Sandy	1,500	1,200	800
AcB:				
Ascalon	Sandy	1,500	1,200	800
AcC:				
Ascalon	Sandy	1,500	1,200	800
AcD:				
Ascalon	Sandy	1,500	1,200	800
AoB:				
Ascalon	Sandy	1,500	1,200	800
Otero	Sandy	1,400	1,100	900
AoC:				
Ascalon	Sandy	2,000	1,500	1,000
Otero	Sandy	1,700	1,400	900
AoD:				
Ascalon	Sandy	1,500	1,200	800
Otero	Sandy	1,400	1,100	900
AoE:				
Ascalon	Sandy	1,500	1,200	800
AoE:				
Otero	Sandy	1,400	1,100	900
BaF:				
Baller	Shallow Foothill	1,500	1,200	1,000
CaA:				
Calkins	Sandy Bottomland	2,500	2,000	1,800
CaB:				
Calkins	Sandy Bottomland	2,500	2,000	1,800
CoB:				
Colby	Loamy Plains	1,200	1,000	600

Table 6.--Rangeland productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb./acre	Lb./acre	Lb./acre
CoC:				
Colby	Loamy Plains	1,200	1,000	600
CoD:				
Colby	Loamy Slopes	1,200	1,000	600
CsB:				
Colby Variant	Loamy Plains	1,300	800	600
Ct:				
Colby	Loamy Slopes	1,200	1,000	600
Gaynor	Shaly Plains	1,100	800	500
GaB:				
Gaynor	Shaly Plains	1,100	800	500
GaD:				
Gaynor	Shaly Plains	1,100	800	500
GrF:				
Goldvale	Ponderosa Loam	700	600	400
Rock outcrop	---	---	---	---
HaB:				
Hargreave	Clayey	1,900	1,400	700
HaD:				
Hargreave	Clayey	1,900	1,400	700
HeB:				
Heldt	Clayey	1,700	1,200	500
HeC:				
Heldt	Clayey	1,700	1,200	500
KuD:				
Kutch	Clayey Foothill	1,500	1,200	800
LaE:				
Laporte	Shallow Foothill	500	400	300
LoB:				
Longmont	Salt Meadow	2,500	2,100	1,800

Table 6.--Rangeland productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb./acre	Lb./acre	Lb./acre
Lv:				
Loveland	Salt Meadow	3,000	2,300	1,500
MdA:				
Manter	Sandy	1,800	1,500	1,000
MdB:				
Manter	Sandy	1,800	1,500	1,000
MdD:				
Manter	Sandy	1,800	1,500	1,000
Me:				
Manvel	Sandy	1,000	800	500
Mm:				
McClave	Salt Meadow	3,500	3,000	2,000
NdD:				
Nederland	Cobbly Foothills	2,500	2,000	1,500
Nh:				
Niwot	Wet Meadow	4,000	3,500	3,000
NnA:				
Nunn	Clayey	1,300	950	800
NnB:				
Nunn	Clayey	1,300	950	800
NuA:				
Nunn	Clayey	1,300	950	800
NuB:				
Nunn	Clayey	1,300	950	800
NuC:				
Nunn	Clayey	1,300	950	800
NuD:				
Nunn	Clayey	1,300	950	800
Nv:				
Nunn	Clayey	1,300	950	800
Kim	Loamy Plains	1,500	1,000	700

Table 6.--Rangeland productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb./acre	Lb./acre	Lb./acre
PgE:				
Peyton	Loamy Park	2,500	1,500	900
Juget	---	---	---	---
ReD:				
Renohill	Clayey	1,400	1,100	800
RnB:				
Renohill	Clayey	1,400	1,100	800
RnD:				
Renohill	Clayey	1,400	1,100	800
SaD:				
Samsil	Shaly Foothill	1,200	800	500
SeE:				
Samsil	Shaly Foothill	1,200	800	500
Shingle	Shaly Foothill	1,800	1,500	1,000
SgE:				
Shingle	Shaly Foothill	1,800	1,500	1,000
Gaynor	Clayey	1,100	800	500
SmF:				
Sixmile	Rocky Foothills	1,500	1,200	1,000
VaB:				
Valmont	Clayey Foothill	1,200	950	800
VaC:				
Valmont	Clayey Foothill	1,200	950	800
VcC:				
Valmont	Cobbly Foothills	1,200	950	800
VcE:				
Valmont	Cobbly Foothills	1,200	950	800
WdB:				
Weld	Sandy	1,600	1,000	750

Table 6.--Rangeland productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb./acre	Lb./acre	Lb./acre
WeB:				
Weld	Loamy Plains	1,600	1,000	750
WlA:				
Weld	Loamy Plains	1,600	1,000	800
WlB:				
Weld	Loamy Plains	1,600	1,000	800
WoB:				
Weld	Loamy Plains	1,600	1,000	800
Colby	Loamy Plains	1,200	1,000	600
WoC:				
Weld	Loamy Plains	1,600	1,000	800
Colby	Loamy Plains	1,200	1,000	600

Table 7.--Windbreaks and environmental plantings

(Absence of an entry indicates that trees generally do not grow to the given height.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
AcA:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; rose; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac; western sandcherry	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---
AcB:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; rose; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac; western sandcherry	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---
AcC:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
AcD:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---
AoB:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---
Otero	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; redosier dogwood; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; honeylocust; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	osageorange; Siberian elm	---	---
AoC:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
AoC:					
Otero	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; redosier dogwood; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; honeylocust; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	osageorange; Siberian elm	---	---
AoD:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---
Otero	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; redosier dogwood; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; honeylocust; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	osageorange; Siberian elm	---	---
AoE:					
Ascalon	common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; Saskatoon serviceberry; Siberian peashrub; skunkbush sumac	American plum; Austrian pine; black locust; bur oak; common hackberry; Douglas fir; eastern redcedar; golden willow; honeylocust; osageorange; pinyon; Rocky Mountain juniper; white mulberry; white fir	blue spruce; green ash; ponderosa pine; Scotch pine	Siberian elm	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
AoE:					
Otero	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; redosier dogwood; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; honeylocust; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	osageorange; Siberian elm	---	---
BaF:					
Baller	---	---	---	---	---
BP:					
Borrow pits	---	---	---	---	---
CaA:					
Calkins	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; redosier dogwood; rose; Saskatoon serviceberry; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	black locust; bur oak; Douglas fir; golden willow; honeylocust; osageorange; white mulberry; white fir	Austrian pine; blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Scotch pine	eastern cottonwood; plains cottonwood; Siberian elm	---
CaB:					
Calkins	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; redosier dogwood; rose; Saskatoon serviceberry; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	black locust; bur oak; Douglas fir; golden willow; honeylocust; osageorange; white mulberry; white fir	Austrian pine; blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Scotch pine	eastern cottonwood; plains cottonwood; Siberian elm	---
CoB:					
Colby	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
CoC:					
Colby	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---
CoD:					
Colby	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---
CsB:					
Colby Variant	---	---	---	---	---
Ct:					
Colby	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---
Gaynor	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
Cu:					
Colluvial land	---	---	---	---	---
DU:					
Dumps	---	---	---	---	---
FcF:					
Fern Cliff	---	---	---	---	---
Allens Park	---	---	---	---	---
Rock outcrop	---	---	---	---	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
GaB:					
Gaynor	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
GaD:					
Gaynor	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
GP:					
Gravel pits and Mine dumps	---	---	---	---	---
GrF:					
Goldvale	---	---	---	---	---
Rock outcrop	---	---	---	---	---
HaB:					
Hargreave	---	---	---	---	common chokecherry; common lilac; eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian elm
HaD:					
Hargreave	---	---	---	---	common chokecherry; common lilac; eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian elm

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
HeB:					
Heldt	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
HeC:					
Heldt	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
JrF:					
Juget	---	---	---	---	---
Rock outcrop	---	---	---	---	---
KuD:					
Kutch	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
LaE:					
Laporte	---	---	---	---	---
LoB:					
Longmont	common lilac; fourwing saltbush; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; narrowleaf cottonwood; Rocky Mountain juniper	golden willow; green ash; honeylocust; plains cottonwood; Siberian elm	---	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
Lv: Loveland	American plum; common chokecherry; common lilac; fourwing saltbush; Nanking cherry; Peking cotoneaster; redosier dogwood; rose; Saskatoon serviceberry; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	bur oak; osageorange; white mulberry	blue spruce; common hackberry; eastern redcedar; golden willow; green ash; honeylocust; ponderosa pine; Rocky Mountain juniper	plains cottonwood; Siberian elm	---
Ma: Made land	---	---	---	---	---
MdA: Manter	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	Austrian pine; blue spruce; bur oak; Douglas fir; eastern redcedar; osageorange; Rocky Mountain juniper; Scotch pine; twoneedle pinyon	black locust; common hackberry; green ash; honeylocust; ponderosa pine; Siberian elm; white fir	western sandcherry	---
MdB: Manter	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	Austrian pine; blue spruce; bur oak; Douglas fir; eastern redcedar; osageorange; Rocky Mountain juniper; Scotch pine; twoneedle pinyon	black locust; common hackberry; green ash; honeylocust; ponderosa pine; Siberian elm; white fir	western sandcherry	---
MdD: Manter	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac	Austrian pine; blue spruce; bur oak; Douglas fir; eastern redcedar; osageorange; Rocky Mountain juniper; Scotch pine; twoneedle pinyon	black locust; common hackberry; green ash; honeylocust; ponderosa pine; Siberian elm; white fir	western sandcherry	---
Me: Manvel	common chokecherry; common lilac; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; Rocky Mountain juniper; white mulberry; Scotch pine	honeylocust; ponderosa pine; Siberian elm	---	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
Mm: McClave	---	---	Russian olive	---	plains cottonwood; ponderosa pine; Siberian elm
NdD: Nederland	---	---	---	---	---
Nh: Niwot	---	---	---	golden willow	plains cottonwood
NnA: Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
NnB: Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	Austrian pine; common hackberry; eastern redcedar; fourwing saltbush; green ash; honeylocust; osageorange; Peking cotoneaster; ponderosa pine; Rocky Mountain juniper; white mulberry; Siberian peashrub; twoneedle pinyon; white fir
NuA: Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	Austrian pine; common hackberry; eastern redcedar; fourwing saltbush; green ash; honeylocust; osageorange; Peking cotoneaster; ponderosa pine; Rocky Mountain juniper; Russian mulberry; Siberian peashrub; twoneedle pinyon; white fir

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
NuB:					
Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
NuC:					
Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon;	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry;	---
NuD:					
Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	Austrian pine; common hackberry; eastern redcedar; fourwing saltbush; green ash; honeylocust; osageorange; Peking cotoneaster; ponderosa pine; Rocky Mountain juniper; Russian mulberry Siberian peashrub; twoneedle pinyon; white fir
Nv:					
Nunn	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	Austrian pine; common hackberry; eastern redcedar; fourwing saltbush; green ash; honeylocust; osageorange; Peking cotoneaster; ponderosa pine; Rocky Mountain juniper; Russian mulberry Siberian peashrub; twoneedle pinyon; white fir

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
Nv:					
KIM	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---
PgE:					
Peyton	---	---	---	---	mountain mahogany; ponderosa pine; prunus; Rocky Mountain juniper; skunkbush sumac; twoneedle pinyon
Juget	---	---	---	---	---
PLY:					
Playas	---	---	---	---	---
PrF:					
Pinata	---	---	---	---	---
Rock outcrop	---	---	---	---	---
ReD:					
Renohill	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
RnB:					
Renohill	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
RnD:					
Renohill	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
Ro:					
Rock outcrop	---	---	---	---	---
SaD:					
Samsil	---	---	---	---	---
SeE:					
Samsil	---	---	---	---	---
Shingle	---	---	---	---	---
SgE:					
Shingle	---	---	---	---	---
Gaynor	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
SmF:					
Sixmile	---	Rocky Mountain juniper	ponderosa pine; Russian olive	Siberian elm	---
Te:					
Terrace escarpments	---	---	---	---	---
VaB:					
Valmont	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
VaC: Valmont	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
VcC: Valmont	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
VcE: Valmont	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; western sandcherry	Austrian pine; black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry	Siberian elm	---	---
W: Water	---	---	---	---	---
WdB: Weld	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
WeB: Weld	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
WlA:					
Weld	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
WlB:					
Weld	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
WoB:					
Weld	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---
Colby	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---
WoC:					
Weld	American plum; common chokecherry; common lilac; Nanking cherry; Peking cotoneaster; rose; Siberian peashrub; silver buffaloberry; skunkbush sumac; twoneedle pinyon	Austrian pine; bur oak; common hackberry; Douglas fir; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; white mulberry; white fir	black locust; Siberian elm	fourwing saltbush; western sandcherry	---

Table 7.--Windbreaks and environmental plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
WoC:					
Colby	common chokecherry; common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	black locust; common hackberry; eastern redcedar; green ash; honeylocust; osageorange; ponderosa pine; Rocky Mountain juniper; twoneedle pinyon	bur oak; Siberian elm	---	---

Table 8.--Recreational development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AcA:					
Ascalon	Slight	Slight	Slight	Slight	Moderate: droughty
AcB:					
Ascalon	Slight	Slight	Moderate: slope	Slight	Moderate: droughty
AcC:					
Ascalon	Slight	Slight	Moderate: slope	Slight	Moderate: droughty
AcD:					
Ascalon	Slight	Slight	Severe: slope	Slight	Moderate: droughty
AoB:					
Ascalon	Slight	Slight	Slight	Slight	Moderate: droughty
Otero	Slight	Slight	Moderate: small stones	Slight	Moderate: droughty
AoC:					
Ascalon	Slight	Slight	Moderate: slope	Slight	Moderate: droughty
Otero	Slight	Slight	Moderate: slope small stones	Slight	Moderate: droughty
AoD:					
Ascalon	Slight	Slight	Severe: slope	Slight	Moderate: droughty
Otero	Slight	Slight	Severe: slope	Slight	Moderate: droughty
AoE:					
Ascalon	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope droughty

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AoE:					
Otero	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope
BaF:					
Baller	Severe: slope small stones depth to rock	Severe: slope small stones depth to rock	Severe: large stones slope small stones	Moderate: large stones slope	Severe: large stones slope small stones
BP:					
Borrow pits	---	---	---	---	---
CaA:					
Calkins	Severe: flooding	Moderate: wetness	Moderate: flooding wetness	Slight	Moderate: flooding
CaB:					
Calkins	Severe: flooding	Moderate: wetness	Moderate: flooding slope wetness	Slight	Moderate: flooding
CoB:					
Colby	Slight	Slight	Moderate: slope	Slight	Slight
CoC:					
Colby	Slight	Slight	Moderate: slope	Slight	Slight
CoD:					
Colby	Slight	Slight	Severe: slope	Slight	Slight
CsB:					
Colby Variant	Moderate: wetness	Moderate: wetness	Moderate: wetness	Slight	Slight
Ct:					
Colby	Slight	Slight	Severe: slope	Slight	Slight
Gaynor	Slight	Slight	Severe: slope	Slight	Moderate: depth to rock

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Cu: Colluvial land	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope small stones depth to rock	Moderate: slope	Severe: slope droughty
DU: Dumps	---	---	---	---	---
FcF: Fern Cliff	Severe: slope	Severe: slope	Severe: slope small stones	Severe: slope	Severe: slope
Allens Park	Severe: slope	Severe: slope	Severe: slope small stones	Severe: slope	Severe: slope
Rock outcrop	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Severe: depth to rock
GaB: Gaynor	Slight	Slight	Moderate: slope depth to rock	Slight	Moderate: depth to rock
GaD: Gaynor	Slight	Slight	Severe: slope	Slight	Moderate: depth to rock
GP: Gravel pits and Mine dumps	Severe: small stones too sandy	Severe: small stones too sandy	Severe: small stones too sandy	Severe: small stones too sandy	Severe: small stones droughty
GrF: Goldvale	Severe: slope	Severe: slope	Severe: slope small stones	Severe: slope	Severe: slope
Rock outcrop	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Severe: depth to rock

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HaB:					
Hargreave	Slight	Slight	Moderate: slope small stones depth to rock	Slight	Moderate: large stones depth to rock
HaD:					
Hargreave	Slight	Slight	Severe: slope	Slight	Moderate: large stones depth to rock
HeB:					
Heldt	Moderate: too clayey	Moderate: too clayey	Moderate: too clayey	Moderate: too clayey	Severe: too clayey
HeC:					
Heldt	Moderate: too clayey	Moderate: too clayey	Moderate: slope too clayey	Moderate: too clayey	Severe: too clayey
JrF:					
Juget	Severe: slope small stones depth to rock	Severe: slope small stones depth to rock	Severe: slope small stones	Severe: small stones	Severe: slope small stones droughty
Rock outcrop	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Severe: depth to rock
KuD:					
Kutch	Slight	Slight	Severe: slope	Slight	Moderate: depth to rock
LaE:					
Laporte	Severe: depth to rock	Severe: depth to rock	Severe: slope depth to rock	Slight	Severe: depth to rock
LoB:					
Longmont	Severe: excess sodium flooding too clayey	Severe: excess sodium excess salt too clayey	Severe: excess sodium too clayey	Severe: too clayey	Severe: excess sodium excess salt

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Lv: Loveland	Severe: flooding	Moderate: percs slowly wetness	Moderate: flooding small stones	Moderate: wetness	Moderate: flooding wetness
Ma: Made land	Severe: percs slowly ponding	Severe: ponding	Severe: percs slowly ponding	Severe: ponding	Severe: ponding
MdA: Manter	Slight	Slight	Moderate: small stones	Slight	Slight
MdB: Manter	Slight	Slight	Moderate: slope small stones	Slight	Slight
MdD: Manter	Slight	Slight	Severe: slope	Slight	Slight
Me: Manvel	Moderate: dusty	Moderate: dusty	Moderate: dusty slope	Severe: erodes easily	Slight
Mm: McClave	Severe: flooding	Moderate: percs slowly wetness	Moderate: flooding wetness	Moderate: wetness	Moderate: flooding wetness
NdD: Nederland	Severe: large stones	Severe: large stones	Severe: large stones slope small stones	Severe: large stones	Severe: large stones small stones
Nh: Niwot	Severe: flooding	Moderate: wetness	Moderate: small stones wetness	Moderate: wetness	Moderate: flooding wetness
NnA: Nunn	Slight	Slight	Slight	Slight	Slight

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
NnB:					
Nunn	Slight	Slight	Moderate: slope	Slight	Slight
NuA:					
Nunn	Slight	Slight	Slight	Slight	Slight
NuB:					
Nunn	Slight	Slight	Moderate: slope	Slight	Slight
NuC:					
Nunn	Slight	Slight	Moderate: slope	Slight	Slight
NuD:					
Nunn	Slight	Slight	Severe: slope	Slight	Slight
Nv:					
Nunn	Slight	Slight	Slight	Slight	Slight
Kim	Slight	Slight	Moderate: small stones	Slight	Slight
PgE:					
Peyton	Severe: small stones	Severe: small stones	Severe: slope small stones	Severe: small stones	Severe: small stones
Juget	Severe: small stones depth to rock	Severe: small stones depth to rock	Severe: slope small stones	Severe: small stones	Severe: small stones droughty
PLY:					
Playas	---	---	---	---	---
PrF:					
Pinata	Severe: slope small stones	Severe: slope small stones	Severe: large stones slope small stones	Severe: slope	Severe: slope small stones
Rock outcrop	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Severe: depth to rock

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ReD:					
Renohill	Severe: depth to rock	Severe: depth to rock	Severe: slope depth to rock	Moderate: dusty	Severe: depth to rock
RnB:					
Renohill	Slight	Slight	Moderate: slope depth to rock	Slight	Moderate: depth to rock
RnD:					
Renohill	Slight	Slight	Severe: slope	Slight	Moderate: depth to rock
Ro:					
Rock outcrop	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Severe: depth to rock
SaD:					
Samsil	Severe: depth to rock	Severe: depth to rock	Severe: slope depth to rock	Moderate: too clayey	Severe: too clayey depth to rock
SeE:					
Samsil	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Moderate: slope too clayey	Severe: slope too clayey depth to rock
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: erodes easily	Severe: slope depth to rock
SgE:					
Shingle	Severe: depth to rock	Severe: depth to rock	Severe: slope depth to rock	Slight	Severe: depth to rock
Gaynor	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope depth to rock
SmF:					
Sixmile	Severe: slope	Severe: slope	Severe: slope small stones	Severe: slope	Severe: slope

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Te:					
Terrace escarpments----	Severe: slope too sandy	Severe: slope too sandy	Severe: slope small stones too sandy	Severe: slope too sandy	Severe: slope droughty
VaB:					
Valmont----------------	Slight	Slight	Moderate: slope	Slight	Slight
VaC:					
Valmont----------------	Slight	Slight	Moderate: slope	Slight	Slight
VcC:					
Valmont----------------	Moderate: large stones	Moderate: large stones	Severe: large stones	Slight	Moderate: large stones small stones
VcE:					
Valmont----------------	Moderate: large stones	Moderate: large stones	Severe: large stones slope	Slight	Moderate: large stones small stones
W:					
Water------------------	---	---	---	---	---
WdB:					
Weld-------------------	Slight	Slight	Moderate: slope	Slight	Slight
WeB:					
Weld-------------------	Slight	Slight	Moderate: slope small stones	Slight	Slight
WlA:					
Weld-------------------	Moderate: dusty	Moderate: dusty	Moderate: dusty	Moderate: dusty	Slight
WlB:					
Weld-------------------	Moderate: dusty	Moderate: dusty	Moderate: dusty slope	Moderate: dusty	Slight

Table 8.--Recreational development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WoB:					
Weld	Moderate: dusty	Moderate: dusty	Moderate: dusty	Moderate: dusty	Slight
Colby	Slight	Slight	Slight	Slight	Slight
WoC:					
Weld	Moderate: dusty	Moderate: dusty	Moderate: dusty slope	Moderate: dusty	Slight
Colby	Slight	Slight	Moderate: slope	Slight	Slight

Table 9.--Wildlife habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
AcA:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
AcB:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
AcC:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
AcD:												
Ascalon	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
AoB:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Otero	Fair	Good	Good	---	---	---	---	---	Good	---	---	---
AoC:												
Ascalon	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Otero	Fair	Good	Good	---	---	---	---	---	Good	---	---	---
AoD:												
Ascalon	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Otero	Fair	Good	Good	---	---	---	---	---	Good	---	---	---
AoE:												
Ascalon	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
AoE:												
Otero	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
BaF:												
Baller	Very poor	Very poor	Poor	---	---	Fair	Very poor	Very poor	Very poor	---	Very poor	Poor
BP:												
Borrow pits	---	---	---	---	---	---	---	---	---	---	---	---
CaA:												
Calkins	Fair	Fair	Good	---	---	Good	Good	Good	Fair	---	Good	Good
CaB:												
Calkins	Fair	Fair	Good	---	---	Good	Good	Good	Fair	---	Good	Good
CoB:												
Colby	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
CoC:												
Colby	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
CoD:												
Colby	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
CsB:												
Colby Variant	Good	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Ct:												
Colby	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
Gaynor	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Cu:												
Colluvial land	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
DU:												
Dumps	---	---	---	---	---	---	---	---	---	---	---	---
FcF:												
Fern Cliff	Poor	Poor	Fair	---	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
FcF:												
Allens Park	Very poor	Very poor	Good	---	Fair	Good	Very poor	Very poor	Poor	Fair	Very poor	---
Rock outcrop	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
GaB:												
Gaynor	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
GaD:												
Gaynor	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
GP:												
Gravel pits and Mine dumps	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
GrF:												
Goldvale	Very poor	Very poor	Fair	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	---
Rock outcrop	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
HaB:												
Hargreave	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
HaD:												
Hargreave	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
HeB:												
Heldt	Fair	Fair	Poor	---	---	Poor	Poor	Very poor	Fair	---	Poor	Fair
HeC:												
Heldt	Fair	Fair	Poor	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Fair

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
JrF:												
Juget	Very poor	Very poor	Poor	---	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Poor
Rock outcrop	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
KuD:												
Kutch	Poor	Poor	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
LaE:												
Laporte	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
LoB:												
Longmont	Poor	Poor	Fair	---	---	Fair	Good	Good	Poor	---	Good	Fair
Lv:												
Loveland	Very poor	Poor	Good	---	---	Fair	Good	Good	Poor	Poor	Good	Fair
Ma:												
Made land	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Very poor	Very poor	Fair	Very poor
MdA:												
Manter	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
MdB:												
Manter	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
MdD:												
Manter	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Me:												
Manvel	Poor	Poor	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
Mm:												
McClave	Poor	Poor	Good	---	---	Fair	Good	Good	Poor	---	Good	---

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
NdD:												
Nederland	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Nh:												
Niwot	Very poor	Poor	Good	---	---	Fair	Good	Good	Poor	---	Good	Fair
NnA:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
NnB:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
NuA:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
NuB:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
NuC:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
NuD:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Nv:												
Nunn	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Kim	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
PgE:												
Peyton	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Juget	Very poor	Very poor	Poor	---	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Poor

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
	Potential for habitat elements								Potential as habitat for--			
PLY:												
Playas	---	---	---	---	---	---	---	---	---	---	---	---
PrF:												
Pinata	Very poor	Very poor	Fair	---	Good	Good	Very poor	Very poor	Poor	Good	Very poor	Fair
Rock outcrop	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
ReD:												
Renohill	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
RnB:												
Renohill	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
RnD:												
Renohill	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Ro:												
Rock outcrop	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
SaD:												
Samsil	Very poor	Very poor	Poor	---	---	Fair	Very poor	Very poor	Very poor	---	Very poor	Poor
SeE:												
Samsil	Very poor	Very poor	Poor	---	---	Fair	Very poor	Very poor	Very poor	---	Very poor	Poor
Shingle	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
SgE:												
Shingle	Poor	Poor	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
Gaynor	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
SmF: Sixmile	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Te: Terrace escarpments	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
VaB: Valmont	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
VaC: Valmont	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
VcC: Valmont	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
VcE: Valmont	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
W: Water	---	---	---	---	---	---	---	---	---	---	---	---
WdB: Weld	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
WeB: Weld	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
WlA: Weld	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
WlB: Weld	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor

Table 9.--Wildlife habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
WoB:												
Weld	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
Colby	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
WoC:												
Weld	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
Colby	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair

Table 10.--Building site development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcA:							
Ascalon	90	Not limited		Not limited		Not limited	
AcB:							
Ascalon	90	Not limited		Not limited		Not limited	
AcC:							
Ascalon	90	Not limited		Not limited		Not limited	
AcD:							
Ascalon	80	Not limited		Not limited		Somewhat limited	
						Slope	0.88
AoB:							
Ascalon	60	Not limited		Not limited		Not limited	
Otero	30	Not limited		Not limited		Not limited	
AoC:							
Ascalon	55	Not limited		Not limited		Not limited	
Otero	35	Not limited		Not limited		Not limited	
AoD:							
Ascalon	50	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Otero	35	Not limited		Not limited		Somewhat limited	
						Slope	0.88
AoE:							
Ascalon	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
Otero	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
BaF:							
Baller--------------	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
BP:							
Borrow pits---------	95	Not rated		Not rated		Not rated	
CaA:							
Calkins-------------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	1.00		
CaB:							
Calkins-------------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	1.00		
CoB:							
Colby---------------	90	Not limited		Not limited		Not limited	
CoC:							
Colby---------------	90	Not limited		Not limited		Not limited	
CoD:							
Colby---------------	80	Not limited		Not limited		Somewhat limited	
						Slope	0.88
CsB:							
Colby Variant-------	85	Not limited		Somewhat limited		Not limited	
				Depth to saturated zone	0.95		
Ct:							
Colby---------------	55	Not limited		Not limited		Somewhat limited	
						Slope	0.88

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Ct:							
Gaynor	30	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Slope	0.88
Cu:							
Colluvial land	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
DU:							
Dumps	95	Not rated		Not rated		Not rated	
FcF:							
Fern Cliff	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.84	Content of large stones	0.84	Content of large stones	0.84
Allens Park	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.42	Depth to hard bedrock	1.00	Depth to hard bedrock	0.42
Rock outcrop	20	Not rated		Not rated		Not rated	
GaB:							
Gaynor	85	Not limited		Somewhat limited		Not limited	
				Depth to soft bedrock	0.42		
GaD:							
Gaynor	80	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Slope	0.50
GP:							
Gravel pits and Mine dumps	94	Not rated		Not rated		Not rated	

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GrF:							
Goldvale------------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.72	Content of large stones	0.72	Content of large stones	0.72
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Rock outcrop--------	30	Not rated		Not rated		Not rated	
HaB:							
Hargreave-----------	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.42	Depth to hard bedrock	1.00	Depth to hard bedrock	0.42
HaD:							
Hargreave-----------	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.42	Depth to hard bedrock	1.00	Slope	0.50
						Depth to hard bedrock	0.42
HeB:							
Heldt---------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
HeC:							
Heldt---------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
JrF:							
Juget---------------	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to hard bedrock	1.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
KuD:							
Kutch---------------	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.42	Slope	0.50

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
LaE:							
Laporte	85	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	1.00
LoB:							
Longmont	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.07	Shrink-swell	1.00	Depth to saturated zone	0.07
Lv:							
Loveland	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
Ma:							
Made land	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
MdA:							
Manter	85	Not limited		Not limited		Not limited	
MdB:							
Manter	85	Not limited		Not limited		Not limited	
MdD:							
Manter	85	Not limited		Not limited		Somewhat limited	
						Slope	0.50
Me:							
Manvel	85	Not limited		Not limited		Not limited	
Mm:							
McClave	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NdD:							
Nederland----------	80	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
						Slope	0.88
Nh:							
Niwot---------------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
NnA:							
Nunn----------------	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NnB:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NuA:							
Nunn----------------	90	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
NuB:							
Nunn----------------	80	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
NuC:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
NuD:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Nv:							
Nunn----------------	50	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Nv:							
Kim	35	Not limited		Not limited		Not limited	
PgE:							
Peyton	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
Juget	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	1.00
PLY:							
Playas	95	Not rated		Not rated		Not rated	
PrF:							
Pinata	45	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Content of large stones	1.00	Content of large stones	1.00
		Shrink-swell	0.50	Slope	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.42	Shrink-swell	0.50	Depth to hard bedrock	0.42
Rock outcrop	35	Not rated		Not rated		Not rated	
ReD:							
Renohill	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Shrink-swell	1.00	Depth to hard bedrock	1.00
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Shrink-swell	1.00
						Slope	0.50
RnB:							
Renohill	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.42		
RnD:							
Renohill	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Slope	0.50

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
Ro:							
Rock outcrop	100	Not rated		Not rated		Not rated	
SaD:							
Samsil	85	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
						Slope	1.00
SeE:							
Samsil	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Shingle	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
SgE:							
Shingle	50	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
Gaynor	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.42		
SmF:							
Sixmile	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.42		
Te:							
Terrace escarpments	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 10.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
VaB:							
Valmont	85	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
VaC:							
Valmont	85	Not limited		Not limited		Not limited	
VcC:							
Valmont	100	Not limited		Not limited		Not limited	
VcE:							
Valmont	90	Not limited		Not limited		Very limited	
						Slope	1.00
W:							
Water	95	Not rated		Not rated		Not rated	
WdB:							
Weld	90	Very limited		Not limited		Very limited	
		Shrink-swell	1.00			Shrink-swell	1.00
WeB:							
Weld	90	Not limited		Not limited		Not limited	
WlA:							
Weld	85	Not limited		Not limited		Not limited	
WlB:							
Weld	85	Not limited		Not limited		Not limited	
WoB:							
Weld	55	Not limited		Not limited		Not limited	
Colby	30	Not limited		Not limited		Not limited	
WoC:							
Weld	50	Not limited		Not limited		Not limited	
Colby	35	Not limited		Not limited		Not limited	

Table 11.--Building site development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcA:							
Ascalon	90	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
AcB:							
Ascalon	90	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
AcC:							
Ascalon	90	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
AcD:							
Ascalon	80	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
AoB:							
Ascalon	60	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Otero	30	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AoC:							
Ascalon	55	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Otero	35	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
AoD:							
Ascalon	50	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Otero	35	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
AoE:							
Ascalon	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
Otero	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10		
BaF:							
Baller	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	1.00	Content of large stones	1.00	Slope	1.00
				Cutbanks cave	0.10		
BP:							
Borrow pits	95	Not rated		Not rated		Not rated	
CaA:							
Calkins	90	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
				Cutbanks cave	0.10		
CaB:							
Calkins	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
				Cutbanks cave	0.10		
CoB:							
Colby	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
CoC:							
Colby	90	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CoD:							
Colby	80	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
CsB:							
Colby Variant	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Depth to saturated zone	0.95		
				Cutbanks cave	0.10		
Ct:							
Colby	55	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Gaynor	30	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Depth to bedrock	0.42
				Cutbanks cave	0.10		
Cu:							
Colluvial land	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Gravel content	0.22
						Content of large stones	0.01
DU:							
Dumps	95	Not rated		Not rated		Not rated	
FcF:							
Fern Cliff	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.84	Content of large stones	0.84	Content of large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.03

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
FcF:							
Allens Park	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
						Droughty	0.73
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.42
		Depth to hard bedrock	0.42	Cutbanks cave	0.10	Gravel content	0.22
						Content of large stones	0.01
Rock outcrop	20	Not rated		Not rated		Not rated	
GaB:							
Gaynor	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Depth to bedrock	0.42
				Cutbanks cave	0.10		
GaD:							
Gaynor	80	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Depth to bedrock	0.42
				Cutbanks cave	0.10		
GP:							
Gravel pits and Mine dumps	94	Not rated		Not rated		Not rated	
GrF:							
Goldvale	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	0.72	Content of large stones	0.72	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.01
				Too clayey	0.03		
Rock outcrop	30	Not rated		Not rated		Not rated	

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
HaB:							
Hargreave	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.42	Depth to hard bedrock	1.00	Depth to bedrock	0.42
				Cutbanks cave	0.10	Content of large stones	0.08
						Droughty	0.01
HaD:							
Hargreave	85	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.42	Depth to hard bedrock	1.00	Depth to bedrock	0.42
				Cutbanks cave	0.10	Content of large stones	0.08
						Droughty	0.01
HeB:							
Heldt	90	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Cutbanks cave	0.10	Too clayey	1.00
		Shrink-swell	0.50	Too clayey	0.03		
HeC:							
Heldt	85	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Cutbanks cave	0.10	Too clayey	1.00
		Shrink-swell	0.50	Too clayey	0.03		
JrF:							
Juget	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Gravel content	1.00
				Cutbanks cave	0.10	Slope	1.00
						Content of large stones	0.01
Rock outcrop	30	Not rated		Not rated		Not rated	
KuD:							
Kutch	85	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Depth to soft bedrock	0.42	Depth to bedrock	0.42
		Frost action	0.50				
				Too clayey	0.12		
				Cutbanks cave	0.10		

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
LaE:							
Laporte-------------	85	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	0.84	Slope	0.84	Slope	0.84
				Cutbanks cave	0.10		
LoB:							
Longmont------------	80	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Salinity	1.00
		Flooding	1.00			Too clayey	1.00
		Shrink-swell	1.00	Flooding	0.60	Sodium content	1.00
		Depth to saturated zone	0.03	Too clayey	0.50	Flooding	0.60
				Cutbanks cave	0.10	Depth to saturated zone	0.03
Lv:							
Loveland------------	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00			Depth to saturated zone	0.03
		Depth to saturated zone	0.03	Cutbanks cave	1.00		
				Flooding	0.60	Content of large stones	0.01
Ma:							
Made land-----------	100	Not rated		Not rated		Very limited	
						Depth to saturated zone	1.00
						Too clayey	1.00
						Droughty	0.92
MdA:							
Manter--------------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
MdB:							
Manter--------------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
MdD:							
Manter--------------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Me:							
Manvel	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Mm:							
McClave	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Flooding	0.60	Depth to saturated zone	0.03
		Depth to saturated zone	0.03	Cutbanks cave	0.10		
NdD:							
Nederland	80	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.79
Nh:							
Niwot	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Cutbanks cave	1.00	Droughty	0.17
		Depth to saturated zone	0.03	Flooding	0.60	Depth to saturated zone	0.03
NnA:							
Nunn	90	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
NnB:							
Nunn	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
NuA:							
Nunn	90	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Too clayey	0.12		
		Frost action	0.50	Cutbanks cave	0.10		
NuB:							
Nunn	80	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Too clayey	0.12		
		Frost action	0.50	Cutbanks cave	0.10		

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
NuC:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Too clayey	0.12		
		Frost action	0.50	Cutbanks cave	0.10		
NuD:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Nv:							
Nunn----------------	50	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Too clayey	0.12		
		Frost action	0.50	Cutbanks cave	0.10		
Kim-----------------	35	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
PgE:							
Peyton--------------	65	Somewhat limited		Very limited		Very limited	
		Slope	0.84	Cutbanks cave	1.00	Gravel content	1.00
		Frost action	0.50	Slope	0.84	Slope	0.84
						Droughty	0.13
						Content of large stones	0.01
PgE:							
Juget---------------	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	0.84	Slope	0.84	Gravel content	1.00
				Cutbanks cave	0.10	Slope	0.84
						Too sandy	0.50
PLY:							
Playas--------------	95	Not rated		Not rated		Not rated	

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
PrF:							
Pinata	45	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Depth to hard bedrock	1.00	Content of large stones	1.00
		Slope	1.00	Content of large stones	1.00	Slope	1.00
		Shrink-swell	0.50			Droughty	0.99
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.42
		Depth to hard bedrock	0.42	Too clayey	0.12		
				Cutbanks cave	0.10		
Rock outcrop	35	Not rated		Not rated		Not rated	
ReD:							
Renohill	85	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	0.91
		Shrink-swell	1.00	Cutbanks cave	0.10		
RnB:							
Renohill	85	Very limited		Somewhat limited		Somewhat limited	
		Shrink-swell	1.00	Depth to soft bedrock	0.42	Depth to bedrock	0.42
				Too clayey	0.12		
				Cutbanks cave	0.10		
RnD:							
Renohill	85	Not limited		Somewhat limited		Somewhat limited	
				Depth to soft bedrock	0.42	Depth to bedrock	0.42
				Cutbanks cave	0.10		
Ro:							
Rock outcrop	100	Not rated		Not rated		Not rated	
SaD:							
Samsil	85	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
				Cutbanks cave	0.10	Too clayey	1.00

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SeE:							
Samsil	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Droughty	1.00
				Cutbanks cave	0.10	Too clayey	1.00
						Slope	1.00
SeE:							
Shingle	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	0.98
SgE:							
Shingle	50	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Droughty	0.95
				Cutbanks cave	0.10	Slope	0.63
Gaynor	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
				Depth to soft bedrock	0.42	Depth to bedrock	0.42
				Cutbanks cave	0.10		
SmF:							
Sixmile	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.42	Content of large stones	1.00
				Cutbanks cave	0.10	Depth to bedrock	0.42
						Droughty	0.07
Te:							
Terrace escarpments	100	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Droughty	1.00
				Slope	1.00	Slope	1.00
						Too sandy	0.50
						Gravel content	0.50

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
VaB:							
Valmont-------------	85	Somewhat limited		Very limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	1.00		
				Too clayey	0.03		
VaC:							
Valmont-------------	85	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
				Too clayey	0.03		
VcC:							
Valmont-------------	100	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Content of large stones	0.68
				Too clayey	0.03		
VcE:							
Valmont-------------	90	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Content of large stones	0.68
W:							
Water---------------	95	Not rated		Not rated		Not rated	
WdB:							
Weld----------------	90	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50	Too clayey	0.06		
WeB:							
Weld----------------	90	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
WlA:							
Weld----------------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
WlB:							
Weld----------------	85	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		

Table 11.--Building site development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Local roads and streets: Value	Shallow excavations: Rating class and limiting features	Shallow excavations: Value	Lawns and landscaping: Rating class and limiting features	Lawns and landscaping: Value
WoB:							
Weld----------------	55	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Colby---------------	30	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
WoC:							
Weld----------------	50	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
WoC:							
Colby---------------	35	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		

Table 12.--Sanitary facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AcA:					
Ascalon	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
AcB:					
Ascalon	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
AcC:					
Ascalon	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
AcD:					
Ascalon	Moderate: percs slowly	Severe: seepage slope	Moderate: too sandy	Slight	Fair: too sandy
AoB:					
Ascalon	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
Otero	Slight	Severe: seepage	Slight	Slight	Good
AoC:					
Ascalon	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
Otero	Slight	Severe: seepage	Slight	Slight	Good
AoD:					
Ascalon	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
Otero	Slight	Severe: seepage slope	Slight	Slight	Good
AoE:					
Ascalon	Moderate: percs slowly slope	Severe: seepage slope	Moderate: slope too sandy	Moderate: slope	Fair: slope too sandy

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AoE:					
Otero	Severe: slope	Severe: seepage slope	Severe: slope	Severe: slope	Poor: slope
BaF:					
Baller	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Poor: slope small stones depth to rock
BP:					
Borrow pits	---	---	---	---	---
CaA:					
Calkins	Severe: flooding wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Fair: wetness
CaB:					
Calkins	Severe: flooding wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Fair: wetness
CoB:					
Colby	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
CoC:					
Colby	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
CoD:					
Colby	Severe: percs slowly	Severe: slope	Slight	Slight	Good
CsB:					
Colby Variant	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Fair: thin layer too clayey wetness
Ct:					
Colby	Severe: percs slowly	Severe: slope	Slight	Slight	Good

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ct:					
Gaynor	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Cu:					
Colluvial land	Severe: slope poor filter depth to rock	Severe: seepage slope depth to rock	Severe: slope too sandy depth to rock	Severe: slope	Poor: seepage too sandy depth to rock
DU:					
Dumps	---	---	---	---	---
FcF:					
Fern Cliff	Severe: slope	Severe: seepage slope	Severe: seepage slope	Severe: seepage slope	Poor: large stones slope
Allens Park	Severe: percs slowly slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Poor: slope small stones depth to rock
Rock outcrop	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: slope depth to rock
GaB:					
Gaynor	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
GaD:					
Gaynor	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
GP:					
Gravel pits and Mine dumps	Severe: poor filter	Severe: seepage	Severe: seepage too sandy	Slight	Poor: seepage small stones too sandy

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GrF:					
Goldvale	Severe: percs slowly slope	Severe: seepage slope	Severe: seepage slope	Severe: slope	Poor: slope
Rock outcrop	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: slope depth to rock
HaB:					
Hargreave	Severe: depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
HaD:					
Hargreave	Severe: depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
HeB:					
Heldt	Severe: percs slowly	Slight	Slight	Slight	Good
HeC:					
Heldt	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
JrF:					
Juget	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Poor: seepage too sandy depth to rock
Rock outcrop	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: slope depth to rock
KuD:					
Kutch	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: too clayey depth to rock	Severe: depth to rock	Poor: too clayey depth to rock
LaE:					
Laporte	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LoB: Longmont	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: excess sodium too clayey
Lv: Loveland	Severe: flooding wetness poor filter	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Poor: seepage small stones too sandy
Ma: Made land	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
MdA: Manter	Slight	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
MdB: Manter	Slight	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
MdD: Manter	Slight	Severe: seepage	Moderate: too sandy	Slight	Fair: too sandy
Me: Manvel	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Mm: McClave	Severe: flooding percs slowly wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Fair: too clayey wetness
NdD: Nederland	Severe: large stones	Severe: large stones seepage	Severe: large stones	Slight	Poor: large stones

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Nh:					
Niwot	Severe: flooding wetness poor filter	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Poor: seepage too sandy
NnA:					
Nunn	Severe: percs slowly	Slight	Slight	Slight	Good
NnB:					
Nunn	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
NuA:					
Nunn	Severe: percs slowly	Slight	Slight	Slight	Good
NuB:					
Nunn	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
NuC:					
Nunn	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
NuD:					
Nunn	Severe: percs slowly	Severe: slope	Slight	Slight	Good
Nv:					
Nunn	Severe: percs slowly	Slight	Slight	Slight	Good
Kim	Moderate: percs slowly	Moderate: seepage	Slight	Slight	Good
PgE:					
Peyton	Severe: percs slowly	Severe: seepage slope	Moderate: slope	Moderate: slope	Poor: small stones
Juget	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Poor: seepage too sandy depth to rock

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PLY:					
Playas	---	---	---	---	---
PrF:					
Pinata	Severe: percs slowly slope depth to rock	Severe: slope depth to rock	Severe: slope too clayey depth to rock	Severe: slope depth to rock	Poor: small stones too clayey depth to rock
Rock outcrop	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: slope depth to rock
ReD:					
Renohill	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: hard to pack depth to rock
RnB:					
Renohill	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
RnD:					
Renohill	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Ro:					
Rock outcrop	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: slope depth to rock
SaD:					
Samsil	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Slight	Poor: hard to pack depth to rock
SeE:					
Samsil	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SgE:					
Shingle	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Gaynor	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
SmF:					
Sixmile	Severe: percs slowly slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Te:					
Terrace escarpments	Severe: slope poor filter	Severe: seepage slope	Severe: slope too sandy	Severe: slope	Poor: seepage small stones too sandy
VaB:					
Valmont	Moderate: percs slowly	Severe: seepage	Slight	Slight	Poor: seepage small stones
VaC:					
Valmont	Moderate: percs slowly	Severe: seepage	Slight	Slight	Poor: seepage small stones
VcC:					
Valmont	Moderate: percs slowly	Severe: seepage	Slight	Slight	Poor: seepage small stones
VcE:					
Valmont	Moderate: percs slowly	Severe: seepage slope	Slight	Slight	Poor: seepage small stones
W:					
Water	---	---	---	---	---

Table 12.--Sanitary facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WdB:					
Weld	Severe: percs slowly	Moderate: seepage slope	Slight	Slight	Good
WeB:					
Weld	Severe: percs slowly	Moderate: seepage slope	Slight	Slight	Good
WlA:					
Weld	Moderate: percs slowly	Moderate: seepage	Slight	Slight	Good
WlB:					
Weld	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
WoB:					
Weld	Moderate: percs slowly	Moderate: seepage	Slight	Slight	Good
Colby	Severe: percs slowly	Slight	Slight	Slight	Good
WoC:					
Weld	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Colby	Severe: percs slowly	Moderate: slope	Slight	Slight	Good

Table 13.--Construction materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AcA:					
Ascalon	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
AcB:					
Ascalon	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AcC:					
Ascalon	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AcD:					
Ascalon	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AoB:					
Ascalon	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Otero	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.03
AoC:					
Ascalon	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
AoC:					
Otero	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.03
AoD:					
Ascalon	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Otero	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.03
AoE:					
Ascalon	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 13.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
AoE:					
Otero	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.03
BaF:					
Baller	85	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
BP:					
Borrow pits	95	Not rated		Not rated	
CaA:					
Calkins	90	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.04
CaB:					
Calkins	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.04
CoB:					
Colby	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CoC:					
Colby	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CoD:					
Colby	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CsB:					
Colby Variant	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ct:					
Colby	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gaynor	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cu:					
Colluvial land	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
DU:					
Dumps	95	Not rated		Not rated	

Table 13.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
FcF:					
Fern Cliff----------	30	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
FcF:					
Allens Park---------	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
Rock outcrop--------	20	Not rated		Not rated	
GaB:					
Gaynor--------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GaD:					
Gaynor--------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GP:					
Gravel pits and Mine dumps--------------	94	Not rated		Not rated	
GrF:					
Goldvale------------	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
Rock outcrop--------	30	Not rated		Not rated	
HaB:					
Hargreave-----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HaD:					
Hargreave-----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HeB:					
Heldt---------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HeC:					
Heldt---------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JrF:					
Juget---------------	50	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.08
Rock outcrop--------	30	Not rated		Not rated	

Table 13.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
KuD:					
Kutch---------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LaE:					
Laporte-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LoB:					
Longmont------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lv:					
Loveland------------	85	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.82
Ma:					
Made land-----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MdA:					
Manter--------------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
MdB:					
Manter--------------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
MdD:					
Manter--------------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Me:					
Manvel--------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mm:					
McClave-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NdD:					
Nederland-----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nh:					
Niwot---------------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.82

Table 13.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
NnA:					
Nunn----------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NnB:					
Nunn----------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NuA:					
Nunn----------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NuB:					
Nunn----------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NuC:					
Nunn----------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NuD:					
Nunn----------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nv:					
Nunn----------------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kim-----------------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PgE:					
Peyton--------------	65	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Juget---------------	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.38	Bottom layer	0.08
PLY:					
Playas--------------	95	Not rated		Not rated	
PrF:					
Pinata--------------	45	Poor		Poor	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.00
Rock outcrop--------	35	Not rated		Not rated	

Table 13.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
ReD:					
Renohill-----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RnB:					
Renohill-----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RnD:					
Renohill-----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ro:					
Rock outcrop--------	100	Not rated		Not rated	
SaD:					
Samsil-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SeE:					
Samsil-------------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shingle------------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SgE:					
Shingle------------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gaynor-------------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SmF:					
Sixmile------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Te:					
Terrace escarpments-	100	Poor		Fair	
		Thickest layer	0.00	Bottom layer	0.86
		Bottom layer	0.00	Thickest layer	0.86
VaB:					
Valmont------------	85	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
VaC:					
Valmont------------	85	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00

Table 13.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
VcC:					
Valmont	100	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
VcE:					
Valmont	90	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
W:					
Water	95	Not rated		Not rated	
WdB:					
Weld	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WeB:					
Weld	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WlA:					
Weld	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WlB:					
Weld	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WoB:					
Weld	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WoC:					
Weld	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.--Construction materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
AcA:							
Ascalon-------------	90	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
AcB:							
Ascalon-------------	90	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
AcC:							
Ascalon-------------	90	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
AcD:							
Ascalon-------------	80	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
AoB:							
Ascalon-------------	60	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
Otero---------------	30	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
AoC:							
Ascalon	55	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
Otero	35	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
AoD:							
Ascalon	50	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
Otero	35	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
AoE:							
Ascalon	45	Poor		Good		Fair	
		Too alkaline	0.00			Slope	0.63
		Low content of organic matter	0.12				
Otero	35	Poor		Fair		Poor	
		Too alkaline	0.00	Slope	0.98	Slope	0.00
		Low content of organic matter	0.12				
BaF:							
Baller	85	Poor		Poor		Poor	
		Stone content	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Stone content	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.18	Slope	0.00
				Cobble content	0.89		
BP:							
Borrow pits	95	Not rated		Not rated		Not rated	

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
CaA:							
Calkins	90	Poor		Fair		Fair	
		Too alkaline	0.00	Depth to saturated zone	0.89	Depth to saturated zone	0.89
						Rock fragments	0.97
CaB:							
Calkins	85	Poor		Fair		Fair	
		Too alkaline	0.00	Depth to saturated zone	0.89	Depth to saturated zone	0.89
						Rock fragments	0.97
CoB:							
Colby	90	Poor		Good		Fair	
		Too alkaline	0.00			Too clayey	0.57
		Low content of organic matter	0.12				
		Too clayey	0.98				
		Water erosion	0.99				
CoC:							
Colby	90	Poor		Good		Fair	
		Too alkaline	0.00			Too clayey	0.57
		Low content of organic matter	0.12				
		Too clayey	0.98				
		Water erosion	0.99				
CoD:							
Colby	80	Poor		Good		Fair	
		Too alkaline	0.00			Too clayey	0.57
		Low content of organic matter	0.12				
		Too clayey	0.98				
		Water erosion	0.99				
CsB:							
Colby Variant	85	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
		Water erosion	0.99				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Ct:							
Colby----------------	55	Poor		Good		Fair	
		Too alkaline	0.00			Too clayey	0.57
		Low content of organic matter	0.12				
		Too clayey	0.98				
		Water erosion	0.99				
Gaynor---------------	30	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.36
		Too clayey	0.50			Depth to bedrock	0.58
		Depth to bedrock	0.58				
		Low content of organic matter	0.88				
		Droughty	0.99				
Cu:							
Colluvial land------	80	Poor		Poor		Poor	
		Too sandy	0.00	Depth to bedrock	0.00	Too sandy	0.00
		Droughty	0.00	Slope	0.92	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
		Low content of organic matter	0.12			Slope	0.00
DU:							
Dumps----------------	95	Not rated		Not rated		Not rated	
FcF:							
Fern Cliff----------	30	Poor		Poor		Poor	
		Stone content	0.00	Stone content	0.00	Slope	0.00
		Too alkaline	0.00	Slope	0.00	Rock fragments	0.28
		Low content of organic matter	0.12			Hard to reclaim	0.50
		Too acid	0.95				
FcF:							
Allens Park---------	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.58	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.88			Depth to bedrock	0.58
Rock outcrop--------	20	Not rated		Not rated		Not rated	

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
GaB:							
Gaynor	85	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.36
		Too clayey	0.50			Depth to bedrock	0.58
		Depth to bedrock	0.58				
		Low content of organic matter	0.88				
		Droughty	0.99				
GaD:							
Gaynor	80	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.36
		Too clayey	0.50			Depth to bedrock	0.58
		Depth to bedrock	0.58				
		Low content of organic matter	0.88				
		Droughty	0.99				
GP:							
Gravel pits and Mine dumps	94	Not rated		Not rated		Not rated	
GrF:							
Goldvale	55	Poor		Poor		Poor	
		Too alkaline	0.00	Stone content	0.00	Slope	0.00
		Stone content	0.00	Slope	0.00	Rock fragments	0.28
		Low content of organic matter	0.12	Shrink-swell	0.99	Hard to reclaim	0.50
Rock outcrop	30	Not rated		Not rated		Not rated	
HaB:							
Hargreave	90	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Depth to bedrock	0.58
		Low content of organic matter	0.12				
		Droughty	0.17				
		Depth to bedrock	0.58				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
HaD:							
Hargreave----------	85	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Depth to bedrock	0.58
		Low content of organic matter	0.12				
		Droughty	0.20				
		Depth to bedrock	0.58				
HeB:							
Heldt---------------	90	Poor		Fair		Fair	
		Too alkaline	0.00	Shrink-swell	0.87	Too clayey	0.07
		Too clayey	0.12				
		Low content of organic matter	0.12				
HeC:							
Heldt---------------	85	Poor		Fair		Fair	
		Too alkaline	0.00	Shrink-swell	0.87	Too clayey	0.07
		Too clayey	0.12				
		Low content of organic matter	0.12				
JrF:							
Juget---------------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
						Slope	0.00
Rock outcrop--------	30	Not rated		Not rated		Not rated	
KuD:							
Kutch---------------	85	Poor		Poor		Poor	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Too clayey	0.00	Shrink-swell	0.15	Depth to bedrock	0.58
		Depth to bedrock	0.58				
		Droughty	0.71				
		Low content of organic matter	0.88				
		Too acid	0.99				
LaE:							
Laporte-------------	85	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Carbonate content	0.00
		Carbonate content	0.00			Slope	0.16
		Water erosion	0.99				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
LoB:							
Longmont-----------	80	Poor		Fair		Poor	
		Too alkaline	0.00	Shrink-swell	0.12	Too clayey	0.00
		Too clayey	0.00	Depth to saturated zone	0.76	Sodium content	0.00
		Sodium content	0.00			Salinity	0.00
		Salinity	0.88			Depth to saturated zone	0.76
Lv:							
Loveland-----------	85	Poor		Fair		Poor	
		Too alkaline	0.00	Depth to saturated zone	0.76	Hard to reclaim	0.00
		Low content of organic matter	0.12			Depth to saturated zone	0.76
Ma:							
Made land----------	100	Poor		Not rated		Not rated	
		Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too clayey	0.00	Shrink-swell	0.12		
		Droughty	0.09				
		Water erosion	0.99				
MdA:							
Manter-------------	85	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.50				
MdB:							
Manter-------------	85	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.50				
MdD:							
Manter-------------	85	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.50				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Me:							
Manvel	85	Poor		Good		Fair	
		Too alkaline	0.00			Carbonate content	0.46
		Carbonate content	0.46				
		Low content of organic matter	0.50				
		Water erosion	0.90				
Mm:							
McClave	85	Poor		Fair		Fair	
		Too alkaline	0.00	Depth to saturated zone	0.76	Depth to saturated zone	0.76
NdD:							
Nederland	80	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Hard to reclaim	0.00
		Stone content	0.08	Stone content	0.08	Rock fragments	0.00
		Low content of organic matter	0.12				
		Droughty	0.18				
Nh:							
Niwot	85	Poor		Fair		Poor	
		Too sandy	0.00	Depth to saturated zone	0.76	Too sandy	0.00
		Too alkaline	0.00			Rock fragments	0.00
		Low content of organic matter	0.12			Hard to reclaim	0.68
		Droughty	0.49			Depth to saturated zone	0.76
NnA:							
Nunn	90	Poor		Fair		Fair	
		Too alkaline	0.00	Shrink-swell	0.80	Too clayey	0.29
		Low content of organic matter	0.12				
		Too clayey	0.50				
		Too acid	0.99				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
NnB:							
Nunn----------------	85	Poor		Fair		Fair	
		Too alkaline	0.00	Shrink-swell	0.83	Too clayey	0.29
		Low content of organic matter	0.12				
		Too clayey	0.50				
		Too acid	0.99				
NuA:							
Nunn----------------	90	Poor		Fair		Poor	
		Too alkaline	0.00	Shrink-swell	0.59	Too clayey	0.00
		Too clayey	0.00				
		Low content of organic matter	0.12				
		Too acid	0.99				
NuB:							
Nunn----------------	80	Poor		Fair		Poor	
		Too alkaline	0.00	Shrink-swell	0.59	Too clayey	0.00
		Too clayey	0.00				
		Low content of organic matter	0.12				
		Too acid	0.99				
NuC:							
Nunn----------------	85	Poor		Fair		Fair	
		Too alkaline	0.00	Shrink-swell	0.72	Too clayey	0.29
		Low content of organic matter	0.12				
		Too clayey	0.50				
		Too acid	0.99				
NuD:							
Nunn----------------	85	Poor		Fair		Fair	
		Too alkaline	0.00	Shrink-swell	0.83	Too clayey	0.29
		Low content of organic matter	0.12				
		Too clayey	0.50				
		Too acid	0.99				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Nv:							
Nunn----------------	50	Poor		Fair		Poor	
		Too alkaline	0.00	Shrink-swell	0.59	Too clayey	0.00
		Too clayey	0.00				
		Low content of organic matter	0.12				
		Too acid	0.99				
Kim-----------------	35	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
		Water erosion	0.99				
PgE:							
Peyton--------------	65	Poor		Good		Poor	
		Too alkaline	0.00			Rock fragments	0.00
		Low content of organic matter	0.50			Slope	0.16
						Hard to reclaim	0.68
		Droughty	0.91				
Juget---------------	20	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00			Depth to bedrock	0.00
		Too sandy	0.36			Slope	0.16
						Too sandy	0.36
PLY:							
Playas--------------	95	Not rated		Not rated		Not rated	
PrF:							
Pinata--------------	45	Poor		Poor		Poor	
		Stone content	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Too clayey	0.00	Stone content	0.00	Rock fragments	0.00
		Droughty	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Shrink-swell	0.92	Depth to bedrock	0.58
		Depth to bedrock	0.58				
Rock outcrop--------	35	Not rated		Not rated		Not rated	

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
ReD:							
Renohill-----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Droughty	0.00	Shrink-swell	0.12	Depth to bedrock	0.00
		Depth to bedrock	0.00				
		Low content of organic matter	0.50				
		Water erosion	0.99				
RnB:							
Renohill-----------	85	Poor		Poor		Poor	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Too clayey	0.00	Shrink-swell	0.12	Depth to bedrock	0.58
		Low content of organic matter	0.50				
		Depth to bedrock	0.58				
		Droughty	0.86				
RnD:							
Renohill-----------	85	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.29
		Low content of organic matter	0.12			Depth to bedrock	0.58
		Too clayey	0.50				
		Depth to bedrock	0.58				
		Droughty	0.97				
		Water erosion	0.99				
Ro:							
Rock outcrop--------	100	Not rated		Not rated		Not rated	
SaD:							
Samsil-------------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Droughty	0.00			Depth to bedrock	0.00
		Depth to bedrock	0.00				
		Low content of organic matter	0.12				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
SeE:							
Samsil	40	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too clayey	0.00
		Droughty	0.00			Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.00
		Low content of organic matter	0.12				
Shingle	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.00
		Low content of organic matter	0.12				
		Water erosion	0.90				
SgE:							
Shingle	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.37
		Low content of organic matter	0.12				
		Water erosion	0.90				
Gaynor	40	Poor		Poor		Fair	
		Too alkaline	0.00	Depth to bedrock	0.00	Too clayey	0.36
		Too clayey	0.50			Slope	0.37
		Depth to bedrock	0.58			Depth to bedrock	0.58
		Low content of organic matter	0.88				
		Droughty	0.99				
SmF:							
Sixmile	80	Poor		Poor		Poor	
		Too alkaline	0.00	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.09	Slope	0.00	Too clayey	0.57
		Low content of organic matter	0.12	Stone content	0.74	Depth to bedrock	0.58
		Stone content	0.57			Rock fragments	0.98
		Depth to bedrock	0.58				
		Too clayey	0.98				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
Te:							
Terrace escarpments-	100	Poor		Poor		Poor	
		Too sandy	0.00	Slope	0.00	Too sandy	0.00
		Wind erosion	0.00			Rock fragments	0.00
		Droughty	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.12			Slope	0.00
VaB:							
Valmont------------	85	Poor		Good		Poor	
		Too alkaline	0.00			Hard to reclaim	0.00
		Too clayey	0.00			Too clayey	0.00
		Low content of organic matter	0.12				
VaC:							
Valmont------------	85	Poor		Good		Poor	
		Too alkaline	0.00			Hard to reclaim	0.00
		Too clayey	0.00			Too clayey	0.00
		Low content of organic matter	0.12				
VcC:							
Valmont------------	100	Poor		Good		Poor	
		Too alkaline	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.12			Rock fragments	0.00
VcE:							
Valmont------------	90	Poor		Good		Poor	
		Too alkaline	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.12			Rock fragments	0.00
		Droughty	0.99				
W:							
Water--------------	95	Not rated		Not rated		Not rated	

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
WdB:							
Weld	90	Poor		Fair		Poor	
		Wind erosion	0.00	Shrink-swell	0.96	Too clayey	0.00
		Too alkaline	0.00				
		Too clayey	0.00				
		Low content of organic matter	0.12				
WeB:							
Weld	90	Poor		Good		Good	
		Too alkaline	0.00				
		Low content of organic matter	0.12				
WlA:							
Weld	85	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.88				
WlB:							
Weld	85	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.88				
WoB:							
Weld	55	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.88				
Colby	30	Poor		Good		Fair	
		Too alkaline	0.00			Too clayey	0.57
		Low content of organic matter	0.12				
		Too clayey	0.98				
		Water erosion	0.99				

Table 14.--Construction materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
WoC:							
Weld	50	Poor		Good		Fair	
		Too alkaline	0.00			Rock fragments	0.97
		Low content of organic matter	0.88				
Colby	35	Poor		Good		Fair	
		Too alkaline	0.00			Too clayey	0.57
		Low content of organic matter	0.12				
		Too clayey	0.98				
		Water erosion	0.99				

Table 15.--Water management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AcA:							
Ascalon	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
AcB:							
Ascalon	90	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
AcC:							
Ascalon	90	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
AcD:							
Ascalon	80	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
AoB:							
Ascalon	60	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Otero	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
AoC:							
Ascalon	55	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Otero	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
AoD:							
Ascalon	50	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Otero	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
AoE:							
Ascalon	45	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	0.01				
Otero	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
		Slope	0.04				
BaF:							
Baller	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.18	Content of large stones	1.00		
				Seepage	0.02		
BP:							
Borrow pits	95	Not rated		Not rated		Not rated	
CaA:							
Calkins	90	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	0.86	Cutbanks cave	0.10
				Seepage	0.04	Depth to water	0.06
CaB:							
Calkins	85	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	0.86	Cutbanks cave	0.10
				Seepage	0.04	Depth to water	0.06
CoB:							
Colby	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.99	Depth to water	1.00
CoC:							
Colby	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.99	Depth to water	1.00
CoD:							
Colby	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.99	Depth to water	1.00

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
CsB:							
Colby Variant-------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.54	Piping	0.95	Slow refill	0.46
				Depth to saturated zone	0.43	Depth to water	0.25
						Cutbanks cave	0.10
Ct:							
Colby---------------	55	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.99	Depth to water	1.00
Gaynor--------------	30	Somewhat limited		Very limited		Very limited	
		Seepage	0.46	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.11	Thin layer	0.85		
Cu:							
Colluvial land------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Seepage	0.03		
		Slope	0.06				
DU:							
Dumps---------------	95	Not rated		Not rated		Not rated	
FcF:							
Fern Cliff----------	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Content of large stones	0.84	Depth to water	1.00
		Slope	0.82	Seepage	0.03		
Allens Park---------	30	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.85	Thin layer	0.85	Depth to water	1.00
		Seepage	0.54	Seepage	0.03		
		Slope	0.41				
Rock outcrop--------	20	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.94				
GaB:							
Gaynor--------------	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.46	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.11	Thin layer	0.85		

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
GaD:							
Gaynor	80	Somewhat limited		Very limited		Very limited	
		Seepage	0.46	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.11	Thin layer	0.85		
GP:							
Gravel pits and Mine dumps	94	Very limited		Not rated		Not rated	
		Seepage	1.00				
GrF:							
Goldvale	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Content of large stones	0.72	Depth to water	1.00
		Slope	0.59	Seepage	0.06		
Rock outcrop	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.94				
HaB:							
Hargreave	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.85	Depth to water	1.00
		Depth to bedrock	0.85				
HaD:							
Hargreave	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.85	Depth to water	1.00
		Depth to bedrock	0.85				
HeB:							
Heldt	90	Not limited		Somewhat limited		Very limited	
				Piping	0.12	Depth to water	1.00
HeC:							
Heldt	85	Not limited		Somewhat limited		Very limited	
				Piping	0.12	Depth to water	1.00
JrF:							
Juget	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.59	Seepage	0.38		

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
JrF:							
Rock outcrop	30	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.82				
KuD:							
Kutch	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.46	Thin layer	0.85	Depth to water	1.00
		Depth to bedrock	0.11	Piping	0.01		
LaE:							
Laporte	85	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	Depth to water	1.00
		Slope	0.01				
LoB:							
Longmont	80	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Slow refill	1.00
				Depth to saturated zone	0.95	Salty water	0.50
						Cutbanks cave	0.10
				Salinity	0.12	Depth to water	0.02
Lv:							
Loveland	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.95	Cutbanks cave	1.00
						Depth to water	0.02
				Seepage	0.82		
Ma:							
Made land	100	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Slow refill	1.00
						Cutbanks cave	0.10
				Hard to pack	0.28		
MdA:							
Manter	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
MdB:							
Manter	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
MdD:							
Manter	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
Me:							
Manvel	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.92	Depth to water	1.00
Mm:							
McClave	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.54	Piping	0.99	Slow refill	0.46
				Depth to saturated zone	0.95	Cutbanks cave	0.10
						Depth to water	0.02
NdD:							
Nederland	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	Depth to water	1.00
				Seepage	0.03		
Nh:							
Niwot	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.95	Cutbanks cave	1.00
				Seepage	0.82	Depth to water	0.02
NnA:							
Nunn	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.63	Depth to water	1.00
NnB:							
Nunn	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.66	Depth to water	1.00
NuA:							
Nunn	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.28	Depth to water	1.00
NuB:							
Nunn	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.28	Depth to water	1.00

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NuC:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.39	Depth to water	1.00
NuD:							
Nunn----------------	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.46	Depth to water	1.00
Nv:							
Nunn----------------	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.28	Depth to water	1.00
Kim-----------------	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00
PgE:							
Peyton--------------	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.03	Depth to water	1.00
		Slope	0.01				
Juget---------------	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.01	Seepage	0.38		
PLY:							
Playas--------------	95	Not limited		Not rated		Not rated	
PrF:							
Pinata--------------	45	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.85	Content of large stones	1.00	Depth to water	1.00
		Slope	0.50				
				Thin layer	0.85		
				Seepage	0.08		
Rock outcrop--------	35	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	0.94				
ReD:							
Renohill------------	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	0.02				

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
RnB:							
Renohill	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.85	Depth to water	1.00
RnD:							
Renohill	85	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Piping	0.96	Depth to water	1.00
		Seepage	0.02	Thin layer	0.85		
Ro:							
Rock outcrop	100	Very limited		Not rated		Not rated	
		Depth to bedrock	1.00				
		Slope	1.00				
SaD:							
Samsil	85	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	Depth to water	1.00
SeE:							
Samsil	40	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Thin layer	1.00	Depth to water	1.00
		Slope	0.03				
Shingle	40	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Piping	1.00	Depth to water	1.00
		Slope	0.03	Thin layer	1.00		
SgE:							
Shingle	50	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.66	Piping	1.00	Depth to water	1.00
		Slope	0.01	Thin layer	1.00		
Gaynor	40	Somewhat limited		Very limited		Very limited	
		Seepage	0.46	Piping	1.00	Depth to water	1.00
		Depth to bedrock	0.11	Thin layer	0.85		
		Slope	0.01				
SmF:							
Sixmile	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.50	Piping	0.94	Depth to water	1.00
		Seepage	0.46	Thin layer	0.85		
		Depth to bedrock	0.11				

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Te:							
Terrace escarpments-	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.86	Depth to water	1.00
		Slope	0.76				
VaB:							
Valmont------------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.95	Depth to water	1.00
				Seepage	0.12		
VaC:							
Valmont------------	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.12	Depth to water	1.00
VcC:							
Valmont------------	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.12	Depth to water	1.00
VcE:							
Valmont------------	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.12	Depth to water	1.00
W:							
Water--------------	95	Not rated		Not rated		Not rated	
WdB:							
Weld---------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00
WeB:							
Weld---------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00
WlA:							
Weld---------------	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00
WlB:							
Weld---------------	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00

Table 15.--Water management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Pond reservoir areas: Value	Embankments, dikes, and levees: Rating class and limiting features	Embankments, dikes, and levees: Value	Aquifer-fed excavated ponds: Rating class and limiting features	Aquifer-fed excavated ponds: Value
WoB:							
Weld----------------	55	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00
Colby---------------	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.99	Depth to water	1.00
WoC:							
Weld----------------	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.72	Piping	1.00	Depth to water	1.00
Colby---------------	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.99	Depth to water	1.00

Table 16.--Engineering index properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
AcA:												
Ascalon---------	0-11	Sandy loam	SM	A-4, A-2	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	11-19	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	19-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
AcB:												
Ascalon---------	0-8	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	8-19	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	19-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
AcC:												
Ascalon---------	0-8	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	8-19	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	19-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
AcD:												
Ascalon---------	0-5	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	5-16	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	16-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
AoB:												
Ascalon---------	0-6	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	6-18	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	18-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
Otero-----------	0-17	Sandy loam	SC, SC-SM	A-2, A-4	0	0-5	85-100	80-100	50-70	25-40	25-30	5-10
	17-60	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0-5	85-100	80-100	80-100	25-50	20-25	NP-5

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
AoC:												
Ascalon---------	0-5	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	5-16	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	16-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
Otero-----------	0-10	Sandy loam	SC, SC-SM	A-2, A-4	0	0-5	85-100	80-100	50-70	25-40	25-30	5-10
	10-60	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0-5	85-100	80-100	80-100	25-50	20-25	NP-5
AoD:												
Ascalon---------	0-6	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	6-17	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	17-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
Otero-----------	0-8	Sandy loam	SC, SC-SM	A-2, A-4	0	0-5	85-100	80-100	50-70	25-40	25-30	5-10
	8-60	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0-5	85-100	80-100	80-100	25-50	20-25	NP-5
AoE:												
Ascalon---------	0-6	Sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-95	25-50	15-25	NP-5
	6-16	Sandy clay loam, sandy loam	CL, SC	A-6	0	0	95-100	90-100	80-100	40-55	25-40	10-20
	16-60	Fine sandy loam, loamy fine sand, sandy loam	SM	A-2	0	0	95-100	95-100	70-95	20-35	---	NP
Otero-----------	0-12	Sandy loam	SC, SC-SM	A-2, A-4	0	0-5	85-100	80-100	50-70	25-40	25-30	5-10
	12-60	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0-5	85-100	80-100	80-100	25-50	20-25	NP-5
BaF:												
Baller----------	0-10	Very stony sandy loam	GC-GM, GM, SC-SM, SM	A-1, A-2	25-70	0-50	45-90	40-85	25-60	15-35	20-25	NP-5
	10-15	Very stony fine sandy loam, very stony sandy loam	GC-GM, GM, SC-SM, SM	A-1, A-2, A-4	25-70	0-50	45-90	40-85	25-70	15-45	20-25	NP-5
	15-19	Unweathered bedrock			---	---	---	---	---	---	---	---
BP:												
Borrow pits-----	---	---	---	---	---	---	---	---	---	---	---	---
CaA:												
Calkins---------	0-14	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	90-100	60-70	30-40	20-25	NP-5
	14-60	Sandy loam	SC-SM, SM	A-2, A-4	0	0	80-100	75-100	60-70	30-40	20-25	NP-5

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
CaB:												
Calkins---------	0-14	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	90-100	60-70	30-40	20-25	NP-5
	14-60	Sandy loam	SC-SM, SM	A-2, A-4	0	0	80-100	75-100	60-70	30-40	20-25	NP-5
CoB:												
Colby-----------	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-43	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	43-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
CoC:												
Colby-----------	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-43	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	43-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
CoD:												
Colby-----------	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-43	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	43-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
CsB:												
Colby Variant---	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-40	Clay loam, silty clay loam, silt loam	ML	A-6, A-7	0	0	100	100	90-100	70-95	30-45	5-15
	40-60	Stratified clay loam to silty clay	CL	A-6	0	0	100	100	90-100	70-95	30-40	10-20
Ct:												
Colby-----------	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-43	Silty clay loam	ML	A-6, A-7, A-4	0	0	100	100	95-100	85-95	30-45	5-15
	43-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
Gaynor----------	0-6	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	6-30	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
Cu:												
Colluvial land--	0-3	Gravelly sandy loam	GC-GM, GM, SC-SM, SM	A-1, A-2	0	0-10	60-80	55-75	35-50	20-30	20-25	NP-5
	3-60	Gravelly sand, very gravelly sand, gravelly loamy sand	GM, GP, GP-GM, SP	A-1	0	0-25	40-70	35-65	20-45	0-15	20-25	NP-5
DU:												
Dumps-----------	---	---	---	---	---	---	---	---	---	---	---	---
FcF:												
Fern Cliff------	0-20	Stony sandy loam	SC, SC-SM	A-2	10-45	0-30	75-90	70-85	45-60	25-35	25-30	5-10
	20-60	Stratified stony sandy loam to stony sandy clay loam	SC, SC-SM	A-2, A-4	10-45	0-30	75-90	70-85	45-75	25-45	25-30	5-10
	60-80	Very stony sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	25-70	0-50	45-90	40-85	25-60	15-35	25-30	5-10

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
FcF:												
Allens Park-----	0-17	Gravelly sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0	0-10	60-80	55-75	35-50	20-30	25-30	5-10
	17-26	Sandy clay loam, gravelly sandy clay loam	GC, GC-GM, SC, SC-SM	A-1, A-2, A-4	0	5-15	60-95	55-90	45-80	20-50	25-35	5-15
	26-30	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	0-14	---
GaB:												
Gaynor----------	0-6	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	6-30	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
GaD:												
Gaynor----------	0-6	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	6-30	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
GP:												
Gravel pits and Mine dumps-----	0-6	Extremely gravelly sand	GP, GW	A-1	---	0-25	10-25	5-25	0-15	0-5	0-14	NP
	6-60	Extremely gravelly sand, extremely gravelly coarse sand, very gravelly coarse sand	GP, GW, SP, SW	A-1	---	0-25	10-55	5-50	0-15	0-5	0-14	NP
GrF:												
Goldvale--------	0-19	Stony coarse sandy loam	SC, SC-SM	A-1, A-2	15-30	10-20	75-90	70-85	40-55	20-30	25-30	5-10
	19-25	Stony sandy clay loam	SC, SC-SM	A-2, A-4	10-45	10-20	75-90	70-85	55-75	25-45	25-30	5-10
	25-57	Stony sandy clay	SC	A-7	10-45	10-20	75-90	70-85	60-80	35-50	40-45	20-25
	57-75	Stony coarse sandy loam, stony sandy clay loam	SC, SC-SM	A-1, A-2, A-4	10-45	10-20	75-90	70-85	40-75	20-45	25-30	5-10
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	0-14	---
HaB:												
Hargreave-------	0-8	Fine sandy loam	SC, SC-SM	A-4	0	0-20	85-100	80-100	55-85	35-50	25-30	5-10
	8-13	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	13-27	Fine sandy loam	SC, SC-SM	A-4	0	0	100	100	70-85	40-50	25-30	5-10
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
HaD:												
Hargreave-------	0-6	Fine sandy loam	SC, SC-SM	A-4	0	0-20	85-100	80-100	55-85	35-50	25-30	5-10
	6-13	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	13-27	Fine sandy loam	SC, SC-SM	A-4	0	0	100	100	70-85	40-50	25-30	5-10
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---
HeB:												
Heldt-----------	0-8	Clay	CL	A-7	0	0	100	95-100	90-100	75-95	40-45	15-20
	8-20	Clay	CL	A-7	0	0	100	95-100	90-100	75-95	40-45	15-20
	20-60	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	35-40	15-20
HeC:												
Heldt-----------	0-6	Clay	CL	A-7	0	0	100	95-100	90-100	75-95	40-45	15-20
	6-20	Clay	CL	A-7	0	0	100	95-100	90-100	75-95	40-45	15-20
	20-60	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	35-40	15-20
JrF:												
Juget-----------	0-6	Very gravelly sandy loam	GC-GM, GM, GP-GM	A-1	0	0-10	35-55	30-50	20-35	10-20	20-25	NP-5
	6-11	Very gravelly loamy sand, very gravelly sand, extremely gravelly sand	GP, GP-GM	A-1	0	0-10	15-55	10-50	5-40	0-15	---	NP
	11-15	Weathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	0-14	---
KuD:												
Kutch-----------	0-7	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
	7-22	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	20-25
	22-30	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	30-34	Unweathered bedrock			---	---	---	---	---	---	---	---
LaE:												
Laporte---------	0-8	Very fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	85-100	80-100	70-95	40-65	20-25	NP-5
	8-13	Loam	CL-ML, ML	A-4	0	0	85-100	80-100	70-95	50-75	20-25	NP-5
	13-17	Weathered bedrock			---	---	---	---	---	---	---	---
LoB:												
Longmont--------	0-60	Clay	CH, CL	A-7	0	0	100	100	90-100	75-95	40-65	15-40
Lv:												
Loveland--------	0-11	Clay loam	CL	A-6	0-5	0-5	90-100	85-100	80-90	60-80	30-40	10-20
	11-30	Clay loam, silty clay loam, loam	CL, CL-ML	A-4, A-6	0-5	0-5	90-100	85-100	80-90	50-85	25-35	5-15
	30-60	Very gravelly sand, gravelly sand, gravelly coarse sand	GP, SP	A-1	0-5	0-10	40-80	30-70	20-40	0-5	---	NP

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
Ma:												
Made land-------	0-10	Silty clay loam	CH, CL, MH	A-7	0	0	100	100	100	90-100	45-75	20-35
	10-60	Silty clay loam, clay, silty clay	CH, CL, MH	A-7	0	0	100	100	100	90-100	45-75	20-35
MdA:												
Manter----------	0-6	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	45-85	25-55	20-30	NP-10
	6-16	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-85	30-55	15-25	NP-10
	16-60	Sandy loam, loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	75-100	40-85	15-50	---	NP
MdB:												
Manter----------	0-6	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	45-85	25-55	20-30	NP-10
	6-16	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-85	30-55	15-25	NP-10
	16-60	Sandy loam, loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	75-100	40-85	15-50	---	NP
MdD:												
Manter----------	0-5	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	45-85	25-55	20-30	NP-10
	5-14	Fine sandy loam, sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-85	30-55	15-25	NP-10
	14-60	Sandy loam, loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	75-100	40-85	15-50	---	NP
Me:												
Manvel----------	0-6	Loam	CL, CL-ML	A-4	0	0	100	95-100	85-95	60-75	25-30	5-10
	6-60	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	75-90	20-40	5-20
Mm:												
McClave---------	0-19	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	19-60	Clay loam, loam, sandy clay loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-100	50-90	25-35	5-15
NdD:												
Nederland-------	0-7	Very cobbly sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0-25	30-60	45-90	40-85	25-60	15-35	25-30	5-10
	7-20	Very cobbly sandy clay loam	GC, GC-GM, SC, SC-SM	A-1, A-2, A-4, A-6	0-25	50-70	45-90	40-85	30-75	15-45	25-35	5-15
	20-60	Very cobbly sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0-25	50-70	45-90	40-85	25-60	15-35	25-30	5-10

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In.				Pct.	Pct.					Pct.	
Nh:												
Niwot-----------	0-14	Loam	CL, CL-ML	A-4	0	0-5	85-100	80-100	70-95	50-75	25-30	5-10
	14-60	Gravelly sand	SP-SM	A-1	0	0-5	60-80	55-75	30-50	5-10	---	NP
NnA:												
Nunn------------	0-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-90	35-55	25-30	5-10
	10-16	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	16-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
NnB:												
Nunn------------	0-10	Sandy clay loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	80-90	35-55	25-30	5-10
	10-14	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	14-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
NuA:												
Nunn------------	0-10	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	10-18	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	18-30	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	30-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
NuB:												
Nunn------------	0-10	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	10-18	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	18-30	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	30-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
NuC:												
Nunn------------	0-10	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	10-22	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	22-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
NuD:												
Nunn------------	0-8	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	8-14	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	14-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
Nv:												
Nunn------------	0-10	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	10-18	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	18-30	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	30-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
Kim-------------	0-11	Clay loam	CL	A-6	0	0-5	85-100	80-100	75-100	60-80	30-35	10-15
	11-60	Loam, clay loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	85-100	80-100	65-100	40-80	25-35	5-15
PgE:												
Peyton----------	0-11	Very gravelly loamy sand	GC-GM, GM, GP-GM	A-1	0	0-10	35-55	30-50	20-40	10-15	20-25	NP-5
	11-30	Gravelly sandy clay loam	GC, GC-GM, SC, SC-SM	A-1, A-2, A-4	0	0-15	60-80	55-75	45-70	20-40	25-30	5-10
	30-43	Gravelly coarse sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0	0-15	60-80	55-75	30-45	15-25	25-30	5-10
	43-60	Gravelly sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0	0-15	60-80	55-75	35-50	20-30	25-30	5-10

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
PgE:												
Juget-----------	0-6	Very gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1	0	0-10	35-55	30-50	15-35	0-10	---	NP
	6-11	Very gravelly loamy sand, very gravelly sand, extremely gravelly sand	GP, GP-GM	A-1	0	0-10	15-55	10-50	5-40	0-15	---	NP
	11-15	Weathered bedrock			---	---	---	---	---	---	---	---
PLY:												
Playas----------	---	---	---	---	---	---	---	---	---	---	---	---
PrF:												
Pinata----------	0-12	Very stony loamy fine sand	GC-GM, GM, SC-SM, SM	A-1, A-2, A-4	25-50	0-30	45-90	40-85	30-75	15-40	20-25	NP-5
	12-32	Very stony clay	CL, GC	A-2, A-7	25-60	0-30	45-90	40-85	35-85	30-85	40-50	20-25
	32-36	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	0-14	---
ReD:												
Renohill--------	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-15	Silty clay	MH, ML	A-7	0	0	100	100	95-100	90-95	45-55	15-25
	15-20	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	20-24	Unweathered bedrock			---	---	---	---	---	---	---	---
RnB:												
Renohill--------	0-9	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	9-32	Silty clay	MH, ML	A-7	0	0	100	100	95-100	90-95	45-55	15-25
	32-36	Unweathered bedrock			---	---	---	---	---	---	---	---
RnD:												
Renohill--------	0-7	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	7-12	Silty clay	MH, ML	A-7	0	0	100	100	95-100	90-95	45-55	15-25
	12-30	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	30-34	Unweathered bedrock			---	---	---	---	---	---	---	---
Ro:												
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---	---	0-14	---
SaD:												
Samsil----------	0-3	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	3-12	Clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	75-95	40-65	15-40
	12-16	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In.				Pct.	Pct.					Pct.	
SeE:												
Samsil----------	0-3	Clay	CL	A-7	0	0	100	100	90-100	75-95	40-50	15-25
	3-12	Clay, silty clay	CH, CL	A-7	0	0	100	100	90-100	75-95	40-65	15-40
	12-16	Weathered bedrock			---	---	---	---	---	---	---	---
Shingle---------	0-4	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	4-13	Silt loam, loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	13-17	Weathered bedrock			---	---	---	---	---	---	---	---
SgE:												
Shingle---------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	4-13	Silt loam, loam	CL, CL-ML	A-4	0	0	100	100	85-100	60-90	25-30	5-10
	13-17	Weathered bedrock			---	---	---	---	---	---	---	---
Gaynor----------	0-6	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	6-30	Silty clay loam	ML	A-4, A-7	0	0	100	100	95-100	85-95	30-50	5-15
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
SmF:												
Sixmile---------	0-4	Stony loam	CL, CL-ML, SC, SC-SM	A-4	10-45	0-30	75-90	70-85	60-80	45-65	25-30	5-10
	4-30	Clay loam	CL	A-6	0-20	0-20	85-100	80-100	75-100	60-80	30-35	10-15
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
Te:												
Terrace escarpments----	0-6	Gravelly sand	SP, SP-SM	A-1	0	0	55-80	50-75	25-50	0-10	---	NP
	6-60	Gravelly sand, very gravelly sand, gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1	0	0-5	45-65	40-60	20-30	0-10	---	NP
VaB:												
Valmont---------	0-9	Clay loam	CL	A-6	0	0-5	100	100	90-100	70-80	30-40	10-20
	9-29	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-100	60-95	35-50	15-25
	29-60	Very gravelly loam, very gravelly sandy loam	GC, GC-GM, GM, GP-GM	A-1, A-2, A-4	0-5	10-15	35-55	30-50	20-50	10-40	20-30	NP-10
VaC:												
Valmont---------	0-7	Clay loam	CL	A-6	0	0-5	100	100	90-100	70-80	30-40	10-20
	7-24	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-100	60-95	35-50	15-25
	24-60	Very gravelly loam, very gravelly sandy loam	GC, GC-GM, GM, GP-GM	A-1, A-2, A-4	0-5	10-15	35-55	30-50	20-50	10-40	20-30	NP-10

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
VcC: Valmont---------	0-8	Cobbly clay loam	CL	A-6	0	15-25	75-90	70-85	65-85	50-70	30-40	10-20
	8-22	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-100	60-95	35-50	15-25
	22-60	Very gravelly loam, very gravelly sandy loam	GC, GC-GM, GM, GP-GM	A-1, A-2, A-4	0-5	10-15	35-55	30-50	20-50	10-40	20-30	NP-10
VcE: Valmont---------	0-6	Cobbly clay loam	CL	A-6	0	15-25	75-90	70-85	65-85	50-70	30-40	10-20
	6-18	Clay loam, clay	CL	A-6, A-7	0	0-5	85-100	80-100	75-100	60-95	35-50	15-25
	18-60	Very gravelly loam, very gravelly sandy loam	GC, GC-GM, GM, GP-GM	A-1, A-2, A-4	0-5	10-15	35-55	30-50	20-50	10-40	20-30	NP-10
W: Water-----------	---	---	---	---	---	---	---	---	---	---	---	---
WdB: Weld------------	0-12	Loamy sand	SM	A-2	0	0	95-100	95-100	85-95	25-35	---	NP
	12-31	Clay loam, silty clay, silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	30-45	15-30
	31-60	Silt loam, loam	CL, CL-ML, ML	A-4	0	0	100	80-100	70-95	50-70	20-30	NP-10
WeB: Weld------------	0-6	Fine sandy loam	SM	A-2, A-4	0	0	95-100	75-100	45-70	25-40	---	NP
	6-18	Clay loam, silty clay, silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	30-45	15-30
	18-60	Silt loam, loam	CL, CL-ML, ML	A-4	0	0	100	80-100	70-95	50-70	20-30	NP-10
WlA: Weld------------	0-6	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	6-18	Silty clay loam, silty clay, clay	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-50	15-30
	18-24	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-95	20-35	5-15
	24-60	Silt loam, loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	75-100	60-100	35-85	20-30	NP-10
WlB: Weld------------	0-6	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	6-18	Silty clay loam, silty clay, clay	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-50	15-30
	18-24	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-95	20-35	5-15
	24-60	Silt loam, loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	75-100	60-100	35-85	20-30	NP-10

Table 16.--Engineering index properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In.				Pct.	Pct.					Pct.	
WoB:												
Weld------------	0-6	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	6-18	Silty clay loam, silty clay, clay	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-50	15-30
	18-24	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-95	20-35	5-15
	24-60	Silt loam, loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	75-100	60-100	35-85	20-30	NP-10
Colby-----------	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-43	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	43-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
WoC:												
Weld------------	0-5	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	5-12	Silty clay loam, silty clay, clay	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-50	15-30
	12-24	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-95	20-35	5-15
	24-60	Silt loam, loam, sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	75-100	60-100	35-85	20-30	NP-10
Colby-----------	0-12	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	12-43	Silty clay loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	85-95	30-45	5-15
	43-60	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15

Table 17.--Physical properties of the soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
AcA:														
Ascalon--------------	0-11	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	11-19	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	19-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
AcB:														
Ascalon--------------	0-8	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	8-19	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	19-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
AcC:														
Ascalon--------------	0-8	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	8-19	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	19-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
AcD:														
Ascalon--------------	0-5	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-16	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	16-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
AoB:														
Ascalon--------------	0-6	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-18	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	18-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
Otero----------------	0-17	---	---	10-20	1.35-1.50	14.11-42.34	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	17-60	---	---	5-18	1.35-1.50	14.11-42.34	0.09-0.14	0.0-2.9	0.0-0.5	.32	.32			
AoC:														
Ascalon--------------	0-5	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-16	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	16-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
Otero----------------	0-10	---	---	10-20	1.35-1.50	14.11-42.34	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	10-60	---	---	5-18	1.35-1.50	14.11-42.34	0.09-0.14	0.0-2.9	0.0-0.5	.32	.32			
AoD:														
Ascalon--------------	0-6	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-17	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	17-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
Otero----------------	0-8	---	---	10-20	1.35-1.50	14.11-42.34	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	8-60	---	---	5-18	1.35-1.50	14.11-42.34	0.09-0.14	0.0-2.9	0.0-0.5	.32	.32			
AoE:														
Ascalon--------------	0-6	---	---	5-15	1.30-1.40	14.11-42.34	0.11-0.16	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-16	---	---	18-35	1.35-1.45	4.23-14.11	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20			
	16-60	---	---	3-12	1.45-1.50	14.11-42.34	0.06-0.13	0.0-2.9	0.0-0.5	.32	.32			
Otero----------------	0-12	---	---	10-20	1.35-1.50	14.11-42.34	0.09-0.12	0.0-2.9	0.5-2.0	.28	.28	5	3	86
	12-60	---	---	5-18	1.35-1.50	14.11-42.34	0.09-0.14	0.0-2.9	0.0-0.5	.32	.32			
BaF:														
Baller---------------	0-10	---	---	5-18	1.35-1.50	14.11-42.34	0.05-0.07	0.0-2.9	1.0-2.0	.10	.24	1	8	0
	10-15	---	---	5-18	1.35-1.50	14.11-42.34	0.05-0.08	0.0-2.9	0.5-1.0	.10	.28			
	15-19	---	---	---	---	0.42-1.41	---	---	---	---	---			
BP:														
Borrow pits----------	---	---	---	---	---	---	---	---	---	---	---	--	---	---

Table 17.--Physical properties of the soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
CaA:														
Calkins--------------	0-14	---	---	5-20	1.35-1.50	4.23-42.34	0.10-0.13	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	14-60	---	---	5-18	1.35-1.50	14.11-42.34	0.10-0.13	0.0-2.9	0.5-2.0	.28	.28			
CaB:														
Calkins--------------	0-14	---	---	5-20	1.35-1.50	4.23-42.34	0.10-0.13	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	14-60	---	---	5-18	1.35-1.50	14.11-42.34	0.10-0.13	0.0-2.9	0.5-2.0	.28	.28			
CoB:														
Colby----------------	0-12	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-43	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	43-60	---	---	27-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.28	.28			
CoC:														
Colby----------------	0-12	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-43	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	43-60	---	---	27-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.28	.28			
CoD:														
Colby----------------	0-12	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-43	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	43-60	---	---	27-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.28	.28			
CsB:														
Colby Variant--------	0-12	---	---	27-34	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-40	---	---	20-34	1.15-1.30	1.41-14.11	0.15-0.21	0.0-2.9	0.0-0.5	.37	.37			
	40-60	---	---	27-42	1.15-1.40	0.42-4.23	0.14-0.21	3.0-5.9	0.0-0.5	.28	.28			
Ct:														
Colby----------------	0-12	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-43	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	43-60	---	---	27-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.28	.28			
Gaynor---------------	0-6	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	3	4L	86
	6-30	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	30-34	---	---	---	---	0.42-14.11	---	---	---	---	---			
Cu:														
Colluvial land-------	0-3	---	---	10-20	1.40-1.50	4.23-42.34	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28	2	3	86
	3-60	---	---	0-10	1.55-1.65	42.34-141.14	0.04-0.07	0.0-2.9	0.0-0.5	.10	.20			
DU:														
Dumps----------------	---	---	---	---	---	---	---	---	---	---	---	--	---	---
FcF:														
Fern Cliff-----------	0-20	---	---	10-20	1.35-1.50	4.23-42.34	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28	5	3	86
	20-60	---	---	15-25	1.25-1.50	4.23-42.34	0.07-0.13	0.0-2.9	0.0-0.5	.17	.32			
	60-80	---	---	10-20	1.35-1.50	4.23-42.34	0.05-0.07	0.0-2.9	0.0-0.5	.10	.32			
Allens Park----------	0-17	---	---	10-20	1.35-1.50	4.23-42.34	0.07-0.10	0.0-2.9	0.5-1.0	.15	.28	2	3	86
	17-26	---	---	20-35	1.25-1.40	1.41-14.11	0.10-0.15	0.0-2.9	0.5-1.0	.10	.20			
	26-30	---	---	---	---	0.42-1.41	---	---	---	---	---			
Rock outcrop---------	0-60	---	---	0-0	---	0.01-0.42	0.00-0.00	---	---	---	---	--	8	0
GaB:														
Gaynor---------------	0-6	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	3	4L	86
	6-30	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	30-34	---	---	---	---	0.42-14.11	---	---	---	---	---			

Table 17.--Physical properties of the soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
GaD:														
Gaynor---------------	0-6	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	3	4L	86
	6-30	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	30-34	---	---	---	---	0.42-14.11	---	---	---	---	---			
GP:														
Gravel pits And Mine dumps---------------	0-6	---	---	0-1	---	42.34-141.14	0.01-0.02	0.0-2.9	0.0-0.1	.02	---	--	8	0
	6-60	---	---	0-1	---	42.34-141.14	0.01-0.02	0.0-2.9	---	.02	---			
GrF:														
Goldvale-------------	0-19	---	---	10-15	1.35-1.50	14.11-42.34	0.07-0.09	0.0-2.9	0.5-1.0	.15	.24	5	3	86
	19-25	---	---	20-25	1.25-1.40	4.23-14.11	0.10-0.13	0.0-2.9	0.5-1.0	.10	.20			
	25-57	---	---	40-45	1.25-1.40	0.42-1.41	0.10-0.13	3.0-5.9	0.0-0.5	.10	.17			
	57-75	---	---	15-25	1.25-1.50	4.23-42.34	0.07-0.13	0.0-2.9	0.0-0.5	.15	.24			
Rock outcrop---------	0-60	---	---	0-0	---	0.01-0.42	0.00-0.00	---	---	---	---	--	8	0
HaB:														
Hargreave------------	0-8	---	---	10-20	1.35-1.50	4.23-42.34	0.12-0.14	0.0-2.9	1.0-2.0	.24	.24	2	3	86
	8-13	---	---	20-34	1.25-1.40	1.41-14.11	0.14-0.18	0.0-2.9	0.0-1.0	.20	.20			
	13-27	---	---	10-20	1.35-1.50	4.23-42.34	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
	27-31	---	---	---	---	0.42-1.41	---	---	---	---	---			
HaD:														
Hargreave------------	0-6	---	---	10-20	1.35-1.50	4.23-42.34	0.12-0.14	0.0-2.9	1.0-2.0	.24	.24	2	3	86
	6-13	---	---	20-34	1.25-1.40	1.41-14.11	0.14-0.18	0.0-2.9	0.0-1.0	.20	.20			
	13-27	---	---	10-20	1.35-1.50	4.23-42.34	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
	27-31	---	---	---	---	0.42-1.41	---	---	---	---	---			
HeB:														
Heldt----------------	0-8	---	---	40-45	1.15-1.30	0.42-1.41	0.14-0.16	3.0-5.9	0.5-2.0	.17	.17	5	4	86
	8-20	---	---	40-45	1.15-1.30	0.42-1.41	0.14-0.16	3.0-5.9	0.5-1.0	.17	.17			
	20-60	---	---	35-40	1.25-1.40	0.42-1.41	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
HeC:														
Heldt----------------	0-6	---	---	40-45	1.15-1.30	0.42-1.41	0.14-0.16	3.0-5.9	0.5-2.0	.17	.17	5	4	86
	6-20	---	---	40-45	1.15-1.30	0.42-1.41	0.14-0.16	3.0-5.9	0.5-1.0	.17	.17			
	20-60	---	---	35-40	1.25-1.40	0.42-1.41	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
JrF:														
Juget----------------	0-6	---	---	8-15	1.35-1.50	14.11-42.34	0.05-0.07	0.0-2.9	2.0-4.0	.05	.20	1	8	0
	6-11	---	---	2-7	1.45-1.60	42.34-141.14	0.01-0.04	0.0-2.9	0.5-1.0	.05	.17			
	11-15	---	---	---	---	0.42-14.11	---	---	---	---	---			
Rock outcrop---------	0-60	---	---	0-0	---	0.01-0.42	0.00-0.00	---	---	---	---	--	8	0
KuD:														
Kutch----------------	0-7	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.21	3.0-5.9	2.0-4.0	.17	.17	3	6	48
	7-22	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	22-30	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.0-0.5	.17	.17			
	30-34	---	---	---	---	0.42-14.11	---	---	---	---	---			
LaE:														
Laporte--------------	0-8	---	---	12-20	1.35-1.50	4.23-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.24	.24	2	3	86
	8-13	---	---	18-27	1.25-1.40	4.23-14.11	0.13-0.16	0.0-2.9	0.5-1.0	.37	.37			
	13-17	---	---	---	---	0.42-14.11	---	---	---	---	---			
LoB:														
Longmont-------------	0-60	---	---	40-60	1.15-1.30	0.42-1.41	0.12-0.16	6.0-8.9	0.5-2.0	.17	.17	5	4	86

Table 17.--Physical properties of the soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
Lv:														
Loveland-------------	0-11	---	---	30-40	1.20-1.25	1.41-4.23	0.18-0.20	3.0-5.9	1.0-3.0	.20	.20	3	4L	86
	11-30	---	---	18-35	1.35-1.45	4.23-14.11	0.18-0.20	0.0-2.9	1.0-2.0	.28	.28			
	30-60	---	---	0-5	1.55-1.65	141.14-705.00	0.03-0.06	0.0-2.9	0.0-0.5	.10	.20			
Ma:														
Made land------------	0-10	---	---	35-70	---	0.00-0.42	0.05-0.07	6.0-8.9	0.0-0.1	.37	---	5	5	56
	10-60	---	---	35-70	---	0.00-0.42	0.05-0.07	6.0-8.9	---	.37	---			
MdA:														
Manter---------------	0-6	---	---	10-20	1.35-1.40	14.11-42.34	0.12-0.16	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	6-16	---	---	9-18	1.40-1.50	14.11-42.34	0.11-0.14	0.0-2.9	1.0-2.0	.15	.15			
	16-60	---	---	5-15	1.45-1.60	14.11-42.34	0.08-0.14	0.0-2.9	0.0-1.0	.15	.15			
MdB:														
Manter---------------	0-6	---	---	10-20	1.35-1.40	14.11-42.34	0.12-0.16	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	6-16	---	---	9-18	1.40-1.50	14.11-42.34	0.11-0.14	0.0-2.9	1.0-2.0	.15	.15			
	16-60	---	---	5-15	1.45-1.60	14.11-42.34	0.08-0.14	0.0-2.9	0.0-1.0	.15	.15			
MdD:														
Manter---------------	0-5	---	---	10-20	1.35-1.40	14.11-42.34	0.12-0.16	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	5-14	---	---	9-18	1.40-1.50	14.11-42.34	0.11-0.14	0.0-2.9	1.0-2.0	.15	.15			
	14-60	---	---	5-15	1.45-1.60	14.11-42.34	0.08-0.14	0.0-2.9	0.0-1.0	.15	.15			
Me:														
Manvel---------------	0-6	---	---	15-27	1.25-1.40	4.23-14.11	0.14-0.18	0.0-2.9	0.5-2.0	.37	.37	3	4L	86
	6-60	---	---	18-35	1.25-1.40	1.41-4.23	0.14-0.18	0.0-2.9	0.0-1.0	.43	.43			
Mm:														
McClave--------------	0-19	---	---	28-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	2.0-4.0	.17	.17	5	6	48
	19-60	---	---	18-35	1.25-1.40	1.41-14.11	0.14-0.21	0.0-2.9	0.5-2.0	.28	.28			
NdD:														
Nederland------------	0-7	---	---	10-20	1.35-1.50	4.23-42.34	0.05-0.07	0.0-2.9	2.0-4.0	.05	.20	4	8	0
	7-20	---	---	25-35	1.25-1.40	1.41-14.11	0.07-0.09	0.0-2.9	0.5-1.0	.05	.20			
	20-60	---	---	10-20	1.35-1.50	4.23-42.34	0.05-0.07	0.0-2.9	0.0-0.5	.10	.32			
Nh:														
Niwot----------------	0-14	---	---	15-27	1.25-1.40	4.23-42.34	0.13-0.16	0.0-2.9	2.0-5.0	.24	.24	2	6	48
	14-60	---	---	0-5	1.45-1.60	141.14-705.00	0.04-0.06	0.0-2.9	0.0-0.5	.10	.20			
NnA:														
Nunn-----------------	0-10	---	---	20-30	1.25-1.40	1.41-14.11	0.14-0.18	0.0-2.9	2.0-4.0	.15	.15	5	5	56
	10-16	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	16-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
NnB:														
Nunn-----------------	0-10	---	---	20-30	1.25-1.40	1.41-14.11	0.14-0.18	0.0-2.9	2.0-4.0	.15	.15	5	5	56
	10-14	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	14-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
NuA:														
Nunn-----------------	0-10	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	2.0-4.0	.17	.17	5	6	48
	10-18	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	18-30	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	30-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			

Table 17.--Physical properties of the soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
NuB:														
Nunn-----------------	0-10	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	2.0-4.0	.17	.17	5	6	48
	10-18	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	18-30	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	30-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
NuC:														
Nunn-----------------	0-10	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	2.0-4.0	.17	.17	5	6	48
	10-22	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	22-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
NuD:														
Nunn-----------------	0-8	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	2.0-4.0	.17	.17	5	6	48
	8-14	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	14-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
Nv:														
Nunn-----------------	0-10	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	2.0-4.0	.17	.17	5	6	48
	10-18	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	18-30	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-1.0	.17	.17			
	30-60	---	---	30-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	0.0-0.5	.28	.28			
Kim------------------	0-11	---	---	27-35	1.25-1.40	1.41-4.23	0.16-0.19	0.0-2.9	0.5-1.0	.24	.24	5	4L	86
	11-60	---	---	20-35	1.30-1.40	4.23-14.11	0.15-0.17	0.0-2.9	0.0-0.5	.37	.37			
PgE:														
Peyton---------------	0-11	---	---	2-10	1.45-1.60	42.34-141.14	0.03-0.04	0.0-2.9	2.0-4.0	.05	.15	5	8	0
	11-30	---	---	20-30	1.25-1.40	1.41-14.11	0.10-0.13	0.0-2.9	0.0-1.0	.10	.20			
	30-43	---	---	10-20	1.35-1.50	4.23-42.34	0.07-0.09	0.0-2.9	0.0-1.0	.15	.24			
	43-60	---	---	10-20	1.35-1.50	4.23-42.34	0.07-0.10	0.0-2.9	0.0-0.5	.17	.32			
Juget----------------	0-6	---	---	2-7	1.45-1.60	42.34-141.14	0.03-0.04	0.0-2.9	2.0-4.0	.02	.05	1	8	0
	6-11	---	---	2-7	1.45-1.60	42.34-141.14	0.01-0.04	0.0-2.9	0.5-1.0	.05	.17			
	11-15	---	---	---	---	0.42-14.11	---	---	---	---	---			
PLY:														
Playas---------------	---	---	---	---	---	---	---	---	---	---	---	--	---	---
PrF:														
Pinata---------------	0-12	---	---	2-10	1.45-1.60	42.34-141.14	0.04-0.06	0.0-2.9	0.0-1.0	.10	.28	2	8	0
	12-32	---	---	40-50	1.15-1.30	0.42-1.41	0.07-0.08	3.0-5.9	0.0-0.5	.05	.17			
	32-36	---	---	---	---	0.42-1.41	---	---	---	---	---			
PrF:														
Rock outcrop---------	0-60	---	---	0-0	---	0.01-0.42	0.00-0.00	---	---	---	---	--	8	0
ReD:														
Renohill-------------	0-5	---	---	20-27	1.25-1.40	4.23-14.11	0.14-0.18	0.0-2.9	1.0-2.0	.28	.28	1	4L	86
	5-15	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.17	6.0-8.9	0.0-1.0	.24	.24			
	15-20	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	20-24	---	---	---	---	0.01-0.42	---	---	---	---	---			
RnB:														
Renohill-------------	0-9	---	---	27-34	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	1.0-2.0	.28	.28	3	4L	86
	9-32	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.17	6.0-8.9	0.0-1.0	.24	.24			
	32-36	---	---	---	---	0.42-1.41	---	---	---	---	---			
RnD:														
Renohill-------------	0-7	---	---	27-34	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	1.0-2.0	.28	.28	3	4L	86
	7-12	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.17	6.0-8.9	0.0-1.0	.24	.24			
	12-30	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	30-34	---	---	---	---	0.42-1.41	---	---	---	---	---			

Table 17.--Physical properties of the soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
Ro:														
Rock outcrop---------	0-60	---	---	0-0	---	0.01-0.42	0.00-0.00	---	---	---	---	--	8	0
SaD:														
Samsil---------------	0-3	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-2.0	.17	.17	2	4	86
	3-12	---	---	40-60	1.15-1.30	0.42-1.41	0.14-0.17	6.0-8.9	0.0-0.5	.17	.17			
	12-16	---	---	---	---	0.42-1.41	---	---	---	---	---			
SeE:														
Samsil---------------	0-3	---	---	40-50	1.15-1.30	0.42-1.41	0.14-0.16	6.0-8.9	0.5-2.0	.17	.17	2	4	86
	3-12	---	---	40-60	1.15-1.30	0.42-1.41	0.14-0.17	6.0-8.9	0.0-0.5	.17	.17			
	12-16	---	---	---	---	0.42-1.41	---	---	---	---	---			
Shingle--------------	0-4	---	---	18-27	1.25-1.40	4.23-14.11	0.14-0.17	0.0-2.9	0.5-1.0	.37	.37	2	4L	86
	4-13	---	---	18-27	1.25-1.30	4.23-14.11	0.14-0.20	0.0-2.9	0.0-0.5	.43	.43			
	13-17	---	---	---	---	0.42-1.41	---	---	---	---	---			
SgE:														
Shingle--------------	0-4	---	---	27-34	1.25-1.40	1.41-4.23	0.17-0.20	0.0-2.9	0.5-1.0	.24	.24	2	4L	86
	4-13	---	---	18-27	1.25-1.30	4.23-14.11	0.14-0.20	0.0-2.9	0.0-0.5	.43	.43			
	13-17	---	---	---	---	0.42-1.41	---	---	---	---	---			
SgE:														
Gaynor---------------	0-6	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	3	4L	86
	6-30	---	---	30-40	1.15-1.30	0.42-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32			
	30-34	---	---	---	---	0.42-14.11	---	---	---	---	---			
SmF:														
Sixmile--------------	0-4	---	---	18-27	1.25-1.40	4.23-14.11	0.10-0.13	0.0-2.9	0.5-1.0	.20	.37	3	4L	86
	4-30	---	---	27-35	1.25-1.40	1.41-4.23	0.10-0.13	0.0-2.9	0.0-0.5	.28	.28			
	30-34	---	---	---	---	0.42-14.11	---	---	---	---	---			
Te:														
Terrace escarpments--	0-6	---	---	0-4	1.55-1.70	42.34-141.14	0.02-0.04	0.0-2.9	0.5-1.0	.10	.17	5	1	180
	6-60	---	---	0-4	1.55-1.70	141.14-705.00	0.02-0.04	0.0-2.9	0.0-0.5	.05	.17			
VaB:														
Valmont--------------	0-9	---	---	28-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	2.0-4.0	.17	.17	4	6	48
	9-29	---	---	35-50	1.15-1.40	0.42-1.41	0.13-0.19	3.0-5.9	0.5-2.0	.24	.24			
	29-60	---	---	10-25	1.25-1.50	4.23-42.34	0.05-0.09	0.0-2.9	0.0-0.5	.15	.43			
VaC:														
Valmont--------------	0-7	---	---	28-40	1.25-1.40	0.42-4.23	0.17-0.21	3.0-5.9	2.0-4.0	.17	.17	4	6	48
	7-24	---	---	35-50	1.15-1.40	0.42-1.41	0.13-0.19	3.0-5.9	0.5-2.0	.24	.24			
	24-60	---	---	10-25	1.25-1.50	4.23-42.34	0.05-0.09	0.0-2.9	0.0-0.5	.15	.43			
VcC:														
Valmont--------------	0-8	---	---	28-40	1.25-1.40	0.42-4.23	0.13-0.16	3.0-5.9	2.0-4.0	.10	.17	4	6	48
	8-22	---	---	35-50	1.15-1.40	0.42-1.41	0.13-0.19	3.0-5.9	0.5-2.0	.24	.24			
	22-60	---	---	10-25	1.25-1.50	4.23-42.34	0.05-0.09	0.0-2.9	0.0-0.5	.15	.43			
VcE:														
Valmont--------------	0-6	---	---	28-40	1.25-1.40	0.42-4.23	0.13-0.16	3.0-5.9	2.0-4.0	.10	.17	4	6	48
	6-18	---	---	35-50	1.15-1.40	0.42-1.41	0.13-0.19	3.0-5.9	0.5-2.0	.24	.24			
	18-60	---	---	10-25	1.25-1.50	4.23-42.34	0.05-0.09	0.0-2.9	0.0-0.5	.15	.43			
W:														
Water----------------	---	---	---	---	---	---	---	---	---	---	---	--	---	---

Table 17.--Physical properties of the soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In.	Pct.	Pct.	Pct.	g/cc	um/sec	In.-in.	Pct.	Pct.					
WdB:														
Weld-----------------	0-12	---	---	2-8	1.55-1.70	42.34-141.14	0.04-0.06	0.0-2.9	1.0-2.0	.20	.20	3	2	134
	12-31	---	---	35-52	1.35-1.55	0.42-1.41	0.18-0.20	6.0-8.9	0.5-2.0	.32	.32			
	31-60	---	---	17-25	1.35-1.50	4.23-14.11	0.16-0.19	0.0-2.9	0.0-0.5	.32	.32			
WeB:														
Weld-----------------	0-6	---	---	4-13	1.40-1.60	14.11-42.34	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	6-18	---	---	35-52	1.35-1.55	0.42-1.41	0.18-0.20	6.0-8.9	0.5-2.0	.32	.32			
	18-60	---	---	17-25	1.35-1.50	4.23-14.11	0.16-0.19	0.0-2.9	0.0-0.5	.32	.32			
WlA:														
Weld-----------------	0-6	---	---	15-27	1.25-1.40	4.23-42.34	0.14-0.17	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	6-18	---	---	35-50	1.30-1.40	0.42-1.41	0.18-0.20	6.0-8.9	0.5-2.0	.28	.28			
	18-24	---	---	20-35	1.25-1.35	4.23-14.11	0.16-0.18	3.0-5.9	0.5-1.0	.28	.28			
	24-60	---	---	15-25	1.25-1.40	4.23-14.11	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28			
WlB:														
Weld-----------------	0-6	---	---	15-27	1.25-1.40	4.23-42.34	0.14-0.17	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	6-18	---	---	35-50	1.30-1.40	0.42-1.41	0.18-0.20	6.0-8.9	0.5-2.0	.28	.28			
	18-24	---	---	20-35	1.25-1.35	4.23-14.11	0.16-0.18	3.0-5.9	0.5-1.0	.28	.28			
	24-60	---	---	15-25	1.25-1.40	4.23-14.11	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28			
WoB:														
Weld-----------------	0-6	---	---	15-27	1.25-1.40	4.23-42.34	0.14-0.17	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	6-18	---	---	35-50	1.30-1.40	0.42-1.41	0.18-0.20	6.0-8.9	0.5-2.0	.28	.28			
	18-24	---	---	20-35	1.25-1.35	4.23-14.11	0.16-0.18	3.0-5.9	0.5-1.0	.28	.28			
	24-60	---	---	15-25	1.25-1.40	4.23-14.11	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28			
Colby----------------	0-12	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-43	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	43-60	---	---	27-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.28	.28			
WoC:														
Weld-----------------	0-5	---	---	15-27	1.25-1.40	4.23-42.34	0.14-0.17	0.0-2.9	2.0-4.0	.24	.24	3	6	48
	5-12	---	---	35-50	1.30-1.40	0.42-1.41	0.18-0.20	6.0-8.9	0.5-2.0	.28	.28			
	12-24	---	---	20-35	1.25-1.35	4.23-14.11	0.16-0.18	3.0-5.9	0.5-1.0	.28	.28			
	24-60	---	---	15-25	1.25-1.40	4.23-14.11	0.12-0.18	0.0-2.9	0.5-1.0	.28	.28			
Colby----------------	0-12	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	12-43	---	---	27-35	1.15-1.30	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.37	.37			
	43-60	---	---	27-35	1.25-1.40	1.41-4.23	0.17-0.21	0.0-2.9	0.0-0.5	.28	.28			

Table 18.--Chemical properties of the soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
AcA:								
Ascalon--------------	0-11	4.0-15	---	6.6-7.8	0	0	0	0
	11-19	5.0-25	---	6.6-7.8	0-5	0	0	0
	19-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
AcB:								
Ascalon--------------	0-8	4.0-15	---	6.6-7.8	0	0	0	0
	8-19	5.0-25	---	6.6-7.8	0-5	0	0	0
	19-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
AcC:								
Ascalon--------------	0-8	4.0-15	---	6.6-7.8	0	0	0	0
	8-19	5.0-25	---	6.6-7.8	0-5	0	0	0
	19-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
AcD:								
Ascalon--------------	0-5	4.0-15	---	6.6-7.8	0	0	0	0
	5-16	5.0-25	---	6.6-7.8	0-5	0	0	0
	16-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
AoB:								
Ascalon--------------	0-6	4.0-15	---	6.6-7.8	0	0	0	0
	6-18	5.0-25	---	6.6-7.8	0-5	0	0	0
	18-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
Otero----------------	0-17	5.0-15	---	7.4-8.4	0-5	0	0	0
	17-60	2.0-10	---	7.4-8.4	1-5	0	0	0
AoC:								
Ascalon--------------	0-5	4.0-15	---	6.6-7.8	0	0	0	0
	5-16	5.0-25	---	6.6-7.8	0-5	0	0	0
	16-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
Otero----------------	0-10	5.0-15	---	7.4-8.4	0-5	0	0	0
	10-60	2.0-10	---	7.4-8.4	1-5	0	0	0
AoD:								
Ascalon--------------	0-6	4.0-15	---	6.6-7.8	0	0	0	0
	6-17	5.0-25	---	6.6-7.8	0-5	0	0	0
	17-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
Otero----------------	0-8	5.0-15	---	7.4-8.4	0-5	0	0	0
	8-60	2.0-10	---	7.4-8.4	1-5	0	0	0

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
AoE:								
Ascalon	0-6	4.0-15	---	6.6-7.8	0	0	0	0
	6-16	5.0-25	---	6.6-7.8	0-5	0	0	0
	16-60	5.0-20	---	7.9-9.0	0-10	0	0.0-2.0	0
Otero	0-12	5.0-15	---	7.4-8.4	0-5	0	0	0
	12-60	2.0-10	---	7.4-8.4	1-5	0	0	0
BaF:								
Baller	0-10	4.0-15	---	6.1-7.8	0	0	0	0
	10-15	2.0-15	---	6.1-7.8	0	0	0	0
	15-19	---	---	---	---	---	---	---
BP:								
Borrow pits	---	---	---	---	---	---	---	---
CaA:								
Calkins	0-14	5.0-20	---	6.6-7.3	0	0	0	0
	14-60	3.0-15	---	6.6-7.8	0	0	0	0
CaB:								
Calkins	0-14	5.0-20	---	6.6-7.3	0	0	0	0
	14-60	3.0-15	---	6.6-7.8	0	0	0	0
CoB:								
Colby	0-12	10-20	---	7.4-8.4	5-10	0	0	0
	12-43	10-20	---	7.4-8.4	5-10	0	0	0
	43-60	10-20	---	7.4-8.4	5-10	0	0	0
CoC:								
Colby	0-12	10-20	---	7.4-8.4	5-10	0	0	0
	12-43	10-20	---	7.4-8.4	5-10	0	0	0
	43-60	10-20	---	7.4-8.4	5-10	0	0	0
CoD:								
Colby	0-12	10-20	---	7.4-8.4	5-10	0	0	0
	12-43	10-20	---	7.4-8.4	5-10	0	0	0
	43-60	10-20	---	7.4-8.4	5-10	0	0	0
CsB:								
Colby Variant	0-12	10-20	---	6.6-7.3	5-10	0	0	0
	12-40	5.0-20	---	7.4-8.4	5-10	0	0	0
	40-60	10-25	---	7.4-9.0	5-10	0	0.0-2.0	0

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
Ct:								
Colby----------------	0-12	10-20	---	7.4-8.4	5-10	0	0	0
	12-43	10-20	---	7.4-8.4	5-10	0	0	0
	43-60	10-20	---	7.4-8.4	5-10	0	0	0
Gaynor---------------	0-6	10-25	---	7.4-8.4	5-10	0	0.0-2.0	0
	6-30	20-35	---	7.9-9.0	5-10	0	0.0-2.0	0
	30-34	---	---	---	---	---	---	---
Cu:								
Colluvial land-------	0-3	5.0-15	---	7.4-8.4	0-10	0	0	0
	3-60	0.0-5.0	---	7.4-8.4	0-10	0	0	0
DU:								
Dumps----------------	---	---	---	---	---	---	---	---
FcF:								
Fern Cliff-----------	0-20	5.0-15	---	5.6-6.5	0	0	0	0
	20-60	5.0-15	---	5.6-6.5	0	0	0	0
	60-80	4.0-15	---	6.1-6.5	0	0	0	0
Allens Park----------	0-17	5.0-15	---	6.1-7.3	0	0	0	0
	17-26	10-25	---	6.1-7.3	0	0	0	0
	26-30	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	0	---
GaB:								
Gaynor---------------	0-6	10-25	---	7.4-8.4	5-10	0	0.0-2.0	0
	6-30	20-35	---	7.9-9.0	5-10	0	0.0-2.0	0
	30-34	---	---	---	---	---	---	---
GaD:								
Gaynor---------------	0-6	10-25	---	7.4-8.4	5-10	0	0.0-2.0	0
	6-30	20-35	---	7.9-9.0	5-10	0	0.0-2.0	0
	30-34	---	---	---	---	---	---	---
GP:								
Gravel pits and Mine dumps---------------	0-6	---	---	---	---	---	0	---
	6-60	---	---	---	---	---	0	---

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
GrF:								
Goldvale	0-19	5.0-10	---	5.6-7.3	0	0	0	0
	19-25	10-15	---	5.6-7.3	0	0	0	0
	25-57	25-35	---	5.6-7.3	0	0	0	0
	57-75	5.0-15	---	5.6-7.3	0	0	0	0
Rock outcrop	0-60	---	---	---	---	---	0	---
HaB:								
Hargreave	0-8	5.0-15	---	6.6-7.3	0	0	0	0
	8-13	10-20	---	6.6-7.3	0	0	0	0
	13-27	4.0-15	---	7.4-7.8	0	0	0	0
	27-31	---	---	---	---	---	---	---
HaD:								
Hargreave	0-6	5.0-15	---	6.6-7.3	0	0	0	0
	6-13	10-20	---	6.6-7.3	0	0	0	0
	13-27	4.0-15	---	7.4-7.8	0	0	0	0
	27-31	---	---	---	---	---	---	---
HeB:								
Heldt	0-8	15-30	---	7.4-8.4	5-10	0	0.0-4.0	0
	8-20	25-35	---	7.4-8.4	5-10	0	0.0-4.0	0
	20-60	20-30	---	7.9-8.4	5-10	0	0.0-4.0	0
HeC:								
Heldt	0-6	15-30	---	7.4-8.4	5-10	0	0.0-4.0	0
	6-20	25-35	---	7.4-8.4	5-10	0	0.0-4.0	0
	20-60	20-30	---	7.9-8.4	5-10	0	0.0-4.0	0
JrF:								
Juget	0-6	5.0-15	---	5.6-7.3	0	0	0	0
	6-11	2.0-5.0	---	5.6-7.3	0	0	0	0
	11-15	---	---	---	---	---	---	---
Rock outcrop	0-60	---	---	---	---	---	0	---
KuD:								
Kutch	0-7	20-35	---	6.1-6.5	0	0	0	0
	7-22	25-40	---	6.1-6.5	0	0	0	0
	22-30	20-40	---	7.9-8.4	5-15	0	0	0
	30-34	---	---	---	---	---	---	---

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
LaE:								
Laporte--------------	0-8	5.0-15	---	7.4-8.4	30-50	0	0	0
	8-13	5.0-15	---	7.9-8.4	30-50	0	0.0-2.0	0
	13-17	---	---	---	---	---	---	---
LoB:								
Longmont-------------	0-60	25-50	---	7.9-9.0	1-15	0-5	4.0-16.0	5-20
Lv:								
Loveland-------------	0-11	15-30	---	7.9-9.0	1-5	0	2.0-4.0	0
	11-30	10-25	---	7.9-9.0	1-15	0	2.0-4.0	0
	30-60	0.0-5.0	---	7.9-9.0	1-10	0	0.0-2.0	0
Ma:								
Made land------------	0-10	---	---	7.4-8.4	---	---	0.0-4.0	---
	10-60	---	---	7.4-8.4	---	---	0.0-4.0	---
MdA:								
Manter---------------	0-6	15-20	---	6.6-7.8	0	0	0	0
	6-16	10-20	---	6.6-7.8	0	0	0	0
	16-60	5.0-15	---	7.9-8.4	0-10	0	0.0-2.0	0
MdB:								
Manter---------------	0-6	15-20	---	6.6-7.8	0	0	0	0
	6-16	10-20	---	6.6-7.8	0	0	0	0
	16-60	5.0-15	---	7.9-8.4	0-10	0	0.0-2.0	0
MdD:								
Manter---------------	0-5	15-20	---	6.6-7.8	0	0	0	0
	5-14	10-20	---	6.6-7.8	0	0	0	0
	14-60	5.0-15	---	7.9-8.4	0-10	0	0.0-2.0	0
Me:								
Manvel---------------	0-6	5.0-20	---	7.9-8.4	0-10	0	0.0-2.0	0
	6-60	5.0-25	---	7.9-8.4	15-40	0-5	2.0-4.0	0-5
Mm:								
McClave--------------	0-19	15-30	---	6.1-7.3	0	0	0	0
	19-60	10-25	---	6.6-7.8	0	0	0	0
NdD:								
Nederland------------	0-7	10-20	---	6.1-7.8	0	0	0	0
	7-20	10-25	---	6.1-7.3	0	0	0	0
	20-60	4.0-15	---	6.1-7.8	0	0	0	0

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
Nh:								
Niwot----------------	0-14	10-25	---	6.6-7.8	0	0	0	0
	14-60	0.0-5.0	---	6.6-7.8	0	0	0	0
NnA:								
Nunn-----------------	0-10	15-30	---	6.1-6.5	0	0	0	0
	10-16	25-40	---	6.6-7.8	0-5	0	0	0
	16-60	15-30	---	7.9-8.4	5-15	0	0	0
NnB:								
Nunn-----------------	0-10	15-30	---	6.1-6.5	0	0	0	0
	10-14	25-40	---	6.6-7.8	0-5	0	0	0
	14-60	15-30	---	7.9-8.4	5-15	0	0	0
NuA:								
Nunn-----------------	0-10	20-35	---	6.1-6.5	0	0	0	0
	10-18	25-40	---	6.6-7.8	0-5	0	0	0
	18-30	25-40	---	7.9-8.4	5-15	0	0	0
	30-60	15-30	---	7.9-8.4	5-15	0	0	0
NuB:								
Nunn-----------------	0-10	20-35	---	6.1-6.5	0	0	0	0
	10-18	25-40	---	6.6-7.8	0-5	0	0	0
	18-30	25-40	---	7.9-8.4	5-15	0	0	0
	30-60	15-30	---	7.9-8.4	5-15	0	0	0
NuC:								
Nunn-----------------	0-10	20-35	---	6.1-6.5	0	0	0	0
	10-22	25-40	---	7.9-8.4	5-15	0	0	0
	22-60	15-30	---	7.9-8.4	5-15	0	0	0
NuD:								
Nunn-----------------	0-8	20-35	---	6.1-6.5	0	0	0	0
	8-14	25-40	---	6.6-7.8	0-5	0	0	0
	14-60	15-30	---	7.9-8.4	5-15	0	0	0
Nv:								
Nunn-----------------	0-10	20-35	---	6.1-6.5	0	0	0	0
	10-18	25-40	---	6.6-7.8	0-5	0	0	0
	18-30	25-40	---	7.9-8.4	5-15	0	0	0
	30-60	15-30	---	7.9-8.4	5-15	0	0	0
Kim------------------	0-11	10-20	---	7.4-8.4	5-15	0	0	0
	11-60	5.0-20	---	7.9-8.4	5-15	0	0.0-4.0	0

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
PgE:								
Peyton----------------	0-11	5.0-15	---	6.6-7.3	0	0	0	0
	11-30	10-20	---	6.6-7.3	0	0	0	0
	30-43	4.0-15	---	6.6-7.3	0	0	0	0
	43-60	4.0-15	---	6.6-7.3	0	0	0	0
Juget-----------------	0-6	5.0-10	---	5.6-7.3	0	0	0	0
	6-11	2.0-5.0	---	5.6-7.3	0	0	0	0
	11-15	---	---	---	---	---	---	---
PLY:								
Playas----------------	---	---	---	---	---	---	---	---
PrF:								
Pinata----------------	0-12	1.0-10	---	6.1-7.3	0	0	0	0
	12-32	15-30	---	6.1-7.3	0	0	0	0
	32-36	---	---	---	---	---	---	---
Rock outcrop----------	0-60	---	---	---	---	---	0	---
ReD:								
Renohill--------------	0-5	10-20	---	7.4-7.8	0-5	0	0	0
	5-15	25-40	---	7.4-7.8	0-5	0	0	0
	15-20	15-30	---	7.9-8.4	5-15	0	0	0
	20-24	---	---	---	---	---	---	---
RnB:								
Renohill--------------	0-9	10-25	---	7.4-7.8	0-5	0	0	0
	9-32	25-40	---	7.4-7.8	0-5	0	0	0
	32-36	---	---	---	---	---	---	---
RnD:								
Renohill--------------	0-7	10-25	---	7.4-7.8	0-5	0	0	0
	7-12	25-40	---	7.4-7.8	0-5	0	0	0
	12-30	15-30	---	7.9-8.4	5-15	0	0	0
	30-34	---	---	---	---	---	---	---
Ro:								
Rock outcrop----------	0-60	---	---	---	---	---	0	---
SaD:								
Samsil----------------	0-3	25-45	---	7.9-8.4	1-10	0-2	0.0-2.0	0-1
	3-12	25-50	---	7.9-8.4	1-5	0-2	0.0-2.0	0-1
	12-16	---	---	---	---	---	---	---

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
SeE:								
Samsil	0-3	25-45	---	7.9-8.4	1-10	0-2	0.0-2.0	0-1
	3-12	25-50	---	7.9-8.4	1-5	0-2	0.0-2.0	0-1
	12-16	---	---	---	---	---	---	---
Shingle	0-4	5.0-20	---	7.4-8.4	1-10	0	0	0
	4-13	5.0-15	---	7.4-8.4	5-15	0	0	0
	13-17	---	---	---	---	---	---	---
SgE:								
Shingle	0-4	10-20	---	7.4-8.4	1-10	0	0	0
	4-13	5.0-15	---	7.4-8.4	5-15	0	0	0
	13-17	---	---	---	---	---	---	---
Gaynor	0-6	10-25	---	7.4-8.4	5-10	0	0.0-2.0	0
	6-30	20-35	---	7.9-9.0	5-10	0	0.0-2.0	0
	30-34	---	---	---	---	---	---	---
SmF:								
Sixmile	0-4	5.0-20	---	7.4-8.4	5-10	0	0	0
	4-30	10-20	---	7.9-8.4	5-10	0	0	0
	30-34	---	---	---	---	---	---	---
Te:								
Terrace escarpments	0-6	1.0-5.0	---	6.6-7.3	0	0	0	0
	6-60	0.0-5.0	---	7.4-8.4	0-5	0	0.0-2.0	0
VaB:								
Valmont	0-9	15-30	---	6.6-7.3	0	0	0	0
	9-29	20-40	---	6.6-8.4	5-10	0	0	0
	29-60	4.0-15	---	7.9-8.4	5-10	0	0.0-2.0	0
VaC:								
Valmont	0-7	15-30	---	6.6-7.3	0	0	0	0
	7-24	20-40	---	6.6-8.4	5-10	0	0	0
	24-60	4.0-15	---	7.9-8.4	5-10	0	0.0-2.0	0
VcC:								
Valmont	0-8	15-30	---	6.6-7.3	0	0	0	0
	8-22	20-40	---	6.6-8.4	5-10	0	0	0
	22-60	4.0-15	---	7.9-8.4	5-10	0	0.0-2.0	0

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
VcE:								
Valmont----------------	0-6	15-30	---	6.6-7.3	0	0	0	0
	6-18	20-40	---	6.6-8.4	5-10	0	0	0
	18-60	4.0-15	---	7.9-8.4	5-10	0	0.0-2.0	0
W:								
Water------------------	---	---	---	---	---	---	---	---
WdB:								
Weld-------------------	0-12	3.0-10	---	6.6-7.3	0	0	0	0
	12-31	20-45	---	7.4-8.4	0-5	0	0.0-2.0	0
	31-60	5.0-15	---	7.4-9.0	1-10	0	0.0-2.0	0
WeB:								
Weld-------------------	0-6	4.0-10	---	6.6-7.8	0	0	0	0
	6-18	20-45	---	7.4-8.4	0-5	0	0.0-2.0	0
	18-60	5.0-15	---	7.4-9.0	1-10	0	0.0-2.0	0
WlA:								
Weld-------------------	0-6	15-30	---	6.6-7.8	0	0	0	0
	6-18	20-30	---	6.6-7.8	0-4	0	0	0
	18-24	20-30	---	7.4-9.0	2-6	0	0.0-2.0	0
	24-60	15-25	---	7.4-9.0	2-6	0	0.0-2.0	0
WlB:								
Weld-------------------	0-6	15-30	---	6.6-7.8	0	0	0	0
	6-18	20-30	---	6.6-7.8	0-4	0	0	0
	18-24	20-30	---	7.4-9.0	2-6	0	0.0-2.0	0
	24-60	15-25	---	7.4-9.0	2-6	0	0.0-2.0	0
WoB:								
Weld-------------------	0-6	15-30	---	6.6-7.8	0	0	0	0
	6-18	20-30	---	6.6-7.8	0-4	0	0	0
	18-24	20-30	---	7.4-9.0	2-6	0	0.0-2.0	0
	24-60	15-25	---	7.4-9.0	2-6	0	0.0-2.0	0
Colby------------------	0-12	10-20	---	7.4-8.4	5-10	0	0	0
	12-43	10-20	---	7.4-8.4	5-10	0	0	0
	43-60	10-20	---	7.4-8.4	5-10	0	0	0
WoC:								
Weld-------------------	0-5	15-30	---	6.6-7.8	0	0	0	0
	5-12	20-30	---	6.6-7.8	0-4	0	0	0
	12-24	20-30	---	7.4-9.0	2-6	0	0.0-2.0	0
	24-60	15-25	---	7.4-9.0	2-6	0	0.0-2.0	0

Table 18.--Chemical properties of the soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In.	meq/100 g	meq/100 g	pH	Pct.	Pct.	mmhos/cm	
WoC:								
Colby----------------	0-12	10-20	---	7.4-8.4	5-10	0	0	0
	12-43	10-20	---	7.4-8.4	5-10	0	0	0
	43-60	10-20	---	7.4-8.4	5-10	0	0	0

Table 19.--Water features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft.	Ft.	Ft.				
AcA:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
AcB:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
AcC:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
AcD:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
AoB:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
Otero	B	Jan-Dec	---	---	---	---	None	---	None
AoC:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
Otero	B	Jan-Dec	---	---	---	---	None	---	None
AoD:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
Otero	B	Jan-Dec	---	---	---	---	None	---	None
AoE:									
Ascalon	B	Jan-Dec	---	---	---	---	None	---	None
Otero	B	Jan-Dec	---	---	---	---	None	---	None
BaF:									
Baller	D	Jan-Dec	---	---	---	---	None	---	None
BP:									
Borrow pits	---	Jan-Dec	---	---	---	---	None	---	None

Table 19.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft.	Ft.	Ft.				
CaA:									
Calkins-------------------	C	April	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		May	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		June	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		July	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		August	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		September	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
CaB:									
Calkins-------------------	C	April	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		May	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		June	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		July	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		August	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
		September	2.0-3.0	>6.0	---	---	None	Very brief	Occasional
CoB:									
Colby---------------------	B	Jan-Dec	---	---	---	---	None	---	None
CoC:									
Colby---------------------	B	Jan-Dec	---	---	---	---	None	---	None
CoD:									
Colby---------------------	B	Jan-Dec	---	---	---	---	None	---	None
CsB:									
Colby Variant-------------	C	May	2.0-4.0	>6.0	---	---	None	---	None
		June	2.0-4.0	>6.0	---	---	None	---	None
		July	2.0-4.0	>6.0	---	---	None	---	None
		August	2.0-4.0	>6.0	---	---	None	---	None
		September	2.0-4.0	>6.0	---	---	None	---	None
		October	2.0-4.0	>6.0	---	---	None	---	None
		November	2.0-4.0	>6.0	---	---	None	---	None
Ct:									
Colby---------------------	B	Jan-Dec	---	---	---	---	None	---	None
Gaynor--------------------	C	Jan-Dec	---	---	---	---	None	---	None
Cu:									
Colluvial land------------	A	Jan-Dec	---	---	---	---	None	---	None
DU:									
Dumps---------------------	---	Jan-Dec	---	---	---	---	None	---	None

Table 19.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft.	Ft.	Ft.				
FcF:									
Fern Cliff----------------	B	Jan-Dec	---	---	---	---	None	---	None
Allens Park---------------	B	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop--------------	D	Jan-Dec	---	---	---	---	None	---	None
GaB:									
Gaynor--------------------	C	Jan-Dec	---	---	---	---	None	---	None
GaD:									
Gaynor--------------------	C	Jan-Dec	---	---	---	---	None	---	None
GP:									
Gravel pits and Mine dumps	A	Jan-Dec	---	---	---	---	None	---	None
GrF:									
Goldvale------------------	B	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop--------------	D	Jan-Dec	---	---	---	---	None	---	None
HaB:									
Hargreave-----------------	C	Jan-Dec	---	---	---	---	None	---	None
HaD:									
Hargreave-----------------	C	Jan-Dec	---	---	---	---	None	---	None
HeB:									
Heldt---------------------	C	Jan-Dec	---	---	---	---	None	---	None
HeC:									
Heldt---------------------	C	Jan-Dec	---	---	---	---	None	---	None
JrF:									
Juget---------------------	D	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop--------------	D	Jan-Dec	---	---	---	---	None	---	None
KuD:									
Kutch---------------------	C	Jan-Dec	---	---	---	---	None	---	None
LaE:									
Laporte-------------------	D	Jan-Dec	---	---	---	---	None	---	None

Table 19.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft.	Ft.	Ft.				
LoB:									
Longmont	C	March	---	---	---	---	None	Brief	Occasional
		April	---	---	---	---	None	Brief	Occasional
		May	2.0-2.5	>6.0	---	---	None	Brief	Occasional
		June	2.0-2.5	>6.0	---	---	None	Brief	Occasional
		July	2.0-2.5	>6.0	---	---	None	Brief	Occasional
		August	2.0-2.5	>6.0	---	---	None	---	None
		September	2.0-2.5	>6.0	---	---	None	---	None
Lv:									
Loveland	C	January	1.5-3.0	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		July	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		August	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		September	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		October	1.5-3.0	>6.0	---	---	None	---	None
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	1.5-3.0	>6.0	---	---	None	---	None
Ma:									
Made land	D	February	0.0	>6.0	0.0-1.0	---	None	---	None
		March	0.0	>6.0	0.0-1.0	---	None	---	None
		April	0.0	>6.0	0.0-1.0	---	None	---	None
		May	0.0	>6.0	0.0-1.0	---	None	---	None
MdA:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
MdB:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
MdD:									
Manter	B	Jan-Dec	---	---	---	---	None	---	None
Me:									
Manvel	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft.	Ft.	Ft.				
Mm:									
McClave	C	March	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		July	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		August	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		September	1.5-3.0	>6.0	---	---	None	Brief	Occasional
NdD:									
Nederland	B	Jan-Dec	---	---	---	---	None	---	None
Nh:									
Niwot	C	March	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	---	---	---	---	None	Brief	Occasional
NnA:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
NnB:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
NuA:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
NuB:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
NuC:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
NuD:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
Nv:									
Nunn	C	Jan-Dec	---	---	---	---	None	---	None
Kim	B	Jan-Dec	---	---	---	---	None	---	None

Table 19.--Water features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft.	Ft.	Ft.				
PgE:									
Peyton	B	Jan-Dec	---	---	---	---	None	---	None
Juget	D	Jan-Dec	---	---	---	---	None	---	None
PLY:									
Playas	---	Jan-Dec	---	---	---	---	None	---	None
PrF:									
Pinata	C	Jan-Dec	---	---	---	---	None	---	None
Rock outcrop	D	Jan-Dec	---	---	---	---	None	---	None
ReD:									
Renohill	D	Jan-Dec	---	---	---	---	None	---	None
RnB:									
Renohill	C	Jan-Dec	---	---	---	---	None	---	None
RnD:									
Renohill	C	Jan-Dec	---	---	---	---	None	---	None
Ro:									
Rock outcrop	D	Jan-Dec	---	---	---	---	None	---	None
SaD:									
Samsil	D	Jan-Dec	---	---	---	---	None	---	None
SeE:									
Samsil	D	Jan-Dec	---	---	---	---	None	---	None
Shingle	D	Jan-Dec	---	---	---	---	None	---	None
SgE:									
Shingle	D	Jan-Dec	---	---	---	---	None	---	None
Gaynor	C	Jan-Dec	---	---	---	---	None	---	None
SmF:									
Sixmile	C	Jan-Dec	---	---	---	---	None	---	None
Te:									
Terrace escarpments	A	Jan-Dec	---	---	---	---	None	---	None
VaB:									
Valmont	C	Jan-Dec	---	---	---	---	None	---	None

Table 19.--Water features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft.	Ft.	Ft.				
VaC:									
Valmont	C	Jan-Dec	---	---	---	---	None	---	None
VcC:									
Valmont	C	Jan-Dec	---	---	---	---	None	---	None
VcE:									
Valmont	C	Jan-Dec	---	---	---	---	None	---	None
W:									
Water	---	Jan-Dec	---	---	---	---	None	---	None
WdB:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
WeB:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
WlA:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
WlB:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
WoB:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
Colby	B	Jan-Dec	---	---	---	---	None	---	None
WoC:									
Weld	C	Jan-Dec	---	---	---	---	None	---	None
Colby	B	Jan-Dec	---	---	---	---	None	---	None

Table 20.--Soil features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
AcA:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
AcB:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
AcC:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
AcD:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
AoB:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
Otero	---	---	---	---	0	---	Low	Moderate	Low
AoC:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
Otero	---	---	---	---	0	---	Low	Moderate	Low
AoD:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
Otero	---	---	---	---	0	---	Low	Moderate	Low
AoE:									
Ascalon	---	---	---	---	0	---	Moderate	High	Low
Otero	---	---	---	---	0	---	Low	Moderate	Low
BaF:									
Baller	Bedrock (lithic)	10-20	---	---	0	---	Low	Moderate	Low
BP:									
Borrow pits	---	---	---	---	---	---	---	---	---
CaA:									
Calkins	---	---	---	---	0	---	High	Moderate	Low
CaB:									
Calkins	---	---	---	---	0	---	High	Moderate	Low
CoB:									
Colby	---	---	---	---	0	---	Low	Low	Low
CoC:									
Colby	---	---	---	---	0	---	Low	Low	Low
CoD:									
Colby	---	---	---	---	0	---	Low	Low	Low
CsB:									
Colby Variant	---	---	---	---	0	---	Moderate	High	Low
Ct:									
Colby	---	---	---	---	0	---	Low	Low	Low

Table 20.--Soil features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
Ct:									
Gaynor-----------------	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	High
Cu:									
Colluvial land---------	Bedrock (lithic)	10-10	---	---	0	---	Low	Moderate	Low
DU:									
Dumps------------------	---	---	---	---	---	---	---	---	---
FcF:									
Fern Cliff-------------	---	---	---	---	0	---	Moderate	High	Moderate
Allens Park------------	Bedrock (lithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Rock outcrop-----------	Bedrock (lithic)	0-0	---	---	0	---	None	---	---
GaB:									
Gaynor-----------------	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	High
GaD:									
Gaynor-----------------	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	High
GP:									
Gravel pits and Mine dumps-----------------	---	---	---	---	0	---	None	---	---
GrF:									
Goldvale---------------	---	---	---	---	0	---	Low	Moderate	Moderate
Rock outcrop-----------	Bedrock (lithic)	0-0	---	---	0	---	None	---	---
HaB:									
Hargreave--------------	Bedrock (lithic)	20-40	---	---	0	---	Low	Moderate	Low
HaD:									
Hargreave--------------	Bedrock (lithic)	20-40	---	---	0	---	Low	Moderate	Low
HeB:									
Heldt------------------	---	---	---	---	0	---	High	High	Low
HeC:									
Heldt------------------	---	---	---	---	0	---	High	High	Low
JrF:									
Juget------------------	Bedrock (lithic)	8-20	---	---	0	---	Low	Moderate	Moderate
Rock outcrop-----------	Bedrock (lithic)	0-0	---	---	0	---	None	---	---
KuD:									
Kutch------------------	Bedrock (paralithic)	20-40	---	---	0	---	Moderate	High	Moderate
LaE:									
Laporte----------------	Bedrock (paralithic)	10-20	---	---	0	---	Low	High	Low
LoB:									
Longmont---------------	---	---	---	---	0	---	High	High	Moderate

Table 20.--Soil features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
Lv:									
Loveland	---	---	---	---	0	---	High	High	Low
Ma:									
Made land	---	---	---	---	0	---	None	High	Low
MdA:									
Manter	---	---	---	---	0	---	Moderate	High	Low
MdB:									
Manter	---	---	---	---	0	---	Moderate	High	Low
MdD:									
Manter	---	---	---	---	0	---	Moderate	High	Low
Me:									
Manvel	---	---	---	---	0	---	Low	High	Low
Mm:									
McClave	---	---	---	---	0	---	High	Moderate	Low
NdD:									
Nederland	---	---	---	---	0	---	Moderate	Moderate	Low
Nh:									
Niwot	---	---	---	---	0	---	High	High	Low
NnA:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
NnB:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
NuA:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
NuB:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
NuC:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
NuD:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
Nv:									
Nunn	---	---	---	---	0	---	Moderate	High	Low
Kim	---	---	---	---	0	---	Low	High	Low
PgE:									
Peyton	---	---	---	---	0	---	Moderate	Moderate	Low
Juget	Bedrock (lithic)	8-20	---	---	0	---	Low	Moderate	Moderate
PLY:									
Playas	---	---	---	---	---	---	---	---	---
PrF:									
Pinata	Bedrock (lithic)	20-40	---	---	0	---	Moderate	Moderate	Low
Rock outcrop	Bedrock (lithic)	0-0	---	---	0	---	None	---	---

Table 20.--Soil features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
ReD:									
Renohill	Bedrock (lithic)	10-20	---	---	0	---	Low	High	Low
RnB:									
Renohill	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Low
RnD:									
Renohill	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Low
Ro:									
Rock outcrop	Bedrock (lithic)	0-0	---	---	0	---	None	---	---
SaD:									
Samsil	Bedrock (paralithic)	10-20	---	---	0	---	Low	High	Moderate
SeE:									
Samsil	Bedrock (paralithic)	10-20	---	---	0	---	Low	High	Moderate
Shingle	Bedrock (paralithic)	10-20	---	---	0	---	Low	Moderate	Low
SgE:									
Shingle	Bedrock (paralithic)	10-20	---	---	0	---	Low	Moderate	Low
Gaynor	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	High
SmF:									
Sixmile	Bedrock (paralithic)	20-40	---	---	0	---	Low	High	Low
Te:									
Terrace escarpments	---	---	---	---	0	---	Low	Moderate	Moderate
VaB:									
Valmont	---	---	---	---	0	---	Low	High	Low
VaC:									
Valmont	---	---	---	---	0	---	Low	High	Low
VcC:									
Valmont	---	---	---	---	0	---	Low	High	Low
VcE:									
Valmont	---	---	---	---	0	---	Low	High	Low
W:									
Water	---	---	---	---	---	---	---	---	---
WdB:									
Weld	---	---	---	---	0	---	Moderate	High	Low
WeB:									
Weld	---	---	---	---	0	---	Moderate	High	Low
WlA:									
Weld	---	---	---	---	0	---	Moderate	High	Low

Table 20.--Soil features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In.	In.		In.	In.			
WlB:									
Weld-------------------	---	---	---	---	0	---	Moderate	High	Low
WoB:									
Weld-------------------	---	---	---	---	0	---	Moderate	High	Low
WoB:									
Colby------------------	---	---	---	---	0	---	Low	Low	Low
WoC:									
Weld-------------------	---	---	---	---	0	---	Moderate	High	Low
Colby------------------	---	---	---	---	0	---	Low	Low	Low

Table 21.--Classification of the soils

Soil name	Family or higher taxonomic class
Allens Park	Fine-loamy, mixed Typic Eutroboralfs
Ascalon	Fine-loamy, mixed, mesic Aridic Argiustolls
Baller	Loamy-skeletal, mixed, mesic Lithic Haplustolls
Calkins	Coarse-loamy, mixed, mesic Cumulic Haplaquolls
Colby	Fine-silty, mixed (calcareous), mesic Aridic Ustorthents
Colby Variant	Fine-silty, mixed (calcareous), mesic Aquic Torriorthents
Colluvial land	Torriorthents
Fern Cliff	Mixed Psammentic Eutroboralfs
Gaynor	Fine, montmorillonitic (calcareous), mesic Ustic Torriorthents
Goldvale	Fine, montmorillonitic Typic Eutroboralfs
Hargreave	Fine-loamy, mixed, mesic Aridic Argiustolls
Heldt	Fine, montmorillonitic, mesic Ustertic Camborthids
Juget	Sandy-skeletal, mixed Lithic Haploborolls
Kim	Fine-loamy, mixed (calcareous), mesic Ustic Torriorthents
Kutch	Fine, montmorillonitic, mesic Torrertic Argiustolls
Laporte	Loamy, carbonatic, mesic Lithic Haplustolls
Longmont	Fine, montmorillonitic (calcareous), mesic Aeric Halaquepts
Loveland	Fine-loamy over sandy or sandy-skeletal, mixed (calcareous), mesic Fluvaquentic Haplaquolls
Manter	Coarse-loamy, mixed, mesic Aridic Argiustolls
Manvel	Fine-silty, mixed (calcareous), mesic Ustic Torriorthents
McClave	Fine-loamy, mixed, mesic Cumulic Haplaquolls
Nederland	Loamy-skeletal, mixed, mesic Aridic Argiustolls
Niwot	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Haplaquolls
Nunn	Fine, montmorillonitic, mesic Aridic Argiustolls
Otero	Coarse-loamy, mixed (calcareous), mesic Aridic Ustorthents
Peyton	Fine-loamy, mixed Aridic Argiborolls
Pinata	Clayey-skeletal, mixed Typic Eutroboralfs
Renohill	Clayey, mixed (calcareous), mesic, shallow Typic Torriorthents
Renohill	Fine, montmorillonitic, mesic Ustollic Haplargids
Samsil	Clayey, montmorillonitic (calcareous), mesic, shallow Ustic Torriorthents
Shingle	Loamy, mixed (calcareous), mesic, shallow Ustic Torriorthents
Sixmile	Fine-loamy, mixed (calcareous), mesic Ustic Torriorthents
Terrace escarpments	Ustic Torriorthents
Valmont	Clayey over loamy-skeletal, montmorillonitic, mesic Aridic Argiustolls
Weld	Fine, montmorillonitic, mesic Aridic Paleustolls

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