

Tab 12



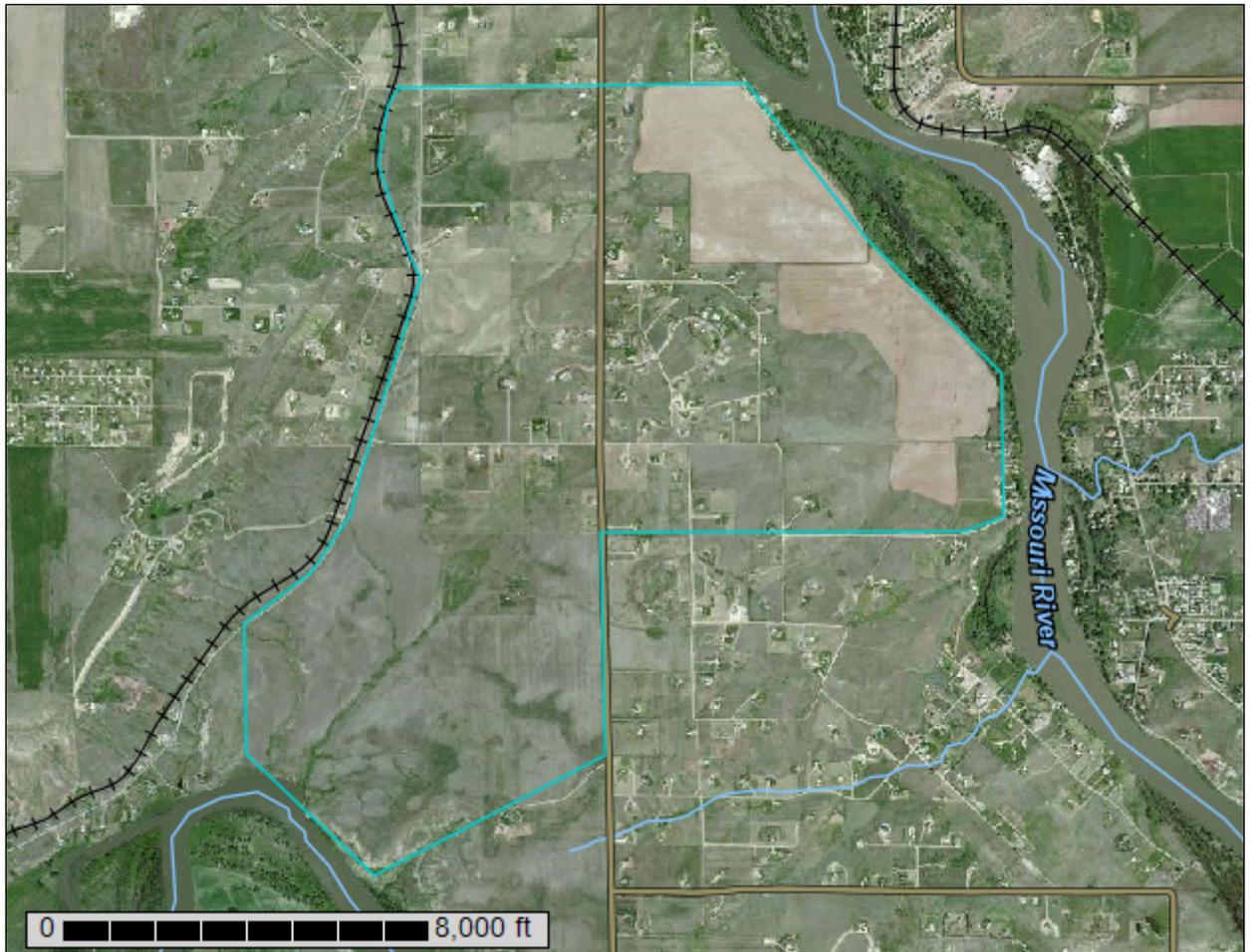
United States
Department of
Agriculture

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 **Cascade 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 (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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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.

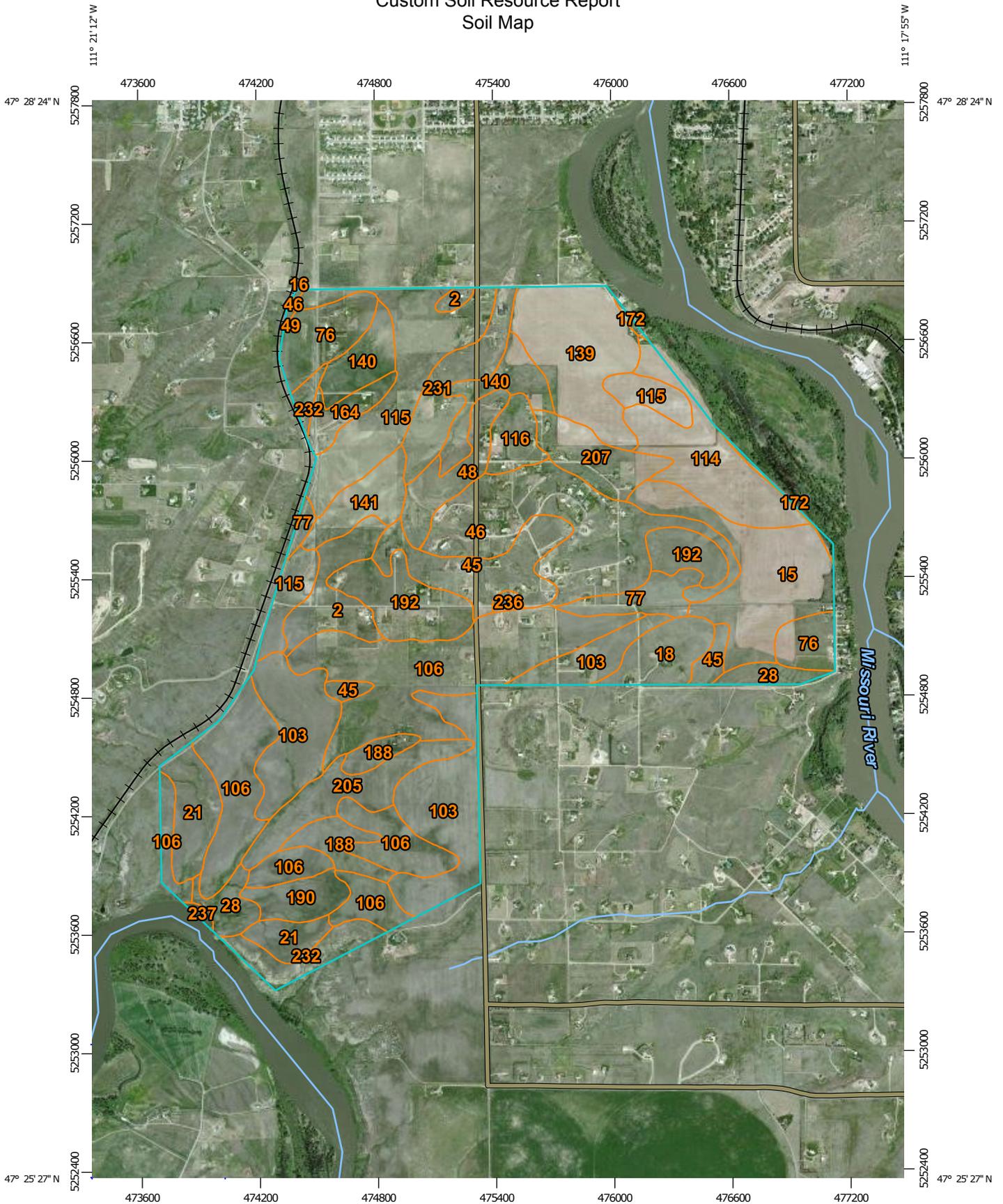
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree 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 identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

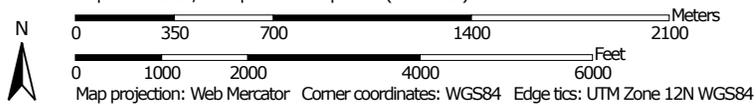
Soil Map

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

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Map Scale: 1:26,600 if printed on A portrait (8.5" x 11") sheet.



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: <http://websoilsurvey.nrcs.usda.gov>
 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: Cascade County Area, Montana
 Survey Area Data: Version 12, 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: Jun 13, 2010—Aug 26, 2010

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

Map Unit Legend

Cascade County Area, Montana (MT613)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Abor-Yawdim clay loams, 4 to 8 percent slopes	42.0	2.5%
15	Assinniboine fine sandy loam, 0 to 4 percent slopes	94.0	5.6%
16	Assinniboine fine sandy loam, 4 to 8 percent slopes	0.4	0.0%
18	Azaar fine sandy loam	31.6	1.9%
21	Big Timber-Castner complex, 8 to 30 percent slopes	49.4	2.9%
28	Bitton and Roy soils, 10 to 65 percent slopes	27.4	1.6%
45	Crago very cobbly loam, 0 to 15 percent slopes	68.5	4.1%
46	Crago-Yawdim complex, 15 to 45 percent slopes	128.7	7.7%
48	Darret silty clay loam, 8 to 20 percent slopes	33.1	2.0%
49	Darret-Castner complex, 2 to 8 percent slopes	0.5	0.0%
76	Farnuf loam, 2 to 4 percent slopes	53.6	3.2%
77	Farnuf loam, 4 to 8 percent slopes	27.8	1.7%
103	Ipano loam, 0 to 4 percent slopes	155.8	9.3%
106	Ipano-Hillon complex, 4 to 10 percent slopes	270.5	16.1%
114	Kobar silty clay loam, 0 to 2 percent slopes	72.1	4.3%
115	Kobar silty clay loam, 2 to 4 percent slopes	126.2	7.5%
116	Kobar silty clay loam, 4 to 8 percent slopes	20.2	1.2%
139	Marias silty clay, 0 to 2 percent slopes	85.8	5.1%
140	Marias silty clay, 2 to 4 percent slopes	54.0	3.2%
141	Marias silty clay, 4 to 8 percent slopes	29.2	1.7%
164	Rentsac-Ethridge complex, 2 to 25 percent slopes	17.2	1.0%
172	Ryell-Rivra complex	4.5	0.3%
188	Tally fine sandy loam, 8 to 15 percent slopes	29.8	1.8%

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Cascade County Area, Montana (MT613)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
190	Tally-Castner complex, 15 to 35 percent slopes	22.9	1.4%
192	Tanna clay loam, 2 to 8 percent slopes	67.4	4.0%
205	Torex loamy sand, 0 to 6 percent slopes	46.8	2.8%
207	Twin Creek loam, 2 to 8 percent slopes	36.6	2.2%
231	Yawdim-Rentsac-Cabbart complex, 15 to 50 percent slopes	43.3	2.6%
232	Yawdim-Rock outcrop complex, 25 to 70 percent slopes	30.7	1.8%
236	Gravel pits	3.3	0.2%
237	Water	2.1	0.1%
Totals for Area of Interest		1,675.5	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

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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.

Cascade County Area, Montana

2—Abor-Yawdim clay loams, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgqz
Elevation: 3,200 to 4,000 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Abor and similar soils: 55 percent
Yawdim and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Abor

Setting

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

Typical profile

A - 0 to 6 inches: clay loam
Bw - 6 to 16 inches: silty clay
Bk - 16 to 30 inches: silty clay
Cr - 30 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 4 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: 15 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 4.7 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)

Description of Yawdim

Setting

Landform: Hills

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Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: clay loam

C - 3 to 16 inches: silty clay loam

Cr - 16 to 60 inches: weathered bedrock

Properties and qualities

Slope: 4 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: 10 percent

Gypsum, maximum in profile: 3 percent

Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Minor Components

Tanna

Percent of map unit: 10 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

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

Abor, silty clay

Percent of map unit: 10 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

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

15—Assinniboine fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cgp6

Elevation: 3,100 to 3,600 feet

Mean annual precipitation: 11 to 18 inches

Mean annual air temperature: 37 to 45 degrees F

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Frost-free period: 105 to 135 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: Alluvial 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 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 8.6 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)

Minor Components

Tally

Percent of map unit: 5 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)

Yetull

Percent of map unit: 5 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sands (Sa) 10-14" p.z. (R052XN175MT)

16—Assinniboine fine sandy loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgpk

Elevation: 3,100 to 3,600 feet

Mean annual precipitation: 11 to 18 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 135 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: Alluvial 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 60 inches: fine sandy 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 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 8.6 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)

Minor Components

Tally

Percent of map unit: 5 percent

Landform: Alluvial fans

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Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (Sy) 10-14" p.z. (R052XN163MT)

Yetull

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sands (Sa) 10-14" p.z. (R052XN175MT)

18—Azaar fine sandy loam

Map Unit Setting

National map unit symbol: cgq8
Elevation: 3,400 to 3,800 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 130 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Azaar

Setting

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

Typical profile

A - 0 to 13 inches: fine sandy loam
Bw - 13 to 22 inches: loam
2Bk - 22 to 32 inches: silty clay loam
2R - 32 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 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: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.5 inches)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Draft Sandy (Sy) RRU 46-C 15-19" p.z. (R046XC505MT)

Minor Components

Lihen

Percent of map unit: 4 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Sands (Sa) RRU 46-C 15-19" p.z. (R046XC606MT)

Ticell

Percent of map unit: 4 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

Azaar, loam

Percent of map unit: 2 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Sandy (Sy) RRU 46-C 15-19" p.z. (R046XC505MT)

21—Big Timber-Castner complex, 8 to 30 percent slopes

Map Unit Setting

National map unit symbol: cgrc

Elevation: 3,100 to 4,500 feet

Mean annual precipitation: 14 to 18 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Big timber and similar soils: 55 percent

Castner and similar soils: 30 percent

Minor components: 15 percent

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

Description of Big Timber

Setting

Landform: Hills

Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: clay loam
C - 6 to 15 inches: gravelly clay loam
Cr - 15 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 30 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 (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 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.3 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-C 13-19" p.z. (R046XC506MT)

Description of Castner

Setting

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

Typical profile

A1 - 0 to 6 inches: channery loam
A2 - 6 to 10 inches: extremely channery loam
Bk - 10 to 16 inches: extremely channery loam
R - 16 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 30 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 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: Very low (about 1.5 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-C 13-19" p.z. (R046XC506MT)

Minor Components

Darret

Percent of map unit: 8 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 46-C 10-14" p.z. (R046XC503MT)

Timberg

Percent of map unit: 7 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clayey (Cy) RRU 46-C 10-14" p.z. (R046XC503MT)

28—Bitton and Roy soils, 10 to 65 percent slopes

Map Unit Setting

National map unit symbol: cgsc

Elevation: 3,400 to 5,300 feet

Mean annual precipitation: 15 to 19 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Roy and similar soils: 45 percent

Bitton and similar soils: 45 percent

Minor components: 10 percent

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

Description of Bitton

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: stony loam

Bk - 7 to 40 inches: very stony loam

C - 40 to 60 inches: very stony clay loam

Properties and qualities

Slope: 10 to 65 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): 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 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Description of Roy

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: stony loam

Bt - 6 to 32 inches: very stony clay loam

Bk - 32 to 60 inches: very stony sandy clay loam

Properties and qualities

Slope: 10 to 65 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 3.9 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: C

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Minor Components

Castner

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

Sinnigam

Percent of map unit: 5 percent

Landform: Hills

Custom Soil Resource Report

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

45—Crago very cobbly loam, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: cgsz
Elevation: 3,400 to 4,000 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Crago

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: very cobbly loam
Bk1 - 3 to 9 inches: very cobbly clay loam
Bk2 - 9 to 36 inches: extremely cobbly sandy loam
C - 36 to 60 inches: very gravelly sandy loam

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
Calcium carbonate, maximum in profile: 70 percent
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)

Minor Components

Cemented gravel layers

Percent of map unit: 5 percent

Binna

Percent of map unit: 5 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

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

46—Crago-Yawdim complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: cgt0

Elevation: 3,400 to 4,000 feet

Mean annual precipitation: 11 to 19 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Yawdim and similar soils: 35 percent

Crago and similar soils: 35 percent

Minor components: 30 percent

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

Description of Crago

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: very cobbly loam

Bk1 - 3 to 9 inches: very cobbly clay loam

Bk2 - 9 to 36 inches: extremely cobbly sandy loam

C - 36 to 60 inches: very gravelly sandy 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 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

Custom Soil Resource Report

Calcium carbonate, maximum in profile: 70 percent
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)

Description of Yawdim

Setting

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

Typical profile

A - 0 to 3 inches: clay loam
C - 3 to 16 inches: silty clay loam
Cr - 16 to 60 inches: weathered bedrock

Properties and qualities

Slope: 15 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: 10 percent
Gypsum, maximum in profile: 3 percent
Available water storage in profile: Very low (about 2.8 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. (R052XN178MT)

Minor Components

Abor

Percent of map unit: 8 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Binna

Percent of map unit: 8 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Lisam

Percent of map unit: 7 percent

Custom Soil Resource Report

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Shallow Clay (SwC) RRU 46-C 13-19" p.z. (R046XC598MT)

Crago, gravelly loam

Percent of map unit: 7 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)

48—Darret silty clay loam, 8 to 20 percent slopes

Map Unit Setting

National map unit symbol: cgt2

Elevation: 3,400 to 4,800 feet

Mean annual precipitation: 14 to 18 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 130 days

Farmland classification: Not prime farmland

Map Unit Composition

Darret and similar soils: 90 percent

Minor components: 10 percent

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

Description of Darret

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: silty clay loam

Bt - 7 to 18 inches: silty clay

Bk - 18 to 28 inches: silty clay loam

Cr - 28 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 20 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): 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

Custom Soil Resource Report

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: Draft Clayey (Cy) RRU 46-N 13-19" p.z. (R046XN247MT)

Minor Components

Big timber

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

Castner

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

49—Darret-Castner complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgt3
Elevation: 3,400 to 4,700 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Darret and similar soils: 60 percent
Castner and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Darret

Setting

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

Typical profile

A - 0 to 7 inches: silty clay loam
Bt - 7 to 18 inches: silty clay

Custom Soil Resource Report

Bk - 18 to 28 inches: silty clay loam
Cr - 28 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): 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: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: Draft Clayey (Cy) RRU 46-N 13-19" p.z. (R046XN247MT)

Description of Castner

Setting

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

Typical profile

A1 - 0 to 6 inches: channery loam
A2 - 6 to 10 inches: extremely channery loam
Bk - 10 to 16 inches: extremely channery loam
R - 16 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 8 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 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: Very low (about 1.5 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-C 13-19" p.z. (R046XC506MT)

Minor Components

Big timber

Percent of map unit: 8 percent
Landform: Hills

Custom Soil Resource Report

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

Sinnigam

Percent of map unit: 7 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

76—Farnuf loam, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: cgv2
Elevation: 3,200 to 4,200 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 130 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
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: loam
Bt - 7 to 15 inches: clay loam
Bk - 15 to 36 inches: loam
C - 36 to 60 inches: stratified gravelly sandy loam to silty 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 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)

Custom Soil Resource Report

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

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Minor Components

Fairfield

Percent of map unit: 5 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Tally

Percent of map unit: 5 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Sandy (Sy) RRU 46-C 15-19" p.z. (R046XC505MT)

77—Farnuf loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgv3

Elevation: 3,200 to 4,200 feet

Mean annual precipitation: 14 to 18 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 130 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

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: loam

Bt - 7 to 15 inches: clay loam

Bk - 15 to 36 inches: loam

C - 36 to 60 inches: stratified gravelly sandy loam to silty clay loam

Custom Soil Resource Report

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 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 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Minor Components

Fairfield

Percent of map unit: 5 percent

Landform: Stream terraces

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Work

Percent of map unit: 5 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

103—Ipano loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: cgmk

Elevation: 3,400 to 4,000 feet

Mean annual precipitation: 14 to 19 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 105 to 130 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ipano and similar soils: 90 percent

Minor components: 10 percent

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

Description of Ipano

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: loam

Bk1 - 8 to 19 inches: silt loam

2Bk2 - 19 to 34 inches: channery loam

2R - 34 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 4 percent

Depth to restrictive feature: 20 to 40 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: 30 percent

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

Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Minor Components

Azaar

Percent of map unit: 5 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Sandy (Sy) RRU 46-C 15-19" p.z. (R046XC505MT)

Reeder

Percent of map unit: 5 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

106—Ipano-Hillon complex, 4 to 10 percent slopes

Map Unit Setting

National map unit symbol: cgmn
Elevation: 3,400 to 3,800 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Ipano

Setting

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

Typical profile

A - 0 to 8 inches: loam
Bk1 - 8 to 19 inches: silt loam
2Bk2 - 19 to 34 inches: channery loam
2R - 34 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 10 percent
Depth to restrictive feature: 20 to 40 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: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Description of Hillon

Setting

Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 5 inches: clay loam
Bk - 5 to 28 inches: clay loam
C - 28 to 60 inches: clay loam

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): 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)

Minor Components

Gerber

Percent of map unit: 10 percent
Landform: Till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) RRU 58A-E 15-19" p.z. (R058AE388MT)

Ticell

Percent of map unit: 10 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

114—Kobar silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cgmy
Elevation: 2,700 to 3,800 feet
Mean annual precipitation: 11 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 135 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Kobar

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: silty clay loam
Bw - 6 to 12 inches: silty clay loam
Bk - 12 to 26 inches: silty clay loam
Bky - 26 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): 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 3.0 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): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Minor Components

Lawther

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Marias

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

115—Kobar silty clay loam, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: cgmz
Elevation: 2,700 to 3,800 feet
Mean annual precipitation: 11 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 135 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Kobar

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: silty clay loam
Bw - 6 to 12 inches: silty clay loam
Bk - 12 to 26 inches: silty clay loam
Bky - 26 to 60 inches: silty 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 0.20 in/hr)

Custom Soil Resource Report

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 3.0 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): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Minor Components

Lawther

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Marias

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

116—Kobar silty clay loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgn0
Elevation: 2,700 to 3,800 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 135 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Kobar

Setting

Landform: Alluvial fans
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: silty clay loam
Bw - 6 to 12 inches: silty clay loam
Bk - 12 to 26 inches: silty clay loam
Bky - 26 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: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 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): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Minor Components

Yamac

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Yamac, clay loam

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

139—Marias silty clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: cgnt
Elevation: 3,200 to 3,600 feet
Mean annual precipitation: 11 to 14 inches

Custom Soil Resource Report

Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 135 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: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: silty clay
Bss - 8 to 34 inches: silty clay
By - 34 to 60 inches: silty 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: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 6 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: 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) 10-14" p.z. (R052XN162MT)

Minor Components

Kobar

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Linnet

Percent of map unit: 5 percent
Landform: Outwash terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

140—Marias silty clay, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: cgnw
Elevation: 3,200 to 3,600 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 135 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: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: silty clay
Bss - 8 to 34 inches: silty clay
By - 34 to 60 inches: silty clay

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): 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: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
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) 10-14" p.z. (R052XN162MT)

Minor Components

Kobar

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Linnet

Percent of map unit: 5 percent
Landform: Outwash terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

141—Marias silty clay, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgnx
Elevation: 3,200 to 3,600 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 110 to 135 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: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: silty clay
Bss - 8 to 34 inches: silty clay
By - 34 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

Custom Soil Resource Report

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: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
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) 10-14" p.z. (R052XN162MT)

Minor Components

Abor

Percent of map unit: 5 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

Kobar

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey (Cy) 10-14" p.z. (R052XN162MT)

164—Rentsac-Ethridge complex, 2 to 25 percent slopes

Map Unit Setting

National map unit symbol: cgpq
Elevation: 3,400 to 3,800 feet
Mean annual precipitation: 11 to 18 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

Rentsac and similar soils: 40 percent
Ethridge and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rentsac

Setting

Landform: Hills
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: very flaggy loam

C - 7 to 18 inches: extremely channery loam

R - 18 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 2 to 15 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): 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 slightly saline (0.0 to 4.0 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: D

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Description of Ethridge

Setting

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: clay loam

Bt - 7 to 16 inches: silty clay

Bk1 - 16 to 20 inches: silty clay loam

Bk2 - 20 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 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 3.0 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): 4e

Hydrologic Soil Group: C

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

Minor Components

Ernem

Percent of map unit: 13 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Castner

Percent of map unit: 12 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

172—Ryell-Rivra complex

Map Unit Setting

National map unit symbol: cgq0

Elevation: 3,300 to 3,600 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 110 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Ryell and similar soils: 50 percent

Rivra and similar soils: 35 percent

Minor components: 15 percent

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

Description of Ryell

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: loam

C1 - 8 to 28 inches: stratified very fine sandy loam to silt loam

2C2 - 28 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 2 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): 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: 15 percent

Available water storage in profile: Low (about 5.8 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)

Description of Rivra

Setting

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 8 inches: gravelly sandy loam

C - 8 to 60 inches: extremely gravelly 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: About 0 to 42 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: A/D

Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R052XN176MT)

Minor Components

Glendive

Percent of map unit: 8 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

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

Havre

Percent of map unit: 7 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

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

188—Tally fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: cgqk

Elevation: 3,300 to 3,800 feet

Mean annual precipitation: 14 to 18 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 105 to 130 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tally and similar soils: 90 percent

Minor components: 10 percent

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

Description of Tally

Setting

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: fine sandy loam

Bw - 7 to 22 inches: fine sandy loam

Bk - 22 to 40 inches: fine sandy loam

C - 40 to 60 inches: sandy 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): 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 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Ecological site: Draft Sandy (Sy) RRU 46-C 15-19" p.z. (R046XC505MT)

Minor Components

Castner

Percent of map unit: 10 percent

Custom Soil Resource Report

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

190—Tally-Castner complex, 15 to 35 percent slopes

Map Unit Setting

National map unit symbol: cgqn
Elevation: 3,300 to 3,600 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Tally and similar soils: 65 percent
Castner and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tally

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: loam
Bw - 7 to 22 inches: fine sandy loam
Bk - 22 to 40 inches: fine sandy loam
C - 40 to 60 inches: sandy 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): 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 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Description of Castner

Setting

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

Typical profile

A1 - 0 to 6 inches: channery loam
A2 - 6 to 10 inches: extremely channery loam
Bk - 10 to 16 inches: extremely channery loam
R - 16 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 35 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 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: Very low (about 1.5 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-C 13-19" p.z. (R046XC506MT)

Minor Components

Tally, fine sandy loam

Percent of map unit: 8 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Sandy (Sy) RRU 46-C 15-19" p.z. (R046XC505MT)

Rock outcrop

Percent of map unit: 2 percent

192—Tanna clay loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgqq
Elevation: 3,300 to 3,900 feet
Mean annual precipitation: 11 to 14 inches
Mean annual air temperature: 39 to 45 degrees F

Custom Soil Resource Report

Frost-free period: 110 to 135 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tanna and similar soils: 90 percent

Minor components: 10 percent

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

Description of Tanna

Setting

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

A - 0 to 6 inches: clay loam

Bt - 6 to 17 inches: clay loam

Bk1 - 17 to 27 inches: clay loam

Bk2 - 27 to 31 inches: very channery loam

Cr - 31 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): 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 3.0 mmhos/cm)

Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: D

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

Minor Components

Ethridge

Percent of map unit: 10 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

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

205—Torex loamy sand, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: cgr6
Elevation: 3,300 to 3,600 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Torex

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A1 - 0 to 8 inches: loamy sand
A2 - 8 to 24 inches: loamy sand
2C - 24 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 0 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): 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 very slightly saline (0.0 to 3.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Sands (Sa) RRU 46-C 15-19" p.z. (R046XC606MT)

Minor Components

Ervide

Percent of map unit: 5 percent

Custom Soil Resource Report

Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sands (Sa) RRU 46-C 15-19" p.z. (R046XC606MT)

Lihen

Percent of map unit: 5 percent
Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sands (Sa) RRU 46-C 15-19" p.z. (R046XC606MT)

207—Twin Creek loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: cgr8
Elevation: 3,300 to 4,200 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 130 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Twin Creek

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

A - 0 to 7 inches: loam
Bw - 7 to 25 inches: loam
Bk - 25 to 45 inches: loam
C - 45 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 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)

Custom Soil Resource Report

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: B

Ecological site: Silty (Si) RRU 46-N 10-14" p.z. (R046XN236MT)

Minor Components

Perma

Percent of map unit: 4 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Fergus

Percent of map unit: 3 percent

Landform: Alluvial fans

Down-slope shape: Linear

Across-slope shape: Linear

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

Straw

Percent of map unit: 3 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

231—Yawdim-Rentsac-Cabbart complex, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: cgs4

Elevation: 3,000 to 4,400 feet

Mean annual precipitation: 11 to 14 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 110 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Yawdim and similar soils: 40 percent

Cabbart and similar soils: 20 percent

Rentsac and similar soils: 20 percent

Abor and similar soils: 8 percent

Minor components: 12 percent

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

Description of Yawdim

Setting

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

Typical profile

A - 0 to 3 inches: silty clay loam
C - 3 to 16 inches: silty clay loam
Cr - 16 to 60 inches: weathered bedrock

Properties and qualities

Slope: 15 to 50 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: 10 percent
Gypsum, maximum in profile: 3 percent
Available water storage in profile: Very low (about 2.8 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. (R052XN178MT)

Description of Rentsac

Setting

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

Typical profile

A - 0 to 7 inches: channery loam
C - 7 to 18 inches: extremely channery loam
R - 18 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 50 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): 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 slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

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Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow (Sw) 10-14" p.z. (R052XN178MT)

Description of Cabbart

Setting

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

Typical profile

A - 0 to 3 inches: loam
Bk - 3 to 18 inches: loam
Cr - 18 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 50 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
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: 5.0
Available water storage in profile: Low (about 3.1 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. (R052XN178MT)

Description of Abor

Setting

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

Typical profile

A - 0 to 6 inches: clay loam
Bw - 6 to 16 inches: silty clay
Bk - 16 to 30 inches: silty clay
Cr - 30 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 4 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

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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 3.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 4.7 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)

Minor Components

Delpoint

Percent of map unit: 7 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R052XN161MT)

Rock outcrop

Percent of map unit: 5 percent

232—Yawdim-Rock outcrop complex, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: cgs5
Elevation: 3,300 to 4,400 feet
Mean annual precipitation: 11 to 19 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Yawdim and similar soils: 55 percent
Rock outcrop: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yawdim

Setting

Landform: Hills
Down-slope shape: Linear

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Across-slope shape: Linear

Typical profile

A - 0 to 3 inches: clay loam
C - 3 to 16 inches: silty clay loam
Cr - 16 to 60 inches: weathered bedrock

Properties and qualities

Slope: 25 to 70 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: 10 percent
Gypsum, maximum in profile: 3 percent
Available water storage in profile: Very low (about 2.8 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. (R052XN178MT)

Minor Components

Castner

Percent of map unit: 15 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Shallow (Sw) RRU 46-C 13-19" p.z. (R046XC506MT)

Bitton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

Roy

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Draft Silty (Si) RRU 46-C 13-19" p.z. (R046XC508MT)

236—Gravel pits

Map Unit Setting

National map unit symbol: cgvy

Elevation: 3,000 to 3,800 feet

Mean annual precipitation: 11 to 14 inches

Frost-free period: 110 to 135 days

Farmland classification: Not prime farmland

Map Unit Composition

Gravel pits: 100 percent

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

237—Water

Map Unit Composition

Water: 100 percent

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

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations 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 interpretation.

Land Classifications

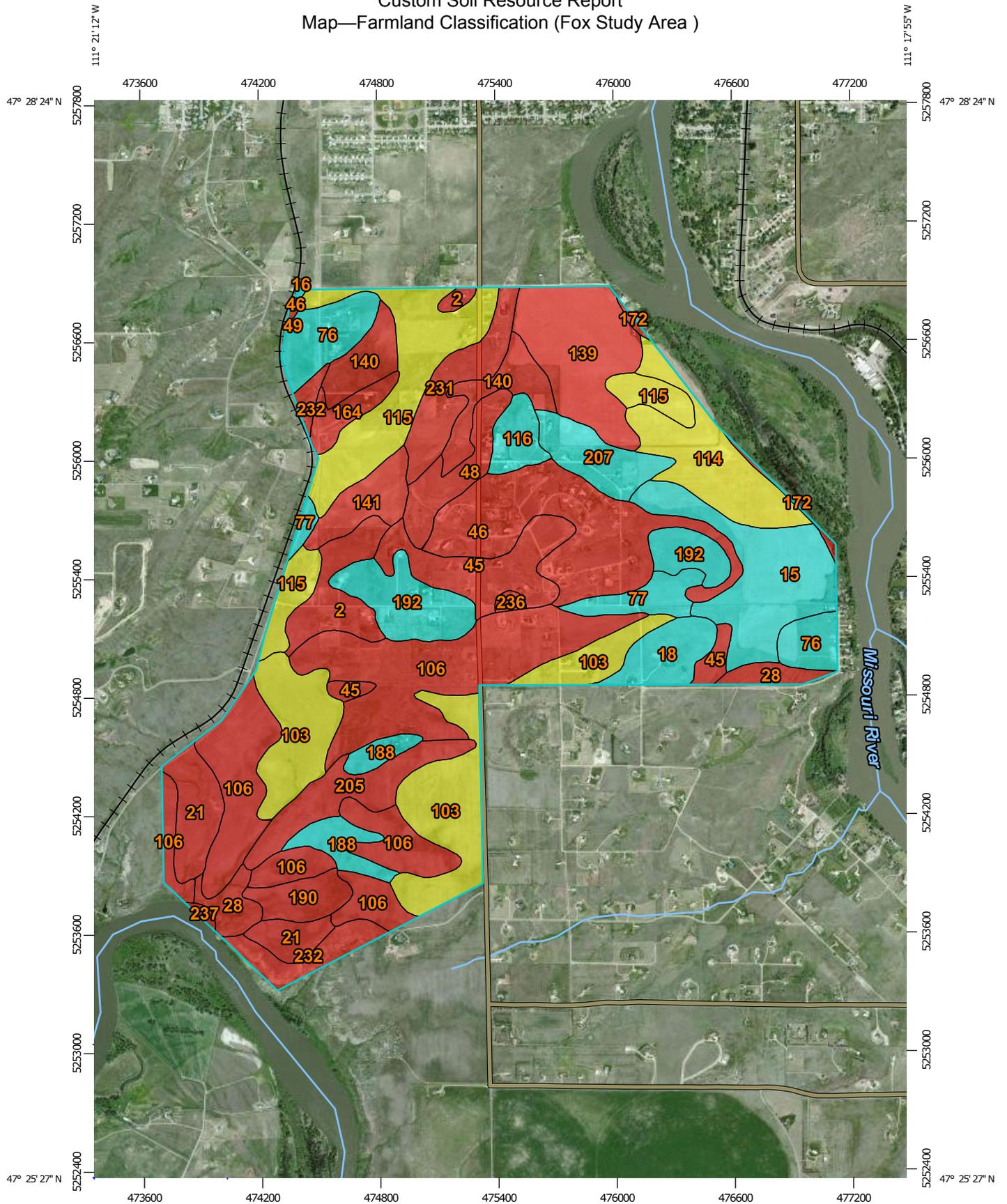
Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification (Fox Study Area)

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

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Map—Farmland Classification (Fox Study Area)



Map Scale: 1:26,600 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Soil Rating Lines

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained

-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Soil Rating Points

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Water Features

MAP INFORMATION

-  Streams and Canals
- Transportation**
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
-  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: <http://websoilsurvey.nrcs.usda.gov>
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: Cascade County Area, Montana
Survey Area Data: Version 12, 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: Jun 13, 2010—Aug 26, 2010

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

Custom Soil Resource Report

Table—Farmland Classification (Fox Study Area)

Farmland Classification— Summary by Map Unit — Cascade County Area, Montana (MT613)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Abor-Yawdim clay loams, 4 to 8 percent slopes	Not prime farmland	42.0	2.5%
15	Assinniboine fine sandy loam, 0 to 4 percent slopes	Farmland of statewide importance	94.0	5.6%
16	Assinniboine fine sandy loam, 4 to 8 percent slopes	Farmland of statewide importance	0.4	0.0%
18	Azaar fine sandy loam	Farmland of statewide importance	31.6	1.9%
21	Big Timber-Castner complex, 8 to 30 percent slopes	Not prime farmland	49.4	2.9%
28	Bitton and Roy soils, 10 to 65 percent slopes	Not prime farmland	27.4	1.6%
45	Crago very cobbly loam, 0 to 15 percent slopes	Not prime farmland	68.5	4.1%
46	Crago-Yawdim complex, 15 to 45 percent slopes	Not prime farmland	128.7	7.7%
48	Darret silty clay loam, 8 to 20 percent slopes	Not prime farmland	33.1	2.0%
49	Darret-Castner complex, 2 to 8 percent slopes	Not prime farmland	0.5	0.0%
76	Farnuf loam, 2 to 4 percent slopes	Farmland of statewide importance	53.6	3.2%
77	Farnuf loam, 4 to 8 percent slopes	Farmland of statewide importance	27.8	1.7%
103	Ipáno loam, 0 to 4 percent slopes	Prime farmland if irrigated	155.8	9.3%
106	Ipáno-Hillon complex, 4 to 10 percent slopes	Not prime farmland	270.5	16.1%
114	Kobar silty clay loam, 0 to 2 percent slopes	Prime farmland if irrigated	72.1	4.3%
115	Kobar silty clay loam, 2 to 4 percent slopes	Prime farmland if irrigated	126.2	7.5%
116	Kobar silty clay loam, 4 to 8 percent slopes	Farmland of statewide importance	20.2	1.2%
139	Marias silty clay, 0 to 2 percent slopes	Not prime farmland	85.8	5.1%
140	Marias silty clay, 2 to 4 percent slopes	Not prime farmland	54.0	3.2%
141	Marias silty clay, 4 to 8 percent slopes	Not prime farmland	29.2	1.7%
164	Rentsac-Ethridge complex, 2 to 25 percent slopes	Not prime farmland	17.2	1.0%

Custom Soil Resource Report

Farmland Classification— Summary by Map Unit — Cascade County Area, Montana (MT613)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
172	Ryell-Rivra complex	Not prime farmland	4.5	0.3%
188	Tally fine sandy loam, 8 to 15 percent slopes	Farmland of statewide importance	29.8	1.8%
190	Tally-Castner complex, 15 to 35 percent slopes	Not prime farmland	22.9	1.4%
192	Tanna clay loam, 2 to 8 percent slopes	Farmland of statewide importance	67.4	4.0%
205	Torex loamy sand, 0 to 6 percent slopes	Not prime farmland	46.8	2.8%
207	Twin Creek loam, 2 to 8 percent slopes	Farmland of statewide importance	36.6	2.2%
231	Yawdim-Rentsac-Cabbart complex, 15 to 50 percent slopes	Not prime farmland	43.3	2.6%
232	Yawdim-Rock outcrop complex, 25 to 70 percent slopes	Not prime farmland	30.7	1.8%
236	Gravel pits	Not prime farmland	3.3	0.2%
237	Water	Not prime farmland	2.1	0.1%
Totals for Area of Interest			1,675.5	100.0%

Rating Options—Farmland Classification (Fox Study Area)

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

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