

Attachment 2: Soil Resource Reports



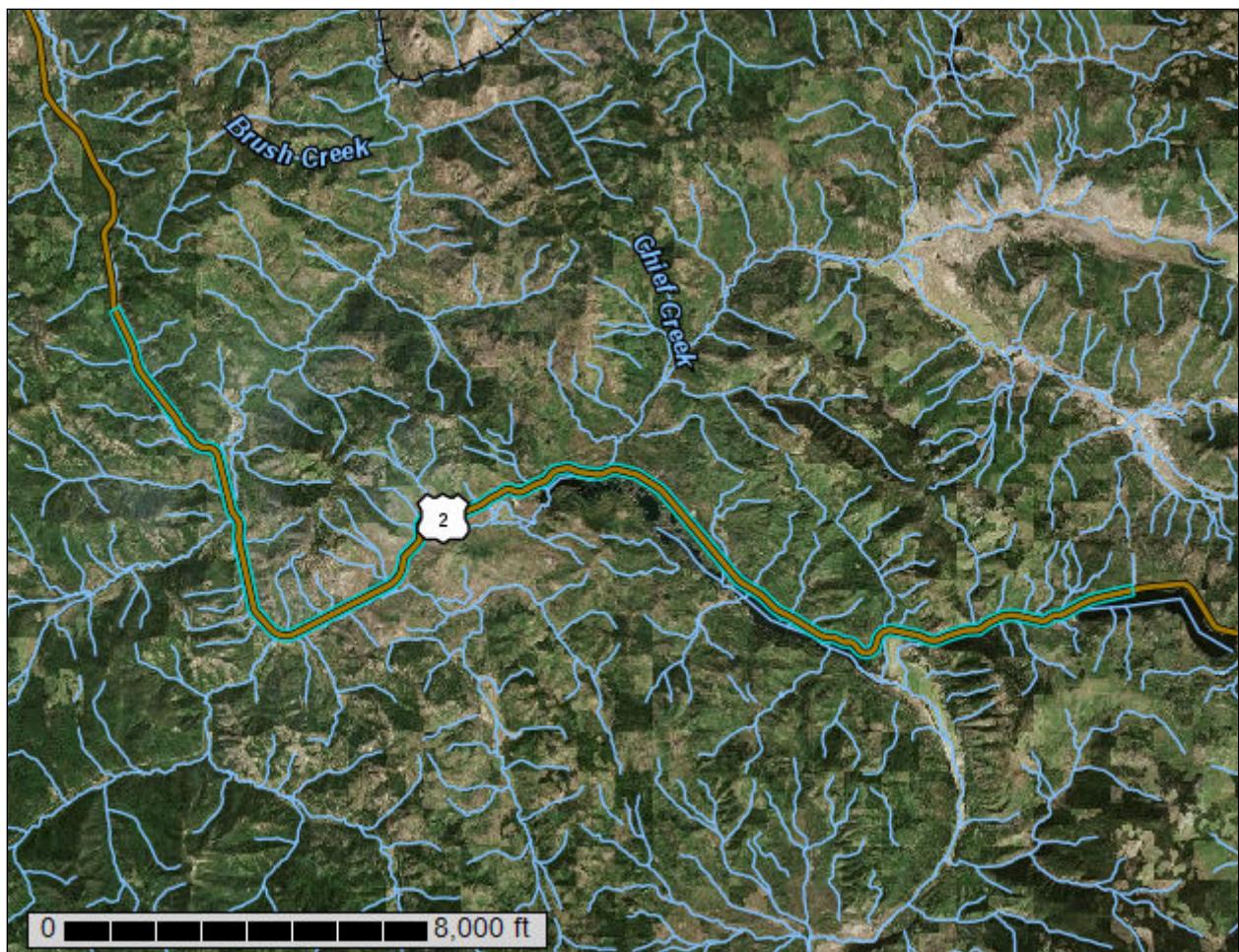
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Flathead County Area and Part of Lincoln County, Montana, Kootenai National Forest Area, Montana-Idaho, and Sanders and Parts of Lincoln and Flathead Counties, Montana



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	6
Soil Map	9
Soil Map.....	10
Legend.....	11
Map Unit Legend.....	13
Map Unit Descriptions.....	16
Flathead County Area and Part of Lincoln County, Montana.....	18
67C—Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes.....	18
222C—Pleasantvalley-Winfall, dry complex, 2 to 8 percent slopes.....	19
222E—Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes.....	21
W—Water.....	24
Kootenai National Forest Area, Montana-Idaho.....	25
67C—Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes.....	25
101—Fluvents, flood plains.....	26
103—Andic Dystrochrepts, alluvial terraces.....	27
105—Aquic Udifluvents, poorly drained.....	28
108—Andic Dystric Eutrochrepts, lacustrine terraces-Andic Dystrochrepts, glacial outwash terraces, complex.....	29
112—Eutric Glossoboralfs, lacustrine terraces.....	30
222E—Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes.....	31
252—Andic Dystrochrepts, breaklands.....	34
301—Dystric Eutrochrepts, glaciated mountain slopes.....	35
302—Typic Ustochrepts, glaciated mountain slopes, steep.....	36
303—Rock outcrop-Lithic Ustochrepts complex, glaciated mountain ridges.....	37
352—Andic Dystrochrepts, glaciated mountain slopes.....	38
W—Water.....	39
Sanders and Parts of Lincoln and Flathead Counties, Montana.....	40
6A—Murrstead mucky peat, 0 to 2 percent slopes.....	40
12C—Auggie silt loam, 2 to 8 percent slopes.....	41
22C—Courville gravelly ashy silt loam, 2 to 8 percent slopes.....	42
30F—Tevis gravelly loam, 35 to 60 percent slopes.....	43
32G—Mitten-Rubble land complex, 40 to 70 percent slopes.....	45
33F—Mitten gravelly ashy silt loam, dry, 35 to 60 percent slopes.....	46
35E—Courville gravelly ashy silt loam, 8 to 30 percent slopes.....	47
35F—Courville gravelly ashy silt loam, 30 to 50 percent slopes.....	49
36E—Rumblecreek gravelly loam, 15 to 30 percent slopes.....	50
40F—Holloway gravelly ashy silt loam, 35 to 60 percent slopes.....	52
48E—Ashworth gravelly ashy silt loam, 8 to 30 percent slopes.....	53
58F—Waldbillig gravelly ashy silt loam, moist, 30 to 50 percent slopes.....	55
67C—Glaciercreek gravelly ashy silt loam, cool, 0 to 8 percent slopes.....	56
68C—Upsata gravelly ashy silt loam, 2 to 8 percent slopes.....	57
68E—Upsata gravelly ashy silt loam, 8 to 30 percent slopes.....	59

69C—Tamarack ash loam, 2 to 8 percent slopes.....	60
72A—Blacklake mucky peat, 0 to 1 percent slopes.....	62
73A—Meadowpeak silt loam, 0 to 2 percent slopes.....	63
74A—Blackcreek silt loam, 0 to 2 percent slopes.....	64
75B—Tallcreek ash loam, 0 to 4 percent slopes.....	66
77E—Beeskove gravelly loam, moist, 15 to 35 percent slopes.....	67
77F—Beeskove gravelly loam, moist, 35 to 60 percent slopes.....	69
82F—Sharrott, cool-Rock outcrop-Rubble land complex, 15 to 60 percent slopes.....	70
92C—Oldtrail gravelly sandy loam, 0 to 8 percent slopes.....	71
98F—Bendahl gravelly ash loam, 30 to 50 percent slopes.....	72
291B—Half Moon silt loam, cool, 2 to 8 percent slopes.....	74
291D—Half Moon silt loam, cool, 8 to 15 percent slopes.....	75
291E—Half Moon silt loam, cool, 15 to 35 percent slopes.....	77
291F—Half Moon silt loam, cool, 35 to 60 percent slopes.....	79
374F—Mitten-Rock outcrop complex, 40 to 70 percent slopes.....	80
582F—Waldbillig-Holloway gravelly ash loam, moist, 30 to 50 percent slopes.....	81
691B—Tamarack-Crystalex complex, 0 to 4 percent slopes.....	83
691D—Tamarack-Crystalex complex, 4 to 15 percent slopes.....	85
691E—Tamarack-Crystalex complex, 15 to 30 percent slopes.....	87
691F—Tamarack-Crystalex complex, 30 to 60 percent slopes.....	89
731A—Meadowpeak-Firetower silt loams, 0 to 2 percent slopes.....	91
808A—Barzee mucky peat, 0 to 2 percent slopes.....	93
858E—Waldbillig gravelly ash loam, moist, 8 to 30 percent slopes.....	94
867E—Glaciercreek gravelly ash loam, cool, 8 to 30 percent slopes.....	95
867F—Glaciercreek gravelly ash loam, cool, 30 to 45 percent slopes.....	97
897C—Mollman gravelly loam, 2 to 8 percent slopes.....	98
897E—Mollman gravelly loam, 8 to 30 percent slopes.....	99
W—Water.....	101
Soil Information for All Uses.....	102
Soil Properties and Qualities.....	102
Soil Qualities and Features.....	102
Parent Material Name.....	102
Soil Reports.....	111
Land Classifications.....	111
Prime and other Important Farmlands.....	111
References.....	115

How Soil Surveys Are Made

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

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

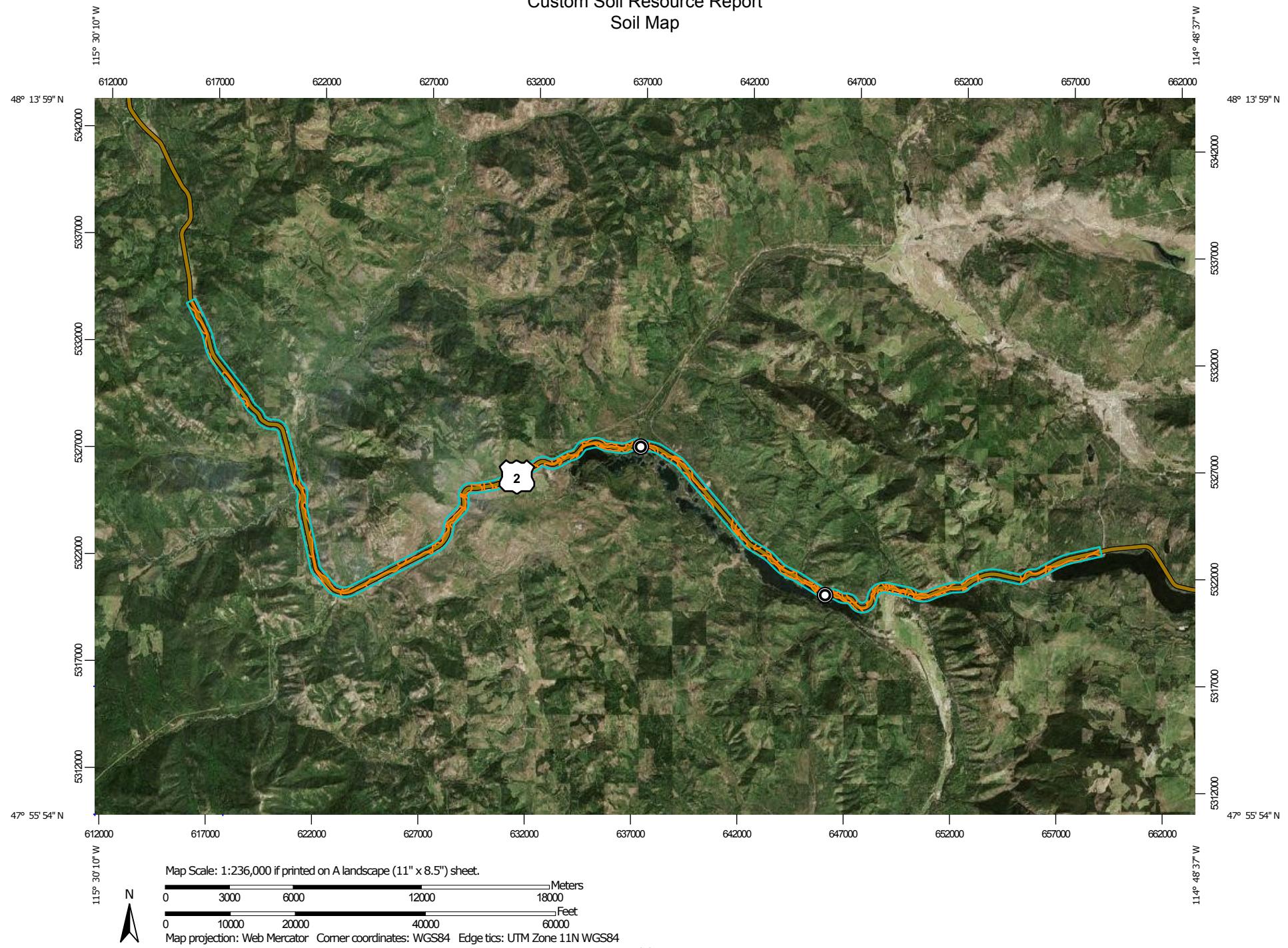
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

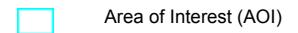
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



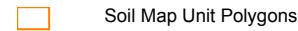
MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils



Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



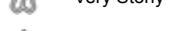
Sodic Spot

Spoil Area



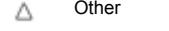
Spoil Area

Stony Spot



Stony Spot

Very Stony Spot



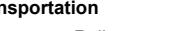
Very Stony Spot

Wet Spot



Wet Spot

Other



Other

Special Line Features



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Flathead County Area and Part of Lincoln County, Montana
 Survey Area Data: Version 11, Sep 19, 2016

Soil Survey Area: Kootenai National Forest Area, Montana-Idaho
 Survey Area Data: Version 15, Sep 20, 2016

Soil Survey Area: Sanders and Parts of Lincoln and Flathead Counties, Montana
 Survey Area Data: Version 17, Sep 20, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

MAP LEGEND

MAP INFORMATION

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Flathead County Area and Part of Lincoln County, Montana (MT618)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
67C	Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes	15.3	0.2%
222C	Pleasantvalley-Winfall, dry complex, 2 to 8 percent slopes	14.5	0.2%
222E	Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes	200.7	3.0%
W	Water	78.4	1.2%
Subtotals for Soil Survey Area		308.9	4.6%
Totals for Area of Interest		6,650.2	100.0%

Kootenai National Forest Area, Montana-Idaho (MT634)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
67C	Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes	87.0	1.3%
101	Fluvents, flood plains	588.4	8.8%
103	Andic Dystrochrepts, alluvial terraces	5.3	0.1%
105	Aquic Udifluvents, poorly drained	162.2	2.4%
108	Andic Dystric Eutrochrepts, lacustrine terraces-Andic Dystrochrepts, glacial outwash terraces, complex	1,313.9	19.8%
112	Eutric Glossoboralfs, lacustrine terraces	301.3	4.5%
222E	Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes	59.1	0.9%
252	Andic Dystrochrepts, breaklands	71.8	1.1%
301	Dystric Eutrochrepts, glaciated mountain slopes	38.5	0.6%
302	Typic Ustochrepts, glaciated mountain slopes, steep	25.4	0.4%
303	Rock outcrop-Lithic Ustochrepts complex, glaciated mountain ridges	22.2	0.3%
352	Andic Dystrochrepts, glaciated mountain slopes	62.1	0.9%
W	Water	5.7	0.1%
Subtotals for Soil Survey Area		2,743.0	41.2%

Custom Soil Resource Report

Kootenai National Forest Area, Montana-Idaho (MT634)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		6,650.2	100.0%

Sanders and Parts of Lincoln and Flathead Counties, Montana (MT651)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Murrstead mucky peat, 0 to 2 percent slopes	15.5	0.2%
12C	Auggie silt loam, 2 to 8 percent slopes	3.7	0.1%
22C	Courville gravelly ashy silt loam, 2 to 8 percent slopes	10.2	0.2%
30F	Tewis gravelly loam, 35 to 60 percent slopes	13.4	0.2%
32G	Mitten-Rubble land complex, 40 to 70 percent slopes	40.2	0.6%
33F	Mitten gravelly ashy silt loam, dry, 35 to 60 percent slopes	7.5	0.1%
35E	Courville gravelly ashy silt loam, 8 to 30 percent slopes	223.9	3.4%
35F	Courville gravelly ashy silt loam, 30 to 50 percent slopes	78.3	1.2%
36E	Rumblecreek gravelly loam, 15 to 30 percent slopes	3.3	0.0%
40F	Holloway gravelly ashy silt loam, 35 to 60 percent slopes	2.5	0.0%
48E	Ashworth gravelly ashy silt loam, 8 to 30 percent slopes	31.8	0.5%
58F	Waldbillig gravelly ashy silt loam, moist, 30 to 50 percent slopes	48.9	0.7%
67C	Glaciercreek gravelly ashy silt loam, cool, 0 to 8 percent slopes	591.8	8.9%
68C	Upsata gravelly ashy silt loam, 2 to 8 percent slopes	59.6	0.9%
68E	Upsata gravelly ashy silt loam, 8 to 30 percent slopes	24.8	0.4%
69C	Tamarack ashy loam, 2 to 8 percent slopes	33.4	0.5%
72A	Blacklake mucky peat, 0 to 1 percent slopes	64.7	1.0%
73A	Meadowpeak silt loam, 0 to 2 percent slopes	7.2	0.1%
74A	Blackcreek silt loam, 0 to 2 percent slopes	18.2	0.3%
75B	Tallcreek ashy silt loam, 0 to 4 percent slopes	164.3	2.5%
77E	Beeskove gravelly loam, moist, 15 to 35 percent slopes	1.0	0.0%

Custom Soil Resource Report

Sanders and Parts of Lincoln and Flathead Counties, Montana (MT651)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
77F	Beeskove gravelly loam, moist, 35 to 60 percent slopes	65.0	1.0%
82F	Sharrott, cool-Rock outcrop-Rubble land complex, 15 to 60 percent slopes	11.6	0.2%
92C	Oldtrail gravelly sandy loam, 0 to 8 percent slopes	8.2	0.1%
98F	Bendahl gravelly ashy silt loam, 30 to 50 percent slopes	2.1	0.0%
291B	Half Moon silt loam, cool, 2 to 8 percent slopes	241.7	3.6%
291D	Half Moon silt loam, cool, 8 to 15 percent slopes	69.6	1.0%
291E	Half Moon silt loam, cool, 15 to 35 percent slopes	129.5	1.9%
291F	Half Moon silt loam, cool, 35 to 60 percent slopes	57.0	0.9%
374F	Mitten-Rock outcrop complex, 40 to 70 percent slopes	5.7	0.1%
582F	Waldbillig-Holloway gravelly ashy silt loams, moist, 30 to 50 percent slopes	5.9	0.1%
691B	Tamarack-Crystalex complex, 0 to 4 percent slopes	310.3	4.7%
691D	Tamarack-Crystalex complex, 4 to 15 percent slopes	78.3	1.2%
691E	Tamarack-Crystalex complex, 15 to 30 percent slopes	20.9	0.3%
691F	Tamarack-Crystalex complex, 30 to 60 percent slopes	68.5	1.0%
731A	Meadowpeak-Firetower silt loams, 0 to 2 percent slopes	90.2	1.4%
808A	Barzee mucky peat, 0 to 2 percent slopes	10.0	0.2%
858E	Waldbillig gravelly ashy silt loam, moist, 8 to 30 percent slopes	238.5	3.6%
867E	Glaciercreek gravelly ashy silt loam, cool, 8 to 30 percent slopes	237.8	3.6%
867F	Glaciercreek gravelly ashy silt loam, cool, 30 to 45 percent slopes	234.9	3.5%
897C	Mollman gravelly loam, 2 to 8 percent slopes	2.2	0.0%
897E	Mollman gravelly loam, 8 to 30 percent slopes	68.9	1.0%
W	Water	197.2	3.0%
Subtotals for Soil Survey Area		3,598.3	54.1%

Sanders and Parts of Lincoln and Flathead Counties, Montana (MT651)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		6,650.2	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic 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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Flathead County Area and Part of Lincoln County, Montana

67C—Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 17n42
Elevation: 2,000 to 4,200 feet
Mean annual precipitation: 22 to 30 inches
Mean annual air temperature: 38 to 45 degrees F
Frost-free period: 70 to 95 days
Farmland classification: Not prime farmland

Map Unit Composition

Glaciercreek and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glaciercreek

Setting

Landform: Stream terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Bw - 1 to 15 inches: gravelly ashy silt loam
2C - 15 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Loonlake

Percent of map unit: 5 percent
Landform: Outwash terraces, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520)

Hydric soil rating: No

Glaciercreek, greater slope

Percent of map unit: 5 percent

Landform: Stream terraces, outwash terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)

Hydric soil rating: No

222C—Pleasantvalley-Winfall, dry complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: mj89

Elevation: 3,500 to 4,260 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 38 to 45 degrees F

Frost-free period: 70 to 95 days

Farmland classification: Not prime farmland

Map Unit Composition

Pleasantvalley and similar soils: 50 percent

Winfall and similar soils: 20 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pleasantvalley

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Volcanic ash over till derived from quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 4 inches: gravelly ashy silt loam

Bw - 4 to 14 inches: gravelly ashy silt loam

2E - 14 to 26 inches: very cobbly silt loam

2E/Bw - 26 to 34 inches: very cobbly silt loam

2E/Bt - 34 to 60 inches: very cobbly silt loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Description of Winfall

Setting

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 9 inches: gravelly loam

E and Bt - 9 to 60 inches: very gravelly loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/pinegrass-kinnikinnick phase (PK322), Douglas-fir/dwarf huckleberry (PK250)

Hydric soil rating: No

Minor Components

Courville

Percent of map unit: 10 percent

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250)

Hydric soil rating: No

Meadowpeak

Percent of map unit: 5 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Riparian Meadow (RM) LRU 44A-Y (R044AY080MT)

Hydric soil rating: Yes

Tallcreek

Percent of map unit: 5 percent

Landform: Outwash terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: spruce/dwarf huckleberry (PK450)

Hydric soil rating: No

Lynchlake, dry

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250)

Hydric soil rating: No

Glaciercreek

Percent of map unit: 5 percent

Landform: Outwash terraces, moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/pinegrass-kinnikinnick phase (PK322),

Douglas-fir/dwarf huckleberry (PK250)

Hydric soil rating: No

222E—Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: mj76

Elevation: 3,520 to 4,800 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 38 to 45 degrees F

Frost-free period: 70 to 95 days

Farmland classification: Not prime farmland

Map Unit Composition

Pleasantvalley and similar soils: 50 percent

Winfall and similar soils: 20 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pleasantvalley

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Volcanic ash over till derived from quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 4 inches: gravelly ashy silt loam

Bw - 4 to 14 inches: gravelly ashy silt loam

2E - 14 to 26 inches: very cobbly silt loam

2E/Bw - 26 to 34 inches: very cobbly silt loam

2E/Bt - 34 to 60 inches: very cobbly silt loam

Properties and qualities

Slope: 8 to 30 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Description of Winfall

Setting

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 9 inches: gravelly loam

E and Bt - 9 to 60 inches: very gravelly loam

Properties and qualities

Slope: 8 to 30 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Custom Soil Resource Report

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-

fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Minor Components

Courville, dry

Percent of map unit: 10 percent

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: Unranked

Courville

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: spruce/dwarf huckleberry (PK450), grand fir/twinflower (PK590)

Hydric soil rating: No

Glaciercreek

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/pinegrass-kinnikinnick phase (PK322), Douglas-fir/dwarf huckleberry (PK250)

Hydric soil rating: No

Combest

Percent of map unit: 3 percent

Landform: Mountain slopes

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Sharrott

Percent of map unit: 2 percent

Landform: Ridges

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Other vegetative classification: Douglas-fir/rough fescue (PK230)

Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Kootenai National Forest Area, Montana-Idaho

67C—Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2lwmq
Elevation: 2,000 to 4,200 feet
Mean annual precipitation: 22 to 30 inches
Mean annual air temperature: 38 to 45 degrees F
Frost-free period: 70 to 95 days
Farmland classification: Not prime farmland

Map Unit Composition

Glaciercreek and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glaciercreek

Setting

Landform: Stream terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Bw - 1 to 15 inches: gravelly ashy silt loam
2C - 15 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Loonlake

Percent of map unit: 5 percent
Landform: Stream terraces, outwash terraces
Down-slope shape: Linear
Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520)

Hydric soil rating: No

Glaciercreek, greater slope

Percent of map unit: 5 percent

Landform: Stream terraces, outwash terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)

Hydric soil rating: No

101—Fluvents, flood plains

Map Unit Setting

National map unit symbol: nvch

Elevation: 1,800 to 4,200 feet

Mean annual precipitation: 20 to 35 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 70 to 110 days

Farmland classification: Not prime farmland

Map Unit Composition

Fluvents and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvents

Setting

Landform: Flood plains

Parent material: Mixed alluvium

Typical profile

A - 2 to 13 inches: gravelly silt loam

C1 - 13 to 23 inches: very gravelly sandy loam

C2 - 23 to 60 inches: sand

Properties and qualities

Slope: 0 to 10 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 24 to 60 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Other vegetative classification: western hemlock/queencup beadlily (CN570),
western redcedar/queencup beadlily (PK530)

Hydric soil rating: No

103—Andic Dystrochrepts, alluvial terraces

Map Unit Setting

National map unit symbol: nvcq

Elevation: 2,000 to 3,500 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 43 to 46 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Andic dystrochrepts and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Andic Dystrochrepts

Setting

Landform: Stream terraces

Parent material: Mixed sandy and gravelly alluvium

Typical profile

Bs - 1 to 8 inches: gravelly silt loam

2A - 8 to 21 inches: very gravelly fine sandy loam

2Bw - 21 to 42 inches: very gravelly fine sandy loam

2Cd - 42 to 62 inches: very cobbly loamy sand

Properties and qualities

Slope: 0 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Other vegetative classification: western redcedar/queencup beadlily (PK530),
western hemlock/queencup beadlily (PK570)

Hydric soil rating: No

105—Aquic Udifluvents, poorly drained

Map Unit Setting

National map unit symbol: nvcs
Elevation: 2,000 to 4,000 feet
Mean annual precipitation: 20 to 24 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 70 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Aquic udifluvents and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aquic Udifluvents

Setting

Landform: Intermontane basins
Parent material: Stratified sandy and silty alluvium

Typical profile

A - 1 to 8 inches: silt loam
C1 - 8 to 20 inches: very gravelly sandy loam
2C2 - 20 to 25 inches: silt loam
2C3 - 25 to 60 inches: stratified fine sandy loam to silt loam to gravelly sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: No

108—Andic Dystric Eutrochrepts, lacustrine terraces-Andic Dystrochrepts, glacial outwash terraces, complex

Map Unit Setting

National map unit symbol: nvcz

Elevation: 2,000 to 4,000 feet

Mean annual precipitation: 15 to 50 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 90 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Andic dystric eutrochrept and similar soils: 60 percent

Andic dystrochrepts and similar soils: 40 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Andic Dystric Eutrochrept

Setting

Landform: Lake terraces

Parent material: Silty glaciolacustrine deposits

Typical profile

Bs - 1 to 10 inches: silt loam

2A - 10 to 15 inches: silt loam

2AB - 15 to 32 inches: silt loam

2Bw - 32 to 57 inches: very fine sandy loam

2BC - 57 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Other vegetative classification: western redcedar/queencup beadlily (PK530), western hemlock/queencup beadlily (PK570)

Hydric soil rating: No

Description of Andic Dystrochrepts

Setting

Landform: Outwash terraces

Parent material: Stratified sandy and gravelly outwash

Typical profile

Bs - 1 to 8 inches: gravelly silt loam

2A - 8 to 21 inches: very gravelly fine sandy loam

2Bw - 21 to 42 inches: very gravelly fine sandy loam

2Cd - 42 to 62 inches: very cobbly loamy sand

Properties and qualities

Slope: 0 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590), grand fir/queencup beadlily (PK520)

Hydric soil rating: No

112—Eutric Glossoboralfs, lacustrine terraces

Map Unit Setting

National map unit symbol: nvd6

Elevation: 2,200 to 3,600 feet

Mean annual precipitation: 25 to 30 inches

Mean annual air temperature: 42 to 45 degrees F

Frost-free period: 100 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Eutric glossoboralfs and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eutric Glossoboralfs

Setting

Landform: Terraces

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Calcareous silty and clayey glaciolacustrine sediments with very minor amounts of volcanic ash in the surface layer

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 8 inches: silty clay loam

B/E - 8 to 19 inches: silty clay loam

Bt - 19 to 31 inches: silty clay loam

C - 31 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Other vegetative classification: western redcedar/queencup beadlily (PK530), western hemlock/queencup beadlily (PK570)

Hydric soil rating: No

222E—Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2lwnm

Elevation: 3,520 to 4,800 feet

Mean annual precipitation: 22 to 28 inches

Mean annual air temperature: 38 to 45 degrees F

Frost-free period: 70 to 95 days

Farmland classification: Not prime farmland

Map Unit Composition

Pleasantvalley and similar soils: 50 percent

Winfall and similar soils: 20 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pleasantvalley

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Volcanic ash over till derived from quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 4 inches: gravelly ashy silt loam

Bw - 4 to 14 inches: gravelly ashy silt loam

2E - 14 to 26 inches: very cobbly silt loam

2E/Bw - 26 to 34 inches: very cobbly silt loam

2E/Bt - 34 to 60 inches: very cobbly silt loam

Properties and qualities

Slope: 8 to 30 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Description of Winfall

Setting

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Till

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 9 inches: gravelly loam

E and Bt - 9 to 60 inches: very gravelly loam

Properties and qualities

Slope: 8 to 30 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Minor Components

Courville, dry

Percent of map unit: 10 percent

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: Unranked

Courville

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: spruce/dwarf huckleberry (PK450), grand fir/twinflower (PK590)

Hydric soil rating: No

Glaciercreek

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/pinegrass-kinnikinnick phase (PK322), Douglas-fir/dwarf huckleberry (PK250)

Hydric soil rating: No

Combest

Percent of map unit: 3 percent

Landform: Mountain slopes

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/pinegrass-kinnikinnick phase (PK322)

Hydric soil rating: No

Sharrott

Percent of map unit: 2 percent

Landform: Ridges

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Other vegetative classification: Douglas-fir/rough fescue (PK230)

Hydric soil rating: No

252—Andic Dystrochrepts, breaklands

Map Unit Setting

National map unit symbol: nvdw
Elevation: 3,100 to 5,000 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 105 days
Farmland classification: Not prime farmland

Map Unit Composition

Andic dystrochrepts and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Andic Dystrochrepts

Setting

Landform: Hillslopes
Parent material: Weathered metasedimentary loamy slope alluvium

Typical profile

Bs - 1 to 8 inches: gravelly silt loam
2A - 8 to 21 inches: very gravelly very fine sandy loam
2Bw - 21 to 42 inches: very gravelly very fine sandy loam
2Cd - 42 to 62 inches: extremely gravelly fine sandy loam

Properties and qualities

Slope: 60 to 80 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: western redcedar/queencup beadlily (PK530), western hemlock/queencup beadlily (PK570), Douglas-fir/ninebark (PK260)
Hydric soil rating: No

301—Dystric Eutrochrepts, glaciated mountain slopes

Map Unit Setting

National map unit symbol: nvdz
Elevation: 2,400 to 3,800 feet
Mean annual precipitation: 25 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Dystric eutrochrept and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dystric Eutrochrept

Setting

Landform: Mountain slopes
Parent material: Alpine loamy till over dense glaciofluvial deposits

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 12 inches: gravelly silt loam
Bw - 12 to 29 inches: very gravelly fine sandy loam
Bt - 29 to 40 inches: very gravelly fine sandy loam
2Cd - 40 to 60 inches: very gravelly fine sandy loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Other vegetative classification: Douglas-fir/snowberry (PK310)
Hydric soil rating: No

302—Typic Ustochrepts, glaciated mountain slopes, steep

Map Unit Setting

National map unit symbol: nvff
Elevation: 3,000 to 4,200 feet
Mean annual precipitation: 25 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Typic ustochrept and similar soils: 80 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Typic Ustochrept

Setting

Landform: Mountain slopes
Parent material: Alpine loamy till over dense glaciofluvial deposits

Typical profile

Oi - 0 to 0 inches: slightly decomposed plant material
A - 0 to 8 inches: very gravelly very fine sandy loam
Bw - 8 to 28 inches: very gravelly very fine sandy loam
2Cd - 28 to 60 inches: very gravelly very fine sandy loam

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Other vegetative classification: Douglas-fir/snowberry (PK310)
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent

303—Rock outcrop-Lithic Ustochrepts complex, glaciated mountain ridges

Map Unit Setting

National map unit symbol: nvjf
Elevation: 3,500 to 4,700 feet
Mean annual precipitation: 25 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
Lithic ustochrept and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lithic Ustochrept

Setting

Landform: Ridges
Parent material: Alpine loamy till over residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 7 inches: very cobbly sandy loam
Bw1 - 7 to 13 inches: very cobbly sandy loam
Bw2 - 13 to 19 inches: extremely cobbly fine sandy loam
R - 19 to 29 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: 4 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Other vegetative classification: Douglas-fir/bluebunch wheatgrass (PK210)
Hydric soil rating: No

352—Andic Dystrochrepts, glaciated mountain slopes

Map Unit Setting

National map unit symbol: nvrj
Elevation: 2,200 to 5,600 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 105 days
Farmland classification: Not prime farmland

Map Unit Composition

Andic dystrochrepts and similar soils: 75 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Andic Dystrochrepts

Setting

Landform: Mountain slopes
Parent material: Loamy till over dense basal till

Typical profile

Bs - 1 to 8 inches: gravelly silt loam
2A - 8 to 21 inches: very gravelly very fine sandy loam
2Bw - 21 to 42 inches: very gravelly very fine sandy loam
2Cd - 42 to 60 inches: very gravelly very fine sandy loam

Properties and qualities

Slope: 20 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: western hemlock/queencup beadlily (PK570), western redcedar/queencup beadlily (PK530), subalpine fir/queencup beadlily (PK620)
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Sanders and Parts of Lincoln and Flathead Counties, Montana

6A—Murrstead mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 57m0
Elevation: 2,300 to 3,800 feet
Mean annual precipitation: 24 to 34 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Murrstead and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Murrstead

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material

Typical profile

Oe1 - 0 to 12 inches: mucky peat
Oe/C - 12 to 21 inches: stratified mucky peat to mucky silt loam
Oe2 - 21 to 46 inches: mucky peat
Cg - 46 to 54 inches: stratified very fine sandy loam to silt
O'e - 54 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Very high (about 18.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

Minor Components

McLangor

Percent of map unit: 7 percent
Landform: Flood plains
Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)

Hydric soil rating: Yes

Meadowpeak

Percent of map unit: 3 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Subirrigated (Sb) 20"+ p.z. (R043XW155MT)

Hydric soil rating: Yes

12C—Auggie silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 5748

Elevation: 3,400 to 4,400 feet

Mean annual precipitation: 24 to 36 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 40 to 105 days

Farmland classification: Not prime farmland

Map Unit Composition

Auggie and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Auggie

Setting

Landform: Lake terraces, lake plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Lacustrine deposits

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

E - 2 to 10 inches: silt loam

Bt/E - 10 to 30 inches: silt loam

Bt - 30 to 48 inches: silty clay loam

C - 48 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Other vegetative classification: subalpine fir/queencup beadlily-dwarf huckleberry phase (PK623)
Hydric soil rating: No

Minor Components

Ashworth

Percent of map unit: 5 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

Half moon

Percent of map unit: 5 percent
Landform: Lake plains, lake terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250)
Hydric soil rating: No

22C—Courville gravelly ashy silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 5777
Elevation: 3,000 to 7,000 feet
Mean annual precipitation: 25 to 50 inches
Mean annual air temperature: 37 to 43 degrees F
Frost-free period: 30 to 90 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Courville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Courville

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 18 inches: gravelly ashy silt loam
2E - 18 to 40 inches: very gravelly loam
2E/Bw - 40 to 60 inches: very gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/queencup beadlily-beargrass phase (PK523), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Minor Components

Courville, greater slope

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily-beargrass phase (PK523), grand fir/twinflower (PK590), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Waldbillig

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/beargrass-blue huckleberry phase (PK691)
Hydric soil rating: No

30F—Tevis gravelly loam, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: 579c

Elevation: 3,300 to 6,000 feet
Mean annual precipitation: 24 to 30 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 40 to 95 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Tevis

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 9 inches: gravelly loam
E/Bw - 9 to 22 inches: extremely gravelly loam
C - 22 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Other vegetative classification: Douglas-fir/blue huckleberry-kinnikinnick phase (PK282), grand fir/twinflower-twinflower phase (PK591)
Hydric soil rating: No

Minor Components

Winkler

Percent of map unit: 5 percent
Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/bluebunch wheatgrass (PK210), Douglas-fir/rough fescue (PK230), Douglas-fir/snowberry-pinegrass phase (PK312)
Hydric soil rating: No

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Holloway

Percent of map unit: 5 percent
Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: subalpine fir/twinflower-beargrass phase (PK662),
subalpine fir/beargrass-blue huckleberry phase (PK691)
Hydric soil rating: No

32G—Mitten-Rubble land complex, 40 to 70 percent slopes

Map Unit Setting

National map unit symbol: 579w
Elevation: 4,200 to 7,000 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 20 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Mitten and similar soils: 55 percent
Rubble land: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mitten

Setting

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over colluvium

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 9 inches: gravelly ashy silt loam
2E - 9 to 25 inches: very gravelly loam
2E/Bw - 25 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 40 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/beargrass (PK510), grand fir/twinflower-twinflower phase (PK591), grand fir/twinflower-beargrass phase (PK592)

Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 9 percent

Hydric soil rating: No

Holloway

Percent of map unit: 6 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/twinflower-beargrass phase (PK662), subalpine fir/beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

33F—Mitten gravelly ashy silt loam, dry, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: 579z

Elevation: 3,300 to 6,000 feet

Mean annual precipitation: 25 to 40 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Mitten and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mitten

Setting

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over colluvium

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 12 inches: gravelly ashy silt loam
2E - 12 to 30 inches: very gravelly loam
2E/Bw - 30 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: Douglas-fir/ninebark-pinegrass phase (PK262), Douglas-fir/pinegrass-pinegrass phase (PK323)
Hydric soil rating: No

Minor Components

Tewis

Percent of map unit: 5 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark-ninebark phase (PK261), Douglas-fir/snowberry-pinegrass phase (PK312)
Hydric soil rating: No

Rubble land

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

35E—Courville gravelly ashy silt loam, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57bl
Elevation: 3,000 to 7,000 feet
Mean annual precipitation: 25 to 50 inches
Mean annual air temperature: 37 to 43 degrees F

Frost-free period: 30 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Courville and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Courville

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 10 inches: gravelly ashy silt loam
2E - 10 to 34 inches: very gravelly loam
2E/Bw - 34 to 60 inches: very gravelly loam

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/queencup beadlily-beargrass phase (PK523), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Minor Components

Courville, greater slope

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily-beargrass phase (PK523), grand fir/twinflower (PK590), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Waldbillig

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

35F—Courville gravelly ashy silt loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 57bm

Elevation: 3,000 to 7,000 feet

Mean annual precipitation: 22 to 50 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 30 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Courville and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Courville

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

Bw - 2 to 10 inches: gravelly ashy silt loam

2E - 10 to 34 inches: very gravelly loam

2E/Bw - 34 to 60 inches: very gravelly loam

Properties and qualities

Slope: 30 to 50 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Waldbillig

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/
beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

Winfall

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/blue huckleberry-kinnikinnick phase
(PK282), grand fir/twinflower (PK590), grand fir/twinflower-beargrass phase
(PK592)

Hydric soil rating: No

36E—Rumblecreek gravelly loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57bv

Elevation: 3,000 to 6,200 feet

Mean annual precipitation: 18 to 45 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 30 to 105 days

Farmland classification: Not prime farmland

Map Unit Composition

Rumblecreek and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumblecreek

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alpine till or drift derived from argillite or quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 9 inches: gravelly loam

E/Bt - 9 to 23 inches: gravelly loam

Bt - 23 to 60 inches: very gravelly clay loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Other vegetative classification: grand fir/twinflower-twinflower phase (PK591), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Minor Components

Wildgen

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/ninebark-ninebark phase (PK261), Douglas-fir/pinegrass-kinnikinnick phase (PK322)
Hydric soil rating: No

Bata

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: subalpine fir/queencup beadlily (PK620)
Hydric soil rating: No

Beeskove

Percent of map unit: 5 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark (PK260)
Hydric soil rating: No

40F—Holloway gravelly ashy silt loam, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: 57cr
Elevation: 3,800 to 7,000 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 37 to 43 degrees F
Frost-free period: 20 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Holloway

Setting

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over colluvium derived from argillite or quartzite

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 11 inches: gravelly ashy silt loam
2E - 11 to 23 inches: extremely gravelly fine sandy loam
2E/Bw - 23 to 43 inches: extremely gravelly fine sandy loam
2C - 43 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/beargrass-grouse whortleberry phase (PK692)
Hydric soil rating: No

Minor Components

Waldbillig

Percent of map unit: 4 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/
beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

Holloway, greater slope

Percent of map unit: 4 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/twinflower-beargrass phase (PK662),
subalpine fir/beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

Holloway, cool

Percent of map unit: 4 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Rubble land

Percent of map unit: 2 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent

Hydric soil rating: No

48E—Ashworth gravelly ashy silt loam, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57fz

Elevation: 2,800 to 4,400 feet

Mean annual precipitation: 12 to 36 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 40 to 115 days

Farmland classification: Not prime farmland

Map Unit Composition

Ashworth and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ashworth

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Bw - 1 to 11 inches: gravelly ashy silt loam
2E - 11 to 21 inches: gravelly loam
2Bk - 21 to 51 inches: very gravelly loam
2C - 51 to 60 inches: very cobbly sandy loam

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: Unranked

Minor Components

Ashworth, greater slope

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

Mollman

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Droughty (SiDr) 15-19" p.z. (R044XW186MT)
Hydric soil rating: No

Auggie

Percent of map unit: 2 percent
Landform: Lake terraces

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

58F—Waldbillig gravelly ashy silt loam, moist, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 57jg
Elevation: 3,200 to 7,000 feet
Mean annual precipitation: 30 to 60 inches
Mean annual air temperature: 37 to 43 degrees F
Frost-free period: 20 to 60 days
Farmland classification: Not prime farmland

Map Unit Composition

Waldbillig and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Waldbillig

Setting

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 12 inches: gravelly ashy silt loam
2E - 12 to 28 inches: very gravelly fine sandy loam
2E/Bw - 28 to 60 inches: very gravelly loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

Minor Components

Waldbillig, greater slope

Percent of map unit: 5 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/ beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

Holloway

Percent of map unit: 4 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: western hemlock/queencup beadlily (CN570), subalpine fir/queencup beadlily (PK620), mountain hemlock/smooth wood-rush-grouse whortleberry phase (PK841), mountain hemlock/smooth wood-rush-menziea phase (PK842)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent

Hydric soil rating: No

67C—Glaciercreek gravelly ashy silt loam, cool, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 57I5

Elevation: 2,000 to 4,200 feet

Mean annual precipitation: 22 to 30 inches

Mean annual air temperature: 38 to 45 degrees F

Frost-free period: 70 to 95 days

Farmland classification: Not prime farmland

Map Unit Composition

Glaciercreek and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glaciercreek

Setting

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

Bw - 1 to 15 inches: gravelly ashy silt loam

2C - 15 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Loonlake

Percent of map unit: 5 percent

Landform: Stream terraces, outwash terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520)

Hydric soil rating: No

Glaciercreek, greater slope

Percent of map unit: 5 percent

Landform: Outwash terraces, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)

Hydric soil rating: No

68C—Upsata gravelly ashy silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 57Id

Elevation: 2,200 to 5,000 feet

Mean annual precipitation: 22 to 36 inches

Mean annual air temperature: 36 to 45 degrees F

Frost-free period: 40 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Upsata and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upsata

Setting

Landform: Outwash plains, stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

Bw - 1 to 14 inches: gravelly ashy silt loam

2BC - 14 to 18 inches: gravelly fine sandy loam

2C - 18 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Other vegetative classification: subalpine fir/menziesia (PK670)

Hydric soil rating: No

Minor Components

Upsata, greater slope

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/menziesia (PK670)

Hydric soil rating: No

Tamarack

Percent of map unit: 3 percent

Landform: Stream terraces, outwash plains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Ashworth

Percent of map unit: 2 percent
Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

68E—Upsata gravelly ashy silt loam, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57Ig
Elevation: 2,200 to 5,000 feet
Mean annual precipitation: 22 to 36 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 40 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Upsata and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upsata

Setting

Landform: Outwash plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Bw - 1 to 14 inches: gravelly ashy silt loam
2BC - 14 to 18 inches: gravelly fine sandy loam
2C - 18 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: subalpine fir/menziesia (PK670)
Hydric soil rating: No

Minor Components

Upsata, greater slope

Percent of map unit: 5 percent
Landform: Outwash plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: subalpine fir/menziesia (PK670)
Hydric soil rating: No

Tamarack

Percent of map unit: 3 percent
Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Ashworth

Percent of map unit: 2 percent
Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

69C—Tamarack ashy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 57ly
Elevation: 2,000 to 4,200 feet
Mean annual precipitation: 22 to 34 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tamarack and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tamarack

Setting

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

Bw - 2 to 12 inches: ashy loam

2E and Bt - 12 to 44 inches: loamy coarse sand

2C - 44 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Glaciercreek

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)

Hydric soil rating: No

Tamarack, greater slope

Percent of map unit: 5 percent

Landform: Stream terraces, outwash plains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

72A—Blacklake mucky peat, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 57md
Elevation: 2,200 to 3,800 feet
Mean annual precipitation: 24 to 34 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Blacklake and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blacklake

Setting

Landform: Closed depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Oe - 0 to 9 inches: mucky peat
Oe/C - 9 to 14 inches: stratified mucky peat to mucky silt loam
C/Oa - 14 to 31 inches: stratified muck to mucky silt loam
C - 31 to 60 inches: stratified very fine sandy loam to silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

Minor Components

McLangor

Percent of map unit: 8 percent
Landform: Closed depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

Meadowpeak

Percent of map unit: 2 percent
Landform: Closed depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Subirrigated (Sb) 20"+ p.z. (R043XW155MT)
Hydric soil rating: Yes

73A—Meadowpeak silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 57mm
Elevation: 2,200 to 3,800 feet
Mean annual precipitation: 24 to 34 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Meadowpeak

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 4 inches: silt loam
C1 - 4 to 25 inches: silt loam
C2 - 25 to 34 inches: stratified loam to silt loam
C3 - 34 to 60 inches: stratified very fine sandy loam to silt

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

Minor Components

Meadowpeak, freq flooded

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

Firetower

Percent of map unit: 5 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Blacklake

Percent of map unit: 5 percent
Landform: Closed depressions on flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

74A—Blackcreek silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 57mp
Elevation: 2,300 to 3,800 feet
Mean annual precipitation: 24 to 34 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Farmland of local importance

Map Unit Composition

Blackcreek and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blackcreek

Setting

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 4 inches: silt loam

Bw - 4 to 10 inches: silt loam

Bk - 10 to 36 inches: silt loam

C1 - 36 to 42 inches: silt

2C2 - 42 to 60 inches: loamy coarse sand, silt

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 12 to 48 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C

Other vegetative classification: spruce/common horsetail (PK410)

Hydric soil rating: Yes

Minor Components

Tallcreek

Percent of map unit: 5 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: spruce/queencup beadlily (PK420)

Hydric soil rating: No

Meadowpeak

Percent of map unit: 4 percent

Landform: Closed depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Subirrigated (Sb) 20"+ p.z. (R043XW155MT)

Hydric soil rating: Yes

Blackcreek, greater slope

Percent of map unit: 1 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: spruce/common horsetail (PK410)

Hydric soil rating: Yes

75B—Tallcreek ashy silt loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 57mr

Elevation: 3,300 to 3,800 feet

Mean annual precipitation: 24 to 30 inches

Mean annual air temperature: 38 to 42 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tallcreek and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tallcreek

Setting

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over glaciolacustrine deposits

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 5 inches: ashy silt loam

Bw - 5 to 19 inches: ashy silt loam

Bk - 19 to 29 inches: silt loam

C1 - 29 to 43 inches: silty clay loam

C2 - 43 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Other vegetative classification: spruce/queencup beadlily (PK420)

Hydric soil rating: No

Minor Components

Blackcreek

Percent of map unit: 7 percent

Landform: Flood plains

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: spruce/common horsetail (PK410)

Hydric soil rating: Yes

Tallcreek, greater slope

Percent of map unit: 3 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: spruce/queencup beadlily (PK420)

Hydric soil rating: No

77E—Beeskove gravelly loam, moist, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 57n2

Elevation: 3,600 to 6,000 feet

Mean annual precipitation: 25 to 50 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 30 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Beeskove and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beeskove

Setting

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from calcareous argillite or quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 9 inches: gravelly loam
E/Bw - 9 to 24 inches: very gravelly loam
Bw - 24 to 41 inches: very gravelly loam
Bk - 41 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Minor Components

Beeskove, bouldery

Percent of map unit: 3 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent

Beeskove, greater slope

Percent of map unit: 2 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590), grand fir/twinflower-beargrass phase (PK592)
Hydric soil rating: No

Felan

Percent of map unit: 2 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear

Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

77F—Beeskove gravelly loam, moist, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: 57n4
Elevation: 4,200 to 6,000 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Beeskove and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beeskove

Setting

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from calcareous argillite or quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 9 inches: gravelly loam
E/Bw - 9 to 24 inches: very gravelly loam
Bw - 24 to 41 inches: very gravelly loam
Bk - 41 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

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

Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/

twinflower (PK590), grand fir/twinflower-beargrass phase (PK592)

Hydric soil rating: No

Minor Components

Mitten

Percent of map unit: 5 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/beargrass (PK510), grand fir/twinflower-twinflower phase (PK591), grand fir/twinflower-beargrass phase (PK592)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

82F—Sharrott, cool-Rock outcrop-Rubble land complex, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: 57p9

Elevation: 3,000 to 5,600 feet

Mean annual precipitation: 17 to 30 inches

Mean annual air temperature: 43 to 45 degrees F

Frost-free period: 70 to 100 days

Farmland classification: Not prime farmland

Map Unit Composition

Sharrott and similar soils: 45 percent

Rock outcrop: 25 percent

Rubble land: 20 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sharrott

Setting

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium or residuum derived from argillite or quartzite

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 3 inches: gravelly loam

Bw - 3 to 7 inches: very gravelly loam

BC - 7 to 16 inches: extremely gravelly loam

R - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Other vegetative classification: Douglas-fir/ninebark-ninebark phase (PK261), Douglas-fir/pinegrass-ponderosa pine phase (PK324)
Hydric soil rating: No

Minor Components

Winkler, cool

Percent of map unit: 10 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark-ninebark phase (PK261), Douglas-fir/pinegrass-ponderosa pine phase (PK324)
Hydric soil rating: No

92C—Oldtrail gravelly sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 57r6
Elevation: 2,200 to 3,500 feet
Mean annual precipitation: 10 to 34 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 115 days
Farmland classification: Not prime farmland

Map Unit Composition

Oldtrail and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oldtrail

Setting

Landform: Drainageways
Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 4 inches: gravelly sandy loam

C1 - 4 to 12 inches: extremely gravelly loamy coarse sand

C2 - 12 to 60 inches: extremely cobbly loamy coarse sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): 7s

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: Unranked

Minor Components

Gardencreek

Percent of map unit: 4 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R044XW124MT)

Hydric soil rating: Yes

Oldtrail, cobbly

Percent of map unit: 4 percent

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Riverwash

Percent of map unit: 2 percent

98F—Bendahl gravelly ashy silt loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 57s3

Elevation: 2,900 to 5,500 feet

Mean annual precipitation: 25 to 45 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Bendahl and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bendahl

Setting

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Bw - 1 to 8 inches: gravelly ashy silt loam
2E/Bw - 8 to 28 inches: very gravelly loam
2Bk - 28 to 60 inches: very gravelly loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/queencup beadlily (PK520)
Hydric soil rating: Unranked

Minor Components

Mollman

Percent of map unit: 5 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark (PK260)
Hydric soil rating: No

Bendahl, greater slope

Percent of map unit: 5 percent

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520)
Hydric soil rating: No

291B—Half Moon silt loam, cool, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 578t
Elevation: 2,300 to 4,800 feet
Mean annual precipitation: 18 to 40 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 50 to 105 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Half Moon

Setting

Landform: Lake terraces, lake plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
E/Bt - 2 to 16 inches: silt loam
Bt - 16 to 28 inches: silty clay loam
Bk - 28 to 37 inches: silt loam
C - 37 to 60 inches: stratified very fine sandy loam to silty clay

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Whitepine

Percent of map unit: 7 percent
Landform: Lake terraces, lake plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark-pinegrass phase (PK262), grand fir/twinflower (PK590)
Hydric soil rating: No

Rumblecreek

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/dwarf huckleberry (PK250), Douglas-fir/blue huckleberry-kinnikinnick phase (PK282)
Hydric soil rating: No

Half moon, greater slope

Percent of map unit: 3 percent
Landform: Lake terraces, lake plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Auggie

Percent of map unit: 2 percent
Landform: Lake terraces, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

291D—Half Moon silt loam, cool, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 578w

Elevation: 2,500 to 4,500 feet
Mean annual precipitation: 14 to 35 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 50 to 120 days
Farmland classification: Farmland of local importance

Map Unit Composition

Half moon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Half Moon

Setting

Landform: Lake terraces, lake plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
E/Bt - 2 to 16 inches: silt loam
Bt - 16 to 28 inches: silty clay loam
Bk - 28 to 37 inches: silt loam
C - 37 to 60 inches: stratified very fine sandy loam to silty clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Auggie

Percent of map unit: 3 percent
Landform: Lake terraces, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Crystalex

Percent of map unit: 3 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Glaciercreek

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 15-19" p.z. (R044XW184MT)
Hydric soil rating: No

Half moon, greater slope

Percent of map unit: 2 percent
Landform: Lake terraces, lake plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

291E—Half Moon silt loam, cool, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: 578y
Elevation: 2,500 to 4,500 feet
Mean annual precipitation: 18 to 35 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 50 to 105 days
Farmland classification: Not prime farmland

Map Unit Composition

Half moon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Half Moon

Setting

Landform: Lake terraces, lake plains
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
E/Bt - 2 to 16 inches: silt loam
Bt - 16 to 28 inches: silty clay loam
Bk - 28 to 37 inches: silt loam
C - 37 to 60 inches: stratified very fine sandy loam to silty clay

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Auggie

Percent of map unit: 5 percent
Landform: Lake terraces, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Half moon, greater slope

Percent of map unit: 5 percent
Landform: Lake terraces, lake plains
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

291F—Half Moon silt loam, cool, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: 5790
Elevation: 2,200 to 4,500 feet
Mean annual precipitation: 18 to 35 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 50 to 105 days
Farmland classification: Not prime farmland

Map Unit Composition

Half moon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Half Moon

Setting

Landform: Lake terraces, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
E/Bt - 2 to 16 inches: silt loam
Bt - 16 to 28 inches: silty clay loam
Bk - 28 to 37 inches: silt loam
C - 37 to 60 inches: stratified very fine sandy loam to silty clay

Properties and qualities

Slope: 35 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Auggie

Percent of map unit: 7 percent
Landform: Lake terraces, lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Tamarack

Percent of map unit: 3 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

374F—Mitten-Rock outcrop complex, 40 to 70 percent slopes

Map Unit Setting

National map unit symbol: 57c1
Elevation: 3,000 to 6,000 feet
Mean annual precipitation: 17 to 40 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Mitten

Setting

Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over colluvium

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 9 inches: gravelly ashy silt loam
2E - 9 to 23 inches: very gravelly loam
2E/Bw - 23 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 40 to 70 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Other vegetative classification: Douglas-fir/ninebark-pinegrass phase (PK262)

Hydric soil rating: No

Minor Components

Sharrott

Percent of map unit: 5 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Douglas-fir/ninebark-ninebark phase (PK261),

Douglas-fir/pinegrass-ponderosa pine phase (PK324)

Hydric soil rating: No

Mitten, lesser slope

Percent of map unit: 5 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/beargrass (PK510), grand fir/twinflower-twinflower phase (PK591), grand fir/twinflower-beargrass phase (PK592)

Hydric soil rating: No

582F—Waldbillig-Holloway gravelly ashy silt loams, moist, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 57j8

Elevation: 3,200 to 7,000 feet

Mean annual precipitation: 28 to 60 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 20 to 70 days

Farmland classification: Not prime farmland

Map Unit Composition

Waldbillig and similar soils: 50 percent

Holloway and similar soils: 40 percent

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

Description of Waldbillig

Setting

*Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over till or drift*

Typical profile

*Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 12 inches: gravelly ashy silt loam
2E - 12 to 28 inches: very gravelly fine sandy loam
2E/Bw - 28 to 60 inches: very gravelly loam*

Properties and qualities

*Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.8 inches)*

Interpretive groups

*Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No*

Description of Holloway

Setting

*Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over colluvium derived from argillite or quartzite*

Typical profile

*Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 12 inches: gravelly ashy silt loam
2E - 12 to 19 inches: extremely gravelly fine sandy loam
2E/Bw - 19 to 54 inches: extremely gravelly fine sandy loam
2C - 54 to 60 inches: extremely gravelly sandy loam*

Properties and qualities

*Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None*

Frequency of ponding: None

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/beargrass-grouse whortleberry phase (PK692)

Hydric soil rating: No

Minor Components

Waldbillig, greater slope

Percent of map unit: 4 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: subalpine fir/menziesia (PK670), subalpine fir/beargrass-blue huckleberry phase (PK691)

Hydric soil rating: No

Ashworth

Percent of map unit: 3 percent

Landform: Mountains

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: western hemlock/queencup beadlily (CN570)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent

Hydric soil rating: No

691B—Tamarack-Crystalex complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 57II

Elevation: 2,000 to 4,200 feet

Mean annual precipitation: 22 to 34 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Farmland of local importance

Map Unit Composition

Tamarack and similar soils: 50 percent

Crystalex and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tamarack

Setting

Landform: Stream terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 12 inches: ashy loam
2E and Bt - 12 to 44 inches: loamy coarse sand
2C - 44 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Description of Crystalex

Setting

Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 22 inches: loamy coarse sand
E and Bt - 22 to 60 inches: stratified loamy sand to sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Tamarack, greater slope

Percent of map unit: 5 percent
Landform: Outwash plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Glaciercreek

Percent of map unit: 5 percent
Landform: Stream terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

691D—Tamarack-Crystalex complex, 4 to 15 percent slopes

Map Unit Setting

National map unit symbol: 57In
Elevation: 2,000 to 4,500 feet
Mean annual precipitation: 18 to 34 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 105 days
Farmland classification: Farmland of local importance

Map Unit Composition

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

Description of Tamarack

Setting

Landform: Outwash plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

Bw - 2 to 12 inches: ashy loam

2E and Bt - 12 to 44 inches: loamy coarse sand

2C - 44 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 4 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Description of Crystalex

Setting

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

E - 1 to 22 inches: loamy coarse sand

E and Bt - 22 to 60 inches: stratified loamy sand to sandy loam

Properties and qualities

Slope: 4 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Glaciercreek

Percent of map unit: 4 percent
Landform: Stream terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

Tamarack, greater slope

Percent of map unit: 3 percent
Landform: Outwash plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Half moon

Percent of map unit: 3 percent
Landform: Lake terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520), grand fir/twinflower (PK590)
Hydric soil rating: No

691E—Tamarack-Crystalex complex, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57lq
Elevation: 2,200 to 3,800 feet
Mean annual precipitation: 14 to 34 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 70 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Tamarack

Setting

Landform: Outwash plains, stream terraces

Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Bw - 2 to 12 inches: ashy loam
2E and Bt - 12 to 44 inches: loamy coarse sand
2C - 44 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Description of Crystalex

Setting

Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 22 inches: loamy coarse sand
E and Bt - 22 to 60 inches: stratified loamy sand to sandy loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Crystalex, greater slope

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Glaciercreek

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 15-19" p.z. (R044XW184MT)

Hydric soil rating: No

691F—Tamarack-Crystalex complex, 30 to 60 percent slopes

Map Unit Setting

National map unit symbol: 57ls

Elevation: 2,200 to 3,800 feet

Mean annual precipitation: 24 to 34 inches

Mean annual air temperature: 43 to 45 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Tamarack and similar soils: 50 percent

Crystalex and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tamarack

Setting

Landform: Outwash plains, stream terraces

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

Bw - 2 to 12 inches: ashy loam

2E and Bt - 12 to 44 inches: loamy coarse sand

2C - 44 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Description of Crystalex

Setting

Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 22 inches: loamy coarse sand
E and Bt - 22 to 60 inches: stratified loamy sand to sandy loam

Properties and qualities

Slope: 30 to 60 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Crystalex, greater slope

Percent of map unit: 5 percent
Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Glaciercreek

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

731A—Meadowpeak-Firetower silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 57mh

Elevation: 2,200 to 3,800 feet

Mean annual precipitation: 24 to 34 inches

Mean annual air temperature: 43 to 45 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Farmland of local importance

Map Unit Composition

Meadowpeak and similar soils: 60 percent

Firetower and similar soils: 30 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meadowpeak

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 4 inches: silt loam

C1 - 4 to 25 inches: silt loam

C2 - 25 to 34 inches: stratified loam to silt loam

C3 - 34 to 60 inches: stratified very fine sandy loam to silt

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 12 to 24 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: Subirrigated (Sb) 20"+ p.z. (R043XW155MT)
Hydric soil rating: Yes

Description of Firetower

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: silt loam
Bw - 6 to 42 inches: silt loam
C - 42 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Blacklake

Percent of map unit: 5 percent
Landform: Closed depressions on flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)
Hydric soil rating: Yes

Tallcreek

Percent of map unit: 3 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: spruce/queencup beadlily (PK420)
Hydric soil rating: No

Firetower, greater slope

Percent of map unit: 2 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

808A—Barzee mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 57nv

Elevation: 3,200 to 3,800 feet

Mean annual precipitation: 24 to 30 inches

Mean annual air temperature: 39 to 43 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Barzee and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barzee

Setting

Landform: Closed depressions on moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Organic material

Typical profile

Oi - 0 to 4 inches: mucky peat

Oe - 4 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: Very high (about 20.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)

Hydric soil rating: Yes

Minor Components

Murrstead

Percent of map unit: 5 percent

Landform: Closed depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)

Hydric soil rating: Yes

McLangor

Percent of map unit: 5 percent

Landform: Closed depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Wet Meadow (WM) 20"+ p.z. (R043XW154MT)

Hydric soil rating: Yes

858E—Waldbillig gravelly ashy silt loam, moist, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57ps

Elevation: 3,800 to 5,600 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 37 to 43 degrees F

Frost-free period: 30 to 60 days

Farmland classification: Not prime farmland

Map Unit Composition

Waldbillig and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Waldbillig

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over till or drift

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

Bw - 2 to 12 inches: gravelly ashy silt loam

2E - 12 to 28 inches: very gravelly fine sandy loam

2E/Bw - 28 to 60 inches: very gravelly loam

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

Minor Components

Waldbillig, greater slope

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: No

Ashworth

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: western hemlock/queencup beadlily (CN570)
Hydric soil rating: Unranked

867E—Glaciercreek gravelly ashy silt loam, cool, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57q2
Elevation: 2,000 to 4,200 feet
Mean annual precipitation: 22 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Glaciercreek and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glaciercreek

Setting

Landform: Stream terraces, outwash plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

Bw - 1 to 15 inches: gravelly ashy silt loam

2C - 15 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 8 to 30 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Glaciercreek, greater slope

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Loonlake

Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/queencup beadlily (PK520)

Hydric soil rating: No

867F—Glaciercreek gravelly ashy silt loam, cool, 30 to 45 percent slopes

Map Unit Setting

National map unit symbol: 57q3
Elevation: 2,000 to 4,200 feet
Mean annual precipitation: 22 to 30 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Glaciercreek and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glaciercreek

Setting

Landform: Stream terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash over alluvium or outwash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Bw - 1 to 15 inches: gravelly ashy silt loam
2C - 15 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 30 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Glaciercreek, greater slope
Percent of map unit: 5 percent

Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Tamarack

Percent of map unit: 5 percent
Landform: Outwash plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

897C—Mollman gravelly loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 57qs
Elevation: 2,900 to 5,500 feet
Mean annual precipitation: 25 to 45 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 40 to 90 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Mollman and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mollman

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alpine till or glacial drift

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 11 inches: gravelly loam
E/Bw - 11 to 21 inches: very gravelly loam
Bk - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 35 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Minor Components

Mollman, greater slope

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: grand fir/twinflower (PK590)

Hydric soil rating: No

Ashworth

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: western hemlock/queencup beadlily (CN570)

Hydric soil rating: No

897E—Mollman gravelly loam, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: 57qt

Elevation: 2,900 to 5,500 feet

Mean annual precipitation: 25 to 45 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 70 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Mollman and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mollman

Setting

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alpine till or glacial drift

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 11 inches: gravelly loam
E/Bw - 11 to 21 inches: very gravelly loam
Bk - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Minor Components

Mollman, greater slope

Percent of map unit: 5 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/twinflower (PK590)
Hydric soil rating: No

Bendahl

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: grand fir/queencup beadlily (PK520)
Hydric soil rating: Unranked

Mollman, dry

Percent of map unit: 2 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Douglas-fir/ninebark (PK260)
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

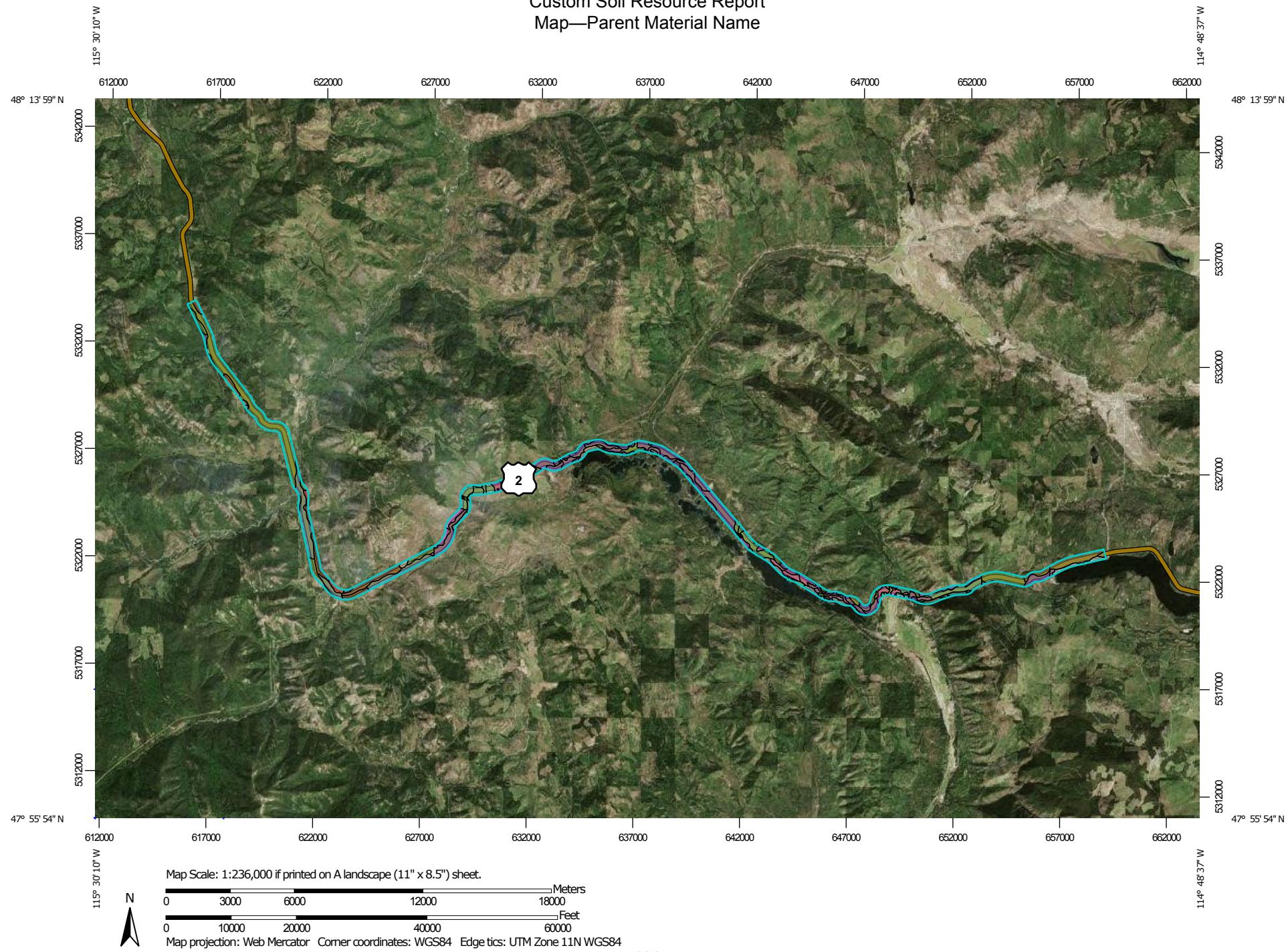
Parent Material Name

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report
Map—Parent Material Name



Custom Soil Resource Report



MAP INFORMATION

-  organic material
-  silty glaciolacustrine deposits
-  stratified sandy and silty alluvium
-  volcanic ash over alluvium or outwash
-  volcanic ash over colluvium
-  volcanic ash over colluvium derived from argillite or quartzite
-  volcanic ash over glaciolacustrine deposits
-  volcanic ash over till derived from quartzite
-  volcanic ash over till or drift
-  weathered metasedimentary loamy slope alluvium
-  Not rated or not available

Background

-  Major Roads
-  Local Roads
-  Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Flathead County Area and Part of Lincoln County, Montana
 Survey Area Data: Version 11, Sep 19, 2016

Soil Survey Area: Kootenai National Forest Area, Montana-Idaho
 Survey Area Data: Version 15, Sep 20, 2016

Soil Survey Area: Sanders and Parts of Lincoln and Flathead Counties, Montana
 Survey Area Data: Version 17, Sep 20, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

MAP INFORMATION

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name

Parent Material Name— Summary by Map Unit — Flathead County Area and Part of Lincoln County, Montana (MT618)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
67C	Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes	volcanic ash over alluvium or outwash	15.3	0.2%
222C	Pleasantvalley-Winfall, dry complex, 2 to 8 percent slopes	volcanic ash over till derived from quartzite	14.5	0.2%
222E	Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes	volcanic ash over till derived from quartzite	200.7	3.0%
W	Water		78.4	1.2%
Subtotals for Soil Survey Area			308.9	4.6%
Totals for Area of Interest			6,650.2	100.0%

Parent Material Name— Summary by Map Unit — Kootenai National Forest Area, Montana-Idaho (MT634)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
67C	Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes	volcanic ash over alluvium or outwash	87.0	1.3%
101	Fluvents, flood plains	mixed alluvium	588.4	8.8%
103	Andic Dystrochrepts, alluvial terraces	mixed sandy and gravelly alluvium	5.3	0.1%
105	Aquic Udifluvents, poorly drained	stratified sandy and silty alluvium	162.2	2.4%
108	Andic Dystric Eutrochrepts, lacustrine terraces- Andic Dystrochrepts, glacial outwash terraces, complex	silty glaciolacustrine deposits	1,313.9	19.8%
112	Eutric Glossoboralfs, lacustrine terraces	calcareous silty and clayey glaciolacustrine sediments with very minor amounts of volcanic ash in the surface layer	301.3	4.5%
222E	Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes	volcanic ash over till derived from quartzite	59.1	0.9%
252	Andic Dystrochrepts, breaklands	weathered metasedimentary loamy slope alluvium	71.8	1.1%
301	Dystric Eutrochrepts, glaciated mountain slopes	alpine loamy till over dense glaciofluvial deposits	38.5	0.6%
302	Typic Ustochrepts, glaciated mountain slopes, steep	alpine loamy till over dense glaciofluvial deposits	25.4	0.4%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Kootenai National Forest Area, Montana-Idaho (MT634)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
303	Rock outcrop-Lithic Ustochrepts complex, glaciated mountain ridges		22.2	0.3%
352	Andic Dystrochrepts, glaciated mountain slopes	loamy till over dense basal till	62.1	0.9%
W	Water		5.7	0.1%
Subtotals for Soil Survey Area			2,743.0	41.2%
Totals for Area of Interest			6,650.2	100.0%

Parent Material Name— Summary by Map Unit — Sanders and Parts of Lincoln and Flathead Counties, Montana (MT651)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6A	Murrstead mucky peat, 0 to 2 percent slopes	organic material	15.5	0.2%
12C	Auggie silt loam, 2 to 8 percent slopes	lacustrine deposits	3.7	0.1%
22C	Courville gravelly ashy silt loam, 2 to 8 percent slopes	volcanic ash over till or drift	10.2	0.2%
30F	Tewis gravelly loam, 35 to 60 percent slopes	colluvium	13.4	0.2%
32G	Mitten-Rubble land complex, 40 to 70 percent slopes	volcanic ash over colluvium	40.2	0.6%
33F	Mitten gravelly ashy silt loam, dry, 35 to 60 percent slopes	volcanic ash over colluvium	7.5	0.1%
35E	Courville gravelly ashy silt loam, 8 to 30 percent slopes	volcanic ash over till or drift	223.9	3.4%
35F	Courville gravelly ashy silt loam, 30 to 50 percent slopes	volcanic ash over till or drift	78.3	1.2%
36E	Rumblecreek gravelly loam, 15 to 30 percent slopes	alpine till or drift derived from argillite or quartzite	3.3	0.0%
40F	Holloway gravelly ashy silt loam, 35 to 60 percent slopes	volcanic ash over colluvium derived from argillite or quartzite	2.5	0.0%
48E	Ashworth gravelly ashy silt loam, 8 to 30 percent slopes	volcanic ash over till or drift	31.8	0.5%
58F	Waldbillig gravelly ashy silt loam, moist, 30 to 50 percent slopes	volcanic ash over till or drift	48.9	0.7%
67C	Glaciercreek gravelly ashy silt loam, cool, 0 to 8 percent slopes	volcanic ash over alluvium or outwash	591.8	8.9%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Sanders and Parts of Lincoln and Flathead Counties, Montana (MT651)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
68C	Upsata gravelly ashy silt loam, 2 to 8 percent slopes	volcanic ash over alluvium or outwash	59.6	0.9%
68E	Upsata gravelly ashy silt loam, 8 to 30 percent slopes	volcanic ash over alluvium or outwash	24.8	0.4%
69C	Tamarack ashy loam, 2 to 8 percent slopes	volcanic ash over alluvium or outwash	33.4	0.5%
72A	Blacklake mucky peat, 0 to 1 percent slopes	alluvium	64.7	1.0%
73A	Meadowpeak silt loam, 0 to 2 percent slopes	alluvium	7.2	0.1%
74A	Blackcreek silt loam, 0 to 2 percent slopes	alluvium	18.2	0.3%
75B	Tallcreek ashy silt loam, 0 to 4 percent slopes	volcanic ash over glaciolacustrine deposits	164.3	2.5%
77E	Beeskove gravelly loam, moist, 15 to 35 percent slopes	colluvium derived from calcareous argillite or quartzite	1.0	0.0%
77F	Beeskove gravelly loam, moist, 35 to 60 percent slopes	colluvium derived from calcareous argillite or quartzite	65.0	1.0%
82F	Sharrott, cool-Rock outcrop-Rubble land complex, 15 to 60 percent slopes	colluvium or residuum derived from argillite or quartzite	11.6	0.2%
92C	Oldtrail gravelly sandy loam, 0 to 8 percent slopes	alluvium	8.2	0.1%
98F	Bendahl gravelly ashy silt loam, 30 to 50 percent slopes	volcanic ash over till or drift	2.1	0.0%
291B	Half Moon silt loam, cool, 2 to 8 percent slopes	lacustrine deposits	241.7	3.6%
291D	Half Moon silt loam, cool, 8 to 15 percent slopes	lacustrine deposits	69.6	1.0%
291E	Half Moon silt loam, cool, 15 to 35 percent slopes	lacustrine deposits	129.5	1.9%
291F	Half Moon silt loam, cool, 35 to 60 percent slopes	lacustrine deposits	57.0	0.9%
374F	Mitten-Rock outcrop complex, 40 to 70 percent slopes	volcanic ash over colluvium	5.7	0.1%
582F	Waldbillig-Holloway gravelly ashy silt loams, moist, 30 to 50 percent slopes	volcanic ash over till or drift	5.9	0.1%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Sanders and Parts of Lincoln and Flathead Counties, Montana (MT651)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
691B	Tamarack-Crystalex complex, 0 to 4 percent slopes	volcanic ash over alluvium or outwash	310.3	4.7%
691D	Tamarack-Crystalex complex, 4 to 15 percent slopes	volcanic ash over alluvium or outwash	78.3	1.2%
691E	Tamarack-Crystalex complex, 15 to 30 percent slopes	volcanic ash over alluvium or outwash	20.9	0.3%
691F	Tamarack-Crystalex complex, 30 to 60 percent slopes	volcanic ash over alluvium or outwash	68.5	1.0%
731A	Meadowpeak-Firetower silt loams, 0 to 2 percent slopes	alluvium	90.2	1.4%
808A	Barzee mucky peat, 0 to 2 percent slopes	organic material	10.0	0.2%
858E	Waldbillig gravelly ashy silt loam, moist, 8 to 30 percent slopes	volcanic ash over till or drift	238.5	3.6%
867E	Glaciercreek gravelly ashy silt loam, cool, 8 to 30 percent slopes	volcanic ash over alluvium or outwash	237.8	3.6%
867F	Glaciercreek gravelly ashy silt loam, cool, 30 to 45 percent slopes	volcanic ash over alluvium or outwash	234.9	3.5%
897C	Mollman gravelly loam, 2 to 8 percent slopes	alpine till or glacial drift	2.2	0.0%
897E	Mollman gravelly loam, 8 to 30 percent slopes	alpine till or glacial drift	68.9	1.0%
W	Water		197.2	3.0%
Subtotals for Soil Survey Area			3,598.3	54.1%
Totals for Area of Interest			6,650.2	100.0%

Rating Options—Parent Material Name

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Flathead County Area and Part of Lincoln County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
67C	Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes	Not prime farmland
222C	Pleasantvalley-Winfall, dry complex, 2 to 8 percent slopes	Not prime farmland
222E	Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes	Not prime farmland
W	Water	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands—Kootenai National Forest Area, Montana-Idaho		
Map Symbol	Map Unit Name	Farmland Classification
67C	Glaciercreek gravelly ashy silt loam, 0 to 8 percent slopes	Not prime farmland
101	Fluvents, flood plains	Not prime farmland
103	Andic Dystrochrepts, alluvial terraces	Farmland of statewide importance
105	Aquic Udifluvents, poorly drained	Not prime farmland
108	Andic Dystric Eutrochrepts, lacustrine terraces-Andic Dystrochrepts, glacial outwash terraces, complex	Not prime farmland
112	Eutric Glossoboralfs, lacustrine terraces	Not prime farmland
222E	Pleasantvalley-Winfall, dry complex, 8 to 30 percent slopes	Not prime farmland
252	Andic Dystrochrepts, breaklands	Not prime farmland
301	Dystric Eutrochrepts, glaciated mountain slopes	Not prime farmland
302	Typic Ustochrepts, glaciated mountain slopes, steep	Not prime farmland
303	Rock outcrop-Lithic Ustochrepts complex, glaciated mountain ridges	Not prime farmland
352	Andic Dystrochrepts, glaciated mountain slopes	Not prime farmland
W	Water	Not prime farmland

Prime and other Important Farmlands—Sanders and Parts of Lincoln and Flathead Counties, Montana		
Map Symbol	Map Unit Name	Farmland Classification
6A	Murrstead mucky peat, 0 to 2 percent slopes	Not prime farmland
12C	Auggie silt loam, 2 to 8 percent slopes	Not prime farmland
22C	Courville gravelly ashy silt loam, 2 to 8 percent slopes	Prime farmland if irrigated
30F	Tevis gravelly loam, 35 to 60 percent slopes	Not prime farmland
32G	Mitten-Rubble land complex, 40 to 70 percent slopes	Not prime farmland
33F	Mitten gravelly ashy silt loam, dry, 35 to 60 percent slopes	Not prime farmland
35E	Courville gravelly ashy silt loam, 8 to 30 percent slopes	Not prime farmland
35F	Courville gravelly ashy silt loam, 30 to 50 percent slopes	Not prime farmland
36E	Rumblecreek gravelly loam, 15 to 30 percent slopes	Not prime farmland
40F	Holloway gravelly ashy silt loam, 35 to 60 percent slopes	Not prime farmland
48E	Ashworth gravelly ashy silt loam, 8 to 30 percent slopes	Not prime farmland
58F	Waldbillig gravelly ashy silt loam, moist, 30 to 50 percent slopes	Not prime farmland
67C	Glaciercreek gravelly ashy silt loam, cool, 0 to 8 percent slopes	Not prime farmland
68C	Upsata gravelly ashy silt loam, 2 to 8 percent slopes	Not prime farmland
68E	Upsata gravelly ashy silt loam, 8 to 30 percent slopes	Not prime farmland
69C	Tamarack ashy loam, 2 to 8 percent slopes	Farmland of statewide importance
72A	Blacklake mucky peat, 0 to 1 percent slopes	Not prime farmland
73A	Meadowpeak silt loam, 0 to 2 percent slopes	Farmland of local importance
74A	Blackcreek silt loam, 0 to 2 percent slopes	Farmland of local importance
75B	Tallcreek ashy silt loam, 0 to 4 percent slopes	Farmland of statewide importance
77E	Beeskove gravelly loam, moist, 15 to 35 percent slopes	Not prime farmland
77F	Beeskove gravelly loam, moist, 35 to 60 percent slopes	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands—Sanders and Parts of Lincoln and Flathead Counties, Montana		
Map Symbol	Map Unit Name	Farmland Classification
82F	Sharrott, cool-Rock outcrop-Rubble land complex, 15 to 60 percent slopes	Not prime farmland
92C	Oldtrail gravelly sandy loam, 0 to 8 percent slopes	Not prime farmland
98F	Bendahl gravelly ashy silt loam, 30 to 50 percent slopes	Not prime farmland
291B	Half Moon silt loam, cool, 2 to 8 percent slopes	Farmland of statewide importance
291D	Half Moon silt loam, cool, 8 to 15 percent slopes	Farmland of local importance
291E	Half Moon silt loam, cool, 15 to 35 percent slopes	Not prime farmland
291F	Half Moon silt loam, cool, 35 to 60 percent slopes	Not prime farmland
374F	Mitten-Rock outcrop complex, 40 to 70 percent slopes	Not prime farmland
582F	Waldbillig-Holloway gravelly ashy silt loams, moist, 30 to 50 percent slopes	Not prime farmland
691B	Tamarack-Crystalex complex, 0 to 4 percent slopes	Farmland of local importance
691D	Tamarack-Crystalex complex, 4 to 15 percent slopes	Farmland of local importance
691E	Tamarack-Crystalex complex, 15 to 30 percent slopes	Not prime farmland
691F	Tamarack-Crystalex complex, 30 to 60 percent slopes	Not prime farmland
731A	Meadowpeak-Firetower silt loams, 0 to 2 percent slopes	Farmland of local importance
808A	Barzee mucky peat, 0 to 2 percent slopes	Not prime farmland
858E	Waldbillig gravelly ashy silt loam, moist, 8 to 30 percent slopes	Not prime farmland
867E	Glaciercreek gravelly ashy silt loam, cool, 8 to 30 percent slopes	Not prime farmland
867F	Glaciercreek gravelly ashy silt loam, cool, 30 to 45 percent slopes	Not prime farmland
897C	Mollman gravelly loam, 2 to 8 percent slopes	Farmland of statewide importance
897E	Mollman gravelly loam, 8 to 30 percent slopes	Not prime farmland
W	Water	Not prime farmland

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



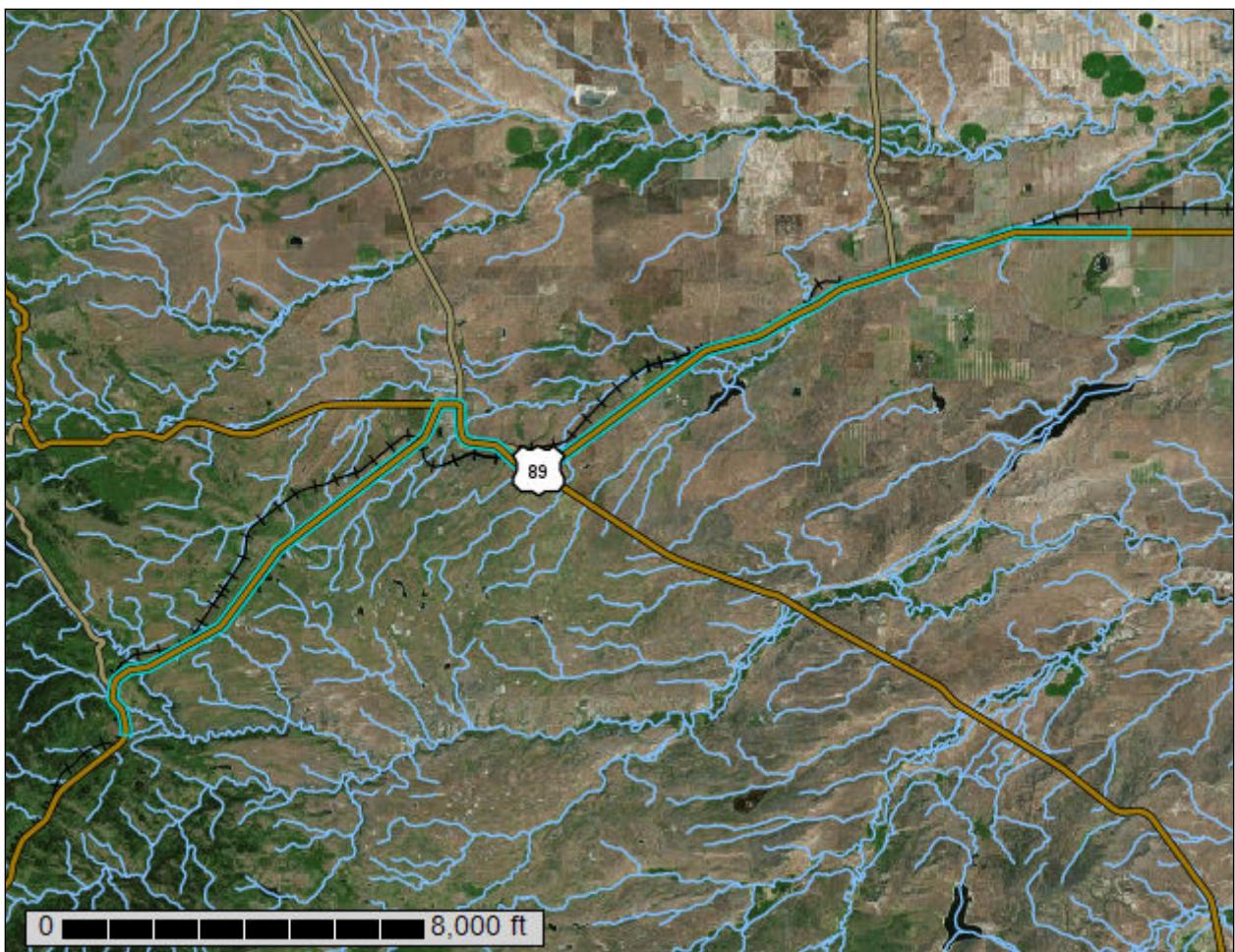
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Glacier County Area and Part of Pondera County, Montana



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	6
Soil Map	9
Soil Map.....	10
Legend.....	11
Map Unit Legend.....	12
Map Unit Descriptions.....	13
Glacier County Area and Part of Pondera County, Montana.....	15
Ah—Arnegard loam, 2 to 8 percent slopes.....	15
BC—Babb cobbly loam, hilly.....	16
Bg—Bearmouth gravelly loam, 0 to 4 percent slopes.....	17
Bh—Beaverton gravelly loam, 0 to 4 percent slopes.....	18
BP—Burnette stony loam, hilly.....	19
DH—Doby-Burnette complex, hilly.....	21
DS—Doby-Shale outcrop complex, very steep.....	23
Fd—Fairfield gravelly loam, 0 to 2 percent slopes.....	24
Fe—Fairfield gravelly loam, 2 to 4 percent slopes.....	25
Ff—Fairfield gravelly loam, 4 to 8 percent slopes.....	27
FU—Fifer-Cheadle-Rock outcrop complex, very steep.....	28
Gp—Gravel pits.....	30
Le—Leavitt complex, undulating.....	30
Mz—Mord loam, sloping.....	32
NB—Nettleton-Burnette association, undulating.....	33
No—Novary loam.....	35
RT—Rock outcrop.....	37
SA—Saline land.....	37
SP—Seeped alluvial land.....	38
SV—Swifton-Mikesell association, hilly.....	39
SW—Swifton-Mord-Rockland association, very steep.....	41
TL—Terrace escarpments and Fairfield soils.....	42
To—Turner loam, 0 to 4 percent slopes.....	44
Tr—Turner cobbly loam, 0 to 4 percent slopes.....	45
W—Lakes and streams.....	47
WF—Wet land.....	47
Wk—Williams cobbly loam, gently sloping.....	48
Wm—Williams cobbly loam, undulating.....	49
WN—Williams complex, hilly.....	51
WO—Williams complex, steep.....	53
Soil Information for All Uses	55
Soil Properties and Qualities.....	55
Soil Qualities and Features.....	55
Parent Material Name.....	55
Soil Reports.....	60
Land Classifications.....	60

Custom Soil Resource Report

Prime and other Important Farmlands.....	60
References.....	63

How Soil Surveys Are Made

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

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

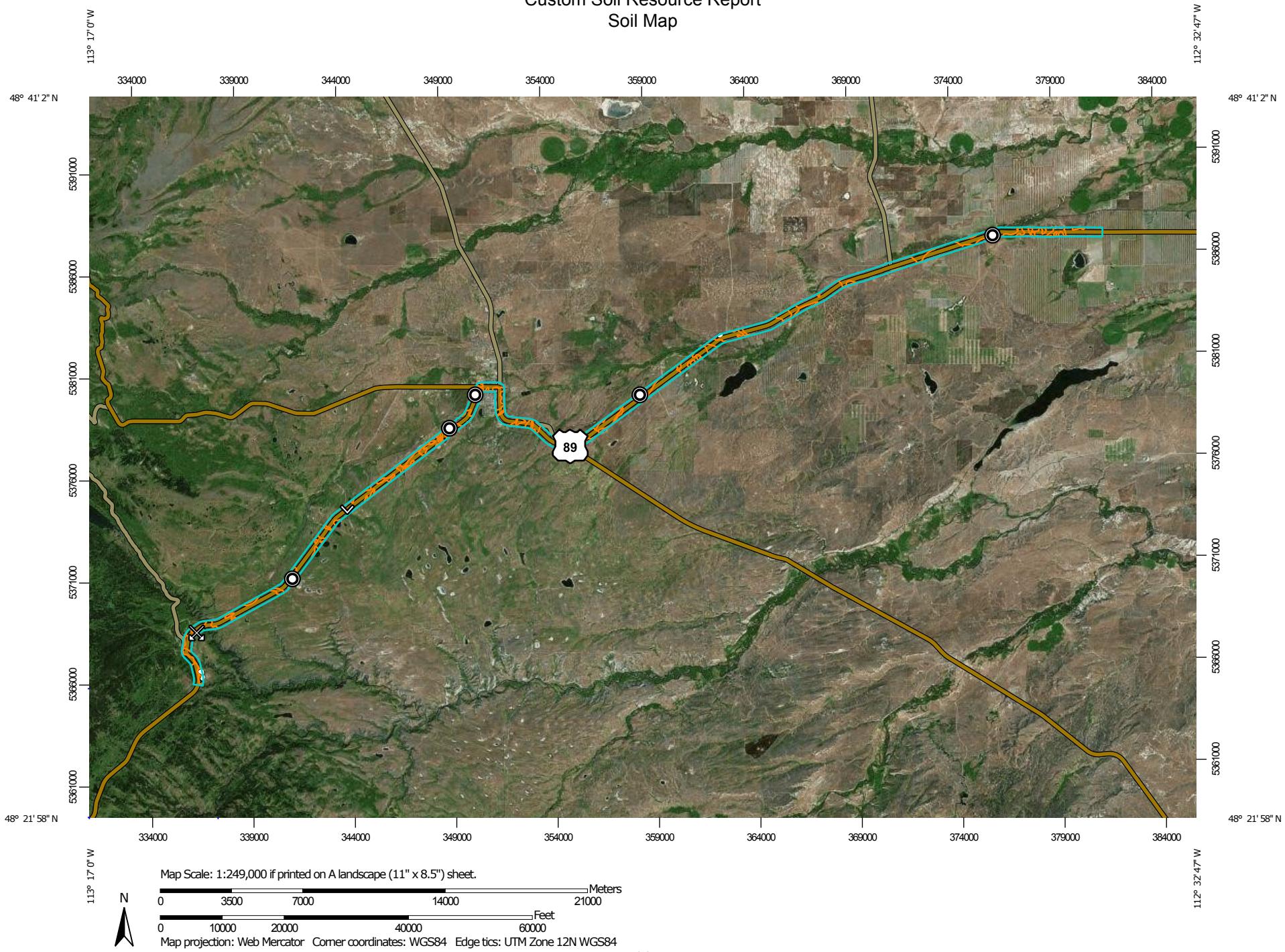
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

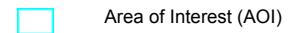
Custom Soil Resource Report

Soil Map



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils



Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip

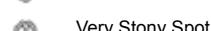


Sodic Spot

Spoil Area



Stony Spot



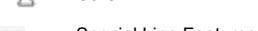
Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



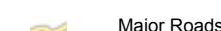
Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Glacier County Area and Part of Pondera County, Montana

Survey Area Data: Version 11, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Glacier County Area and Part of Pondera County, Montana (MT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ah	Arnegard loam, 2 to 8 percent slopes	0.9	0.0%
BC	Babb cobby loam, hilly	533.6	8.3%
Bg	Bearmouth gravelly loam, 0 to 4 percent slopes	28.5	0.4%
Bh	Beaverton gravelly loam, 0 to 4 percent slopes	684.5	10.6%
BP	Burnette stony loam, hilly	174.4	2.7%
DH	Doby-Burnette complex, hilly	132.0	2.0%
DS	Doby-Shale outcrop complex, very steep	117.0	1.8%
Fd	Fairfield gravelly loam, 0 to 2 percent slopes	195.6	3.0%
Fe	Fairfield gravelly loam, 2 to 4 percent slopes	87.8	1.4%
Ff	Fairfield gravelly loam, 4 to 8 percent slopes	12.7	0.2%
FU	Fifer-Cheadle-Rock outcrop complex, very steep	11.0	0.2%
Gp	Gravel pits	82.9	1.3%
Le	Leavitt complex, undulating	132.2	2.1%
Mz	Mord loam, sloping	65.5	1.0%
NB	Nettleton-Burnette association, undulating	503.6	7.8%
No	Novary loam	193.7	3.0%
RT	Rock outcrop	20.4	0.3%
SA	Saline land	331.1	5.1%
SP	Seeped alluvial land	3.1	0.0%
SV	Swifton-Mikesell association, hilly	55.6	0.9%
SW	Swifton-Mord-Rockland association, very steep	68.2	1.1%
TL	Terrace escarpments and Fairfield soils	94.9	1.5%
To	Turner loam, 0 to 4 percent slopes	42.8	0.7%
Tr	Turner cobby loam, 0 to 4 percent slopes	211.0	3.3%
W	Lakes and streams	88.5	1.4%
WF	Wet land	601.9	9.3%

Glacier County Area and Part of Pondera County, Montana (MT600)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Wk	Williams cobbly loam, gently sloping	208.3	3.2%
Wm	Williams cobbly loam, undulating	938.8	14.6%
WN	Williams complex, hilly	817.3	12.7%
WO	Williams complex, steep	3.6	0.1%
Totals for Area of Interest		6,441.5	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic 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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Glacier County Area and Part of Pondera County, Montana

Ah—Arnegard loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xq5

Elevation: 3,600 to 4,500 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Arnegard and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arnegard

Setting

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 11 inches: loam

Bw - 11 to 36 inches: loam

Bk - 36 to 60 inches: loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Minor Components

Reeder

Percent of map unit: 10 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

BC—Babb cobbly loam, hilly

Map Unit Setting

National map unit symbol: 4xqb
Elevation: 4,500 to 6,000 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Babb and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Babb

Setting

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

Typical profile

A - 0 to 7 inches: cobbly loam
Bw - 7 to 21 inches: gravelly loam
Bk - 21 to 60 inches: gravelly loam

Properties and qualities

Slope: 10 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Minor Components

Cheadle

Percent of map unit: 8 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 15-19" p.z. (R044XC469MT)

Hydric soil rating: No

Gapo

Percent of map unit: 2 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)

Hydric soil rating: Yes

Bg—Bearmouth gravelly loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xqq

Elevation: 4,400 to 5,000 feet

Mean annual precipitation: 15 to 20 inches

Mean annual air temperature: 36 to 45 degrees F

Frost-free period: 60 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Bearmouth and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bearmouth

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: gravelly loam

Bw - 5 to 13 inches: very gravelly loam

2C - 13 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Ecological site: Shallow to Gravel (SwGr) RRU 46-N 13-19" p.z. (R046XN251MT)

Hydric soil rating: No

Minor Components

Tinsley

Percent of map unit: 10 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Gravel (Gr) RRU 46-N 13-19" p.z. (R046XN601MT)

Hydric soil rating: No

Bh—Beaverton gravelly loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xqr

Elevation: 3,900 to 5,000 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Not prime farmland

Map Unit Composition

Beaverton and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Beaverton

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: gravelly loam

Bt - 7 to 14 inches: very gravelly clay loam

2C - 14 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)
Hydric soil rating: No

Minor Components

Turner

Percent of map unit: 8 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Novary

Percent of map unit: 2 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

BP—Burnette stony loam, hilly

Map Unit Setting

National map unit symbol: 4xqj
Elevation: 4,500 to 5,200 feet
Mean annual precipitation: 16 to 24 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 60 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Burnette and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Burnette

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A1 - 0 to 5 inches: stony loam

A2 - 5 to 15 inches: clay loam

Bt - 15 to 32 inches: clay

Bk - 32 to 50 inches: clay

BC - 50 to 66 inches: clay

Properties and qualities

Slope: 8 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Minor Components

Burnette

Percent of map unit: 3 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Nettleton

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Doby

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)
Hydric soil rating: No

Adel

Percent of map unit: 2 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Gapo

Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

DH—Doby-Burnette complex, hilly

Map Unit Setting

National map unit symbol: 4xr9
Elevation: 4,600 to 5,600 feet
Mean annual precipitation: 16 to 24 inches
Mean annual air temperature: 37 to 43 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Doby and similar soils: 50 percent
Burnette and similar soils: 45 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Doby

Setting

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

Typical profile

A - 0 to 5 inches: clay loam
Bw - 5 to 13 inches: clay

C - 13 to 19 inches: clay

Cr - 19 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 35 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)

Hydric soil rating: No

Description of Burnette

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A1 - 0 to 5 inches: stony loam

A2 - 5 to 15 inches: clay loam

Bt - 15 to 32 inches: clay

Bk - 32 to 50 inches: clay

BC - 50 to 66 inches: clay

Properties and qualities

Slope: 8 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Draft Clayey (Cy) RRU 46-N 13-19" p.z. (R046XN247MT)

Hydric soil rating: No

Minor Components

Gapo

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

DS—Doby-Shale outcrop complex, very steep

Map Unit Setting

National map unit symbol: 4xrc
Elevation: 4,600 to 5,600 feet
Mean annual precipitation: 16 to 24 inches
Mean annual air temperature: 37 to 43 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Doby and similar soils: 50 percent
Shale outcrop: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Doby

Setting

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

Typical profile

A - 0 to 5 inches: clay loam
Bw - 5 to 13 inches: clay
C - 13 to 19 inches: clay
Cr - 19 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 20 to 60 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)

Hydric soil rating: No

Minor Components

Burnette

Percent of map unit: 10 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Hanson

Percent of map unit: 10 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Fd—Fairfield gravelly loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 4xrv

Elevation: 3,700 to 4,700 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Fairfield and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fairfield

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: gravelly loam
Bt - 4 to 17 inches: clay loam
Bk - 17 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Martinsdale

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Fairfield

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Fe—Fairfield gravelly loam, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xrw
Elevation: 3,700 to 4,700 feet
Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Fairfield and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fairfield

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: gravelly loam

Bt - 4 to 17 inches: clay loam

Bk - 17 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 35 percent

Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Fairfield

Percent of map unit: 10 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Ff—Fairfield gravelly loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: 4xrx
Elevation: 3,700 to 4,700 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Fairfield and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fairfield

Setting

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

Typical profile

A - 0 to 4 inches: gravelly loam
Bt - 4 to 17 inches: clay loam
Bk - 17 to 52 inches: clay loam
Cr - 52 to 60 inches: weathered bedrock

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: 48 to 72 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Fairfield

Percent of map unit: 4 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Martinsdale

Percent of map unit: 3 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Arnegard

Percent of map unit: 3 percent

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

FU—Fifer-Cheadle-Rock outcrop complex, very steep

Map Unit Setting

National map unit symbol: 4xrn

Elevation: 4,500 to 6,000 feet

Mean annual precipitation: 16 to 24 inches

Mean annual air temperature: 36 to 45 degrees F

Frost-free period: 60 to 110 days

Farmland classification: Not prime farmland

Map Unit Composition

Fifer and similar soils: 35 percent

Cheadle and similar soils: 30 percent

Rock outcrop: 30 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fifer

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam
Bk - 6 to 20 inches: silty clay loam
Cr - 20 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)
Hydric soil rating: No

Description of Cheadle

Setting

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

Typical profile

A - 0 to 7 inches: flaggy sandy loam
C - 7 to 20 inches: very flaggy sandy loam
R - 20 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)

Hydric soil rating: No

Minor Components

Doby

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)

Hydric soil rating: No

Adel

Percent of map unit: 2 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Pishkun

Percent of map unit: 1 percent

Landform: Escarpments

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Gp—Gravel pits

Map Unit Setting

National map unit symbol: 4xsc

Elevation: 3,600 to 5,500 feet

Mean annual precipitation: 12 to 14 inches

Frost-free period: 90 to 110 days

Farmland classification: Not prime farmland

Map Unit Composition

Gravel pits: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Le—Leavitt complex, undulating

Map Unit Setting

National map unit symbol: 4xtg

Elevation: 4,200 to 6,000 feet

Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 60 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Leavitt and similar soils: 45 percent
Leavitt and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leavitt

Setting

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

Typical profile

A - 0 to 7 inches: loam
Bt - 7 to 20 inches: clay loam
Bk - 20 to 62 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Description of Leavitt

Setting

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

Typical profile

A - 0 to 7 inches: cobbly loam
Bt - 7 to 20 inches: gravelly clay loam
Bk - 20 to 62 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Minor Components

Adel

Percent of map unit: 18 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Nishon

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

Mz—Mord loam, sloping

Map Unit Setting

National map unit symbol: 4xvj
Elevation: 4,800 to 6,200 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 39 to 41 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Mord and similar soils: 90 percent

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

Description of Mord

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 16 inches: loam

E/B - 16 to 21 inches: gravelly clay loam

Bt - 21 to 60 inches: cobbly clay

Properties and qualities

Slope: 4 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 20"+ p.z. (R043XN417MT)

Hydric soil rating: No

Minor Components

Mord

Percent of map unit: 10 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 20"+ p.z. (R043XN417MT)

Hydric soil rating: No

NB—Nettleton-Burnette association, undulating

Map Unit Setting

National map unit symbol: 4xvk

Elevation: 4,600 to 5,600 feet

Mean annual precipitation: 20 to 35 inches

Mean annual air temperature: 34 to 45 degrees F

Frost-free period: 60 to 90 days

Farmland classification: Not prime farmland

Map Unit Composition

Nettleton and similar soils: 60 percent

Burnette and similar soils: 35 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nettleton

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 19 inches: loam

E - 19 to 22 inches: clay

Bt - 22 to 50 inches: clay

Cr - 50 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: 40 to 60 inches to paralithic bedrock

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Description of Burnette

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A1 - 0 to 5 inches: loam

A2 - 5 to 15 inches: clay loam

Bt - 15 to 32 inches: clay

Bk - 32 to 50 inches: clay

BC - 50 to 66 inches: clay

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Minor Components

Mikesell

Percent of map unit: 4 percent
Landform: Mountains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Gapo

Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

No—Novary loam

Map Unit Setting

National map unit symbol: 4xvn
Elevation: 3,900 to 5,100 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 80 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Novary and similar soils: 95 percent
Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Novary

Setting

Landform: Swales

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 26 inches: loam

Cg1 - 26 to 42 inches: stratified loam to silty clay

Cg2 - 42 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 0 to 24 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D

Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)

Hydric soil rating: Yes

Minor Components

Bear lake

Percent of map unit: 3 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)

Hydric soil rating: Yes

Saline soils

Percent of map unit: 2 percent

Hydric soil rating: No

RT—Rock outcrop

Map Unit Setting

National map unit symbol: 4xw1
Elevation: 3,300 to 7,200 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Cheadle

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-N 13-19" p.z. (R046XN250MT)
Hydric soil rating: No

SA—Saline land

Map Unit Setting

National map unit symbol: 4xw9
Elevation: 3,300 to 5,400 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Saline land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saline Land

Typical profile

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

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Ecological site: Saline Lowland (SL) RRU 46-N 15-19" p.z. (R046XN600MT)
Hydric soil rating: No

Minor Components

Bigsag

Percent of map unit: 5 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XN171MT)
Hydric soil rating: Yes

SP—Seeped alluvial land

Map Unit Setting

National map unit symbol: 4xwc
Elevation: 3,700 to 5,000 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Seeped alluvial land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Seeped Alluvial Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: No

Minor Components

Novary

Percent of map unit: 5 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

SV—Swifton-Mikesell association, hilly

Map Unit Setting

National map unit symbol: 4xwh
Elevation: 4,900 to 6,200 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 34 to 43 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Swifton and similar soils: 60 percent
Mikesell and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swifton

Setting

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

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 23 inches: gravelly loam
B/E - 23 to 72 inches: gravelly sandy clay loam

Properties and qualities

Slope: 8 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Mikesell

Setting

Landform: Mountains
Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material

E - 3 to 9 inches: clay loam

B/E - 9 to 24 inches: clay loam

Bt - 24 to 30 inches: clay

Bk1 - 30 to 52 inches: clay loam

Bk2 - 52 to 60 inches: silty clay loam

Properties and qualities

Slope: 8 to 35 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Mord

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 20"+ p.z. (R043XN417MT)

Hydric soil rating: No

Nettleton

Percent of map unit: 4 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Gapo

Percent of map unit: 1 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)

Hydric soil rating: Yes

SW—Swifton-Mord-Rockland association, very steep

Map Unit Setting

National map unit symbol: 4xwj
Elevation: 4,900 to 6,200 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 37 to 43 degrees F
Frost-free period: 60 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Swifton and similar soils: 35 percent
Mord and similar soils: 35 percent
Rockland: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swifton

Setting

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

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 23 inches: gravelly loam
B/E - 23 to 72 inches: gravelly sandy clay loam

Properties and qualities

Slope: 15 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Mord

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 16 inches: stony loam

E/B - 16 to 21 inches: gravelly clay loam

Bt - 21 to 60 inches: cobbly clay

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 20"+ p.z. (R043XN417MT)

Hydric soil rating: No

TL—Terrace escarpments and Fairfield soils

Map Unit Setting

National map unit symbol: 4xx0

Elevation: 3,600 to 4,700 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Not prime farmland

Map Unit Composition

Terrace escarpments and similar soils: 40 percent

Fairfield and similar soils: 40 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terrace Escarpments

Setting

Landform: Stream terraces

Landform position (three-dimensional): Riser

Parent material: Alluvium

Properties and qualities

Slope: 10 to 40 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Fairfield

Setting

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

Typical profile

A - 0 to 4 inches: gravelly loam
Bt - 4 to 17 inches: clay loam
Bk - 17 to 60 inches: clay loam

Properties and qualities

Slope: 10 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Arnegard

Percent of map unit: 5 percent
Landform: Hillslopes
Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Castner

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Hydric soil rating: No

Cabba

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Hydric soil rating: No

Wayden

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Hydric soil rating: No

To—Turner loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xxc

Elevation: 3,700 to 4,900 feet

Mean annual precipitation: 12 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Turner and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Turner

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 12 inches: clay loam
Bk - 12 to 26 inches: gravelly loam
2C - 26 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Beaverton

Percent of map unit: 10 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)
Hydric soil rating: No

Tr—Turner cobbly loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 4xxd
Elevation: 3,700 to 4,900 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Turner and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Turner

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: cobbly loam

Bt - 4 to 12 inches: clay loam

Bk - 12 to 26 inches: gravelly loam

2C - 26 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Turner

Percent of map unit: 5 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Beaverton

Percent of map unit: 5 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)

Hydric soil rating: No

W—Lakes and streams

Map Unit Setting

National map unit symbol: 4xxj
Mean annual precipitation: 12 to 14 inches
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

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

WF—Wet land

Map Unit Setting

National map unit symbol: 4xxm
Elevation: 3,600 to 5,200 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Wet land and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wet Land

Setting

Landform: Channels
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C

Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)

Hydric soil rating: Yes

Minor Components

Babb

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Wk—Williams cobbly loam, gently sloping

Map Unit Setting

National map unit symbol: 4xxz

Elevation: 3,800 to 4,600 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 110 days

Farmland classification: Not prime farmland

Map Unit Composition

Williams and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williams

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: cobbly loam

Bt - 3 to 15 inches: clay loam

Bk - 15 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 2 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Williams

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

Wm—Williams cobbly loam, undulating

Map Unit Setting

National map unit symbol: 4xy0
Elevation: 3,800 to 4,600 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Williams and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williams

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: cobbly loam
Bt - 3 to 15 inches: clay loam
Bk - 15 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Arnegard

Percent of map unit: 4 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)
Hydric soil rating: No

Zahl

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nishon

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

WN—Williams complex, hilly

Map Unit Setting

National map unit symbol: 4xxr
Elevation: 3,800 to 4,600 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Williams

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: cobbly loam
Bt - 3 to 15 inches: clay loam
Bk - 15 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 4 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Williams

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: loam

Bt - 3 to 15 inches: clay loam

Bk - 15 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 4 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Zahl

Percent of map unit: 9 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Arnegard

Percent of map unit: 9 percent

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-N 13-19" p.z. (R046XN252MT)

Hydric soil rating: No

Nishon

Percent of map unit: 2 percent

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)

Hydric soil rating: Yes

WO—Williams complex, steep

Map Unit Setting

National map unit symbol: 4xxs
Elevation: 3,800 to 4,600 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Williams and similar soils: 70 percent
Williams and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williams

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: cobbly loam
Bt - 3 to 15 inches: clay loam
Bk - 15 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Williams

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: loam

Bt - 3 to 15 inches: clay loam

Bk - 15 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Zahl

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

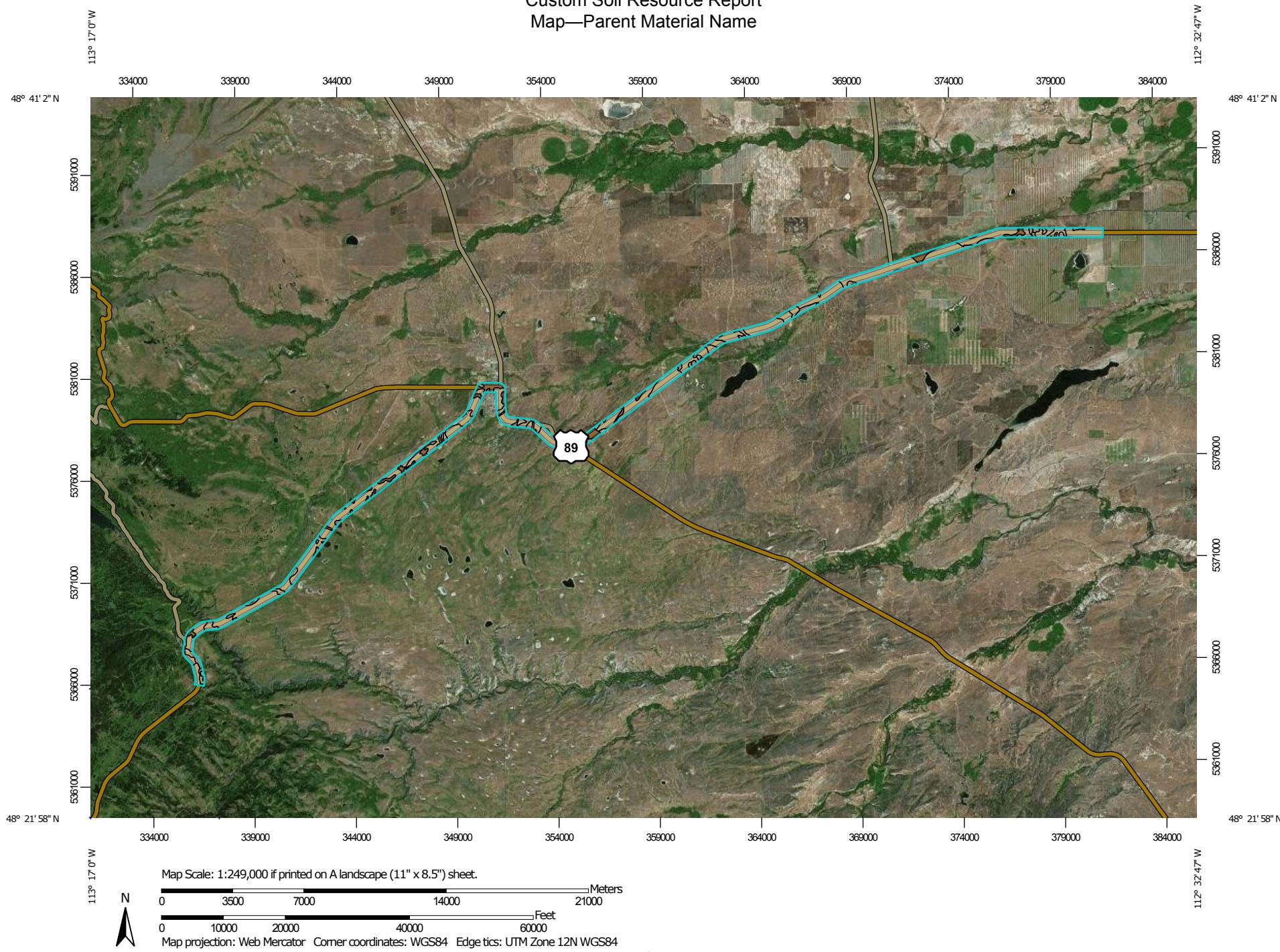
Parent Material Name

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report Map—Parent Material Name



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils

Soil Rating Polygons



alluvium



Not rated or not available

Soil Rating Lines



alluvium



Not rated or not available

Soil Rating Points



alluvium



Not rated or not available

Water Features

Streams and Canals



Streams and Canals

Transportation

Rails



Rails

Interstate Highways



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Glacier County Area and Part of Pondera County, Montana

Survey Area Data: Version 11, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name

Parent Material Name— Summary by Map Unit — Glacier County Area and Part of Pondera County, Montana (MT600)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ah	Arnegard loam, 2 to 8 percent slopes		0.9	0.0%
BC	Babb cobbly loam, hilly		533.6	8.3%
Bg	Bearmouth gravelly loam, 0 to 4 percent slopes		28.5	0.4%
Bh	Beaverton gravelly loam, 0 to 4 percent slopes		684.5	10.6%
BP	Burnette stony loam, hilly		174.4	2.7%
DH	Doby-Burnette complex, hilly		132.0	2.0%
DS	Doby-Shale outcrop complex, very steep		117.0	1.8%
Fd	Fairfield gravelly loam, 0 to 2 percent slopes		195.6	3.0%
Fe	Fairfield gravelly loam, 2 to 4 percent slopes		87.8	1.4%
Ff	Fairfield gravelly loam, 4 to 8 percent slopes		12.7	0.2%
FU	Fifer-Cheadle-Rock outcrop complex, very steep		11.0	0.2%
Gp	Gravel pits		82.9	1.3%
Le	Leavitt complex, undulating		132.2	2.1%
Mz	Mord loam, sloping		65.5	1.0%
NB	Nettleton-Burnette association, undulating		503.6	7.8%
No	Novary loam		193.7	3.0%
RT	Rock outcrop		20.4	0.3%
SA	Saline land		331.1	5.1%
SP	Seeped alluvial land		3.1	0.0%
SV	Swifton-Mikesell association, hilly		55.6	0.9%
SW	Swifton-Mord-Rockland association, very steep		68.2	1.1%
TL	Terrace escarpments and Fairfield soils		94.9	1.5%
To	Turner loam, 0 to 4 percent slopes		42.8	0.7%
Tr	Turner cobbly loam, 0 to 4 percent slopes		211.0	3.3%
W	Lakes and streams		88.5	1.4%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Glacier County Area and Part of Pondera County, Montana (MT600)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WF	Wet land	alluvium	601.9	9.3%
Wk	Williams cobby loam, gently sloping		208.3	3.2%
Wm	Williams cobby loam, undulating		938.8	14.6%
WN	Williams complex, hilly		817.3	12.7%
WO	Williams complex, steep		3.6	0.1%
Totals for Area of Interest			6,441.5	100.0%

Rating Options—Parent Material Name

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Glacier County Area and Part of Pondera County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
Ah	Arnegard loam, 2 to 8 percent slopes	Farmland of statewide importance
BC	Babb cobbly loam, hilly	Not prime farmland
Bg	Bearmouth gravelly loam, 0 to 4 percent slopes	Not prime farmland
Bh	Beaverton gravelly loam, 0 to 4 percent slopes	Not prime farmland
BP	Burnette stony loam, hilly	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands—Glacier County Area and Part of Pondera County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
DH	Doby-Burnette complex, hilly	Not prime farmland
DS	Doby-Shale outcrop complex, very steep	Not prime farmland
Fd	Fairfield gravelly loam, 0 to 2 percent slopes	Farmland of statewide importance
Fe	Fairfield gravelly loam, 2 to 4 percent slopes	Farmland of statewide importance
Ff	Fairfield gravelly loam, 4 to 8 percent slopes	Farmland of statewide importance
FU	Fifer-Cheadle-Rock outcrop complex, very steep	Not prime farmland
Gp	Gravel pits	Not prime farmland
Le	Leavitt complex, undulating	Not prime farmland
Mz	Mord loam, sloping	Not prime farmland
NB	Nettleton-Burnette association, undulating	Not prime farmland
No	Novary loam	Not prime farmland
RT	Rock outcrop	Not prime farmland
SA	Saline land	Not prime farmland
SP	Seeped alluvial land	Not prime farmland
SV	Swifton-Mikesell association, hilly	Not prime farmland
SW	Swifton-Mord-Rockland association, very steep	Not prime farmland
TL	Terrace escarpments and Fairfield soils	Not prime farmland
To	Turner loam, 0 to 4 percent slopes	Prime farmland if irrigated
Tr	Turner cobbly loam, 0 to 4 percent slopes	Not prime farmland
W	Lakes and streams	Not prime farmland
WF	Wet land	Not prime farmland
Wk	Williams cobbly loam, gently sloping	Not prime farmland
Wm	Williams cobbly loam, undulating	Not prime farmland
WN	Williams complex, hilly	Not prime farmland
WO	Williams complex, steep	Not prime farmland

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



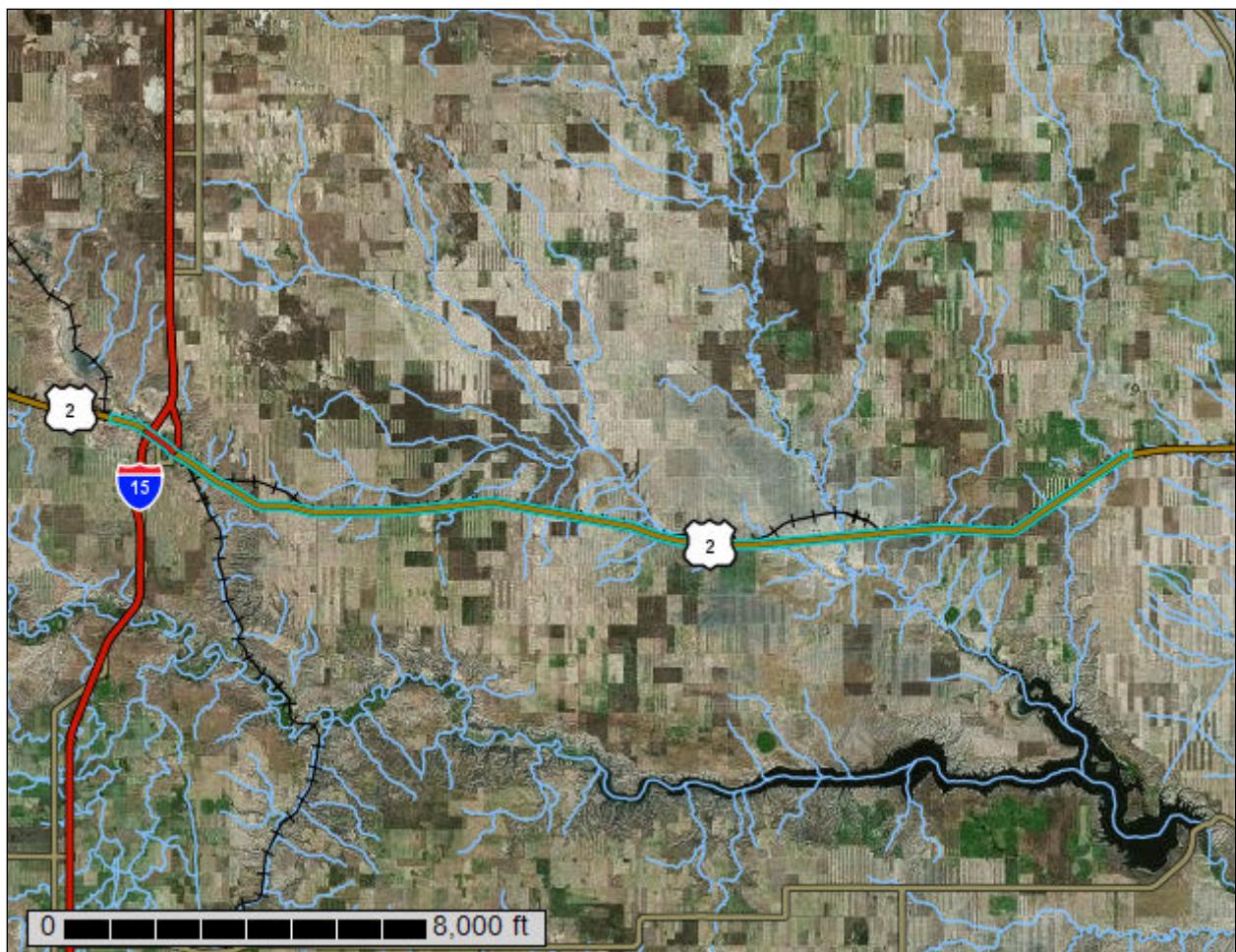
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Liberty County, Montana, and Toole County, Montana



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	6
Soil Map	9
Soil Map.....	10
Legend.....	11
Map Unit Legend.....	13
Map Unit Descriptions.....	15
Liberty County, Montana.....	18
35B—Assinniboine fine sandy loam, 0 to 4 percent slopes.....	18
224E—Hillon-Joplin loams, 8 to 25 percent slopes.....	19
331B—Phillips-Elloam complex, 0 to 4 percent slopes.....	21
421C—Joplin-Hillon loams, 2 to 8 percent slopes.....	23
442C—Kevin-Elloam clay loams, 2 to 8 percent slopes.....	26
503B—Telstad-Joplin loams, 0 to 4 percent slopes.....	28
561B—Scobey-Kevin clay loams, 0 to 4 percent slopes.....	31
561C—Scobey-Kevin clay loams, 2 to 8 percent slopes.....	33
605C—Yamacall-Havre loams, 0 to 8 percent slopes.....	36
Toole County, Montana.....	39
16B—Degrand loam, 0 to 4 percent slopes.....	39
19B—Kenilworth loam, 0 to 4 percent slopes.....	40
22E—Hillon clay loam, 8 to 25 percent slopes.....	41
23A—Acel silty clay loam, 0 to 2 percent slopes.....	43
28A—Nishon clay loam, 0 to 1 percent slopes.....	44
29B—Nunemaker silty clay loam, 0 to 4 percent slopes.....	46
29C—Nunemaker silty clay loam, 4 to 8 percent slopes.....	47
30B—Marvan silty clay, 0 to 4 percent slopes.....	49
30C—Marvan silty clay, 4 to 8 percent slopes.....	50
32B—Kobase silty clay loam, 0 to 4 percent slopes.....	51
32C—Kobase silty clay loam, 4 to 8 percent slopes.....	53
37B—Evanston clay loam, 0 to 4 percent slopes.....	55
38B—Ethridge clay loam, 0 to 4 percent slopes.....	56
39B—Ferd loam, 0 to 4 percent slopes.....	57
42B—Joplin clay loam, 0 to 4 percent slopes.....	59
44B—Kevin clay loam, 0 to 4 percent slopes.....	60
44C—Kevin clay loam, 4 to 8 percent slopes.....	62
47B—Marias silty clay, 0 to 4 percent slopes.....	63
48B—Vanda silty clay, 0 to 4 percent slopes.....	65
53E—Sunburst clay loam, 15 to 25 percent slopes.....	66
53F—Sunburst clay loam, 25 to 70 percent slopes.....	68
54B—Trudau loam, 0 to 4 percent slopes.....	69
62A—Vaeda silty clay loam, 0 to 2 percent slopes.....	70
79B—Yamacall loam, 0 to 4 percent slopes.....	72
141A—McKenzie clay, saline, 0 to 2 percent slopes.....	73
222E—Hillon-Neldore complex, 8 to 25 percent slopes.....	74

222F—Hillon-Neldore complex, 25 to 70 percent slopes.....	76
311B—Creed-Gerdrum-Absher complex, 0 to 4 percent slopes.....	78
321B—Kobase silty clay loam, calcareous, 0 to 4 percent slopes.....	81
321C—Kobase silty clay loam, calcareous, 4 to 8 percent slopes.....	82
332B—Phillips-Kevin complex, 0 to 4 percent slopes.....	84
364C—Chinook fine sandy loam, 0 to 8 percent slopes.....	86
372B—Evanston fine sandy loam, 0 to 4 percent slopes.....	88
391B—Ferd-Creed-Gerdrum complex, 0 to 4 percent slopes.....	89
402A—Gerdrum-Absher complex, 0 to 2 percent slopes.....	92
421C—Joplin-Hillon loams, 2 to 8 percent slopes.....	94
421D—Joplin-Hillon clay loams, 8 to 15 percent slopes.....	97
423B—Joplin-Hillon clay loams, 0 to 3 percent slopes.....	99
427B—Joplin complex, 0 to 4 percent slopes.....	101
441C—Kevin-Hillon clay loams, 2 to 8 percent slopes.....	103
445B—Kevin complex, 0 to 4 percent slopes.....	105
446C—Kevin-Elloam clay loams, 2 to 8 percent slopes.....	107
521B—Elloam-Absher clay loams, 0 to 4 percent slopes.....	110
561B—Scobey-Kevin clay loams, 0 to 4 percent slopes.....	112
601A—Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded....	114
793B—Yamacall loam, calcareous, 0 to 4 percent slopes.....	116
971C—Neldore-Bascovy clays, 2 to 8 percent slopes.....	118
W—Water.....	120
Soil Information for All Uses.....	121
Soil Properties and Qualities.....	121
Soil Qualities and Features.....	121
Parent Material Name.....	121
Soil Reports.....	128
Land Classifications.....	128
Prime and other Important Farmlands.....	128
References.....	132

How Soil Surveys Are Made

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

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

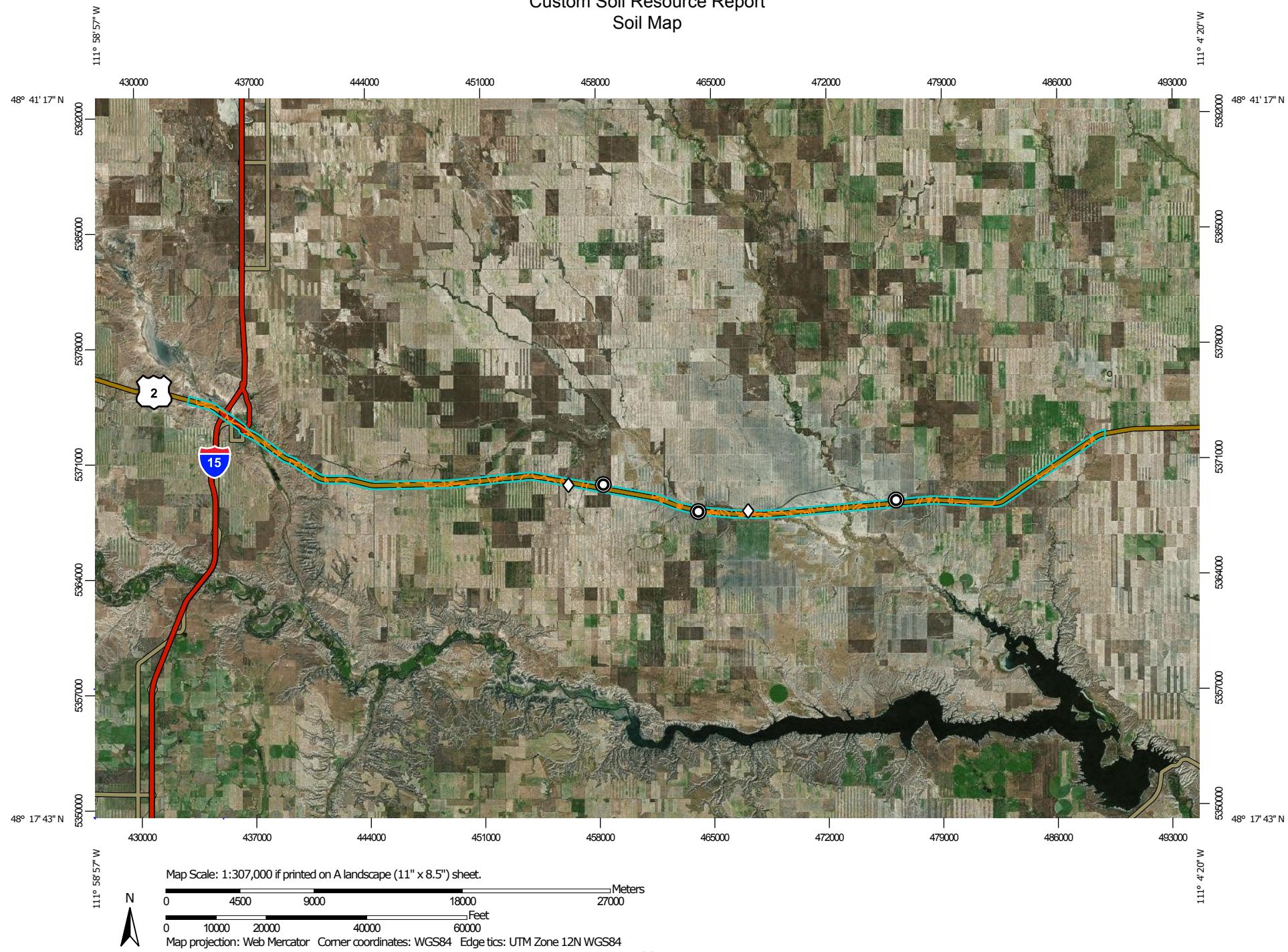
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

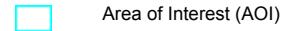
Custom Soil Resource Report

Soil Map



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils



Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot

Spoil Area



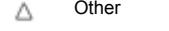
Spoil Area

Stony Spot



Stony Spot

Very Stony Spot



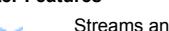
Very Stony Spot

Wet Spot



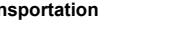
Wet Spot

Other



Other

Special Line Features



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Liberty County, Montana

Survey Area Data: Version 12, Sep 28, 2015

Soil Survey Area: Toole County, Montana

Survey Area Data: Version 11, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Liberty County, Montana (MT051)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
35B	Assiniboine fine sandy loam, 0 to 4 percent slopes	1.5	0.0%
224E	Hillon-Joplin loams, 8 to 25 percent slopes	11.0	0.2%
331B	Phillips-Elloam complex, 0 to 4 percent slopes	86.6	1.3%
421C	Joplin-Hillon loams, 2 to 8 percent slopes	464.8	7.0%
442C	Kevin-Elloam clay loams, 2 to 8 percent slopes	295.0	4.4%
503B	Telstad-Joplin loams, 0 to 4 percent slopes	21.8	0.3%
561B	Scobey-Kevin clay loams, 0 to 4 percent slopes	282.1	4.2%
561C	Scobey-Kevin clay loams, 2 to 8 percent slopes	28.6	0.4%
605C	Yamacall-Havre loams, 0 to 8 percent slopes	11.7	0.2%
Subtotals for Soil Survey Area		1,203.2	18.0%
Totals for Area of Interest		6,672.3	100.0%

Toole County, Montana (MT101)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
16B	Degrand loam, 0 to 4 percent slopes	0.0	0.0%
19B	Kenilworth loam, 0 to 4 percent slopes	25.5	0.4%
22E	Hillon clay loam, 8 to 25 percent slopes	21.8	0.3%
23A	Acel silty clay loam, 0 to 2 percent slopes	3.9	0.1%
28A	Nishon clay loam, 0 to 1 percent slopes	3.6	0.1%
29B	Nunemaker silty clay loam, 0 to 4 percent slopes	246.7	3.7%
29C	Nunemaker silty clay loam, 4 to 8 percent slopes	60.1	0.9%
30B	Marvan silty clay, 0 to 4 percent slopes	381.0	5.7%
30C	Marvan silty clay, 4 to 8 percent slopes	13.5	0.2%
32B	Kobase silty clay loam, 0 to 4 percent slopes	334.1	5.0%

Custom Soil Resource Report

Toole County, Montana (MT101)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
32C	Kobase silty clay loam, 4 to 8 percent slopes	115.8	1.7%
37B	Evanston clay loam, 0 to 4 percent slopes	128.6	1.9%
38B	Ethridge clay loam, 0 to 4 percent slopes	45.3	0.7%
39B	Ferd loam, 0 to 4 percent slopes	93.3	1.4%
42B	Joplin clay loam, 0 to 4 percent slopes	159.1	2.4%
44B	Kevin clay loam, 0 to 4 percent slopes	13.4	0.2%
44C	Kevin clay loam, 4 to 8 percent slopes	22.2	0.3%
47B	Marias silty clay, 0 to 4 percent slopes	223.0	3.3%
48B	Vanda silty clay, 0 to 4 percent slopes	56.1	0.8%
53E	Sunburst clay loam, 15 to 25 percent slopes	90.0	1.3%
53F	Sunburst clay loam, 25 to 70 percent slopes	84.2	1.3%
54B	Trudau loam, 0 to 4 percent slopes	37.0	0.6%
62A	Vaeda silty clay loam, 0 to 2 percent slopes	130.5	2.0%
79B	Yamacall loam, 0 to 4 percent slopes	3.5	0.1%
141A	McKenzie clay, saline, 0 to 2 percent slopes	49.9	0.7%
222E	Hillon-Neldore complex, 8 to 25 percent slopes	48.4	0.7%
222F	Hillon-Neldore complex, 25 to 70 percent slopes	159.0	2.4%
311B	Creed-Gerdrum-Absher complex, 0 to 4 percent slopes	159.5	2.4%
321B	Kobase silty clay loam, calcareous, 0 to 4 percent slopes	214.5	3.2%
321C	Kobase silty clay loam, calcareous, 4 to 8 percent slopes	30.4	0.5%
332B	Phillips-Kevin complex, 0 to 4 percent slopes	834.0	12.5%
364C	Chinook fine sandy loam, 0 to 8 percent slopes	0.7	0.0%
372B	Evanston fine sandy loam, 0 to 4 percent slopes	246.8	3.7%

Custom Soil Resource Report

Toole County, Montana (MT101)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
391B	Ferd-Creed-Gerdrum complex, 0 to 4 percent slopes	19.8	0.3%
402A	Gerdrum-Absher complex, 0 to 2 percent slopes	9.4	0.1%
421C	Joplin-Hillon loams, 2 to 8 percent slopes	21.6	0.3%
421D	Joplin-Hillon clay loams, 8 to 15 percent slopes	8.4	0.1%
423B	Joplin-Hillon clay loams, 0 to 3 percent slopes	78.0	1.2%
427B	Joplin complex, 0 to 4 percent slopes	612.1	9.2%
441C	Kevin-Hillon clay loams, 2 to 8 percent slopes	32.3	0.5%
445B	Kevin complex, 0 to 4 percent slopes	26.9	0.4%
446C	Kevin-Elloam clay loams, 2 to 8 percent slopes	17.7	0.3%
521B	Elloam-Absher clay loams, 0 to 4 percent slopes	26.3	0.4%
561B	Scobey-Kevin clay loams, 0 to 4 percent slopes	249.8	3.7%
601A	Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded	233.7	3.5%
793B	Yamacall loam, calcareous, 0 to 4 percent slopes	2.4	0.0%
971C	Neldore-Bascovy clays, 2 to 8 percent slopes	86.4	1.3%
W	Water	8.9	0.1%
Subtotals for Soil Survey Area		5,469.1	82.0%
Totals for Area of Interest		6,672.3	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic 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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

Custom Soil Resource Report

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

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

Liberty County, Montana

35B—Assinniboine fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: ck4t

Elevation: 2,750 to 3,460 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Assinniboine and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Assinniboine

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: fine sandy loam

Bt - 7 to 15 inches: sandy clay loam

Bk - 15 to 43 inches: fine sandy loam

BC - 43 to 60 inches: stratified fine sandy loam to fine sand

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)

Hydric soil rating: No

Minor Components

Assinniboine

Percent of map unit: 3 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 2 percent

Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)

Hydric soil rating: No

224E—Hillon-Joplin loams, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: ck3t

Elevation: 2,750 to 3,460 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 65 percent

Joplin and similar soils: 30 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: loam

Bk - 6 to 27 inches: loam

Bky - 27 to 60 inches: loam

Properties and qualities

Slope: 8 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Joplin

Setting

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

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 9 inches: clay loam
Bk - 9 to 20 inches: loam
Bky - 20 to 60 inches: loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Hillon

Percent of map unit: 2 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)
Hydric soil rating: No

Slopes more than 25 percent

Percent of map unit: 1 percent

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

331B—Phillips-Elloam complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: ck4p

Elevation: 2,750 to 3,460 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 60 percent

Elloam and similar soils: 30 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

E - 0 to 7 inches: loam

Bt - 7 to 16 inches: clay

Bk - 16 to 50 inches: clay loam

Bky - 50 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

E - 0 to 2 inches: clay loam
Btn - 2 to 9 inches: clay
Bkn - 9 to 15 inches: clay
Bknyz - 15 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Minor Components

Phillips

Percent of map unit: 3 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nishon

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

Joplin, calcareous surface

Percent of map unit: 2 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Hillon

Percent of map unit: 2 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

421C—Joplin-Hillon loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2l07b

Elevation: 2,000 to 3,870 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 100 to 140 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Joplin and similar soils: 50 percent

Hillon and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Joplin

Setting

Landform: Moraines

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam

Bt - 6 to 9 inches: clay loam

Bk1 - 9 to 22 inches: clay loam

Bk2 - 22 to 41 inches: clay loam

BCyz - 41 to 57 inches: loam

Cz - 57 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Hillon

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bk1 - 6 to 14 inches: loam
Bk2 - 14 to 29 inches: loam
BCyz - 29 to 41 inches: loam
Cz - 41 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Evanston

Percent of map unit: 4 percent
Landform: Moraines
Landform position (three-dimensional): Head slope
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Overflow (Ov) LRU 52-A (R052XA060MT)
Hydric soil rating: No

Fortbenton

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (Sy) LRU 52-A (R052XA110MT)
Hydric soil rating: No

Hillon, gravelly surface

Percent of map unit: 2 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Moraines
Landform position (three-dimensional): Base slope
Microfeatures of landform position: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Closed Depression (CD) LRU 52-A (R052XA071MT)
Hydric soil rating: Yes

Delpoint

Percent of map unit: 1 percent
Landform: Moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)
Hydric soil rating: No

442C—Kevin-Elloam clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: ck5h
Elevation: 2,750 to 3,460 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Kevin and similar soils: 55 percent
Elloam and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kevin

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: clay loam
Bt - 3 to 8 inches: clay
Bk1 - 8 to 25 inches: clay loam
Bk2 - 25 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

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

Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

E - 0 to 2 inches: clay loam
Btn - 2 to 9 inches: clay
Bkn - 9 to 15 inches: clay
Bknyz - 15 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Minor Components

Slopes more than 8 percent

Percent of map unit: 2 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nishon

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

Kevin

Percent of map unit: 2 percent
Landform: Till plains

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Joplin

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Slopes less than 2 percent

Percent of map unit: 2 percent
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

503B—Telstad-Joplin loams, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2v55g
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Telstad and similar soils: 50 percent
Joplin and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Telstad

Setting

Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 15 inches: clay loam
Bk1 - 15 to 30 inches: clay loam
Bk2 - 30 to 45 inches: clay loam
BCyz - 45 to 61 inches: loam
Cz - 61 to 79 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Joplin

Setting

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 22 inches: clay loam
Bk2 - 22 to 41 inches: clay loam
BCyz - 41 to 57 inches: loam
Cz - 57 to 79 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 6 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Fortbenton

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (Sy) LRU 52-A (R052XA110MT)
Hydric soil rating: No

Ferd

Percent of map unit: 2 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Overflow (Ov) LRU 52-A (R052XA060MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Ground moraines
Microfeatures of landform position: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Closed Depression (CD) LRU 52-A (R052XA071MT)
Hydric soil rating: Yes

Elloam

Percent of map unit: 1 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) LRU 52-A (R052XA006MT)
Hydric soil rating: No

561B—Scobey-Kevin clay loams, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2t3kb
Elevation: 2,490 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Scobey and similar soils: 50 percent
Kevin and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 15 inches: clay
Bk1 - 15 to 29 inches: clay loam
Bk2 - 29 to 43 inches: clay loam
BCyz - 43 to 61 inches: clay loam
Cz - 61 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Kevin

Setting

Landform: Flats
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 58 inches: clay loam
Cz - 58 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 8 percent
Landform: Rises
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)

Hydric soil rating: No

Elloam

Percent of map unit: 3 percent

Landform: Flats

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) LRU 52-A (R052XA006MT)

Hydric soil rating: No

Acel

Percent of map unit: 2 percent

Landform: Swales

Down-slope shape: Concave

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Nishon

Percent of map unit: 2 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: Overflow (Ov) LRU 52-A (R052XA060MT)

Hydric soil rating: Yes

561C—Scobey-Kevin clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t3k4

Elevation: 2,000 to 3,870 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 100 to 140 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Scobey and similar soils: 45 percent

Kevin and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Moraines

Landform position (two-dimensional): Foothslope, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 15 inches: clay

Bk1 - 15 to 29 inches: clay loam

Bk2 - 29 to 44 inches: clay loam

BCyz - 44 to 61 inches: clay loam

Cz - 61 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 4 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 12.0

Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

Description of Kevin

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 9 inches: clay loam

Bk1 - 9 to 23 inches: clay loam

Bk2 - 23 to 41 inches: clay loam

BCyz - 41 to 57 inches: clay loam

Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 8 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Elloam

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Acel

Percent of map unit: 2 percent
Landform: Moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 2 percent
Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

605C—Yamacall-Havre loams, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: ck6b
Elevation: 2,750 to 3,460 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Yamacall

Setting

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

Typical profile

A - 0 to 5 inches: loam
Bw - 5 to 12 inches: loam
Bk - 12 to 27 inches: loam
Bky - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

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

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Havre

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: loam
C - 5 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: No

Minor Components

Slopes more than 8 percent

Percent of map unit: 2 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Bigsandy

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

Benz

Percent of map unit: 2 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: No

Beaverell

Percent of map unit: 2 percent
Landform: Eskers
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XC216MT)
Hydric soil rating: No

Glendive

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Toole County, Montana

16B—Degrand loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl2k
Elevation: 3,200 to 3,680 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Degrand

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 5 inches: loam
Bt - 5 to 14 inches: clay loam
Bk - 14 to 24 inches: sandy clay loam
2C - 24 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Slopes more than 4 percent

Percent of map unit: 10 percent
Hydric soil rating: No

Degrand

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

19B—Kenilworth loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl2s
Elevation: 3,080 to 3,400 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Kenilworth

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: loam
Bt - 6 to 11 inches: sandy clay loam
Bk1 - 11 to 15 inches: sandy clay loam
2Bk2 - 15 to 24 inches: clay loam
2C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Nunemaker

Percent of map unit: 7 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Elloam

Percent of map unit: 7 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

McKenzie

Percent of map unit: 1 percent

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)

Hydric soil rating: Yes

22E—Hillon clay loam, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: cl3c

Elevation: 3,000 to 4,000 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam

Bk - 5 to 30 inches: clay loam

Bky - 30 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

Minor Components

Slopes more than 25 percent

Percent of map unit: 5 percent

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

Kevin

Percent of map unit: 4 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Neldore

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XN179MT)

Hydric soil rating: No

Bascovy

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey-Steep (CyStp) 10-14" p.z. (R052XN164MT)

Hydric soil rating: No

Cabbart

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Hydric soil rating: No

23A—Acel silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sy7l

Elevation: 2,590 to 3,940 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Acel and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Acel

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciofluvial deposits

Typical profile

A - 0 to 6 inches: silty clay loam

Bt - 6 to 20 inches: silty clay

Bk - 20 to 66 inches: silty clay loam

2By - 66 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Slightly saline (4.0 to 6.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 8.0

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Minor Components

Nishon

Percent of map unit: 6 percent

Landform: Potholes

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)

Hydric soil rating: Yes

Ethridge

Percent of map unit: 3 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Gerdrum

Percent of map unit: 1 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

28A—Nishon clay loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: cl3r

Elevation: 3,200 to 4,070 feet

Mean annual precipitation: 13 to 17 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 105 days

Farmland classification: Not prime farmland

Map Unit Composition

Nishon and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nishon

Setting

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 4 inches: clay loam

Bt - 4 to 22 inches: clay

Bk - 22 to 60 inches: clay

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D

Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)

Hydric soil rating: Yes

Minor Components

Artificially drained soils

Percent of map unit: 3 percent

Hydric soil rating: No

McKenzie, saline

Percent of map unit: 1 percent

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)

Hydric soil rating: Yes

Nishon

Percent of map unit: 1 percent

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)

Hydric soil rating: Yes

29B—Nunemaker silty clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl3s

Elevation: 3,000 to 3,400 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Nunemaker and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nunemaker

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciofluvial deposits

Typical profile

A - 0 to 4 inches: silty clay loam

Bw - 4 to 12 inches: silty clay

Bk - 12 to 21 inches: clay

Bky - 21 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Minor Components

Marvan

Percent of map unit: 7 percent
Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Vanda

Percent of map unit: 6 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Mckenzie

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

29C—Nunemaker silty clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl3t
Elevation: 3,000 to 3,400 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Nunemaker

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Glaciofluvial deposits

Typical profile

A - 0 to 4 inches: silty clay loam
Bw - 4 to 12 inches: silty clay
Bk - 12 to 21 inches: clay
Bky - 21 to 60 inches: clay loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Minor Components

Vanda

Percent of map unit: 4 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Marvan

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Slopes more than 8 percent

Percent of map unit: 3 percent
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Slopes less than 4 percent

Percent of map unit: 3 percent
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

McKenzie

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

30B—Marvan silty clay, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl3y
Elevation: 3,000 to 3,480 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Marvan and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marvan

Setting

Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 7 inches: silty clay
Bssyz - 7 to 30 inches: silty clay
Bnyz - 30 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 38.0

Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Minor Components

Vanda

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)

Hydric soil rating: No

Bascovy

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

30C—Marvan silty clay, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl3z

Elevation: 3,000 to 3,480 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Marvan and similar soils: 85 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marvan

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 7 inches: silty clay
Bssyz - 7 to 30 inches: silty clay
Bnyz - 30 to 60 inches: silty clay

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 38.0
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Minor Components

Vanda

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Bascovy

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

32B—Kobase silty clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl45

Elevation: 3,000 to 3,480 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Kobase

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: silty clay loam
Bw - 5 to 12 inches: silty clay loam
Bk - 12 to 28 inches: silty clay loam
By - 28 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Minor Components

Kobase, calcareous

Percent of map unit: 8 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-C 11-14" p.z. (R058AC041MT)
Hydric soil rating: No

Marvan

Percent of map unit: 3 percent
Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Mckenzie

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

Vanda

Percent of map unit: 2 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

32C—Kobase silty clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl46
Elevation: 3,000 to 3,480 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Kobase

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: silty clay loam
Bw - 5 to 12 inches: silty clay loam

Bk - 12 to 28 inches: silty clay loam

By - 28 to 60 inches: silty clay loam

Properties and qualities

Slope: 4 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Minor Components

Trudau

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)

Hydric soil rating: No

Bascovy

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Ethridge

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

37B—Evanston clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl4v
Elevation: 3,000 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Evanston

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: clay loam
Bt - 6 to 15 inches: clay loam
Bk - 15 to 32 inches: clay loam
C - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Evanston, calcareous

Percent of map unit: 10 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Chinook

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

38B—Ethridge clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl50

Elevation: 3,000 to 4,000 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ethridge and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ethridge

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 15 inches: silty clay

Bk - 15 to 38 inches: silty clay loam

BC - 38 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Minor Components

Marias

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Marvan

Percent of map unit: 5 percent
Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Vanda

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

39B—Ferd loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl54
Elevation: 3,000 to 3,800 feet

Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Ferd

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: loam
E/Bt - 5 to 9 inches: loam
Bt - 9 to 16 inches: clay loam
Bk - 16 to 41 inches: clay loam
BC - 41 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Gerdrum

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Absher

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 5 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

42B—Joplin clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl5q
Elevation: 3,080 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Joplin

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 4 inches: clay loam
Bt - 4 to 9 inches: clay loam
Bk - 9 to 26 inches: clay loam
C - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Joplin, calcareous

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Elloam

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 5 percent

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

44B—Kevin clay loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl64

Elevation: 3,080 to 3,800 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Kevin and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kevin

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 5 inches: clay loam

Bt - 5 to 9 inches: clay loam

Bk - 9 to 24 inches: clay loam

C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Slopes more than 4 percent

Percent of map unit: 5 percent

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Kevin, calcareous

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Elloam

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

44C—Kevin clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl65
Elevation: 3,080 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Kevin

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 5 inches: clay loam
Bt - 5 to 9 inches: clay loam
Bk - 9 to 24 inches: clay loam
C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Slopes more than 8 percent

Percent of map unit: 5 percent

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Kevin, calcareous

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Elloam

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

47B—Marias silty clay, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl6b

Elevation: 3,000 to 3,400 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Marias and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marias

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: silty clay

Bss - 5 to 27 inches: clay

Bssy - 27 to 60 inches: clay

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 8.0

Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Minor Components

Ethridge

Percent of map unit: 4 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Kobase

Percent of map unit: 4 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

McKenzie

Percent of map unit: 2 percent

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)

Hydric soil rating: Yes

48B—Vanda silty clay, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl6g
Elevation: 3,000 to 3,400 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Vanda

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 1 inches: silty clay
Bkn - 1 to 9 inches: silty clay
Bknyz - 9 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Minor Components

Benz

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: No

Marvan

Percent of map unit: 5 percent
Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Creed

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Gerdrum

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

53E—Sunburst clay loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: cl6x
Elevation: 3,080 to 3,480 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Sunburst

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 6 inches: clay loam

Bky - 6 to 60 inches: clay

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Clayey-Steep (CyStp) 10-14" p.z. (R052XN164MT)

Hydric soil rating: No

Minor Components

Noncalcareous surface layers

Percent of map unit: 5 percent

Ecological site: Clayey-Steep (CyStp) 10-14" p.z. (R052XN164MT)

Hydric soil rating: No

Hillon

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

Kevin

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

53F—Sunburst clay loam, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: cl6y
Elevation: 3,080 to 3,480 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Sunburst

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 6 inches: clay loam
Bky - 6 to 60 inches: clay

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Clayey-Steep (CyStp) 10-14" p.z. (R052XN164MT)
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)
Hydric soil rating: No

Kevin

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)
Hydric soil rating: No

Noncalcareous surface layers

Percent of map unit: 5 percent
Ecological site: Clayey-Steep (CyStp) 10-14" p.z. (R052XN164MT)
Hydric soil rating: No

54B—Trudau loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl6z
Elevation: 3,000 to 3,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Trudau and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Trudau

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 4 inches: loam
Bw - 4 to 12 inches: clay loam
Bkz - 12 to 60 inches: stratified clay loam to sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: No

Minor Components

Marvan

Percent of map unit: 5 percent
Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Vanda

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

62A—Vaeda silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cl7m
Elevation: 3,200 to 3,400 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Vaeda and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vaeda

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

E - 0 to 2 inches: silty clay loam

Bnz - 2 to 13 inches: silty clay

Bnyz - 13 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 20.0

Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)

Hydric soil rating: No

Minor Components

Creed

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

Marias

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

79B—Yamacall loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl95

Elevation: 3,000 to 3,800 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Yamacall and similar soils: 85 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yamacall

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: loam

Bw - 6 to 11 inches: loam

Bk - 11 to 60 inches: loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Yetull

Percent of map unit: 5 percent
Landform: Dunes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sands (Sa) 10-14" p.z. (R052XN175MT)
Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 5 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

141A—McKenzie clay, saline, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cl27
Elevation: 3,180 to 3,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of McKenzie

Setting

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

A - 0 to 4 inches: clay
Bw - 4 to 12 inches: clay
Byz - 12 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

Minor Components

Slickspots

Percent of map unit: 10 percent

McKenzie

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

222E—Hillon-Neldore complex, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: cl37
Elevation: 3,080 to 4,100 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 50 percent
Neldore and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam
Bk - 5 to 30 inches: clay loam
Bky - 30 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)
Hydric soil rating: No

Description of Neldore

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum

Typical profile

A - 0 to 6 inches: clay
C - 6 to 18 inches: clay
Cr - 18 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XN179MT)

Hydric soil rating: No

Minor Components

Slopes more than 25 percent

Percent of map unit: 10 percent

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: No

222F—Hillon-Neldore complex, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: cl38

Elevation: 3,080 to 4,100 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 45 percent

Neldore and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam

Bk - 5 to 30 inches: clay loam

Bky - 30 to 60 inches: clay loam

Properties and qualities

Slope: 45 to 70 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)
Hydric soil rating: No

Description of Neldore

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum

Typical profile

A - 0 to 6 inches: clay
C - 6 to 18 inches: clay
Cr - 18 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XN179MT)
Hydric soil rating: No

Minor Components

Slopes less than 25 percent

Percent of map unit: 10 percent
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

311B—Creed-Gerdrum-Absher complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl40
Elevation: 3,000 to 4,200 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Creed and similar soils: 35 percent
Gerdrum and similar soils: 30 percent
Absher and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Creed

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 5 inches: clay loam
Btn - 5 to 12 inches: clay
Bknyz - 12 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 20.0
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Description of Gerdrum

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 4 inches: clay loam
Btn - 4 to 14 inches: clay
Bknyz - 14 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Description of Absher

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 2 inches: clay
Btn - 2 to 13 inches: clay
Bknyz - 13 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Strongly saline (16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 70.0
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Minor Components

Ethridge

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Evanston

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Ferd

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

321B—Kobase silty clay loam, calcareous, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl42
Elevation: 3,000 to 3,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Kobase

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: silty clay loam
Bw - 5 to 12 inches: silty clay loam
Bk - 12 to 28 inches: silty clay loam
By - 28 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Minor Components

Marvan

Percent of map unit: 5 percent

Landform: Lake plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Vanda

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)

Hydric soil rating: No

Noncalcareous surface layers

Percent of map unit: 5 percent

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

321C—Kobase silty clay loam, calcareous, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl43

Elevation: 3,000 to 3,700 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Kobase and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kobase

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: silty clay loam
Bw - 5 to 12 inches: silty clay loam
Bk - 12 to 28 inches: silty clay loam
By - 28 to 60 inches: silty clay loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Minor Components

Noncalcareous surface layers

Percent of map unit: 5 percent
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Slopes less than 4 percent

Percent of map unit: 4 percent
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Marvan

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Vanda

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

332B—Phillips-Kevin complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2sy83
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Phillips and similar soils: 50 percent
Kevin and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

A - 0 to 2 inches: loam
E - 2 to 7 inches: loam
Bt - 7 to 11 inches: clay
Btk - 11 to 15 inches: clay loam
Bk - 15 to 36 inches: clay loam
BCyz - 36 to 50 inches: clay loam
Cz - 50 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Kevin

Setting

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 57 inches: clay loam
Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Elloam

Percent of map unit: 4 percent

Landform: Ground moraines
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: No

Ethrige

Percent of map unit: 2 percent

Landform: Ground moraines

Microfeatures of landform position: Swales

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Nishon

Percent of map unit: 2 percent

Landform: Depressions on ground moraines

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Thoeny

Percent of map unit: 2 percent

Landform: Ground moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

364C—Chinook fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl4j

Elevation: 3,100 to 3,900 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Chinook and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chinook

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 6 inches: fine sandy loam
Bw - 6 to 23 inches: fine sandy loam
Bk - 23 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Minor Components

Slopes more than 8 percent

Percent of map unit: 5 percent
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Kobase

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Kremlin

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Lihen

Percent of map unit: 2 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Busby

Percent of map unit: 2 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)

Hydric soil rating: No

372B—Evanston fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl4n

Elevation: 3,200 to 3,500 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 36 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Evanston and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Evanston

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: fine sandy loam

Bt - 6 to 15 inches: clay loam

Bk - 15 to 32 inches: clay loam

C - 32 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Minor Components

Slopes more than 4 percent

Percent of map unit: 10 percent
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Chinook

Percent of map unit: 5 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

391B—Ferd-Creed-Gerdrum complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl52
Elevation: 3,000 to 3,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Ferd and similar soils: 40 percent
Creed and similar soils: 35 percent
Gerdrum and similar soils: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ferd

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 5 inches: loam
E/Bt - 5 to 9 inches: loam
Bt - 9 to 16 inches: clay loam
Bk - 16 to 41 inches: clay loam
BC - 41 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Creed

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 5 inches: loam
Btn - 5 to 12 inches: clay
Bknyz - 12 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 20.0
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

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

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Description of Gerdrum

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 4 inches: clay loam
Btn - 4 to 14 inches: clay
Bknyz - 14 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Minor Components

Absher

Percent of map unit: 2 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Gerdrum

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Slickspots

Percent of map unit: 1 percent

402A—Gerdrum-Absher complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cl57
Elevation: 3,000 to 3,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Gerdrum and similar soils: 55 percent
Absher and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gerdrum

Setting

Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 4 inches: clay loam
Btn - 4 to 14 inches: clay
Bknyz - 14 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Description of Abshar

Setting

Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 2 inches: clay
Btn - 2 to 13 inches: clay
Bknyz - 13 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Strongly saline (16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 70.0
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Minor Components

Ferd

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nobe

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)

Hydric soil rating: No

Slickspots

Percent of map unit: 5 percent

421C—Joplin-Hillon loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t07b

Elevation: 2,000 to 3,870 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 100 to 140 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Joplin and similar soils: 50 percent

Hillon and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Joplin

Setting

Landform: Moraines

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam

Bt - 6 to 9 inches: clay loam

Bk1 - 9 to 22 inches: clay loam

Bk2 - 22 to 41 inches: clay loam

BCyz - 41 to 57 inches: loam

Cz - 57 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Hillon

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bk1 - 6 to 14 inches: loam
Bk2 - 14 to 29 inches: loam
BCyz - 29 to 41 inches: loam
Cz - 41 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Evanston

Percent of map unit: 4 percent

Landform: Moraines

Landform position (three-dimensional): Head slope

Microfeatures of landform position: Swales

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: Overflow (Ov) LRU 52-A (R052XA060MT)

Hydric soil rating: No

Fortbenton

Percent of map unit: 2 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope, summit

Landform position (three-dimensional): Nose slope

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Sandy (Sy) LRU 52-A (R052XA110MT)

Hydric soil rating: No

Hillon, gravelly surface

Percent of map unit: 2 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)

Hydric soil rating: No

Nishon

Percent of map unit: 1 percent

Landform: Moraines

Landform position (three-dimensional): Base slope

Microfeatures of landform position: Closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: Closed Depression (CD) LRU 52-A (R052XA071MT)

Hydric soil rating: Yes

Delpoint

Percent of map unit: 1 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XN168MT)

Hydric soil rating: No

421D—Joplin-Hillon clay loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: cl5c
Elevation: 3,100 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Joplin and similar soils: 45 percent
Hillon and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Joplin

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 4 inches: clay loam
Bt - 4 to 9 inches: clay loam
Bk - 9 to 26 inches: clay loam
C - 26 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

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

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Hillon

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam
Bk - 5 to 30 inches: clay loam
Bky - 30 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Elloam

Percent of map unit: 13 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Mckenzie

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

423B—Joplin-Hillon clay loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: cl5d
Elevation: 3,100 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Joplin, calcareous, and similar soils: 50 percent
Hillon and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Joplin, Calcareous

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 4 inches: clay loam
Bt - 4 to 9 inches: clay loam
Bk - 9 to 26 inches: clay loam
C - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

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

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Hillon

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam
Bk - 5 to 30 inches: clay loam
Bky - 30 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Noncalcareous surface layers

Percent of map unit: 7 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Elloam

Percent of map unit: 6 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Mckenzie

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

427B—Joplin complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl51
Elevation: 3,100 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Joplin and similar soils: 45 percent
Joplin, calcareous, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Joplin

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 4 inches: clay loam
Bt - 4 to 9 inches: clay loam
Bk - 9 to 26 inches: clay loam
C - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Description of Joplin, Calcareous

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 4 inches: clay loam

Bt - 4 to 9 inches: clay loam

Bk - 9 to 26 inches: clay loam

C - 26 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Elloam

Percent of map unit: 7 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)

Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 6 percent

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Mckenzie

Percent of map unit: 2 percent

Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)
Hydric soil rating: Yes

441C—Kevin-Hillon clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t071
Elevation: 2,490 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kevin and similar soils: 50 percent
Hillon and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kevin

Setting

Landform: Rises
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 58 inches: clay loam
Cz - 58 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Hillon

Setting

Landform: Rises
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: clay loam
Bk1 - 6 to 16 inches: clay loam
Bk2 - 16 to 32 inches: clay loam
BCyz - 32 to 42 inches: clay loam
Cz - 42 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Scobey

Percent of map unit: 8 percent
Landform: Rises

Landform position (two-dimensional): Footslope, backslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Hillon, gravelly surface

Percent of map unit: 3 percent
Landform: Knolls
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Ethridge

Percent of map unit: 3 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Clayey (Cy) LRU 52-A (R052XA001MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Overflow (Ov) LRU 52-A (R052XA060MT)
Hydric soil rating: Yes

445B—Kevin complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl5y
Elevation: 3,100 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kevin and similar soils: 50 percent
Kevin, calcareous, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kevin

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 5 inches: clay loam

Bt - 5 to 9 inches: clay loam

Bk - 9 to 24 inches: clay loam

C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Description of Kevin, Calcareous

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 5 inches: clay loam

Bt - 5 to 9 inches: clay loam

Bk - 9 to 24 inches: clay loam

C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Minor Components

Elloam

Percent of map unit: 7 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 7 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

446C—Kevin-Elloam clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cl61
Elevation: 3,100 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Kevin and similar soils: 55 percent

Elloam and similar soils: 35 percent

Minor components: 8 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kevin

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 5 inches: clay loam

Bt - 5 to 9 inches: clay loam

Bk - 9 to 24 inches: clay loam

C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 4 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Gypsum, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

E - 0 to 4 inches: clay loam

Btn - 4 to 15 inches: clay loam

Btkn - 15 to 25 inches: clay loam

Bknzy - 25 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Minor Components

Kevin, calcareous

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Nishon

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R052XN166MT)
Hydric soil rating: Yes

Absher

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Slickspots

Percent of map unit: 2 percent

521B—Elloam-Absher clay loams, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl6v
Elevation: 3,000 to 3,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Elloam

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 4 inches: clay loam
Btn - 4 to 15 inches: clay loam
Btkn - 15 to 25 inches: clay loam
Bknzy - 25 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D
Ecological site: Claypan (Cp) 10-14" p.z. (R052XN086MT)
Hydric soil rating: No

Description of Abshar

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 2 inches: clay loam
Btn - 2 to 13 inches: clay
Bknyz - 13 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Strongly saline (16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 70.0
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XN172MT)
Hydric soil rating: No

Minor Components

Phillips

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Slickspots

Percent of map unit: 5 percent

561B—Scobey-Kevin clay loams, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2t3kb
Elevation: 2,490 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Scobey and similar soils: 50 percent
Kevin and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 15 inches: clay
Bk1 - 15 to 29 inches: clay loam
Bk2 - 29 to 43 inches: clay loam
BCyz - 43 to 61 inches: clay loam
Cz - 61 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Kevin

Setting

Landform: Flats
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 58 inches: clay loam
Cz - 58 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 8 percent
Landform: Rises
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)

Hydric soil rating: No

Elloam

Percent of map unit: 3 percent

Landform: Flats

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Claypan (Cp) LRU 52-A (R052XA006MT)

Hydric soil rating: No

Acel

Percent of map unit: 2 percent

Landform: Swales

Down-slope shape: Concave

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Nishon

Percent of map unit: 2 percent

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: Overflow (Ov) LRU 52-A (R052XA060MT)

Hydric soil rating: Yes

601A—Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: cl7j

Elevation: 3,000 to 3,900 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Havre and similar soils: 50 percent

Glendive and similar soils: 35 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: loam
C1 - 6 to 24 inches: stratified fine sandy loam to clay loam
C2 - 24 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Description of Glendive

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 5 inches: fine sandy loam
C1 - 5 to 16 inches: sandy loam
C2 - 16 to 60 inches: stratified loamy fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)
Hydric soil rating: No

Minor Components

Harlake

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

Occasionally flooded soils

Percent of map unit: 4 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Bigsag

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XN171MT)
Hydric soil rating: Yes

Bigsandy

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Subirrigated (Sb) RRU 46-N 13-19" p.z. (R046XN256MT)
Hydric soil rating: Yes

793B—Yamacall loam, calcareous, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cl90
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Yamacall

Setting

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: loam

Bw - 6 to 11 inches: loam

Bk - 11 to 60 inches: loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Minor Components

Noncalcareous surface layers

Percent of map unit: 5 percent

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

Trudau

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XN170MT)

Hydric soil rating: No

Slopes more than 4 percent

Percent of map unit: 5 percent

Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Hydric soil rating: No

971C—Neldore-Bascovy clays, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: clb1
Elevation: 3,000 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Neldore and similar soils: 45 percent
Bascovy and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Neldore

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum

Typical profile

A - 0 to 6 inches: clay
C - 6 to 18 inches: clay
Cr - 18 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XN179MT)
Hydric soil rating: No

Description of Bascovy

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum

Typical profile

A - 0 to 4 inches: clay

Bss1 - 4 to 13 inches: clay

Bss2 - 13 to 30 inches: clay

Cr - 30 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Minor Components

Slopes more than 8 percent

Percent of map unit: 5 percent

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XN179MT)

Hydric soil rating: No

Marias

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Marvan

Percent of map unit: 5 percent

Landform: Fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

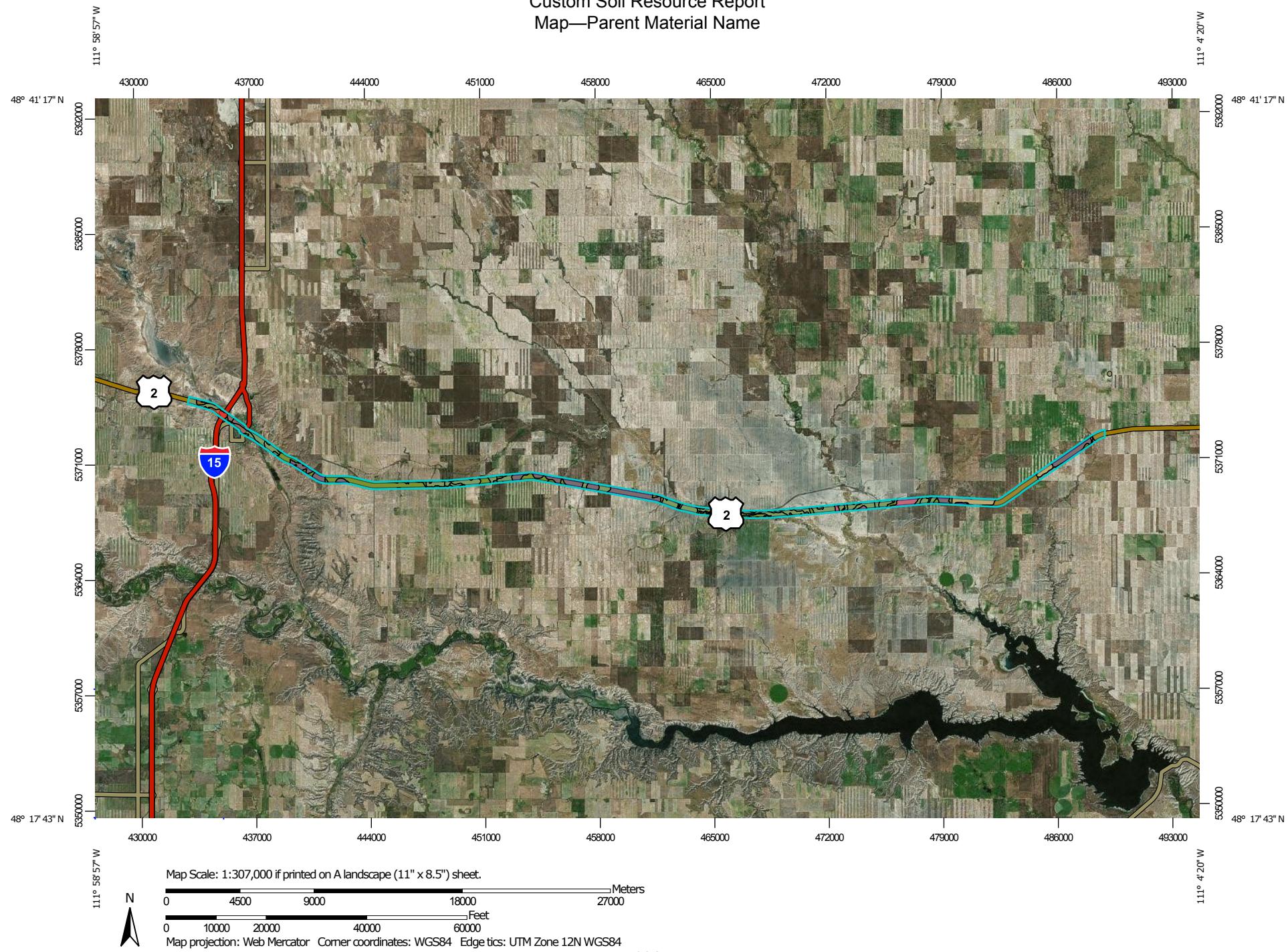
Parent Material Name

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

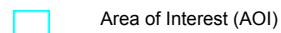
For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report
Map—Parent Material Name



MAP LEGEND

Area of Interest (AOI)



Soils

Soil Rating Polygons

- alluvium
- clayey till
- fine-loamy till
- glaciofluvial deposits
- glaciolacustrine deposits
- residuum
- till
- Not rated or not available

Soil Rating Lines

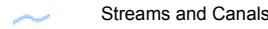
- alluvium
- clayey till
- fine-loamy till
- glaciofluvial deposits
- glaciolacustrine deposits
- residuum
- till
- Not rated or not available

Soil Rating Points

- alluvium
- clayey till
- fine-loamy till
- glaciofluvial deposits

- glaciolacustrine deposits
- residuum
- till
- Not rated or not available

Water Features



Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Liberty County, Montana
Survey Area Data: Version 12, Sep 28, 2015

Soil Survey Area: Toole County, Montana
Survey Area Data: Version 11, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name

Parent Material Name— Summary by Map Unit — Liberty County, Montana (MT051)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
35B	Assinniboine fine sandy loam, 0 to 4 percent slopes		1.5	0.0%
224E	Hillon-Joplin loams, 8 to 25 percent slopes		11.0	0.2%
331B	Phillips-Elloam complex, 0 to 4 percent slopes		86.6	1.3%
421C	Joplin-Hillon loams, 2 to 8 percent slopes	fine-loamy till	464.8	7.0%
442C	Kevin-Elloam clay loams, 2 to 8 percent slopes		295.0	4.4%
503B	Telstad-Joplin loams, 0 to 4 percent slopes	fine-loamy till	21.8	0.3%
561B	Scobey-Kevin clay loams, 0 to 4 percent slopes	clayey till	282.1	4.2%
561C	Scobey-Kevin clay loams, 2 to 8 percent slopes	clayey till	28.6	0.4%
605C	Yamacall-Havre loams, 0 to 8 percent slopes		11.7	0.2%
Subtotals for Soil Survey Area			1,203.2	18.0%
Totals for Area of Interest			6,672.3	100.0%

Parent Material Name— Summary by Map Unit — Toole County, Montana (MT101)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
16B	Degrand loam, 0 to 4 percent slopes	alluvium	0.0	0.0%
19B	Kenilworth loam, 0 to 4 percent slopes	alluvium	25.5	0.4%
22E	Hillon clay loam, 8 to 25 percent slopes	till	21.8	0.3%
23A	Acel silty clay loam, 0 to 2 percent slopes	glaciofluvial deposits	3.9	0.1%
28A	Nishon clay loam, 0 to 1 percent slopes	alluvium	3.6	0.1%
29B	Nunemaker silty clay loam, 0 to 4 percent slopes	glaciofluvial deposits	246.7	3.7%
29C	Nunemaker silty clay loam, 4 to 8 percent slopes	glaciofluvial deposits	60.1	0.9%
30B	Marvan silty clay, 0 to 4 percent slopes	alluvium	381.0	5.7%
30C	Marvan silty clay, 4 to 8 percent slopes	alluvium	13.5	0.2%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Toole County, Montana (MT101)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
32B	Kobase silty clay loam, 0 to 4 percent slopes	alluvium	334.1	5.0%
32C	Kobase silty clay loam, 4 to 8 percent slopes	alluvium	115.8	1.7%
37B	Evanston clay loam, 0 to 4 percent slopes	alluvium	128.6	1.9%
38B	Ethridge clay loam, 0 to 4 percent slopes	alluvium	45.3	0.7%
39B	Ferd loam, 0 to 4 percent slopes	alluvium	93.3	1.4%
42B	Joplin clay loam, 0 to 4 percent slopes	till	159.1	2.4%
44B	Kevin clay loam, 0 to 4 percent slopes	till	13.4	0.2%
44C	Kevin clay loam, 4 to 8 percent slopes	till	22.2	0.3%
47B	Marias silty clay, 0 to 4 percent slopes	alluvium	223.0	3.3%
48B	Vanda silty clay, 0 to 4 percent slopes	alluvium	56.1	0.8%
53E	Sunburst clay loam, 15 to 25 percent slopes	till	90.0	1.3%
53F	Sunburst clay loam, 25 to 70 percent slopes	till	84.2	1.3%
54B	Trudau loam, 0 to 4 percent slopes	alluvium	37.0	0.6%
62A	Vaeda silty clay loam, 0 to 2 percent slopes	alluvium	130.5	2.0%
79B	Yamacall loam, 0 to 4 percent slopes	alluvium	3.5	0.1%
141A	McKenzie clay, saline, 0 to 2 percent slopes	glaciolacustrine deposits	49.9	0.7%
222E	Hillon-Neldore complex, 8 to 25 percent slopes	till	48.4	0.7%
222F	Hillon-Neldore complex, 25 to 70 percent slopes	till	159.0	2.4%
311B	Creed-Gerdrum-Absher complex, 0 to 4 percent slopes	alluvium	159.5	2.4%
321B	Kobase silty clay loam, calcareous, 0 to 4 percent slopes	alluvium	214.5	3.2%
321C	Kobase silty clay loam, calcareous, 4 to 8 percent slopes	alluvium	30.4	0.5%
332B	Phillips-Kevin complex, 0 to 4 percent slopes	clayey till	834.0	12.5%
364C	Chinook fine sandy loam, 0 to 8 percent slopes	alluvium	0.7	0.0%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Toole County, Montana (MT101)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
372B	Evanston fine sandy loam, 0 to 4 percent slopes	alluvium	246.8	3.7%
391B	Ferd-Creed-Gerdrum complex, 0 to 4 percent slopes	alluvium	19.8	0.3%
402A	Gerdrum-Absher complex, 0 to 2 percent slopes	alluvium	9.4	0.1%
421C	Joplin-Hillon loams, 2 to 8 percent slopes	fine-loamy till	21.6	0.3%
421D	Joplin-Hillon clay loams, 8 to 15 percent slopes	till	8.4	0.1%
423B	Joplin-Hillon clay loams, 0 to 3 percent slopes	till	78.0	1.2%
427B	Joplin complex, 0 to 4 percent slopes	till	612.1	9.2%
441C	Kevin-Hillon clay loams, 2 to 8 percent slopes	fine-loamy till	32.3	0.5%
445B	Kevin complex, 0 to 4 percent slopes	till	26.9	0.4%
446C	Kevin-Elloam clay loams, 2 to 8 percent slopes	till	17.7	0.3%
521B	Elloam-Absher clay loams, 0 to 4 percent slopes	till	26.3	0.4%
561B	Scobey-Kevin clay loams, 0 to 4 percent slopes	clayey till	249.8	3.7%
601A	Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded	alluvium	233.7	3.5%
793B	Yamacall loam, calcareous, 0 to 4 percent slopes	alluvium	2.4	0.0%
971C	Neldore-Bascovy clays, 2 to 8 percent slopes	residuum	86.4	1.3%
W	Water		8.9	0.1%
Subtotals for Soil Survey Area			5,469.1	82.0%
Totals for Area of Interest			6,672.3	100.0%

Rating Options—Parent Material Name

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Liberty County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
35B	Assinniboine fine sandy loam, 0 to 4 percent slopes	Farmland of statewide importance
224E	Hillon-Joplin loams, 8 to 25 percent slopes	Not prime farmland
331B	Phillips-Elloam complex, 0 to 4 percent slopes	Not prime farmland
421C	Joplin-Hillon loams, 2 to 8 percent slopes	Farmland of statewide importance
442C	Kevin-Elloam clay loams, 2 to 8 percent slopes	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands—Liberty County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
503B	Telstad-Joplin loams, 0 to 4 percent slopes	Prime farmland if irrigated
561B	Scobey-Kevin clay loams, 0 to 4 percent slopes	Prime farmland if irrigated
561C	Scobey-Kevin clay loams, 2 to 8 percent slopes	Farmland of statewide importance
605C	Yamacall-Havre loams, 0 to 8 percent slopes	Farmland of statewide importance

Prime and other Important Farmlands—Toole County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
16B	Degrand loam, 0 to 4 percent slopes	Prime farmland if irrigated
19B	Kenilworth loam, 0 to 4 percent slopes	Farmland of statewide importance
22E	Hillon clay loam, 8 to 25 percent slopes	Not prime farmland
23A	Acel silty clay loam, 0 to 2 percent slopes	Farmland of statewide importance
28A	Nishon clay loam, 0 to 1 percent slopes	Not prime farmland
29B	Nunemaker silty clay loam, 0 to 4 percent slopes	Farmland of statewide importance
29C	Nunemaker silty clay loam, 4 to 8 percent slopes	Farmland of statewide importance
30B	Marvan silty clay, 0 to 4 percent slopes	Not prime farmland
30C	Marvan silty clay, 4 to 8 percent slopes	Not prime farmland
32B	Kobase silty clay loam, 0 to 4 percent slopes	Farmland of statewide importance
32C	Kobase silty clay loam, 4 to 8 percent slopes	Farmland of statewide importance
37B	Evanston clay loam, 0 to 4 percent slopes	Prime farmland if irrigated
38B	Ethridge clay loam, 0 to 4 percent slopes	Prime farmland if irrigated
39B	Ferd loam, 0 to 4 percent slopes	Not prime farmland
42B	Joplin clay loam, 0 to 4 percent slopes	Prime farmland if irrigated
44B	Kevin clay loam, 0 to 4 percent slopes	Prime farmland if irrigated
44C	Kevin clay loam, 4 to 8 percent slopes	Farmland of statewide importance
47B	Marias silty clay, 0 to 4 percent slopes	Not prime farmland
48B	Vanda silty clay, 0 to 4 percent slopes	Not prime farmland
53E	Sunburst clay loam, 15 to 25 percent slopes	Not prime farmland
53F	Sunburst clay loam, 25 to 70 percent slopes	Not prime farmland
54B	Trudau loam, 0 to 4 percent slopes	Not prime farmland
62A	Vaeda silty clay loam, 0 to 2 percent slopes	Not prime farmland
79B	Yamacall loam, 0 to 4 percent slopes	Prime farmland if irrigated
141A	McKenzie clay, saline, 0 to 2 percent slopes	Not prime farmland
222E	Hillon-Neldore complex, 8 to 25 percent slopes	Not prime farmland
222F	Hillon-Neldore complex, 25 to 70 percent slopes	Not prime farmland
311B	Creed-Gerdrum-Absher complex, 0 to 4 percent slopes	Not prime farmland
321B	Kobase silty clay loam, calcareous, 0 to 4 percent slopes	Farmland of statewide importance
321C	Kobase silty clay loam, calcareous, 4 to 8 percent slopes	Farmland of statewide importance
332B	Phillips-Kevin complex, 0 to 4 percent slopes	Farmland of statewide importance
364C	Chinook fine sandy loam, 0 to 8 percent slopes	Farmland of statewide importance

Custom Soil Resource Report

Prime and other Important Farmlands—Toole County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
372B	Evanston fine sandy loam, 0 to 4 percent slopes	Farmland of statewide importance
391B	Ferd-Creed-Gerdrum complex, 0 to 4 percent slopes	Not prime farmland
402A	Gerdrum-Absher complex, 0 to 2 percent slopes	Not prime farmland
421C	Joplin-Hillon loams, 2 to 8 percent slopes	Farmland of statewide importance
421D	Joplin-Hillon clay loams, 8 to 15 percent slopes	Not prime farmland
423B	Joplin-Hillon clay loams, 0 to 3 percent slopes	Farmland of statewide importance
427B	Joplin complex, 0 to 4 percent slopes	Farmland of statewide importance
441C	Kevin-Hillon clay loams, 2 to 8 percent slopes	Farmland of statewide importance
445B	Kevin complex, 0 to 4 percent slopes	Farmland of statewide importance
446C	Kevin-Elloam clay loams, 2 to 8 percent slopes	Not prime farmland
521B	Elloam-Absher clay loams, 0 to 4 percent slopes	Not prime farmland
561B	Scobey-Kevin clay loams, 0 to 4 percent slopes	Prime farmland if irrigated
601A	Havre-Glendive complex, 0 to 2 percent slopes, rarely flooded	Not prime farmland
793B	Yamacall loam, calcareous, 0 to 4 percent slopes	Farmland of statewide importance
971C	Neldore-Bascovy clays, 2 to 8 percent slopes	Not prime farmland
W	Water	Not prime farmland

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



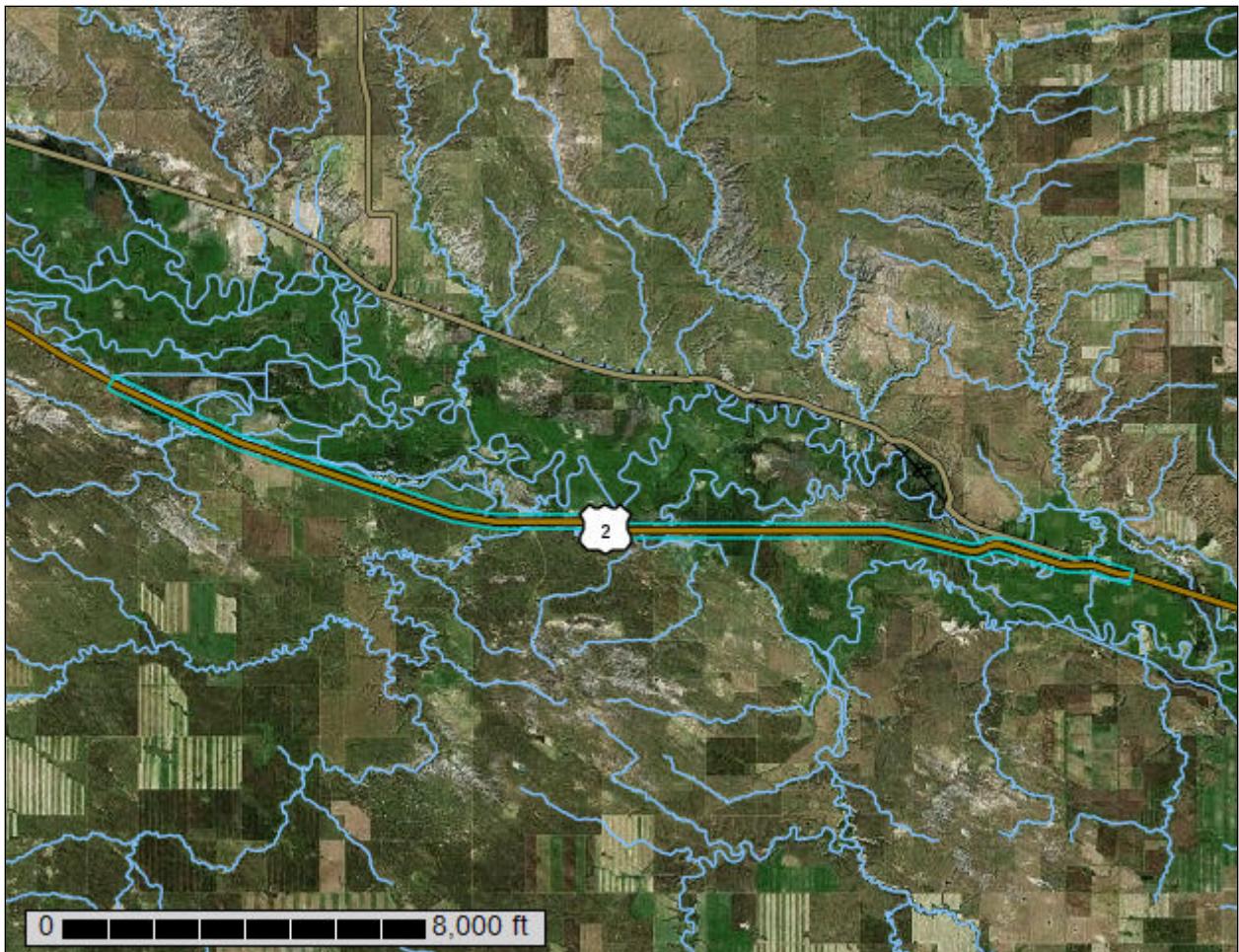
United States
Department of
Agriculture



Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Blaine County and Part of Phillips County Area, Montana, and Phillips County Area, Montana



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....	2
How Soil Surveys Are Made.....	6
Soil Map.....	9
Soil Map.....	10
Legend.....	11
Map Unit Legend.....	13
Map Unit Descriptions.....	14
Blaine County and Part of Phillips County Area, Montana.....	16
2—Assinniboine fine sandy loam, 0 to 4 percent slopes.....	16
20—Bowdoin clay.....	17
26—Cabbart-Hillon association, steep.....	18
31—Chinook fine sandy loam, 2 to 6 percent slopes.....	20
48—Hanly loamy fine sand.....	21
50—Harlem silty clay loam.....	23
51—Harlem silty clay loam, saline.....	24
52—Harlem silty clay.....	25
53—Harlem silty clay, saline.....	27
54—Harlem variant-Lardell silty clay loams.....	29
55—Havre loam.....	31
57—Havre silty clay loam.....	32
59—Havre, Hanly, and Glendive soils, channelled.....	33
60—Havre variant-Lardell silty clay loams.....	36
67—Hillon clay loam, 25 to 45 percent slopes.....	38
68—Hillon-Kevin clay loams, 15 to 35 percent slopes.....	39
76—Lardell silty clay loam.....	41
91—Nishon clay loam.....	43
95—Phillips loam, 0 to 4 percent slopes.....	44
97—Phillips-Elloam complex, 0 to 4 percent slopes.....	46
98—Phillips-Elloam complex, 4 to 8 percent slopes.....	48
119—Telstad loam, 0 to 4 percent slopes.....	50
121—Telstad-Joplin loams, 2 to 8 percent slopes.....	52
123—Thoeny-Elloam complex, 0 to 4 percent slopes.....	55
131—Ustic Torrifluvents, wet.....	57
153—Water.....	58
Phillips County Area, Montana.....	59
60A—Havre loam, 0 to 2 percent slopes.....	59
90A—Harlake clay, 0 to 2 percent slopes.....	60
93A—Bowdoin clay, 0 to 2 percent slopes.....	62
604A—Bullhook loam, 0 to 2 percent slopes.....	63
811A—Glendive-Havre loams, 0 to 2 percent slopes.....	65
902A—Lostriver-Bullhook complex, 0 to 2 percent slopes.....	67
903A—Harlake-Lostriver clays, 0 to 2 percent slopes.....	69
905A—Harlake-Havre clay loams, 0 to 2 percent slopes.....	71
Soil Information for All Uses.....	74

Custom Soil Resource Report

Soil Properties and Qualities.....	74
Soil Qualities and Features.....	74
Parent Material Name.....	74
Soil Reports.....	80
Land Classifications.....	80
Prime and other Important Farmlands.....	80
References.....	83

How Soil Surveys Are Made

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

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

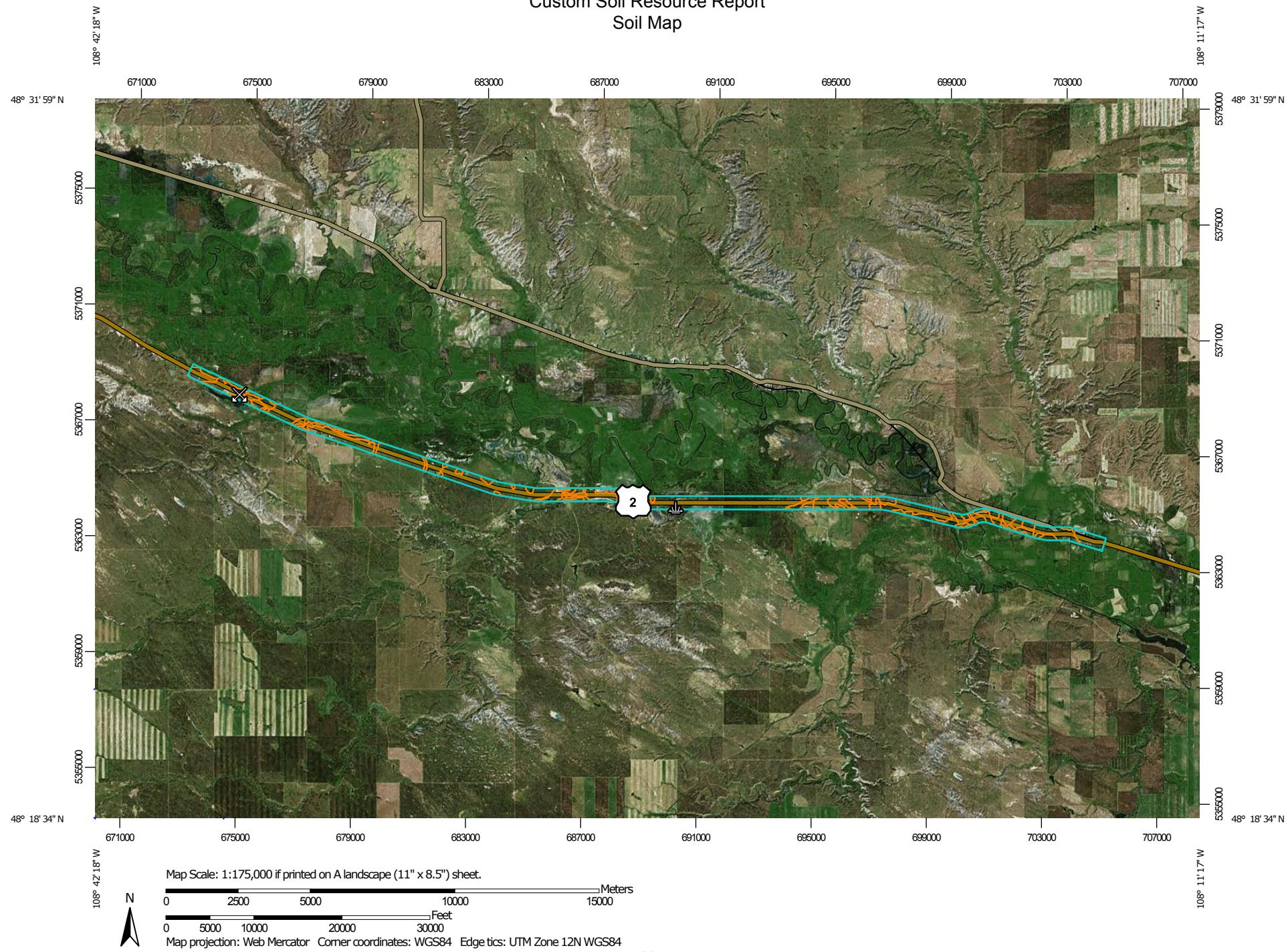
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)	
	Area of Interest (AOI)
Soils	
	Soil Map Unit Polygons
	Soil Map Unit Lines
	Soil Map Unit Points
Special Point Features	
	Blowout
	Borrow Pit
	Clay Spot
	Closed Depression
	Gravel Pit
	Gravelly Spot
	Landfill
	Lava Flow
	Marsh or swamp
	Mine or Quarry
	Miscellaneous Water
	Perennial Water
	Rock Outcrop
	Saline Spot
	Sandy Spot
	Severely Eroded Spot
	Sinkhole
	Slide or Slip
	Sodic Spot
Water Features	
	Streams and Canals
Transportation	
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
Background	
	Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Blaine County and Part of Phillips County Area, Montana
 Survey Area Data: Version 13, Sep 28, 2015

Soil Survey Area: Phillips County Area, Montana
 Survey Area Data: Version 12, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Blaine County and Part of Phillips County Area, Montana (MT608)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Assiniboine fine sandy loam, 0 to 4 percent slopes	114.8	3.1%
20	Bowdoine clay	714.7	19.3%
26	Cabbar-Hillon association, steep	19.3	0.5%
31	Chinook fine sandy loam, 2 to 6 percent slopes	19.0	0.5%
48	Hanly loamy fine sand	14.9	0.4%
50	Harlem silty clay loam	47.1	1.3%
51	Harlem silty clay loam, saline	9.9	0.3%
52	Harlem silty clay	209.0	5.6%
53	Harlem silty clay, saline	226.5	6.1%
54	Harlem variant-Lardell silty clay loams	35.2	0.9%
55	Havre loam	42.9	1.2%
57	Havre silty clay loam	13.0	0.4%
59	Havre, Hanly, and Glendive soils, channeled	5.2	0.1%
60	Havre variant-Lardell silty clay loams	62.5	1.7%
67	Hillon clay loam, 25 to 45 percent slopes	37.4	1.0%
68	Hillon-Kevin clay loams, 15 to 35 percent slopes	170.7	4.6%
76	Lardell silty clay loam	225.5	6.1%
91	Nishon clay loam	3.1	0.1%
95	Phillips loam, 0 to 4 percent slopes	5.8	0.2%
97	Phillips-Elloam complex, 0 to 4 percent slopes	49.3	1.3%
98	Phillips-Elloam complex, 4 to 8 percent slopes	35.5	1.0%
119	Telstad loam, 0 to 4 percent slopes	888.0	23.9%
121	Telstad-Joplin loams, 2 to 8 percent slopes	85.0	2.3%
123	Thoeny-Elloam complex, 0 to 4 percent slopes	74.7	2.0%
131	Ustic Torrifluvents, wet	37.5	1.0%
153	Water	31.5	0.8%
Subtotals for Soil Survey Area		3,178.0	85.7%

Blaine County and Part of Phillips County Area, Montana (MT608)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		3,708.9	100.0%
Phillips County Area, Montana (MT641)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
60A	Havre loam, 0 to 2 percent slopes	167.7	4.5%
90A	Harlake clay, 0 to 2 percent slopes	201.2	5.4%
93A	Bowdoine clay, 0 to 2 percent slopes	49.4	1.3%
604A	Bullhook loam, 0 to 2 percent slopes	7.3	0.2%
811A	Glendive-Havre loams, 0 to 2 percent slopes	0.7	0.0%
902A	Lostriver-Bullhook complex, 0 to 2 percent slopes	27.0	0.7%
903A	Harlake-Lostriver clays, 0 to 2 percent slopes	49.8	1.3%
905A	Harlake-Havre clay loams, 0 to 2 percent slopes	27.8	0.8%
Subtotals for Soil Survey Area		530.9	14.3%
Totals for Area of Interest		3,708.9	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic 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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Blaine County and Part of Phillips County Area, Montana

2—Assinniboine fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cmf7

Elevation: 2,500 to 3,500 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Assinniboine and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Assinniboine

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or eolian deposits over till

Typical profile

A - 0 to 9 inches: fine sandy loam

Bt - 9 to 21 inches: sandy clay loam

Bk - 21 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)

Hydric soil rating: No

Minor Components

Chinook

Percent of map unit: 5 percent

Landform: Fans on till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)
Hydric soil rating: No

Cozberg

Percent of map unit: 5 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)

Hydric soil rating: No

20—Bowdoin clay

Map Unit Setting

National map unit symbol: cmf8

Elevation: 2,300 to 2,500 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Bowdoin and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bowdoin

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or glaciolacustrine deposits

Typical profile

A - 0 to 6 inches: clay

Bnss - 6 to 34 inches: clay

Bssy - 34 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 30.0

Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 5 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Hydric soil rating: No

Vanda

Percent of map unit: 5 percent

Landform: Terraces, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-C 11-14" p.z. (R058AC053MT)

Hydric soil rating: No

26—Cabbart-Hillon association, steep

Map Unit Setting

National map unit symbol: cmg4

Elevation: 2,300 to 3,800 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Cabbart and similar soils: 55 percent

Hillon and similar soils: 30 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cabbart

Setting

Landform: Escarpments, hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone and siltstone

Typical profile

A - 0 to 4 inches: loam
C - 4 to 12 inches: loam
Cr - 12 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow (Sw) 10-14" p.z. (R052XC214MT)
Hydric soil rating: No

Description of Hillon

Setting

Landform: Ridges
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 26 inches: clay loam
Bky - 26 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)

Hydric soil rating: No

Minor Components

Yamac

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-C 11-14" p.z. (R058AC040MT)

Hydric soil rating: No

Kevin

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: No

31—Chinook fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: cmgv

Elevation: 2,500 to 3,500 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Chinook and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chinook

Setting

Landform: Fans on till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or eolian deposits over till

Typical profile

A - 0 to 6 inches: fine sandy loam
Bw - 6 to 16 inches: fine sandy loam
Bk - 16 to 60 inches: fine sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Elloam

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Kevin

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

48—Hanly loamy fine sand

Map Unit Setting

National map unit symbol: cmjn
Elevation: 2,300 to 3,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Hanly and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanly

Setting

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy alluvium

Typical profile

A - 0 to 3 inches: loamy fine sand

C - 3 to 60 inches: stratified sand to fine sandy loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 4w

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: A

Ecological site: Sands (Sa) 10-14" p.z. (R052XC211MT)

Hydric soil rating: No

Minor Components

Glendive

Percent of map unit: 5 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)

Hydric soil rating: No

Havre

Percent of map unit: 5 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

50—Harlem silty clay loam

Map Unit Setting

National map unit symbol: cmjz
Elevation: 2,300 to 2,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Harlem and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 10 inches: silty clay loam
C1 - 10 to 46 inches: stratified silty clay loam to clay
C2 - 46 to 66 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Minor Components

Havre

Percent of map unit: 4 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Lardell

Percent of map unit: 3 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: Yes

Harlem, silty clay

Percent of map unit: 3 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

51—Harlem silty clay loam, saline

Map Unit Setting

National map unit symbol: cmk1
Elevation: 2,300 to 3,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Harlem and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 10 inches: silty clay loam
C1 - 10 to 46 inches: stratified clay loam to silty clay
C2 - 46 to 60 inches: stratified loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Minor Components

Havre

Percent of map unit: 7 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Lardell

Percent of map unit: 3 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: Yes

52—Harlem silty clay

Map Unit Setting

National map unit symbol: cmk4
Elevation: 2,300 to 2,700 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Harlem and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 10 inches: silty clay

C1 - 10 to 46 inches: stratified silty clay loam to clay

C2 - 46 to 66 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 5.0

Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Minor Components

Havre

Percent of map unit: 4 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Bowdoin

Percent of map unit: 4 percent
Landform: Terraces, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Lardell

Percent of map unit: 2 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: Yes

53—Harlem silty clay, saline

Map Unit Setting

National map unit symbol: cmk5
Elevation: 2,300 to 2,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Harlem, saline, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem, Saline

Setting

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: silty clay
C - 6 to 60 inches: stratified clay loam to silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 42 to 60 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 30.0

Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 3 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Marvan

Percent of map unit: 3 percent

Landform: Terraces, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-C 11-14" p.z. (R058AC041MT)

Hydric soil rating: No

Vanda

Percent of map unit: 3 percent

Landform: Terraces, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-C 11-14" p.z. (R058AC053MT)

Hydric soil rating: No

Lardell

Percent of map unit: 1 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)

Hydric soil rating: Yes

54—Harlem variant-Lardell silty clay loams

Map Unit Setting

National map unit symbol: cmk6
Elevation: 2,300 to 2,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Harlem and similar soils: 60 percent
Lardell and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 7 inches: silty clay loam
C1 - 7 to 28 inches: silty clay loam
C2 - 28 to 44 inches: silty clay loam
C3 - 44 to 60 inches: stratified loam to silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): 6w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: D
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: No

Description of Lardell

Setting

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Az - 0 to 8 inches: silty clay loam
Bz1 - 8 to 29 inches: silty clay loam
Bz2 - 29 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 60 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Strongly saline (16.0 to 50.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 80.0
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 7s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: Yes

Minor Components

Havre, saline

Percent of map unit: 5 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Harlem, saline

Percent of map unit: 5 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

55—Havre loam

Map Unit Setting

National map unit symbol: cmk8
Elevation: 2,300 to 3,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Havre and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 8 inches: loam
C - 8 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Minor Components

Glendive

Percent of map unit: 5 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)
Hydric soil rating: No

Harlem

Percent of map unit: 5 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

57—Havre silty clay loam

Map Unit Setting

National map unit symbol: cmkg
Elevation: 2,300 to 3,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Havre and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 8 inches: silty clay loam
C - 8 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 5 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Havre, somewhat poorly drained

Percent of map unit: 5 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: No

59—Havre, Hanly, and Glendive soils, channeled

Map Unit Setting

National map unit symbol: cmkk
Elevation: 2,300 to 3,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Havre and similar soils: 30 percent
Hanly and similar soils: 30 percent
Glendive and similar soils: 30 percent
Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 8 inches: loam

C - 8 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: B

Ecological site: Draft Overflow (Ov) RRU 46-C 13-19 p.z. (R046XC504MT)

Hydric soil rating: No

Description of Hanly

Setting

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy alluvium

Typical profile

A - 0 to 3 inches: loamy fine sand

C - 3 to 60 inches: stratified sand to fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 6w

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: A

Ecological site: Draft Overflow (Ov) RRU 46-C 13-19 p.z. (R046XC504MT)

Hydric soil rating: No

Description of Glendive

Setting

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 7 inches: fine sandy loam

C - 7 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: B

Ecological site: Draft Overflow (Ov) RRU 46-C 13-19 p.z. (R046XC504MT)

Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 4 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) RRU 58A-C 11-14" p.z. (R058AC045MT)

Hydric soil rating: No

Rivra

Percent of map unit: 4 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)

Hydric soil rating: No

Lallie

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R052XC225MT)
Hydric soil rating: Yes

60—Havre variant-Lardell silty clay loams

Map Unit Setting

National map unit symbol: cmkm
Elevation: 2,300 to 2,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Havre and similar soils: 60 percent
Lardell and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 7 inches: silty clay loam
C1 - 7 to 19 inches: silty clay loam
C2 - 19 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 30.0

Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6w

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: C

Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)

Hydric soil rating: No

Description of Lardell

Setting

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Az - 0 to 8 inches: silty clay loam

Bz1 - 8 to 29 inches: silty clay loam

Bz2 - 29 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Strongly saline (16.0 to 50.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 80.0

Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 7s

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)

Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 5 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Glendive

Percent of map unit: 5 percent

Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)
Hydric soil rating: No

67—Hillon clay loam, 25 to 45 percent slopes

Map Unit Setting

National map unit symbol: cmkx
Elevation: 2,300 to 3,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hillon

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 26 inches: clay loam
Bky - 26 to 60 inches: clay loam

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)

Hydric soil rating: No

Minor Components

Kevin

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)

Hydric soil rating: No

Lisam

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XC215MT)

Hydric soil rating: No

Cabbart

Percent of map unit: 5 percent

Landform: Escarpments

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) RRU 58A-C 11-14" p.z. (R058AC057MT)

Hydric soil rating: No

68—Hillon-Kevin clay loams, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: cmkz

Elevation: 2,300 to 3,600 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 45 percent

Kevin and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

A - 0 to 4 inches: clay loam

Bk - 4 to 26 inches: clay loam

Bky - 26 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)

Hydric soil rating: No

Description of Kevin

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

A - 0 to 3 inches: clay loam

Bt - 3 to 9 inches: clay loam

Bk1 - 9 to 30 inches: clay loam

Bk2 - 30 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)
Hydric soil rating: No

Minor Components

Chinook

Percent of map unit: 5 percent
Landform: Fans on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Scobey

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Yamac

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) RRU 58A-C 11-14" p.z. (R058AC040MT)
Hydric soil rating: No

76—Lardell silty clay loam

Map Unit Setting

National map unit symbol: cmlh
Elevation: 2,300 to 2,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Lardell and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lardell

Setting

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Az - 0 to 8 inches: silty clay loam

Bz1 - 8 to 29 inches: silty clay loam

Bz2 - 29 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 12 to 60 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Strongly saline (16.0 to 50.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 80.0

Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 7s

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)

Hydric soil rating: Yes

Minor Components

Havre

Percent of map unit: 3 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)

Hydric soil rating: No

Harlem

Percent of map unit: 3 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)

Hydric soil rating: No

Nobe

Percent of map unit: 3 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)

Hydric soil rating: No

Soils with grv substratum

Percent of map unit: 1 percent

Hydric soil rating: No

91—Nishon clay loam

Map Unit Setting

National map unit symbol: cmmk

Elevation: 2,500 to 3,300 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Nishon and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nishon

Setting

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

E - 0 to 5 inches: clay loam

Btg - 5 to 22 inches: clay

Bkg - 22 to 60 inches: clay

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C/D

Ecological site: Draft Overflow (Ov) RRU 46-C 13-19 p.z. (R046XC504MT)

Hydric soil rating: Yes

Minor Components

Dimmick

Percent of map unit: 5 percent

Landform: Potholes

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Wet Meadow (WM) 10-14" p.z. (R052XC225MT)

Hydric soil rating: Yes

95—Phillips loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2sy7z

Elevation: 2,000 to 3,870 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 100 to 140 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Phillips and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Ground moraines

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

A - 0 to 2 inches: loam

E - 2 to 7 inches: loam

Bt - 7 to 11 inches: clay

Btk - 11 to 15 inches: clay loam

Bk - 15 to 36 inches: clay loam

BCyz - 36 to 50 inches: clay loam

Cz - 50 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Kevin

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Elloam

Percent of map unit: 2 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Thoeny

Percent of map unit: 2 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ethridge

Percent of map unit: 2 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

97—Phillips-Elloam complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cmmw
Elevation: 2,300 to 3,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 60 percent
Elloam and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 7 inches: loam
Bt - 7 to 15 inches: clay
Bk - 15 to 36 inches: clay loam
Bky - 36 to 78 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

E - 0 to 3 inches: clay loam

Bt - 3 to 9 inches: clay loam

Bk - 9 to 28 inches: clay loam

Bky - 28 to 62 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Minor Components

Assinniboine

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)

Hydric soil rating: No

Kevin

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Telstad

Percent of map unit: 5 percent

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Thoeny

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

98—Phillips-Elloam complex, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cmmz
Elevation: 2,300 to 3,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 60 percent
Elloam and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 7 inches: loam
Bt - 7 to 15 inches: clay
Bk - 15 to 36 inches: clay loam
Bky - 36 to 78 inches: clay loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 3 inches: clay loam
Bt - 3 to 9 inches: clay loam
Bk - 9 to 28 inches: clay loam
Bky - 28 to 62 inches: clay loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Thoeny

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Kevin

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Telstad

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Chinook

Percent of map unit: 4 percent
Landform: Ridges on till plains, knolls on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

119—Telstad loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2v55h
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Telstad and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Telstad

Setting

Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 15 inches: clay loam
Bk1 - 15 to 30 inches: clay loam
Bk2 - 30 to 45 inches: clay loam
BCyz - 45 to 61 inches: loam
Cz - 61 to 79 inches: loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Joplin

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ferd

Percent of map unit: 2 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Fortbenton

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Elloam

Percent of map unit: 1 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

121—Telstad-Joplin loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v55f
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Telstad and similar soils: 45 percent
Joplin and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Telstad

Setting

Landform: Recessional moraines
Landform position (two-dimensional): Foothslope, toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam

Bt - 6 to 15 inches: clay loam
Bk1 - 15 to 30 inches: clay loam
Bk2 - 30 to 45 inches: clay loam
BCyz - 45 to 61 inches: loam
Cz - 61 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Description of Joplin

Setting

Landform: Recessional moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 22 inches: clay loam
Bk2 - 22 to 41 inches: clay loam
BCyz - 41 to 57 inches: loam
Cz - 57 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 6 percent
Landform: Recessional moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Loamy (Lo) LRU 52-A (R052XA032MT)
Hydric soil rating: No

Fortbenton

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (Sy) LRU 52-A (R052XA110MT)
Hydric soil rating: No

Nishon

Percent of map unit: 2 percent
Landform: Recessional moraines
Microfeatures of landform position: Closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Closed Depression (CD) LRU 52-A (R052XA071MT)
Hydric soil rating: Yes

Ferd

Percent of map unit: 2 percent
Landform: Ground moraines
Microfeatures of landform position: Open depressions
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Elloam

Percent of map unit: 1 percent
Landform: Recessional moraines
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: Claypan (Cp) LRU 52-A (R052XA006MT)
Hydric soil rating: No

Marmarth

Percent of map unit: 1 percent
Landform: Recessional moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

123—Thoeny-Elloam complex, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cmb4
Elevation: 2,400 to 3,600 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Thoeny and similar soils: 60 percent
Elloam and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thoeny

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 6 inches: loam
Bt - 6 to 12 inches: clay
Bk - 12 to 28 inches: clay loam
Bky - 28 to 52 inches: clay loam
By - 52 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

E - 0 to 3 inches: clay loam

Bt - 3 to 9 inches: clay loam

Bk - 9 to 28 inches: clay loam

Bky - 28 to 62 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Minor Components

Kevin

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Phillips

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Nobe

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

131—Ustic Torrifluvents, wet

Map Unit Setting

National map unit symbol: cbmn
Elevation: 2,300 to 3,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

Ustic torrifluvents and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustic Torrifluvents

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Havre

Percent of map unit: 2 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Harlem

Percent of map unit: 2 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Very gravelly substratum soils

Percent of map unit: 1 percent
Hydric soil rating: No

153—Water

Map Unit Setting

National map unit symbol: cmn5
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 125 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Phillips County Area, Montana

60A—Havre loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnw7

Elevation: 2,170 to 3,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Havre and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 5 inches: loam

C1 - 5 to 25 inches: stratified fine sandy loam to clay loam

C2 - 25 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 10.0

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Minor Components

Bullhook

Percent of map unit: 5 percent

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Lallie

Percent of map unit: 5 percent
Landform: Oxbows
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R052XC225MT)
Hydric soil rating: Yes

90A—Harlake clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnx8
Elevation: 2,170 to 3,400 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Harlake

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 8 inches: clay
C1 - 8 to 50 inches: stratified silt loam to clay
C2 - 50 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Minor Components

Lostriver

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Havre

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Bullhook

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Bowdoin

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Somewhat poorly drained soils

Percent of map unit: 2 percent
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: No

Lallie

Percent of map unit: 2 percent
Landform: Oxbows
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Wet Meadow (WM) 10-14" p.z. (R052XC225MT)
Hydric soil rating: Yes

93A—Bowdoin clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnxw
Elevation: 2,170 to 3,400 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Bowdoin

Setting

Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

A - 0 to 3 inches: clay
Bnss - 3 to 31 inches: clay
Bnssy - 31 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Gypsum, maximum in profile: 10 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

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

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: Unranked

Minor Components

Strongly saline soils

Percent of map unit: 7 percent
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Strongly sodic soils

Percent of map unit: 7 percent
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Wheatbelt

Percent of map unit: 1 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: Yes

604A—Bullhook loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnw6
Elevation: 2,170 to 3,400 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Bullhook and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bullhook

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 4 inches: loam
C - 4 to 14 inches: stratified fine sandy loam to clay loam
Cyz - 14 to 60 inches: fine sandy loam, clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Minor Components

Havre

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Glendive

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Strongly saline soils

Percent of map unit: 2 percent
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Strongly sodic soils

Percent of map unit: 2 percent
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

811A—Glendive-Havre loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnwt

Elevation: 2,170 to 3,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Glendive and similar soils: 60 percent

Havre and similar soils: 30 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glendive

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 4 inches: loam

C1 - 4 to 26 inches: sandy loam

C2 - 26 to 60 inches: stratified loamy fine sand to clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Other vegetative classification: not specified (WOODLAND)

Hydric soil rating: No

Description of Havre

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: loam
C1 - 6 to 25 inches: stratified fine sandy loam to clay loam
C2 - 25 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Other vegetative classification: not specified (WOODLAND)
Hydric soil rating: No

Minor Components

Hanly

Percent of map unit: 4 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)
Hydric soil rating: No

Bullhook

Percent of map unit: 4 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Lallie

Percent of map unit: 2 percent
Landform: Oxbows
Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Wet Meadow (WM) 10-14" p.z. (R052XC225MT)

Hydric soil rating: Yes

902A—Lostriver-Bullhook complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnx4

Elevation: 2,170 to 3,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Lostriver and similar soils: 50 percent

Bullhook and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lostriver

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ayz - 0 to 6 inches: clay

Cyz1 - 6 to 21 inches: stratified clay loam to clay

Cyz2 - 21 to 60 inches: stratified clay loam to clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 30.0

Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Description of Bullhook

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 4 inches: loam
C - 4 to 14 inches: stratified fine sandy loam to clay loam
Cyz - 14 to 60 inches: fine sandy loam, clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Minor Components

Strongly saline soils

Percent of map unit: 3 percent
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Harlem

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Strongly sodic soils

Percent of map unit: 2 percent

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Havre

Percent of map unit: 2 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

903A—Harlake-Lostriver clays, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnx5

Elevation: 2,170 to 3,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Harlake and similar soils: 50 percent

Lostriver and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlake

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 8 inches: clay

C1 - 8 to 50 inches: stratified silt loam to clay

C2 - 50 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Description of Lostriver

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ayz - 0 to 6 inches: clay
Cyz1 - 6 to 21 inches: stratified clay loam to clay
Cyz2 - 21 to 60 inches: stratified clay loam to clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Minor Components

Bowdoin

Percent of map unit: 4 percent
Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Havre

Percent of map unit: 2 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Strongly saline soils

Percent of map unit: 2 percent

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)

Hydric soil rating: No

Strongly sodic soils

Percent of map unit: 2 percent

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

905A—Harlake-Havre clay loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnx7

Elevation: 2,170 to 3,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Harlake and similar soils: 50 percent

Havre and similar soils: 35 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlake

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 6 inches: clay loam

C1 - 6 to 48 inches: stratified silt loam to silty clay

C2 - 48 to 60 inches: stratified fine sandy loam to silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 36 to 60 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Subirrigated (Sb) 10-14" p.z. (R052XC218MT)

Hydric soil rating: No

Description of Havre

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 6 inches: clay loam

C1 - 6 to 25 inches: stratified loam to clay loam

C2 - 25 to 60 inches: stratified loam to clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 36 to 60 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 10.0

Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Subirrigated (Sb) 10-14" p.z. (R052XC218MT)
Hydric soil rating: No

Minor Components

Clay surface layers

Percent of map unit: 5 percent
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Moderately saline soils

Percent of map unit: 3 percent
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Occasionally flooded soils

Percent of map unit: 3 percent
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)
Hydric soil rating: No

Moderately sodic soils

Percent of map unit: 2 percent
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Poorly drained soils

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Wet Meadow (WM) RRU 46-C 15-19" p.z. (R046XC518MT)
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

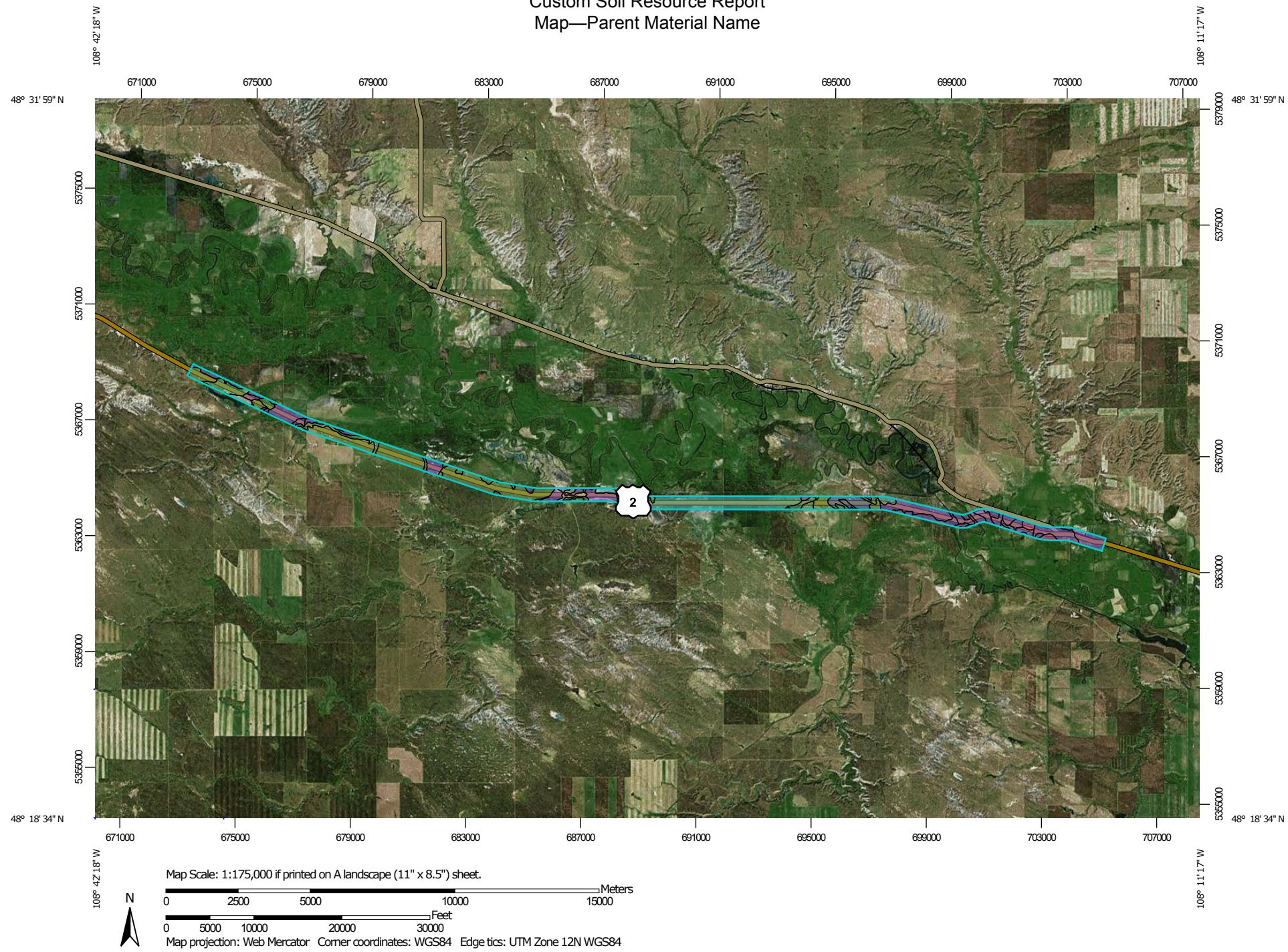
Parent Material Name

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report
Map—Parent Material Name



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils

Soil Rating Polygons

alluvium	residuum weathered from sandstone and siltstone
alluvium and/or eolian deposits over till	sandy alluvium
alluvium and/or glaciolacustrine deposits	till
clayey till	Not rated or not available
fine-loamy till	
glaciolacustrine deposits	
residuum weathered from sandstone and siltstone	
sandy alluvium	
till	
Not rated or not available	

Soil Rating Points

alluvium	alluvium
alluvium and/or eolian deposits over till	alluvium and/or eolian deposits over till
alluvium and/or glaciolacustrine deposits	alluvium and/or glaciolacustrine deposits
clayey till	clayey till
fine-loamy till	fine-loamy till
glaciolacustrine deposits	glaciolacustrine deposits
residuum weathered from sandstone and siltstone	residuum weathered from sandstone and siltstone
sandy alluvium	sandy alluvium
till	till
Not rated or not available	Not rated or not available

Soil Rating Lines

alluvium	alluvium
alluvium and/or eolian deposits over till	alluvium and/or eolian deposits over till
alluvium and/or glaciolacustrine deposits	alluvium and/or glaciolacustrine deposits
clayey till	clayey till
fine-loamy till	fine-loamy till
glaciolacustrine deposits	glaciolacustrine deposits

Water Features



Streams and Canals

Transportation






Rails

Interstate Highways

US Routes

Major Roads

MAP INFORMATION

Background



Local Roads



Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Blaine County and Part of Phillips County Area, Montana
Survey Area Data: Version 13, Sep 28, 2015

Soil Survey Area: Phillips County Area, Montana
Survey Area Data: Version 12, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name

Parent Material Name— Summary by Map Unit — Blaine County and Part of Phillips County Area, Montana (MT608)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Assinniboine fine sandy loam, 0 to 4 percent slopes	alluvium and/or eolian deposits over till	114.8	3.1%
20	Bowdoin clay	alluvium and/or glaciolacustrine deposits	714.7	19.3%
26	Cabbart-Hillon association, steep	residuum weathered from sandstone and siltstone	19.3	0.5%
31	Chinook fine sandy loam, 2 to 6 percent slopes	alluvium and/or eolian deposits over till	19.0	0.5%
48	Hanly loamy fine sand	sandy alluvium	14.9	0.4%
50	Harlem silty clay loam	alluvium	47.1	1.3%
51	Harlem silty clay loam, saline	alluvium	9.9	0.3%
52	Harlem silty clay	alluvium	209.0	5.6%
53	Harlem silty clay, saline	alluvium	226.5	6.1%
54	Harlem variant-Lardell silty clay loams	alluvium	35.2	0.9%
55	Havre loam	alluvium	42.9	1.2%
57	Havre silty clay loam	alluvium	13.0	0.4%
59	Havre, Hanly, and Glendive soils, channeled	alluvium	5.2	0.1%
60	Havre variant-Lardell silty clay loams	alluvium	62.5	1.7%
67	Hillon clay loam, 25 to 45 percent slopes	till	37.4	1.0%
68	Hillon-Kevin clay loams, 15 to 35 percent slopes	till	170.7	4.6%
76	Lardell silty clay loam	alluvium	225.5	6.1%
91	Nishon clay loam	alluvium	3.1	0.1%
95	Phillips loam, 0 to 4 percent slopes	clayey till	5.8	0.2%
97	Phillips-Elloam complex, 0 to 4 percent slopes	till	49.3	1.3%
98	Phillips-Elloam complex, 4 to 8 percent slopes	till	35.5	1.0%
119	Telstad loam, 0 to 4 percent slopes	fine-loamy till	888.0	23.9%
121	Telstad-Joplin loams, 2 to 8 percent slopes	fine-loamy till	85.0	2.3%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Blaine County and Part of Phillips County Area, Montana (MT608)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
123	Thoeny-Elloam complex, 0 to 4 percent slopes	tilt	74.7	2.0%
131	Ustic Torrifluvents, wet		37.5	1.0%
153	Water		31.5	0.8%
Subtotals for Soil Survey Area			3,178.0	85.7%
Totals for Area of Interest			3,708.9	100.0%

Parent Material Name— Summary by Map Unit — Phillips County Area, Montana (MT641)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
60A	Havre loam, 0 to 2 percent slopes	alluvium	167.7	4.5%
90A	Harlake clay, 0 to 2 percent slopes	alluvium	201.2	5.4%
93A	Bowdoin clay, 0 to 2 percent slopes	glaciolacustrine deposits	49.4	1.3%
604A	Bullhook loam, 0 to 2 percent slopes	alluvium	7.3	0.2%
811A	Glendive-Havre loams, 0 to 2 percent slopes	alluvium	0.7	0.0%
902A	Lostriver-Bullhook complex, 0 to 2 percent slopes	alluvium	27.0	0.7%
903A	Harlake-Lostriver clays, 0 to 2 percent slopes	alluvium	49.8	1.3%
905A	Harlake-Havre clay loams, 0 to 2 percent slopes	alluvium	27.8	0.8%
Subtotals for Soil Survey Area			530.9	14.3%
Totals for Area of Interest			3,708.9	100.0%

Rating Options—Parent Material Name

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Blaine County and Part of Phillips County Area, Montana		
Map Symbol	Map Unit Name	Farmland Classification
2	Assiniboine fine sandy loam, 0 to 4 percent slopes	Farmland of statewide importance
20	Bowdoin clay	Not prime farmland
26	Cabarr-Hillion association, steep	Not prime farmland
31	Chinook fine sandy loam, 2 to 6 percent slopes	Farmland of statewide importance
48	Hanly loamy fine sand	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands—Blaine County and Part of Phillips County Area, Montana		
Map Symbol	Map Unit Name	Farmland Classification
50	Harlem silty clay loam	Prime farmland if irrigated
51	Harlem silty clay loam, saline	Not prime farmland
52	Harlem silty clay	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
53	Harlem silty clay, saline	Not prime farmland
54	Harlem variant-Lardell silty clay loams	Not prime farmland
55	Havre loam	Not prime farmland
57	Havre silty clay loam	Prime farmland if irrigated
59	Havre, Hanly, and Glendive soils, channeled	Not prime farmland
60	Havre variant-Lardell silty clay loams	Not prime farmland
67	Hillon clay loam, 25 to 45 percent slopes	Not prime farmland
68	Hillon-Kevin clay loams, 15 to 35 percent slopes	Not prime farmland
76	Lardell silty clay loam	Not prime farmland
91	Nishon clay loam	Not prime farmland
95	Phillips loam, 0 to 4 percent slopes	Farmland of statewide importance
97	Phillips-Elloam complex, 0 to 4 percent slopes	Not prime farmland
98	Phillips-Elloam complex, 4 to 8 percent slopes	Not prime farmland
119	Telstad loam, 0 to 4 percent slopes	Prime farmland if irrigated
121	Telstad-Joplin loams, 2 to 8 percent slopes	Farmland of statewide importance
123	Thoeny-Elloam complex, 0 to 4 percent slopes	Not prime farmland
131	Ustic Torrifluvents, wet	Not prime farmland
153	Water	Not prime farmland

Prime and other Important Farmlands—Phillips County Area, Montana		
Map Symbol	Map Unit Name	Farmland Classification
60A	Havre loam, 0 to 2 percent slopes	Farmland of statewide importance
90A	Harlake clay, 0 to 2 percent slopes	Farmland of statewide importance
93A	Bowdoin clay, 0 to 2 percent slopes	Not prime farmland
604A	Bullhook loam, 0 to 2 percent slopes	Not prime farmland
811A	Glendive-Havre loams, 0 to 2 percent slopes	Farmland of statewide importance
902A	Lostriver-Bullhook complex, 0 to 2 percent slopes	Not prime farmland
903A	Harlake-Lostriver clays, 0 to 2 percent slopes	Not prime farmland
905A	Harlake-Havre clay loams, 0 to 2 percent slopes	Farmland of statewide importance

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



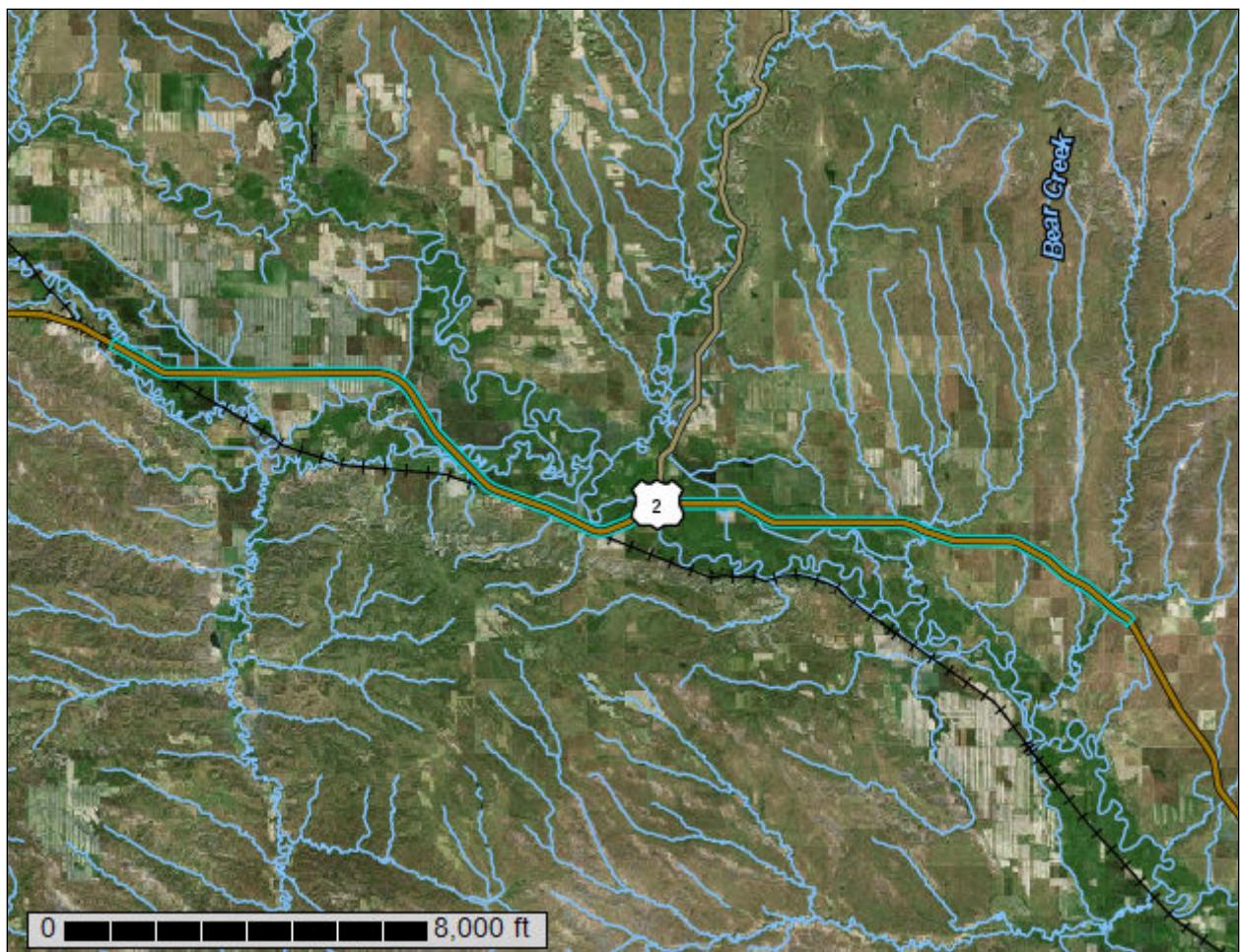
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Phillips County Area, Montana, and Valley County, Montana



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	6
Soil Map	9
Soil Map.....	10
Legend.....	11
Map Unit Legend.....	13
Map Unit Descriptions.....	14
Phillips County Area, Montana.....	16
90A—Harlake clay, 0 to 2 percent slopes.....	16
93A—Bowdoin clay, 0 to 2 percent slopes.....	17
W—Water.....	19
Valley County, Montana.....	20
2—Aquic Ustifluvents, saline.....	20
5—Bowdoin clay.....	21
13—Evanston-Lonna loams, 2 to 9 percent slopes.....	22
22—Harlem silty clay loam.....	24
23—Harlem clay.....	25
25—Havre silty clay loam.....	27
26—Havre-Glendive complex.....	28
27—Havre-Harlem silty clays.....	30
30—Hillon-Telstad loams, 9 to 15 percent slopes.....	31
32—Lallie silty clay.....	33
36—Lonna silt loam, 1 to 3 percent slopes.....	34
37—Lonna-Marias complex, 1 to 3 percent slopes.....	36
38—Marias clay, 1 to 9 percent slopes.....	38
46—Phillips loam, 0 to 4 percent slopes.....	40
47—Phillips-Elloam complex, 1 to 9 percent slopes.....	42
49—Phillips-Kevin complex, 2 to 8 percent slopes.....	44
52—Redvale loam, 0 to 3 percent slopes.....	47
57—Scobey-Kevin clay loams, 2 to 8 percent slopes.....	48
59—Scobey-Sunburst clay loams, 5 to 25 percent slopes.....	50
60—Sunburst clay loam, 9 to 35 percent slopes.....	53
65—Telstad loam, 2 to 8 percent slopes.....	55
70—Tinsley complex, 9 to 35 percent slopes.....	56
75—Ustic Torrifluvents, gently sloping.....	59
76—Vaeda silty clay.....	60
79—Water.....	62
Soil Information for All Uses	63
Soil Properties and Qualities.....	63
Soil Qualities and Features.....	63
Parent Material Name.....	63
Soil Reports	69
Land Classifications.....	69
Prime and other Important Farmlands.....	69

Custom Soil Resource Report

References.....	72
------------------------	----

How Soil Surveys Are Made

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

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

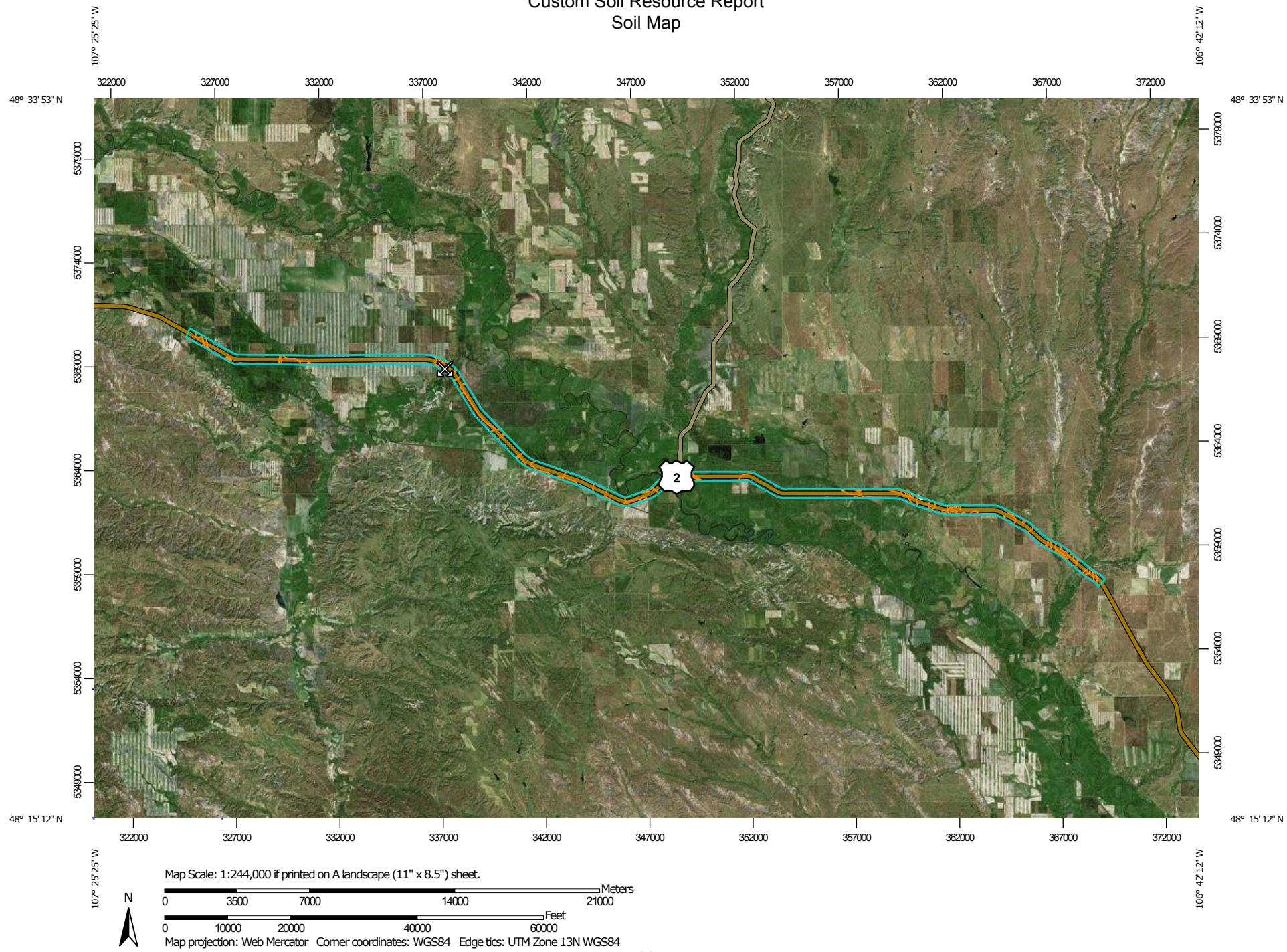
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

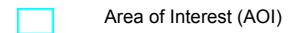
Custom Soil Resource Report

Soil Map



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils



Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot

Spoil Area



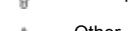
Stony Spot



Very Stony Spot



Wet Spot

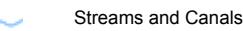


Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Phillips County Area, Montana

Survey Area Data: Version 12, Sep 28, 2015

Soil Survey Area: Valley County, Montana

Survey Area Data: Version 19, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Phillips County Area, Montana (MT641)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
90A	Harlake clay, 0 to 2 percent slopes	47.8	0.9%
93A	Bowdoine clay, 0 to 2 percent slopes	491.0	8.9%
W	Water	8.9	0.2%
Subtotals for Soil Survey Area		547.6	9.9%
Totals for Area of Interest		5,533.5	100.0%

Valley County, Montana (MT105)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Aquic Ustifluvents, saline	39.7	0.7%
5	Bowdoine clay	101.6	1.8%
13	Evanston-Lonna loams, 2 to 9 percent slopes	20.7	0.4%
22	Harlem silty clay loam	171.4	3.1%
23	Harlem clay	1,304.0	23.6%
25	Havre silty clay loam	260.4	4.7%
26	Havre-Glendive complex	15.3	0.3%
27	Havre-Harlem silty clays	424.1	7.7%
30	Hillon-Telstad loams, 9 to 15 percent slopes	5.2	0.1%
32	Lallie silty clay	62.7	1.1%
36	Lonna silt loam, 1 to 3 percent slopes	151.2	2.7%
37	Lonna-Marias complex, 1 to 3 percent slopes	45.8	0.8%
38	Marias clay, 1 to 9 percent slopes	1,048.6	19.0%
46	Phillips loam, 0 to 4 percent slopes	567.0	10.2%
47	Phillips-Elloam complex, 1 to 9 percent slopes	13.5	0.2%
49	Phillips-Kevin complex, 2 to 8 percent slopes	147.4	2.7%
52	Redvale loam, 0 to 3 percent slopes	31.5	0.6%
57	Scobey-Kevin clay loams, 2 to 8 percent slopes	3.8	0.1%
59	Scobey-Sunburst clay loams, 5 to 25 percent slopes	40.5	0.7%

Valley County, Montana (MT105)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
60	Sunburst clay loam, 9 to 35 percent slopes	237.3	4.3%
65	Telstad loam, 2 to 8 percent slopes	23.2	0.4%
70	Tinsley complex, 9 to 35 percent slopes	22.5	0.4%
75	Ustic Torrifluvents, gently sloping	100.7	1.8%
76	Vaeda silty clay	126.8	2.3%
79	Water	21.1	0.4%
Subtotals for Soil Survey Area		4,985.9	90.1%
Totals for Area of Interest		5,533.5	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic 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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Phillips County Area, Montana

90A—Harlake clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnx8

Elevation: 2,170 to 3,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 120 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Harlake and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlake

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 8 inches: clay

C1 - 8 to 50 inches: stratified silt loam to clay

C2 - 50 to 60 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Gypsum, maximum in profile: 3 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Minor Components

Lostriver

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Havre

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Bullhook

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Bowdoin

Percent of map unit: 2 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Somewhat poorly drained soils

Percent of map unit: 2 percent
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R052XC209MT)
Hydric soil rating: No

Lallie

Percent of map unit: 2 percent
Landform: Oxbows
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R052XC225MT)
Hydric soil rating: Yes

93A—Bowdoin clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cnxw

Elevation: 2,170 to 3,400 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Bowdoin

Setting

Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits

Typical profile

A - 0 to 3 inches: clay
Bnss - 3 to 31 inches: clay
Bnssy - 31 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Gypsum, maximum in profile: 10 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: Unranked

Minor Components

Strongly saline soils

Percent of map unit: 7 percent
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Strongly sodic soils

Percent of map unit: 7 percent
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Wheatbelt

Percent of map unit: 1 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)

Hydric soil rating: Yes

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Valley County, Montana

2—Aquic Ustifluvents, saline

Map Unit Setting

National map unit symbol: clk8
Elevation: 900 to 3,600 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Aquic ustifluvents and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aquic Ustifluvents

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C
Ecological site: Saline Lowland (SL) RRU 58A-E 10-14" p.z. (R058AE012MT)
Hydric soil rating: No

Minor Components

Lallie

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)
Hydric soil rating: Yes

5—Bowdoin clay

Map Unit Setting

National map unit symbol: clb
Elevation: 1,800 to 4,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Bowdoin and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bowdoin

Setting

Landform: Flood plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 5 inches: clay
Bss - 5 to 22 inches: clay
By - 22 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 6 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Vaeda

Percent of map unit: 4 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

13—Evanston-Lonna loams, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: clk1
Elevation: 1,900 to 6,600 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Evanston

Setting

Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: loam
Bt - 5 to 17 inches: clay loam
Bk - 17 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

Description of Lonna

Setting

Landform: Lake plains, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: loam
Bw - 5 to 11 inches: silt loam
Bk - 11 to 26 inches: silty clay loam
C - 26 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

Minor Components

Floweree

Percent of map unit: 5 percent
Landform: Hillslopes on lake plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

Phillips

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

22—Harlem silty clay loam

Map Unit Setting

National map unit symbol: clkc
Elevation: 1,800 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Harlem and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium and/or clayey glaciolacustrine deposits

Typical profile

A - 0 to 6 inches: silty clay loam
C1 - 6 to 36 inches: stratified silty clay loam to clay
C2 - 36 to 72 inches: stratified fine sandy loam to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Minor Components

Bowdoin

Percent of map unit: 5 percent
Landform: Stream terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

Havre

Percent of map unit: 5 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

23—Harlem clay

Map Unit Setting

National map unit symbol: clkd
Elevation: 1,800 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium and/or clayey glaciolacustrine deposits

Typical profile

A - 0 to 6 inches: clay

C1 - 6 to 36 inches: stratified clay to silty clay loam

C2 - 36 to 72 inches: stratified silty clay loam to fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 4s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Minor Components

Bowdoin

Percent of map unit: 6 percent

Landform: Stream terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

Havre

Percent of map unit: 4 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

25—Havre silty clay loam

Map Unit Setting

National map unit symbol: clkg
Elevation: 1,900 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Havre and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 5 inches: silty clay loam
C - 5 to 65 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 5 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Glendive

Percent of map unit: 5 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

26—Havre-Glendive complex

Map Unit Setting

National map unit symbol: clkh
Elevation: 1,900 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Havre and similar soils: 65 percent
Glendive and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 5 inches: silty clay loam
C - 5 to 65 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Description of Glendive

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: loam
C1 - 8 to 40 inches: sandy loam
C2 - 40 to 60 inches: stratified loamy fine sand to clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 10 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

27—Havre-Harlem silty clays

Map Unit Setting

National map unit symbol: clkj
Elevation: 1,900 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Havre and similar soils: 50 percent
Harlem and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium and/or glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: silty clay
C - 5 to 65 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Description of Harlem

Setting

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium and/or clayey glaciolacustrine deposits

Typical profile

A - 0 to 6 inches: silty clay

C1 - 6 to 36 inches: stratified clay to silty clay loam

C2 - 36 to 72 inches: stratified silty clay loam to fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

30—Hillon-Telstad loams, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: clkn

Elevation: 1,900 to 4,000 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 100 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 50 percent

Telstad and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Hillslopes on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 4 inches: loam
Bky - 4 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Description of Telstad

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: loam
Bt - 8 to 16 inches: clay loam
Bk1 - 16 to 34 inches: loam
Bk2 - 34 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Minor Components

Phillips

Percent of map unit: 6 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Tinsley

Percent of map unit: 4 percent

Landform: Hillslopes, hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)

Hydric soil rating: No

32—Lallie silty clay

Map Unit Setting

National map unit symbol: clkq

Elevation: 900 to 6,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 34 to 45 degrees F

Frost-free period: 110 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Lallie and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lallie

Setting

Landform: Oxbows

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous clayey alluvium

Typical profile

A - 0 to 6 inches: silty clay

Cg - 6 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Available water storage in profile: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: C/D

Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)

Hydric soil rating: Yes

Minor Components

Havre

Percent of map unit: 5 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

36—Lonna silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: clkv

Elevation: 1,900 to 4,500 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 110 to 130 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Lonna and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lonna

Setting

Landform: Lake plains, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium

Typical profile

A - 0 to 5 inches: silt loam
Bw - 5 to 11 inches: silt loam
Bk - 11 to 26 inches: silty clay loam
C - 26 to 65 inches: silty clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

Minor Components

Marias

Percent of map unit: 8 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Floweree

Percent of map unit: 2 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

37—Lonna-Marias complex, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: clkw
Elevation: 1,900 to 6,600 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Lonna and similar soils: 50 percent
Marias and similar soils: 45 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lonna

Setting

Landform: Lake plains, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: silt loam
Bw - 5 to 11 inches: silt loam
Bk - 11 to 26 inches: silty clay loam
C - 26 to 65 inches: silty clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Description of Marias

Setting

Landform: Lake plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: clay

Bss - 6 to 27 inches: clay

Bssy - 27 to 74 inches: clay

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Minor Components

Evanston

Percent of map unit: 3 percent

Landform: Lake plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Floweree

Percent of map unit: 2 percent

Landform: Hillslopes on lake plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

38—Marias clay, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: clkx
Elevation: 1,900 to 4,800 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Marias and similar soils: 95 percent
Marias and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marias

Setting

Landform: Lake plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: clay
Bss - 6 to 27 inches: clay
Bssy - 27 to 74 inches: clay

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Description of Marias

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 15 inches: silty clay
Bss - 15 to 33 inches: clay
Bssy - 33 to 60 inches: clay

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 6 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Minor Components

Sunburst

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R054XE530MT)
Hydric soil rating: No

Lonna

Percent of map unit: 1 percent
Landform: Lake plains, fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)
Hydric soil rating: No

Absher

Percent of map unit: 1 percent
Landform: Terraces

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

Vaeda

Percent of map unit: 1 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

46—Phillips loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2sy7z
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

A - 0 to 2 inches: loam
E - 2 to 7 inches: loam
Bt - 7 to 11 inches: clay
Btk - 11 to 15 inches: clay loam
Bk - 15 to 36 inches: clay loam
BCyz - 36 to 50 inches: clay loam
Cz - 50 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Kevin

Percent of map unit: 3 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Elloam

Percent of map unit: 2 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Thoeny

Percent of map unit: 2 percent
Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ethridge

Percent of map unit: 2 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

47—Phillips-Elloam complex, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: cl17
Elevation: 1,900 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 50 percent
Elloam and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 5 inches: loam
Bt - 5 to 12 inches: clay
Bk - 12 to 36 inches: clay loam
C - 36 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

E - 0 to 3 inches: clay loam

Btn - 3 to 10 inches: clay

Bkn - 10 to 20 inches: clay loam

Bknyz - 20 to 43 inches: clay loam

C - 43 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Minor Components

Scobey

Percent of map unit: 10 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Delpoint

Percent of map unit: 7 percent

Landform: Hills, ridges

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Cabbart

Percent of map unit: 5 percent

Landform: Hillslopes, ridges
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow (Sw) RRU 58A-E 10-14" p.z. (R058AE019MT)
Hydric soil rating: No

Nobe

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: Yes

49—Phillips-Kevin complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vyr1
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 45 percent
Kevin and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

A - 0 to 2 inches: loam

E - 2 to 7 inches: loam
Bt - 7 to 11 inches: clay
Btk - 11 to 15 inches: clay loam
Bk - 15 to 36 inches: clay loam
BCyz - 36 to 50 inches: clay loam
Cz - 50 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Kevin

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 57 inches: clay loam
Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 4 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Thoeny

Percent of map unit: 4 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Elloam

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ethridge

Percent of map unit: 3 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

52—Redvale loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: clf
Elevation: 2,000 to 6,600 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Redvale and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Redvale

Setting

Landform: Fans, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: loam
Bt1 - 6 to 11 inches: clay loam
Bt2 - 11 to 20 inches: clay
Bk - 20 to 30 inches: gravelly clay loam
2C - 30 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (1.0 to 3.0 mmhos/cm)
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Minor Components

Attewan

Percent of map unit: 6 percent

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Evanston

Percent of map unit: 4 percent

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

57—Scobey-Kevin clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t3k4

Elevation: 2,000 to 3,870 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 100 to 140 days

Farmland classification: Not prime farmland

Map Unit Composition

Scobey and similar soils: 45 percent

Kevin and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Moraines

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 15 inches: clay

Bk1 - 15 to 29 inches: clay loam

Bk2 - 29 to 44 inches: clay loam

BCyz - 44 to 61 inches: clay loam

Cz - 61 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 4 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 12.0

Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

Description of Kevin

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 9 inches: clay loam

Bk1 - 9 to 23 inches: clay loam

Bk2 - 23 to 41 inches: clay loam

BCyz - 41 to 57 inches: clay loam

Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 4 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 12.0

Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 8 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Elloam

Percent of map unit: 3 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Acel

Percent of map unit: 2 percent

Landform: Moraines

Microfeatures of landform position: Swales

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Nishon

Percent of map unit: 2 percent

Landform: Depressions on moraines

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

59—Scobey-Sunburst clay loams, 5 to 25 percent slopes

Map Unit Setting

National map unit symbol: clln

Elevation: 1,900 to 4,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 110 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Scobey and similar soils: 50 percent
Sunburst and similar soils: 30 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam
Bt - 5 to 15 inches: clay loam
Bky - 15 to 60 inches: clay loam

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Description of Sunburst

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 28 inches: clay loam
Bky - 28 to 60 inches: clay loam

Properties and qualities

Slope: 5 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)
Hydric soil rating: No

Minor Components

Phillips

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Elloam

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Hillon

Percent of map unit: 4 percent
Landform: Hillslopes on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Telstad

Percent of map unit: 3 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Thoeny

Percent of map unit: 3 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

60—Sunburst clay loam, 9 to 35 percent slopes

Map Unit Setting

National map unit symbol: clq
Elevation: 1,900 to 5,500 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Sunburst and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sunburst

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 28 inches: clay loam
Bky - 28 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)
Hydric soil rating: No

Minor Components

Scobey

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Hillon

Percent of map unit: 4 percent
Landform: Hillslopes on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)
Hydric soil rating: No

Thebo

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Phillips

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Cabbart

Percent of map unit: 2 percent
Landform: Hillslopes, ridges
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow (Sw) RRU 58A-E 10-14" p.z. (R058AE019MT)
Hydric soil rating: No

Lisam

Percent of map unit: 2 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow Clay (SwC) RRU 58A-E 10-14" p.z. (R058AE199MT)
Hydric soil rating: No

65—Telstad loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2sy84
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Telstad and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Telstad

Setting

Landform: Moraines
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 15 inches: clay loam
Bk1 - 15 to 30 inches: clay loam
Bk2 - 30 to 45 inches: clay loam
BCyz - 45 to 61 inches: loam
Cz - 61 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ferd

Percent of map unit: 3 percent
Landform: Moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Elloam

Percent of map unit: 1 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

70—Tinsley complex, 9 to 35 percent slopes

Map Unit Setting

National map unit symbol: clm2
Elevation: 1,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Tinsley and similar soils: 40 percent

Farnuf and similar soils: 15 percent

Turner and similar soils: 15 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tinsley

Setting

Landform: Hills, hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 4 inches: very gravelly sandy loam

C - 4 to 60 inches: very gravelly sand

Properties and qualities

Slope: 9 to 35 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: A

Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)

Hydric soil rating: No

Description of Farnuf

Setting

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Old alluvium

Typical profile

A - 0 to 7 inches: loam

Bt - 7 to 23 inches: clay loam

Bk - 23 to 50 inches: loam

2C - 50 to 60 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 9 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Description of Turner

Setting

Landform: Hillslopes, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 5 inches: loam
Bt - 5 to 19 inches: clay loam
2C - 19 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Minor Components

Martinsdale

Percent of map unit: 10 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Reeder

Percent of map unit: 10 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Doney

Percent of map unit: 5 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R053AE064MT)
Hydric soil rating: No

Tally

Percent of map unit: 5 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R053AE062MT)
Hydric soil rating: No

75—Ustic Torrifluvents, gently sloping

Map Unit Setting

National map unit symbol: clm7
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Ustic torrifluvents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustic Torrifluvents

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

C - 7 to 40 inches: stratified sandy loam to clay loam
2C - 40 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B
Ecological site: Overflow (Ov) 10-14" p.z. (R052XC207MT)
Hydric soil rating: No

76—Vaeda silty clay

Map Unit Setting

National map unit symbol: clm8
Elevation: 1,900 to 4,800 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Vaeda and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vaeda

Setting

Landform: Fans, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

E - 0 to 3 inches: silty clay
By1 - 3 to 10 inches: silty clay
By2 - 10 to 72 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 20.0

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

Minor Components

Absher

Percent of map unit: 3 percent

Landform: Terraces, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

Marias

Percent of map unit: 1 percent

Landform: Lake plains, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Nobe

Percent of map unit: 1 percent

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R053AE071MT)

Hydric soil rating: No

79—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

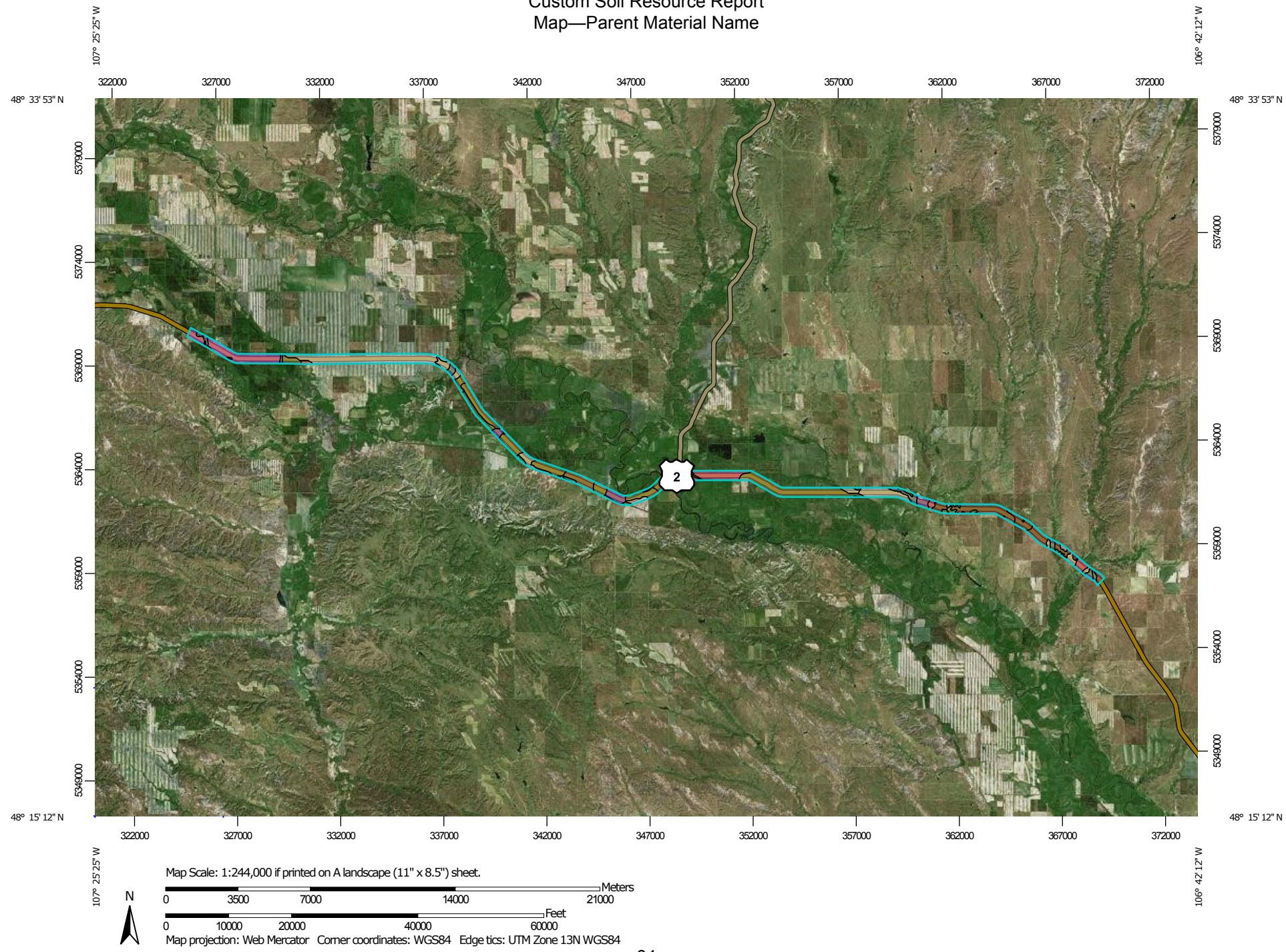
Parent Material Name

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report Map—Parent Material Name



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Soils

Soil Rating Polygons

alluvium	alluvium and/or glaciolacustrine deposits
alluvium and/or glaciolacustrine deposits	calcareous clayey alluvium
calcareous clayey alluvium	clayey alluvium
clayey alluvium	clayey alluvium and/or clayey glaciolacustrine deposits
clayey alluvium and/or clayey glaciolacustrine deposits	clayey till
clayey till	fine-loamy till
fine-loamy till	glaciolacustrine deposits
glaciolacustrine deposits	loamy alluvium
loamy alluvium	loamy alluvium and/or glaciolacustrine deposits
loamy alluvium and/or glaciolacustrine deposits	silty alluvium
silty alluvium	silty glaciolacustrine deposits
silty glaciolacustrine deposits	till
till	Not rated or not available
Not rated or not available	

Soil Rating Lines



alluvium

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Phillips County Area, Montana
Survey Area Data: Version 12, Sep 28, 2015

Soil Survey Area: Valley County, Montana
Survey Area Data: Version 19, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name

Parent Material Name— Summary by Map Unit — Phillips County Area, Montana (MT641)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
90A	Harlake clay, 0 to 2 percent slopes	alluvium	47.8	0.9%
93A	Bowdoin clay, 0 to 2 percent slopes	glaciolacustrine deposits	491.0	8.9%
W	Water		8.9	0.2%
Subtotals for Soil Survey Area			547.6	9.9%
Totals for Area of Interest			5,533.5	100.0%

Parent Material Name— Summary by Map Unit — Valley County, Montana (MT105)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Aquic Ustifluvents, saline	alluvium	39.7	0.7%
5	Bowdoin clay	clayey alluvium	101.6	1.8%
13	Evanston-Lonna loams, 2 to 9 percent slopes	alluvium and/or glaciolacustrine deposits	20.7	0.4%
22	Harlem silty clay loam	clayey alluvium and/or clayey glaciolacustrine deposits	171.4	3.1%
23	Harlem clay	clayey alluvium and/or clayey glaciolacustrine deposits	1,304.0	23.6%
25	Havre silty clay loam	loamy alluvium	260.4	4.7%
26	Havre-Glendive complex	loamy alluvium	15.3	0.3%
27	Havre-Harlem silty clays	loamy alluvium and/or glaciolacustrine deposits	424.1	7.7%
30	Hillon-Telstad loams, 9 to 15 percent slopes	til	5.2	0.1%
32	Lallie silty clay	calcareous clayey alluvium	62.7	1.1%
36	Lonna silt loam, 1 to 3 percent slopes	silty alluvium	151.2	2.7%
37	Lonna-Marias complex, 1 to 3 percent slopes	silty glaciolacustrine deposits	45.8	0.8%
38	Marias clay, 1 to 9 percent slopes		1,048.6	19.0%
46	Phillips loam, 0 to 4 percent slopes	clayey till	567.0	10.2%
47	Phillips-Elloam complex, 1 to 9 percent slopes	til	13.5	0.2%
49	Phillips-Kevin complex, 2 to 8 percent slopes	clayey till	147.4	2.7%
52	Redvale loam, 0 to 3 percent slopes	alluvium	31.5	0.6%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Valley County, Montana (MT105)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
57	Scobey-Kevin clay loams, 2 to 8 percent slopes	clayey till	3.8	0.1%
59	Scobey-Sunburst clay loams, 5 to 25 percent slopes	till	40.5	0.7%
60	Sunburst clay loam, 9 to 35 percent slopes		237.3	4.3%
65	Telstad loam, 2 to 8 percent slopes	fine-loamy till	23.2	0.4%
70	Tinsley complex, 9 to 35 percent slopes	alluvium	22.5	0.4%
75	Ustic Torrifluvents, gently sloping	alluvium	100.7	1.8%
76	Vaeda silty clay		126.8	2.3%
79	Water		21.1	0.4%
Subtotals for Soil Survey Area			4,985.9	90.1%
Totals for Area of Interest			5,533.5	100.0%

Rating Options—Parent Material Name

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Phillips County Area, Montana		
Map Symbol	Map Unit Name	Farmland Classification
90A	Harlake clay, 0 to 2 percent slopes	Farmland of statewide importance
93A	Bowdoin clay, 0 to 2 percent slopes	Not prime farmland
W	Water	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands–Valley County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
2	Aquic Ustifluvents, saline	Not prime farmland
5	Bowdoin clay	Not prime farmland
13	Evanston-Lonna loams, 2 to 9 percent slopes	Not prime farmland
22	Harlem silty clay loam	Not prime farmland
23	Harlem clay	Not prime farmland
25	Havre silty clay loam	Farmland of statewide importance
26	Havre-Glendive complex	Farmland of statewide importance
27	Havre-Harlem silty clays	Not prime farmland
30	Hillon-Telstad loams, 9 to 15 percent slopes	Not prime farmland
32	Lallie silty clay	Not prime farmland
36	Lonna silt loam, 1 to 3 percent slopes	Farmland of statewide importance
37	Lonna-Marias complex, 1 to 3 percent slopes	Not prime farmland
38	Marias clay, 1 to 9 percent slopes	Not prime farmland
46	Phillips loam, 0 to 4 percent slopes	Not prime farmland
47	Phillips-Elloam complex, 1 to 9 percent slopes	Not prime farmland
49	Phillips-Kevin complex, 2 to 8 percent slopes	Not prime farmland
52	Redvale loam, 0 to 3 percent slopes	Prime farmland if irrigated
57	Scobey-Kevin clay loams, 2 to 8 percent slopes	Not prime farmland
59	Scobey-Sunburst clay loams, 5 to 25 percent slopes	Not prime farmland
60	Sunburst clay loam, 9 to 35 percent slopes	Not prime farmland
65	Telstad loam, 2 to 8 percent slopes	Not prime farmland
70	Tinsley complex, 9 to 35 percent slopes	Not prime farmland
75	Ustic Torrifluvents, gently sloping	Not prime farmland
76	Vaeda silty clay	Not prime farmland
79	Water	Not prime farmland

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



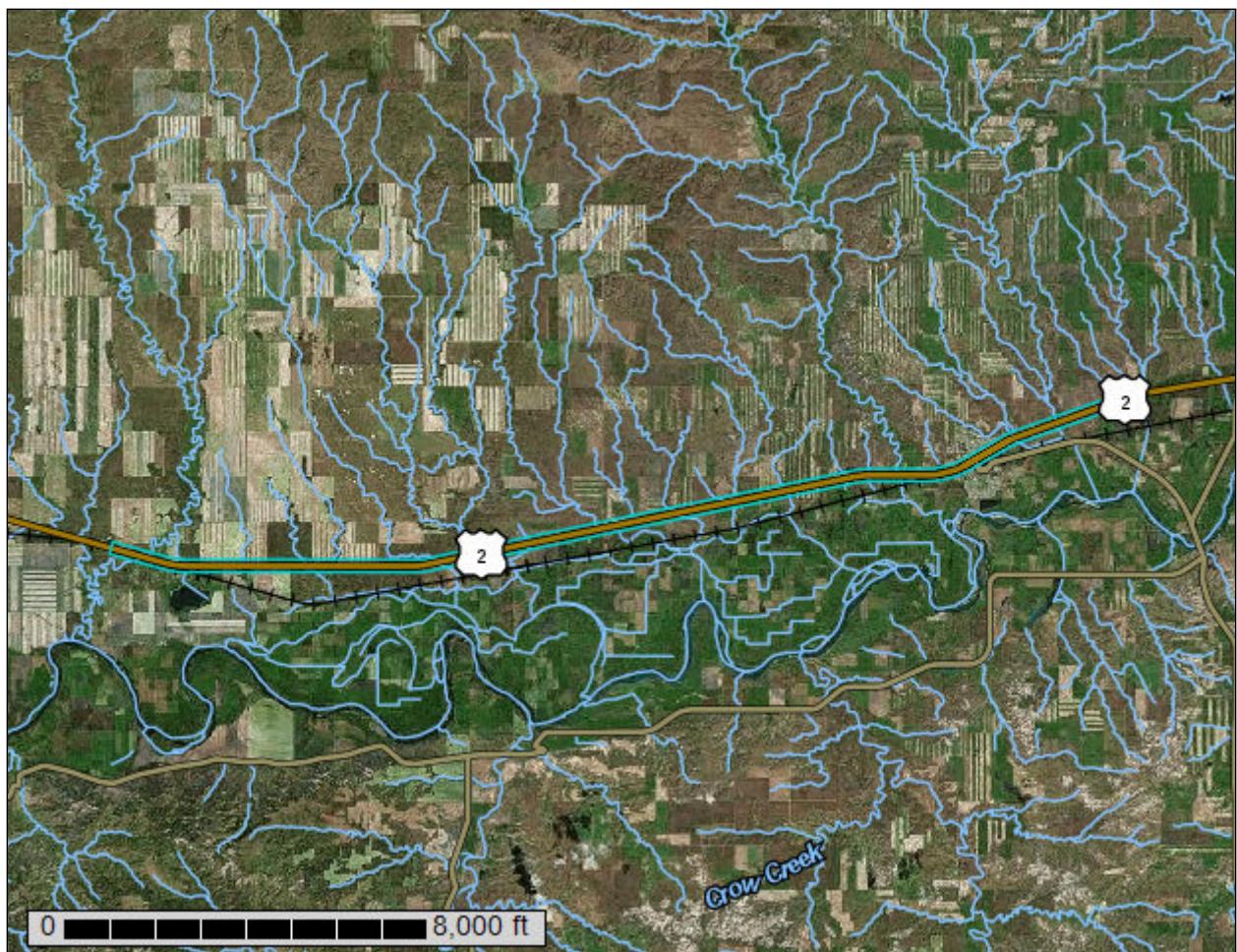
United States
Department of
Agriculture



Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Roosevelt and Daniels Counties, Montana, and Valley County, Montana



Preface

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	6
Soil Map	9
Soil Map.....	10
Legend.....	11
Map Unit Legend.....	13
Map Unit Descriptions.....	15
Roosevelt and Daniels Counties, Montana.....	17
1—Adger silty clay loam, 1 to 8 percent slopes.....	17
8—Bowdoin clay, protected.....	18
15—Evanston loam, 2 to 8 percent slopes.....	20
18—Farnuf loam, 2 to 8 percent slopes.....	21
20—Fluvaquents, saline, 0 to 2 percent slopes.....	23
21—Glendive fine sandy loam, protected, 0 to 2 percent slopes.....	24
23—Harlem silty clay loam, protected, 0 to 2 percent slopes.....	25
24—Havre silt loam, protected, 0 to 2 percent slopes.....	27
26—Havrelon loam, 0 to 2 percent slopes.....	28
29—Havrelon-Trembles complex, protected, 0 to 2 percent slopes.....	29
30—Hillon loam, 8 to 15 percent slopes.....	31
31—Hillon loam, 15 to 45 percent slopes.....	33
32—Hillon-Tinsley complex, 8 to 15 percent slopes.....	34
33—Hillon-Tinsley complex, 15 to 45 percent slopes.....	36
34—Lallie silty clay, saline, 0 to 2 percent slopes.....	38
37—Lohler silty clay, protected, 0 to 2 percent slopes.....	39
50—Telstad loam, 2 to 8 percent slopes.....	41
51—Telstad-Hillon loams, 2 to 8 percent slopes.....	42
52—Thebo-Lisam complex, 15 to 45 percent slopes.....	44
55—Trembles fine sandy loam, protected, 0 to 2 percent slopes.....	46
62—Ustic Torrifluvents, 0 to 2 percent slopes.....	48
63—Ustifluvents, saline, 0 to 2 percent slopes.....	49
64—Vanda variant silty clay, 4 to 10 percent slopes.....	50
65—Vanda variant-Thebo-Lisam complex, 4 to 15 percent slopes.....	51
69—Williams loam, 2 to 8 percent slopes.....	54
70—Williams-Zahill loams, 2 to 8 percent slopes.....	56
71—Zahill loam, 8 to 15 percent slopes.....	58
76—Zahill-Tinsley complex, 15 to 45 percent slopes.....	60
Valley County, Montana.....	63
1—Absher-Vaeda complex, 1 to 5 percent slopes.....	63
5—Bowdoin clay.....	65
23—Harlem clay.....	66
25—Havre silty clay loam.....	67
27—Havre-Harlem silty clays.....	69
38—Marias clay, 1 to 9 percent slopes.....	70
47—Phillips-Elloam complex, 1 to 9 percent slopes.....	73

Custom Soil Resource Report

49—Phillips-Kevin complex, 2 to 8 percent slopes.....	75
51—Phillips-Thoeny loams, 0 to 2 percent slopes.....	78
52—Redvale loam, 0 to 3 percent slopes.....	80
57—Scobey-Kevin clay loams, 2 to 8 percent slopes.....	81
59—Scobey-Sunburst clay loams, 5 to 25 percent slopes.....	83
60—Sunburst clay loam, 9 to 35 percent slopes.....	86
61—Sunburst-Lisam complex, 9 to 35 percent slopes.....	88
68—Thebo-Lisam clays, 2 to 15 percent slopes.....	90
75—Ustic Torrifluvents, gently sloping.....	92
79—Water.....	93
Soil Information for All Uses.....	94
Soil Properties and Qualities.....	94
Soil Qualities and Features.....	94
Parent Material Name.....	94
Soil Reports.....	101
Land Classifications.....	101
Prime and other Important Farmlands.....	101
References.....	105

How Soil Surveys Are Made

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

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units).

Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

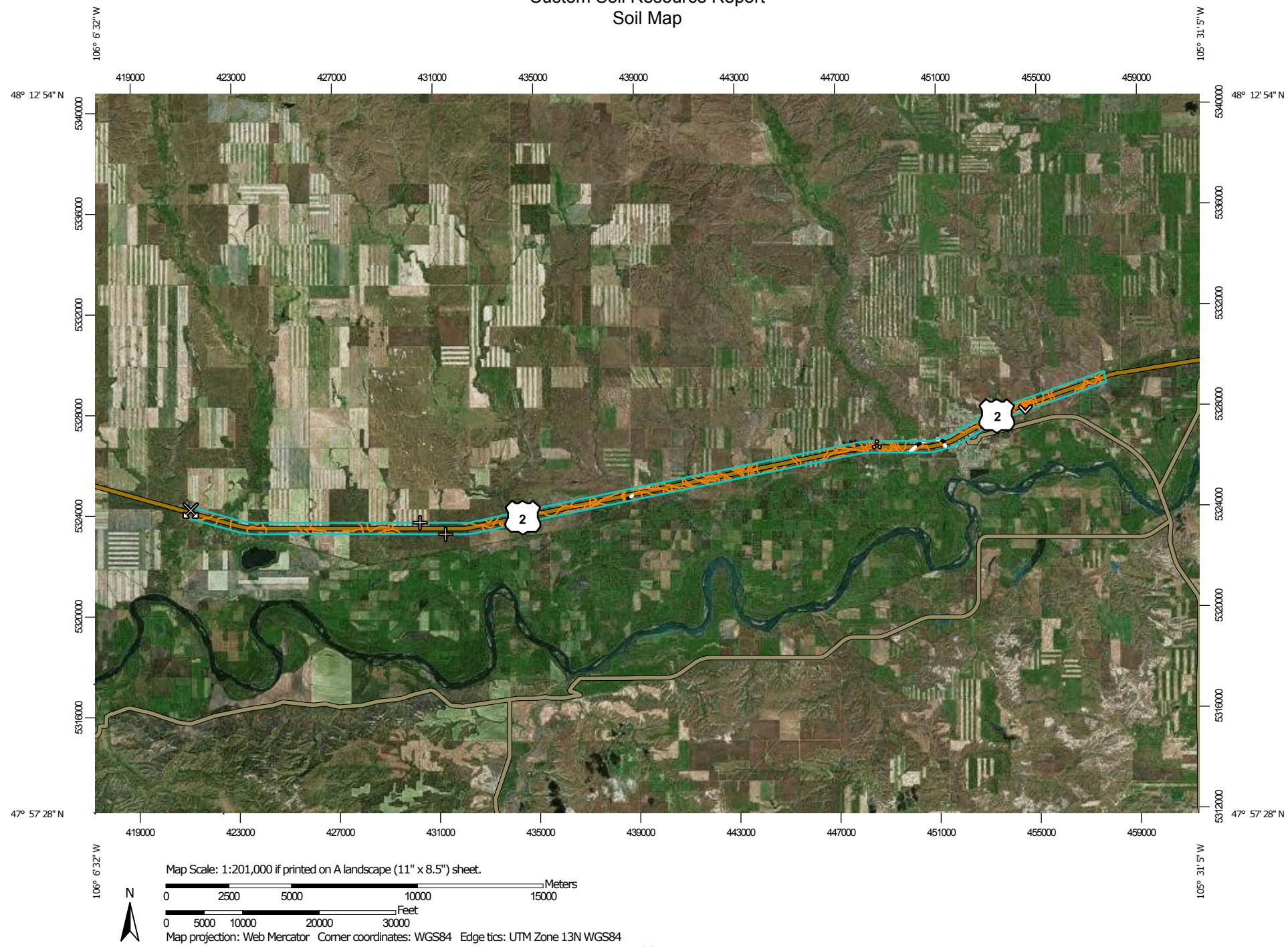
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)	
	Area of Interest (AOI)
Soils	
	Soil Map Unit Polygons
	Soil Map Unit Lines
	Soil Map Unit Points
Special Point Features	
	Blowout
	Borrow Pit
	Clay Spot
	Closed Depression
	Gravel Pit
	Gravelly Spot
	Landfill
	Lava Flow
	Marsh or swamp
	Mine or Quarry
	Miscellaneous Water
	Perennial Water
	Rock Outcrop
	Saline Spot
	Sandy Spot
	Severely Eroded Spot
	Sinkhole
	Slide or Slip
	Sodic Spot
Water Features	
	Streams and Canals
Transportation	
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
Background	
	Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Roosevelt and Daniels Counties, Montana
 Survey Area Data: Version 14, Sep 28, 2015

Soil Survey Area: Valley County, Montana
 Survey Area Data: Version 19, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Roosevelt and Daniels Counties, Montana (MT661)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Adger silty clay loam, 1 to 8 percent slopes	21.8	0.5%
8	Bowdoine clay, protected	27.9	0.7%
15	Evanston loam, 2 to 8 percent slopes	256.2	6.0%
18	Farnuf loam, 2 to 8 percent slopes	69.4	1.6%
20	Fluvaquents, saline, 0 to 2 percent slopes	19.7	0.5%
21	Glendive fine sandy loam, protected, 0 to 2 percent slopes	7.1	0.2%
23	Harlem silty clay loam, protected, 0 to 2 percent slopes	33.1	0.8%
24	Havre silt loam, protected, 0 to 2 percent slopes	24.3	0.6%
26	Havrelon loam, 0 to 2 percent slopes	29.5	0.7%
29	Havrelon-Trembles complex, protected, 0 to 2 percent slopes	54.4	1.3%
30	Hillon loam, 8 to 15 percent slopes	186.6	4.4%
31	Hillon loam, 15 to 45 percent slopes	125.1	2.9%
32	Hillon-Tinsley complex, 8 to 15 percent slopes	18.3	0.4%
33	Hillon-Tinsley complex, 15 to 45 percent slopes	106.5	2.5%
34	Lallie silty clay, saline, 0 to 2 percent slopes	113.7	2.7%
37	Lohler silty clay, protected, 0 to 2 percent slopes	197.4	4.6%
50	Telstad loam, 2 to 8 percent slopes	43.3	1.0%
51	Telstad-Hillon loams, 2 to 8 percent slopes	467.4	11.0%
52	Thebo-Lisam complex, 15 to 45 percent slopes	9.6	0.2%
55	Trembles fine sandy loam, protected, 0 to 2 percent slopes	44.8	1.1%
62	Ustic Torrifluvents, 0 to 2 percent slopes	79.4	1.9%

Custom Soil Resource Report

Roosevelt and Daniels Counties, Montana (MT661)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
63	Ustifluvents, saline, 0 to 2 percent slopes	4.5	0.1%
64	Vanda variant silty clay, 4 to 10 percent slopes	167.4	3.9%
65	Vanda variant-Thebo-Lisam complex, 4 to 15 percent slopes	72.4	1.7%
69	Williams loam, 2 to 8 percent slopes	3.3	0.1%
70	Williams-Zahill loams, 2 to 8 percent slopes	44.1	1.0%
71	Zahill loam, 8 to 15 percent slopes	81.8	1.9%
76	Zahill-Tinsley complex, 15 to 45 percent slopes	103.9	2.4%
Subtotals for Soil Survey Area		2,413.0	56.8%
Totals for Area of Interest		4,246.4	100.0%

Valley County, Montana (MT105)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Absher-Vaeda complex, 1 to 5 percent slopes	115.4	2.7%
5	Bowdoine clay	2.2	0.1%
23	Harlem clay	214.0	5.0%
25	Havre silty clay loam	63.4	1.5%
27	Havre-Harlem silty clays	18.5	0.4%
38	Marias clay, 1 to 9 percent slopes	149.5	3.5%
47	Phillips-Elloam complex, 1 to 9 percent slopes	20.8	0.5%
49	Phillips-Kevin complex, 2 to 8 percent slopes	785.6	18.5%
51	Phillips-Thoeny loams, 0 to 2 percent slopes	101.8	2.4%
52	Redvale loam, 0 to 3 percent slopes	76.2	1.8%
57	Scobey-Kevin clay loams, 2 to 8 percent slopes	29.4	0.7%
59	Scobey-Sunburst clay loams, 5 to 25 percent slopes	70.2	1.7%
60	Sunburst clay loam, 9 to 35 percent slopes	54.2	1.3%
61	Sunburst-Lisam complex, 9 to 35 percent slopes	20.6	0.5%
68	Thebo-Lisam clays, 2 to 15 percent slopes	48.1	1.1%

Valley County, Montana (MT105)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
75	Ustic Torrifluvents, gently sloping	53.3	1.3%
79	Water	10.3	0.2%
Subtotals for Soil Survey Area		1,833.3	43.2%
Totals for Area of Interest		4,246.4	100.0%

Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic 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. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Roosevelt and Daniels Counties, Montana

1—Adger silty clay loam, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: cpbm
Elevation: 1,920 to 2,970 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Adger

Setting

Landform: Hills, alluvial fans
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 2 inches: silty clay loam
Bt - 2 to 8 inches: silty clay
Cyz - 8 to 60 inches: silty clay

Properties and qualities

Slope: 1 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) LRU 53A-Y (R053AE073MT)
Hydric soil rating: No

Minor Components

Farnuf

Percent of map unit: 4 percent
Landform: Hills, alluvial fans
Landform position (two-dimensional): Foothills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Savage

Percent of map unit: 3 percent
Landform: Alluvial fans, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)
Hydric soil rating: No

Farland

Percent of map unit: 3 percent
Landform: Alluvial fans, hills
Landform position (two-dimensional): Foothills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Nobe

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R053AE072MT)
Hydric soil rating: No

Cherry

Percent of map unit: 2 percent
Landform: Hills, alluvial fans
Landform position (two-dimensional): Foothills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

8—Bowdoin clay, protected

Map Unit Setting

National map unit symbol: cpf3
Elevation: 1,880 to 2,120 feet

Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Bowdoin and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bowdoin

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 3 inches: clay
C1 - 3 to 16 inches: clay
C2 - 16 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) LRU 53A-Y (R053AE073MT)
Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Havre

Percent of map unit: 2 percent

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Havrelon

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Lohler

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)
Hydric soil rating: No

Mckenzie

Percent of map unit: 1 percent
Landform: Basin floors, depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: Yes

15—Evanston loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cpbt
Elevation: 1,990 to 2,710 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Evanston and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Evanston

Setting

Landform: Stream terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Loamy alluvium

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 12 inches: clay loam
Bk - 12 to 23 inches: loam
Ck - 23 to 60 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Minor Components

Telstad

Percent of map unit: 6 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Hillon

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

18—Farnuf loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cpbx

Elevation: 1,870 to 3,110 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Farnuf and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Farnuf

Setting

Landform: Alluvial fans, hills
Landform position (two-dimensional): Foothills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 18 inches: clay loam
Btk - 18 to 36 inches: silt loam
C - 36 to 60 inches: stratified gravelly sandy loam to silty clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Minor Components

Williams

Percent of map unit: 4 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Farmland

Percent of map unit: 3 percent
Landform: Alluvial fans, hills
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Bowbells

Percent of map unit: 3 percent
Landform: Swales, depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: No

20—Fluvaquents, saline, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpc0
Elevation: 1,910 to 2,810 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)

Hydric soil rating: Yes

Minor Components

Harlem

Percent of map unit: 6 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Riverwash

Percent of map unit: 4 percent

Hydric soil rating: No

21—Glendive fine sandy loam, protected, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpc1

Elevation: 1,970 to 2,280 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Glendive and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Glendive

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 7 inches: fine sandy loam

C1 - 7 to 15 inches: sandy loam

C2 - 15 to 60 inches: stratified loamy fine sand to silt loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)
Hydric soil rating: No

Minor Components

Havre

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Banks

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: No

23—Harlem silty clay loam, protected, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpc3
Elevation: 1,970 to 2,170 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Harlem and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 4 inches: silty clay loam
C - 4 to 60 inches: stratified clay to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Minor Components

Havre

Percent of map unit: 9 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Lallie

Percent of map unit: 1 percent
Landform: Lakebeds, oxbows
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)
Hydric soil rating: Yes

24—Havre silt loam, protected, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpc4
Elevation: 1,970 to 2,050 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Havre and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 7 inches: silt loam
C - 7 to 60 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Minor Components

Glendive

Percent of map unit: 6 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XC212MT)
Hydric soil rating: No

Harlem

Percent of map unit: 4 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

26—Havrelon loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpc6
Elevation: 1,870 to 2,910 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Havrelon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havrelon

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 7 inches: loam
C - 7 to 60 inches: stratified silty clay loam to very fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: B

Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)

Hydric soil rating: No

Minor Components

Lohler

Percent of map unit: 5 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)

Hydric soil rating: No

Trembles

Percent of map unit: 4 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)

Hydric soil rating: No

Somewhat poorly drained soils

Percent of map unit: 1 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

29—Havrelon-Trembles complex, protected, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpc9

Elevation: 1,870 to 2,220 feet

Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Havrelon and similar soils: 60 percent

Trembles and similar soils: 30 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havrelon

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy alluvium

Typical profile

A - 0 to 7 inches: stratified silty clay loam to very fine sandy loam

C - 7 to 60 inches: stratified silty clay loam to very fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Description of Trembles

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 8 inches: fine sandy loam

C1 - 8 to 48 inches: stratified fine sandy loam to loam

C2 - 48 to 60 inches: stratified fine sandy loam to loamy sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Ecological site: Sandy (Sy) 10-14" p.z. (R053AE062MT)

Hydric soil rating: No

Minor Components

Banks

Percent of map unit: 6 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)

Hydric soil rating: No

Lohler

Percent of map unit: 4 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)

Hydric soil rating: No

30—Hillon loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: cpcc

Elevation: 2,000 to 2,590 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 36 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam
Ck - 7 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Minor Components

Telstad

Percent of map unit: 6 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Evanston

Percent of map unit: 4 percent
Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

31—Hillon loam, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cpcd
Elevation: 2,000 to 2,510 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam
Ck - 7 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)
Hydric soil rating: No

Minor Components

Evanston

Percent of map unit: 6 percent
Landform: Stream terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Tinsley

Percent of map unit: 4 percent
Landform: Ridges, knolls, terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)
Hydric soil rating: No

32—Hillon-Tinsley complex, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: cpcf
Elevation: 2,000 to 2,710 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 75 percent
Tinsley and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam
Ck - 7 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Description of Tinsley

Setting

Landform: Terraces, ridges, knolls
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly outwash

Typical profile

A - 0 to 3 inches: very gravelly sandy loam
C - 3 to 45 inches: very gravelly sand
Ck - 45 to 60 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: Gravel (Gr) 10-14" p.z. (R052XC617MT)
Hydric soil rating: No

Minor Components

Evanston

Percent of map unit: 5 percent

Landform: Alluvial fans, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Tinsley

Percent of map unit: 3 percent
Landform: Terraces, ridges, knolls
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)
Hydric soil rating: No

Wabek

Percent of map unit: 2 percent
Landform: Plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)
Hydric soil rating: No

33—Hillon-Tinsley complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cpcg
Elevation: 2,000 to 2,710 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Hillon and similar soils: 75 percent
Tinsley and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillon

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam
Ck - 7 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)
Hydric soil rating: No

Description of Tinsley

Setting

Landform: Terraces, ridges, knolls
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly outwash

Typical profile

A - 0 to 3 inches: very gravelly sandy loam
C - 3 to 45 inches: very gravelly sand
Ck - 45 to 60 inches: very gravelly sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Gravel (Gr) 10-14" p.z. (R052XC617MT)
Hydric soil rating: No

Minor Components

Wabek

Percent of map unit: 10 percent

Landform: Plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)

Hydric soil rating: No

34—Lallie silty clay, saline, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpch

Elevation: 1,870 to 2,870 feet

Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Lallie and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lallie

Setting

Landform: Lakebeds, oxbows

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical profile

A - 0 to 3 inches: silty clay

C - 3 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 5.0

Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: C/D

Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)

Hydric soil rating: Yes

Minor Components

Bowdoin

Percent of map unit: 5 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) LRU 53A-Y (R053AE073MT)

Hydric soil rating: No

Lohler

Percent of map unit: 5 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)

Hydric soil rating: No

37—Lohler silty clay, protected, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpcl

Elevation: 1,870 to 2,080 feet

Mean annual precipitation: 12 to 15 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Lohler and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lohler

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical profile

A - 0 to 7 inches: silty clay
C - 7 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)
Hydric soil rating: No

Minor Components

Havrelon

Percent of map unit: 6 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Bowdoin

Percent of map unit: 3 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) LRU 53A-Y (R053AE073MT)
Hydric soil rating: No

Lallie

Percent of map unit: 1 percent
Landform: Oxbows, lakebeds
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)
Hydric soil rating: Yes

50—Telstad loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2sy84
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Telstad and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Telstad

Setting

Landform: Moraines
Landform position (two-dimensional): Footslope, backslope, toeslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 15 inches: clay loam
Bk1 - 15 to 30 inches: clay loam
Bk2 - 30 to 45 inches: clay loam
BCyz - 45 to 61 inches: loam
Cz - 61 to 79 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 5 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ferd

Percent of map unit: 3 percent
Landform: Moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Elloam

Percent of map unit: 1 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

51—Telstad-Hillon loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cpd3
Elevation: 2,020 to 2,680 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Telstad and similar soils: 60 percent

Hillon and similar soils: 30 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Telstad

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy glacial till

Typical profile

A - 0 to 5 inches: loam

Bt - 5 to 15 inches: clay loam

Ck - 15 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Description of Hillon

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam

Ck - 7 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Minor Components

Phillips

Percent of map unit: 4 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Elloam

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Evanston

Percent of map unit: 3 percent
Landform: Stream terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

52—Thebo-Lisam complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cpd4
Elevation: 1,960 to 2,620 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Thebo and similar soils: 55 percent

Lisam and similar soils: 30 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thebo

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from shale

Typical profile

A - 0 to 2 inches: clay

Bk - 2 to 25 inches: clay

Ck - 25 to 32 inches: clay

Cr - 32 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 30 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Description of Lisam

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from calcareous shale

Typical profile

A - 0 to 4 inches: silty clay

C - 4 to 17 inches: silty clay

Cr - 17 to 60 inches: weathered bedrock

Properties and qualities

Slope: 20 to 45 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XC215MT)
Hydric soil rating: No

Minor Components

Zahill

Percent of map unit: 8 percent
Landform: Knolls, hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R053AE064MT)
Hydric soil rating: No

Hillon

Percent of map unit: 7 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)
Hydric soil rating: No

55—Trembles fine sandy loam, protected, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpd7
Elevation: 1,870 to 2,020 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Trembles and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Trembles

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 8 inches: fine sandy loam

C1 - 8 to 48 inches: stratified fine sandy loam to loam

C2 - 48 to 60 inches: stratified fine sandy loam to loamy sand

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Ecological site: Sandy (Sy) 10-14" p.z. (R053AE062MT)

Hydric soil rating: No

Minor Components

Havrelon

Percent of map unit: 5 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Banks

Percent of map unit: 5 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)

Hydric soil rating: No

62—Ustic Torrifluvents, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpdh
Elevation: 1,990 to 2,490 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Ustic torrifluvents and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustic Torrifluvents

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: Overflow (Ov) 10-14" p.z. (R052XC207MT)
Hydric soil rating: No

Minor Components

Riverwash

Percent of map unit: 9 percent
Hydric soil rating: No

Lallie

Percent of map unit: 1 percent
Landform: Lakebeds, oxbows
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)
Hydric soil rating: Yes

63—Ustifluvents, saline, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cpdj
Elevation: 1,910 to 2,840 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Ustifluvents and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustifluvents

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: Saline Overflow (SOv) 10-14" p.z. (R053AE072MT)
Hydric soil rating: No

Minor Components

Riverwash

Percent of map unit: 9 percent
Hydric soil rating: No

Lallie

Percent of map unit: 1 percent
Landform: Lakebeds, oxbows
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Meadow (WM) 10-14" p.z. (R053AE068MT)
Hydric soil rating: Yes

64—Vanda variant silty clay, 4 to 10 percent slopes

Map Unit Setting

National map unit symbol: cpdk
Elevation: 1,950 to 2,540 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Vanda and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vanda

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 8 inches: silty clay
Cz1 - 8 to 24 inches: silty clay loam
Cz2 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 4 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6
Hydrologic Soil Group: D
Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)
Hydric soil rating: No

Minor Components

Lisam

Percent of map unit: 5 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XC215MT)

Hydric soil rating: No

Thebo

Percent of map unit: 5 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

65—Vanda variant-Thebo-Lisam complex, 4 to 15 percent slopes

Map Unit Setting

National map unit symbol: cpdl

Elevation: 1,970 to 2,680 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 120 days

Farmland classification: Not prime farmland

Map Unit Composition

Vanda and similar soils: 45 percent

Thebo and similar soils: 30 percent

Lisam and similar soils: 15 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vanda

Setting

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical profile

A - 0 to 8 inches: silty clay

Cz1 - 8 to 24 inches: silty clay loam

Cz2 - 24 to 60 inches: silty clay

Properties and qualities

Slope: 4 to 10 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 30.0

Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Description of Thebo

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from shale

Typical profile

A - 0 to 2 inches: clay

Bk - 2 to 25 inches: clay

Ck - 25 to 32 inches: clay

Cr - 32 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 6 to 15 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) 10-14" p.z. (R052XC205MT)

Hydric soil rating: No

Description of Lisam

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from calcareous shale

Typical profile

A - 0 to 4 inches: silty clay

C - 4 to 17 inches: silty clay

Cr - 17 to 60 inches: weathered bedrock

Properties and qualities

Slope: 10 to 15 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XC215MT)

Hydric soil rating: No

Minor Components

Zahill

Percent of map unit: 5 percent

Landform: Hills, knolls

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Hillon

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

69—Williams loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cpdq
Elevation: 1,920 to 2,910 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Williams and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williams

Setting

Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 12 inches: clay loam
Btk - 12 to 31 inches: clay loam
Ck - 31 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Minor Components

Farnuf

Percent of map unit: 3 percent
Landform: Hills, alluvial fans
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Dooley

Percent of map unit: 2 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R053AE062MT)
Hydric soil rating: No

Savage

Percent of map unit: 2 percent
Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: Yes

Bowbells

Percent of map unit: 1 percent
Landform: Swales, depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: No

Zahill

Percent of map unit: 1 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

70—Williams-Zahill loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cpds
Elevation: 1,910 to 2,820 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Williams and similar soils: 65 percent
Zahill and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williams

Setting

Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam
Bt - 7 to 12 inches: clay loam
Btk - 12 to 31 inches: clay loam
Ck - 31 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Description of Zahill

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy glacial till

Typical profile

Ap - 0 to 7 inches: loam

Ck - 7 to 24 inches: clay loam

C - 24 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Minor Components

Savage

Percent of map unit: 3 percent

Landform: Terraces, alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) LRU 53A-Y (R053AE061MT)

Hydric soil rating: No

Farnuf

Percent of map unit: 3 percent

Landform: Hills, alluvial fans

Landform position (two-dimensional): Footslope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Bowbells

Percent of map unit: 2 percent

Landform: Depressions, swales

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: Yes

Zahl

Percent of map unit: 1 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

71—Zahill loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: cpdt
Elevation: 1,910 to 2,830 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Zahill

Setting

Landform: Hills, knolls
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

A - 0 to 4 inches: loam
Ck - 4 to 22 inches: clay loam
C - 22 to 60 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Minor Components

Zahill, steeper slopes

Percent of map unit: 5 percent

Landform: Hills, knolls

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Zahl

Percent of map unit: 4 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Williams

Percent of map unit: 3 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

Farnuf

Percent of map unit: 3 percent

Landform: Hills, alluvial fans

Landform position (two-dimensional): Footslope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)

Hydric soil rating: No

76—Zahill-Tinsley complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cpdz
Elevation: 1,950 to 2,880 feet
Mean annual precipitation: 12 to 15 inches
Mean annual air temperature: 34 to 45 degrees F
Frost-free period: 105 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Zahill and similar soils: 75 percent
Tinsley and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zahill

Setting

Landform: Hills, knolls
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glacial till

Typical profile

A - 0 to 4 inches: loam
Ck - 4 to 22 inches: clay loam
C - 22 to 60 inches: clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R053AE064MT)
Hydric soil rating: No

Description of Tinsley

Setting

Landform: Terraces, ridges, knolls
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and gravelly outwash

Typical profile

A - 0 to 3 inches: very gravelly sandy loam
C - 3 to 45 inches: very gravelly sand
Ck - 45 to 60 inches: very gravelly sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)
Hydric soil rating: No

Minor Components

Wabek

Percent of map unit: 3 percent
Landform: Terraces, plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)
Hydric soil rating: No

Zahl

Percent of map unit: 3 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R053AE060MT)
Hydric soil rating: No

Tally

Percent of map unit: 2 percent
Landform: Hills, terraces
Landform position (two-dimensional): Footslope

Custom Soil Resource Report

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R053AE062MT)

Hydric soil rating: No

Cabba

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 10-14" p.z. (R053AE077MT)

Hydric soil rating: No

Valley County, Montana

1—Absher-Vaeda complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: clxj
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Absher

Setting

Landform: Fans, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

E - 0 to 2 inches: clay loam
Btn - 2 to 14 inches: clay
Bkyz - 14 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 70.0
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

Description of Vaeda

Setting

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

E - 0 to 3 inches: silty clay

By1 - 3 to 10 inches: silty clay

By2 - 10 to 72 inches: silty clay

Properties and qualities

Slope: 1 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 20.0

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

Minor Components

Note

Percent of map unit: 6 percent

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)

Hydric soil rating: No

Phillips

Percent of map unit: 4 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

5—Bowdoin clay

Map Unit Setting

National map unit symbol: cllb
Elevation: 1,800 to 4,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Bowdoin and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bowdoin

Setting

Landform: Flood plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium

Typical profile

A - 0 to 5 inches: clay
Bss - 5 to 22 inches: clay
By - 22 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 6 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Vaeda

Percent of map unit: 4 percent
Landform: Flood plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

23—Harlem clay

Map Unit Setting

National map unit symbol: clkd
Elevation: 1,800 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Harlem and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harlem

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium and/or clayey glaciolacustrine deposits

Typical profile

A - 0 to 6 inches: clay
C1 - 6 to 36 inches: stratified clay to silty clay loam
C2 - 36 to 72 inches: stratified silty clay loam to fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Minor Components

Bowdoin

Percent of map unit: 6 percent
Landform: Stream terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)
Hydric soil rating: No

Havre

Percent of map unit: 4 percent
Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

25—Havre silty clay loam

Map Unit Setting

National map unit symbol: clkg
Elevation: 1,900 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Havre and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy alluvium

Typical profile

A - 0 to 5 inches: silty clay loam

C - 5 to 65 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Minor Components

Harlem

Percent of map unit: 5 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Glendive

Percent of map unit: 5 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

27—Havre-Harlem silty clays

Map Unit Setting

National map unit symbol: clkj
Elevation: 1,900 to 6,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Havre and similar soils: 50 percent
Harlem and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Havre

Setting

Landform: Terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium and/or glaciolacustrine deposits

Typical profile

A - 0 to 5 inches: silty clay
C - 5 to 65 inches: stratified fine sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Description of Harlem

Setting

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium and/or clayey glaciolacustrine deposits

Typical profile

A - 0 to 6 inches: silty clay

C1 - 6 to 36 inches: stratified clay to silty clay loam

C2 - 36 to 72 inches: stratified silty clay loam to fine sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

38—Marias clay, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: clkx

Elevation: 1,900 to 4,800 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Marias and similar soils: 95 percent

Marias and similar soils: 85 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marias

Setting

Landform: Lake plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: clay

Bss - 6 to 27 inches: clay

Bssy - 27 to 74 inches: clay

Properties and qualities

Slope: 1 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Description of Marias

Setting

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical profile

A - 0 to 15 inches: silty clay

Bss - 15 to 33 inches: clay

Bssy - 33 to 60 inches: clay

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Custom Soil Resource Report

Gypsum, maximum in profile: 6 percent

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 13.0

Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Minor Components

Sunburst

Percent of map unit: 2 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) 10-14" p.z. (R054XE530MT)

Hydric soil rating: No

Lonna

Percent of map unit: 1 percent

Landform: Lake plains, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Absher

Percent of map unit: 1 percent

Landform: Terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

Vaeda

Percent of map unit: 1 percent

Landform: Flood plains, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

47—Phillips-Elloam complex, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: cl17
Elevation: 1,900 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 50 percent
Elloam and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 5 inches: loam
Bt - 5 to 12 inches: clay
Bk - 12 to 36 inches: clay loam
C - 36 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Description of Elloam

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

E - 0 to 3 inches: clay loam

Btn - 3 to 10 inches: clay

Bkn - 10 to 20 inches: clay loam

Bknyz - 20 to 43 inches: clay loam

C - 43 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Minor Components

Scobey

Percent of map unit: 10 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Delpoint

Percent of map unit: 7 percent

Landform: Hills, ridges

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Cabbart

Percent of map unit: 5 percent
Landform: Hillslopes, ridges
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow (Sw) RRU 58A-E 10-14" p.z. (R058AE019MT)
Hydric soil rating: No

Nobe

Percent of map unit: 2 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Upland (SU) 10-14" p.z. (R052XC210MT)
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Overflow (Ov) 10-14" p.z. (R053AE067MT)
Hydric soil rating: Yes

49—Phillips-Kevin complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vyr1
Elevation: 2,000 to 3,870 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 100 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 45 percent
Kevin and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

A - 0 to 2 inches: loam
E - 2 to 7 inches: loam
Bt - 7 to 11 inches: clay
Btk - 11 to 15 inches: clay loam
Bk - 15 to 36 inches: clay loam
BCyz - 36 to 50 inches: clay loam
Cz - 50 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 12 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Kevin

Setting

Landform: Moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam
Bt - 6 to 9 inches: clay loam
Bk1 - 9 to 23 inches: clay loam
Bk2 - 23 to 41 inches: clay loam
BCyz - 41 to 57 inches: clay loam
Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 14 percent
Gypsum, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 4 percent
Landform: Moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Thoeny

Percent of map unit: 4 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Elloam

Percent of map unit: 3 percent
Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ethridge

Percent of map unit: 3 percent
Landform: Ground moraines
Microfeatures of landform position: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Nishon

Percent of map unit: 1 percent
Landform: Depressions on ground moraines
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

51—Phillips-Thoeny loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cld
Elevation: 1,900 to 4,800 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Phillips and similar soils: 70 percent
Thoeny and similar soils: 25 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phillips

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

E - 0 to 5 inches: loam
Bt - 5 to 12 inches: clay
Bk - 12 to 36 inches: clay loam
C - 36 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Description of Thoeny

Setting

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

E - 0 to 7 inches: loam

Bt - 7 to 12 inches: clay

Btk - 12 to 28 inches: clay loam

Bk - 28 to 52 inches: clay loam

By - 52 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): 4s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: D

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Minor Components

Absher

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

52—Redvale loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: clf
Elevation: 2,000 to 6,600 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Redvale and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Redvale

Setting

Landform: Fans, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 6 inches: loam
Bt1 - 6 to 11 inches: clay loam
Bt2 - 11 to 20 inches: clay
Bk - 20 to 30 inches: gravelly clay loam
2C - 30 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (1.0 to 3.0 mmhos/cm)
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Minor Components

Attewan

Percent of map unit: 6 percent

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

Evanston

Percent of map unit: 4 percent

Landform: Fans, terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) RRU 58A-E 10-14" p.z. (R058AE001MT)

Hydric soil rating: No

57—Scobey-Kevin clay loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t3k4

Elevation: 2,000 to 3,870 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 39 to 46 degrees F

Frost-free period: 100 to 140 days

Farmland classification: Not prime farmland

Map Unit Composition

Scobey and similar soils: 45 percent

Kevin and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Moraines

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 15 inches: clay

Bk1 - 15 to 29 inches: clay loam

Bk2 - 29 to 44 inches: clay loam

BCyz - 44 to 61 inches: clay loam

Cz - 61 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 4 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 12.0

Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

Description of Kevin

Setting

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Clayey till

Typical profile

Ap - 0 to 6 inches: clay loam

Bt - 6 to 9 inches: clay loam

Bk1 - 9 to 23 inches: clay loam

Bk2 - 23 to 41 inches: clay loam

BCyz - 41 to 57 inches: clay loam

Cz - 57 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 14 percent

Gypsum, maximum in profile: 4 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 12.0

Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Hillon

Percent of map unit: 8 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Elloam

Percent of map unit: 3 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Acel

Percent of map unit: 2 percent

Landform: Moraines

Microfeatures of landform position: Swales

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Nishon

Percent of map unit: 2 percent

Landform: Depressions on moraines

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

59—Scobey-Sunburst clay loams, 5 to 25 percent slopes

Map Unit Setting

National map unit symbol: clln

Elevation: 1,900 to 4,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 110 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Scobey and similar soils: 50 percent
Sunburst and similar soils: 30 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scobey

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

A - 0 to 5 inches: clay loam
Bt - 5 to 15 inches: clay loam
Bky - 15 to 60 inches: clay loam

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Description of Sunburst

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 28 inches: clay loam
Bky - 28 to 60 inches: clay loam

Properties and qualities

Slope: 5 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)
Hydric soil rating: No

Minor Components

Phillips

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Elloam

Percent of map unit: 5 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)
Hydric soil rating: No

Hillon

Percent of map unit: 4 percent
Landform: Hillslopes on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Telstad

Percent of map unit: 3 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Thoeny

Percent of map unit: 3 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

60—Sunburst clay loam, 9 to 35 percent slopes

Map Unit Setting

National map unit symbol: clq
Elevation: 1,900 to 5,500 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Sunburst and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sunburst

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 28 inches: clay loam
Bky - 28 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)
Hydric soil rating: No

Minor Components

Scobey

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Hillon

Percent of map unit: 4 percent
Landform: Hillslopes on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Steep (SiStp) 10-14" p.z. (R052XC223MT)
Hydric soil rating: No

Thebo

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)
Hydric soil rating: No

Phillips

Percent of map unit: 4 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)
Hydric soil rating: No

Cabbart

Percent of map unit: 2 percent
Landform: Hillslopes, ridges
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow (Sw) RRU 58A-E 10-14" p.z. (R058AE019MT)
Hydric soil rating: No

Lisam

Percent of map unit: 2 percent
Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow Clay (SwC) RRU 58A-E 10-14" p.z. (R058AE199MT)
Hydric soil rating: No

61—Sunburst-Lisam complex, 9 to 35 percent slopes

Map Unit Setting

National map unit symbol: cllr
Elevation: 1,900 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Sunburst and similar soils: 40 percent
Lisam and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sunburst

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 4 inches: clay loam
Bk - 4 to 28 inches: clay loam
Bky - 28 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Hilly (TH) 10-14" p.z. (R052XC220MT)
Hydric soil rating: No

Description of Lisam

Setting

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from clayey shale

Typical profile

A - 0 to 12 inches: clay

Cr - 12 to 60 inches: weathered bedrock

Properties and qualities

Slope: 9 to 35 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: Shallow Clay (SwC) 10-14" p.z. (R052XC215MT)

Hydric soil rating: No

Minor Components

Thebo

Percent of map unit: 10 percent

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Elloam

Percent of map unit: 5 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Phillips

Percent of map unit: 3 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Tinsley

Percent of map unit: 2 percent

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Gravelly (Gr) LRU 53A-Y (R053AE621MT)

Hydric soil rating: No

68—Thebo-Lisam clays, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: clz

Elevation: 1,900 to 5,500 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 110 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Thebo and similar soils: 50 percent

Lisam and similar soils: 40 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Thebo

Setting

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from shale

Typical profile

A - 0 to 4 inches: clay

Bss - 4 to 23 inches: clay

Cr - 23 to 60 inches: bedrock

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained

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

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Clayey (Cy) RRU 58A-E 10-14" p.z. (R058AE002MT)

Hydric soil rating: No

Description of Lisam

Setting

Landform: Hillslopes

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from clayey shale

Typical profile

A - 0 to 12 inches: clay

Cr - 12 to 60 inches: weathered bedrock

Properties and qualities

Slope: 3 to 15 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Shallow Clay (SwC) RRU 58A-E 10-14" p.z. (R058AE199MT)

Hydric soil rating: No

Minor Components

Vaeda

Percent of map unit: 3 percent

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) RRU 58A-E 10-14" p.z. (R058AE014MT)

Hydric soil rating: No

Phillips

Percent of map unit: 3 percent

Landform: Till plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Silty (Si) 10-14" p.z. (R052XC217MT)

Hydric soil rating: No

Absher

Percent of map unit: 2 percent

Landform: Terraces, fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Dense Clay (DC) 10-14" p.z. (R052XC206MT)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent

Hydric soil rating: No

75—Ustic Torrifluvents, gently sloping

Map Unit Setting

National map unit symbol: clm7

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 110 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Ustic torrifluvents and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ustic Torrifluvents

Setting

Landform: Terraces, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

C - 7 to 40 inches: stratified sandy loam to clay loam

2C - 40 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 36 to 72 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: B

Ecological site: Overflow (Ov) 10-14" p.z. (R052XC207MT)

Hydric soil rating: No

79—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

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

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

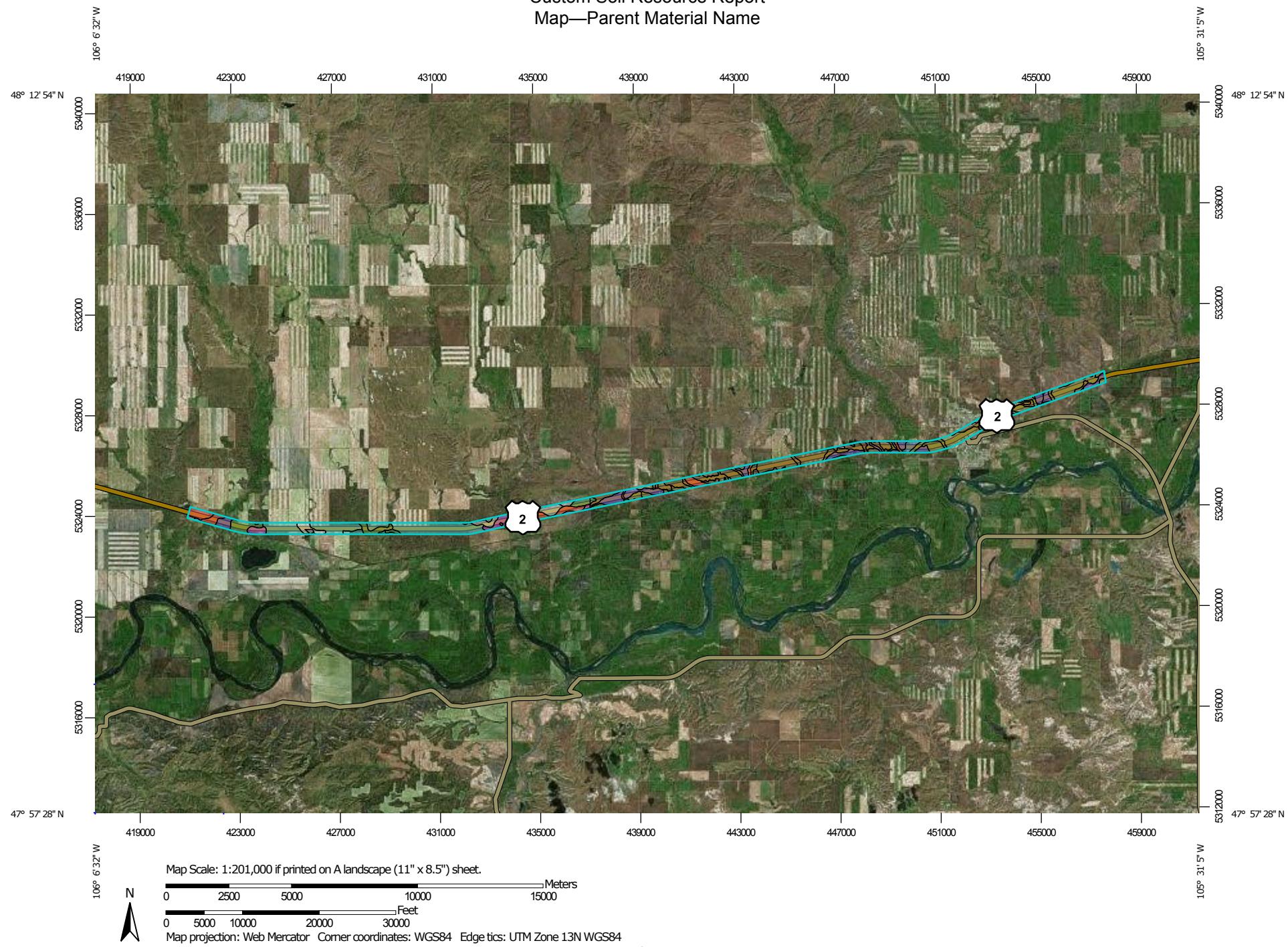
Parent Material Name

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report
Map—Parent Material Name



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)	
 Area of Interest (AOI)	

Soils

Soil Rating Polygons	
 alluvium	 clayey till
 clayey alluvium	 coarse-loamy alluvium
 clayey alluvium and/or clayey glaciolacustrine deposits	 fine-loamy till
 clayey till	 loamy alluvium
 coarse-loamy alluvium	 loamy alluvium and/or glaciolacustrine deposits
 fine-loamy till	 loamy glacial till
 loamy alluvium	 residuum weathered from shale
 loamy alluvium and/or glaciolacustrine deposits	 till
 loamy glacial till	 Not rated or not available
 residuum weathered from shale	
 till	
 Not rated or not available	

Soil Rating Lines

 alluvium	 clayey till
 clayey alluvium	 coarse-loamy alluvium
 clayey alluvium and/or clayey glaciolacustrine deposits	 fine-loamy till

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Roosevelt and Daniels Counties, Montana
Survey Area Data: Version 14, Sep 28, 2015

Soil Survey Area: Valley County, Montana
Survey Area Data: Version 19, Sep 28, 2015

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name

Parent Material Name— Summary by Map Unit — Roosevelt and Daniels Counties, Montana (MT661)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Adger silty clay loam, 1 to 8 percent slopes	clayey alluvium	21.8	0.5%
8	Bowdoin clay, protected	clayey alluvium	27.9	0.7%
15	Evanston loam, 2 to 8 percent slopes	loamy alluvium	256.2	6.0%
18	Farnuf loam, 2 to 8 percent slopes	loamy alluvium	69.4	1.6%
20	Fluvaquents, saline, 0 to 2 percent slopes	alluvium	19.7	0.5%
21	Glendive fine sandy loam, protected, 0 to 2 percent slopes	coarse-loamy alluvium	7.1	0.2%
23	Harlem silty clay loam, protected, 0 to 2 percent slopes	clayey alluvium	33.1	0.8%
24	Havre silt loam, protected, 0 to 2 percent slopes	loamy alluvium	24.3	0.6%
26	Havrelon loam, 0 to 2 percent slopes	loamy alluvium	29.5	0.7%
29	Havrelon-Trembles complex, protected, 0 to 2 percent slopes	loamy alluvium	54.4	1.3%
30	Hillon loam, 8 to 15 percent slopes	loamy glacial till	186.6	4.4%
31	Hillon loam, 15 to 45 percent slopes	loamy glacial till	125.1	2.9%
32	Hillon-Tinsley complex, 8 to 15 percent slopes	loamy glacial till	18.3	0.4%
33	Hillon-Tinsley complex, 15 to 45 percent slopes	loamy glacial till	106.5	2.5%
34	Lallie silty clay, saline, 0 to 2 percent slopes	clayey alluvium	113.7	2.7%
37	Lohler silty clay, protected, 0 to 2 percent slopes	clayey alluvium	197.4	4.6%
50	Telstad loam, 2 to 8 percent slopes	fine-loamy till	43.3	1.0%
51	Telstad-Hillon loams, 2 to 8 percent slopes	loamy glacial till	467.4	11.0%
52	Thebo-Lisam complex, 15 to 45 percent slopes	residuum weathered from shale	9.6	0.2%
55	Trembles fine sandy loam, protected, 0 to 2 percent slopes	coarse-loamy alluvium	44.8	1.1%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Roosevelt and Daniels Counties, Montana (MT661)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
62	Ustic Torrifluvents, 0 to 2 percent slopes	alluvium	79.4	1.9%
63	Ustifluvents, saline, 0 to 2 percent slopes	alluvium	4.5	0.1%
64	Vanda variant silty clay, 4 to 10 percent slopes	clayey alluvium	167.4	3.9%
65	Vanda variant-Thebo-Lisam complex, 4 to 15 percent slopes	clayey alluvium	72.4	1.7%
69	Williams loam, 2 to 8 percent slopes	loamy glacial till	3.3	0.1%
70	Williams-Zahill loams, 2 to 8 percent slopes	loamy glacial till	44.1	1.0%
71	Zahill loam, 8 to 15 percent slopes	loamy glacial till	81.8	1.9%
76	Zahill-Tinsley complex, 15 to 45 percent slopes	loamy glacial till	103.9	2.4%
Subtotals for Soil Survey Area			2,413.0	56.8%
Totals for Area of Interest			4,246.4	100.0%

Parent Material Name— Summary by Map Unit — Valley County, Montana (MT105)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Absher-Vaeda complex, 1 to 5 percent slopes	alluvium	115.4	2.7%
5	Bowdoin clay	clayey alluvium	2.2	0.1%
23	Harlem clay	clayey alluvium and/or clayey glaciolacustrine deposits	214.0	5.0%
25	Havre silty clay loam	loamy alluvium	63.4	1.5%
27	Havre-Harlem silty clays	loamy alluvium and/or glaciolacustrine deposits	18.5	0.4%
38	Marias clay, 1 to 9 percent slopes		149.5	3.5%
47	Phillips-Elloam complex, 1 to 9 percent slopes	till	20.8	0.5%
49	Phillips-Kevin complex, 2 to 8 percent slopes	clayey till	785.6	18.5%
51	Phillips-Thoeny loams, 0 to 2 percent slopes	till	101.8	2.4%
52	Redvale loam, 0 to 3 percent slopes	alluvium	76.2	1.8%
57	Scobey-Kevin clay loams, 2 to 8 percent slopes	clayey till	29.4	0.7%
59	Scobey-Sunburst clay loams, 5 to 25 percent slopes	till	70.2	1.7%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Valley County, Montana (MT105)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
60	Sunburst clay loam, 9 to 35 percent slopes		54.2	1.3%
61	Sunburst-Lisam complex, 9 to 35 percent slopes		20.6	0.5%
68	Thebo-Lisam clays, 2 to 15 percent slopes	residuum weathered from shale	48.1	1.1%
75	Ustic Torrifluvents, gently sloping	alluvium	53.3	1.3%
79	Water		10.3	0.2%
Subtotals for Soil Survey Area			1,833.3	43.2%
Totals for Area of Interest			4,246.4	100.0%

Rating Options—Parent Material Name

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Roosevelt and Daniels Counties, Montana		
Map Symbol	Map Unit Name	Farmland Classification
1	Adger silty clay loam, 1 to 8 percent slopes	Not prime farmland
8	Bowdoin clay, protected	Not prime farmland
15	Evanston loam, 2 to 8 percent slopes	Farmland of statewide importance
18	Farnuf loam, 2 to 8 percent slopes	Farmland of statewide importance
20	Fluvaquents, saline, 0 to 2 percent slopes	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands—Roosevelt and Daniels Counties, Montana		
Map Symbol	Map Unit Name	Farmland Classification
21	Glendive fine sandy loam, protected, 0 to 2 percent slopes	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
23	Harlem silty clay loam, protected, 0 to 2 percent slopes	Farmland of statewide importance
24	Havre silt loam, protected, 0 to 2 percent slopes	Farmland of statewide importance
26	Havrelon loam, 0 to 2 percent slopes	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
29	Havrelon-Trembles complex, protected, 0 to 2 percent slopes	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
30	Hillon loam, 8 to 15 percent slopes	Not prime farmland
31	Hillon loam, 15 to 45 percent slopes	Not prime farmland
32	Hillon-Tinsley complex, 8 to 15 percent slopes	Not prime farmland
33	Hillon-Tinsley complex, 15 to 45 percent slopes	Not prime farmland
34	Lallie silty clay, saline, 0 to 2 percent slopes	Not prime farmland
37	Lohler silty clay, protected, 0 to 2 percent slopes	Not prime farmland
50	Telstad loam, 2 to 8 percent slopes	Not prime farmland
51	Telstad-Hillon loams, 2 to 8 percent slopes	Not prime farmland
52	Thebo-Lisam complex, 15 to 45 percent slopes	Not prime farmland
55	Trembles fine sandy loam, protected, 0 to 2 percent slopes	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
62	Ustic Torrifluvents, 0 to 2 percent slopes	Not prime farmland
63	Ustifluvents, saline, 0 to 2 percent slopes	Not prime farmland
64	Vanda variant silty clay, 4 to 10 percent slopes	Not prime farmland
65	Vanda variant-Thebo-Lisam complex, 4 to 15 percent slopes	Not prime farmland
69	Williams loam, 2 to 8 percent slopes	Farmland of statewide importance
70	Williams-Zahill loams, 2 to 8 percent slopes	Not prime farmland
71	Zahill loam, 8 to 15 percent slopes	Not prime farmland
76	Zahill-Tinsley complex, 15 to 45 percent slopes	Not prime farmland

Prime and other Important Farmlands—Valley County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
1	Absher-Vaeda complex, 1 to 5 percent slopes	Not prime farmland
5	Bowdoin clay	Not prime farmland
23	Harlem clay	Not prime farmland
25	Havre silty clay loam	Farmland of statewide importance
27	Havre-Harlem silty clays	Not prime farmland
38	Marias clay, 1 to 9 percent slopes	Not prime farmland
47	Phillips-Elloam complex, 1 to 9 percent slopes	Not prime farmland
49	Phillips-Kevin complex, 2 to 8 percent slopes	Not prime farmland

Custom Soil Resource Report

Prime and other Important Farmlands–Valley County, Montana		
Map Symbol	Map Unit Name	Farmland Classification
51	Phillips-Thoeny loams, 0 to 2 percent slopes	Not prime farmland
52	Redvale loam, 0 to 3 percent slopes	Prime farmland if irrigated
57	Scobey-Kevin clay loams, 2 to 8 percent slopes	Not prime farmland
59	Scobey-Sunburst clay loams, 5 to 25 percent slopes	Not prime farmland
60	Sunburst clay loam, 9 to 35 percent slopes	Not prime farmland
61	Sunburst-Lisam complex, 9 to 35 percent slopes	Not prime farmland
68	Thebo-Lisam clays, 2 to 15 percent slopes	Not prime farmland
75	Ustic Torrifluvents, gently sloping	Not prime farmland
79	Water	Not prime farmland

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf