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 Mercer County, North Dakota

November 1, 2017

Preface

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

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

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

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

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

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

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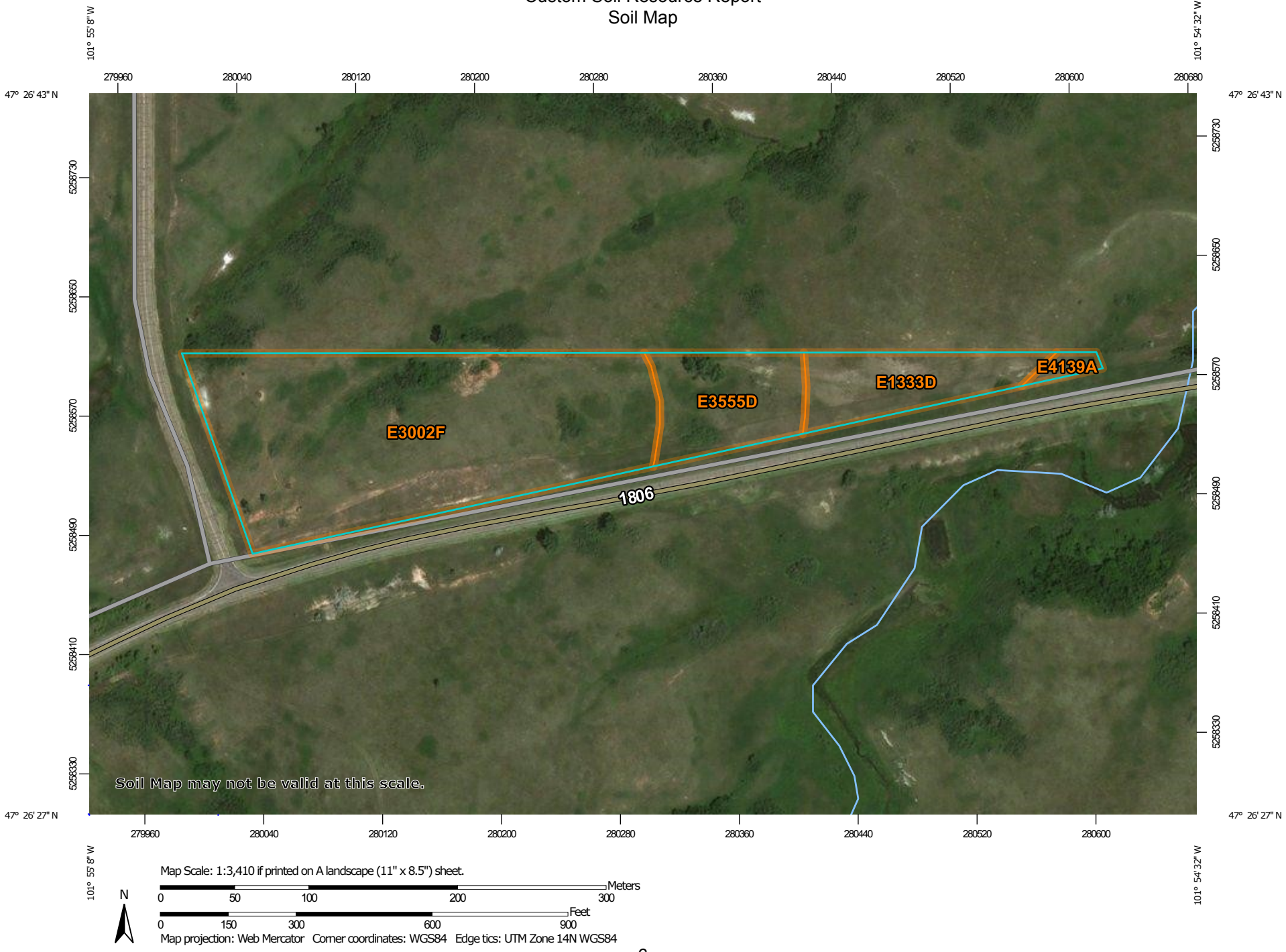
Contents

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:3,410 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

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
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- Saline Spot
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- Sinkhole
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- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
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Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Mercer County, North Dakota
Survey Area Data: Version 24, Oct 2, 2017

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

Date(s) aerial images were photographed: Sep 6, 2014—Sep 10, 2016

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
E1333D	Vebar-Cohagen fine sandy loams, 9 to 15 percent slopes	1.5	13.1%
E3002F	Ringling-Cabba complex, 9 to 35 percent slopes	7.9	70.9%
E3555D	Zahl-Williams loams, 9 to 15 percent slopes	1.6	14.6%
E4139A	Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded	0.2	1.4%
Totals for Area of Interest		**11.1**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Mercer County, North Dakota

E1333D—Vebar-Cohagen fine sandy loams, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2r6tf
Elevation: 1,650 to 3,600 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Vebar and similar soils: 52 percent
Cohagen and similar soils: 20 percent
Flasher and similar soils: 10 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vebar

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy residuum weathered from calcareous sandstone

Typical profile

A - 0 to 5 inches: fine sandy loam
Bw - 5 to 26 inches: fine sandy loam
BCk - 26 to 32 inches: fine sandy loam
Cr - 32 to 60 inches: bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.01 to 14.17 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: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Sandy (R054XY026ND)

Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Description of Cohagen

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy residuum weathered from sandstone

Typical profile

A - 0 to 3 inches: fine sandy loam
C - 3 to 17 inches: fine sandy loam
Cr - 17 to 60 inches: bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.01 to 14.17 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: 1 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 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: Shallow Sandy (R054XY043ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Description of Flasher

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Sandy residuum weathered from sandstone

Typical profile

A - 0 to 6 inches: loamy fine sand
AC - 6 to 10 inches: loamy fine sand
Cr - 10 to 60 inches: bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 7 to 20 inches to paralithic bedrock

Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 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: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: Shallow Sandy (R054XY043ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Minor Components

Tally

Percent of map unit: 8 percent
Landform: Ridges, hills
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (R054XY026ND)
Other vegetative classification: Droughty Loam (G054XY120ND)
Hydric soil rating: No

Parshall

Percent of map unit: 5 percent
Landform: Swales
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Loamy Overflow (R054XY023ND)
Other vegetative classification: Overflow (G054XY500ND)
Hydric soil rating: No

Amor

Percent of map unit: 3 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Droughty Loam (G054XY120ND)
Hydric soil rating: No

Zahl

Percent of map unit: 2 percent
Landform: Ridges, hills
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex

Across-slope shape: Convex
Ecological site: Thin Loamy (R054XY038ND)
Other vegetative classification: Limy Upland (G054XY400ND)
Hydric soil rating: No

E3002F—Ringling-Cabba complex, 9 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2qz7d
Elevation: 1,650 to 3,600 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Ringling, channery, and similar soils: 60 percent
Cabba and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ringling, Channery

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from porcellanite

Typical profile

A - 0 to 5 inches: channery loam
Bw - 5 to 17 inches: very channery loam
2Ck - 17 to 42 inches: channers
2C - 42 to 60 inches: channers

Properties and qualities

Slope: 9 to 35 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent

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

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: Very Shallow (R054XY035ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Description of Cabba

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-loamy residuum weathered from sedimentary rock

Typical profile

A - 0 to 3 inches: loam
Bk - 3 to 15 inches: loam
Cr - 15 to 60 inches: bedrock

Properties and qualities

Slope: 9 to 35 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 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
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow Loamy (R054XY030ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Minor Components

Rock outcrop, porcelanite

Percent of map unit: 7 percent
Landform: Knobs, ridges
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex, linear
Ecological site: Non-site (R054XY999ND)

Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Searing

Percent of map unit: 5 percent
Landform: Ridges, hills
Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Droughty Loam (G054XY120ND)
Hydric soil rating: No

Dogtooth

Percent of map unit: 4 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Thin Claypan (R054XY033ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

Chama

Percent of map unit: 2 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Limy Residual (R054XY046ND)
Other vegetative classification: Limy Upland (G054XY400ND)
Hydric soil rating: No

Amor

Percent of map unit: 2 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Droughty Loam (G054XY120ND)
Hydric soil rating: No

E3555D—Zahl-Williams loams, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: cdpx
Elevation: 1,650 to 3,600 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Zahl and similar soils: 45 percent
Williams and similar soils: 22 percent
Minor components: 33 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zahl

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Fine-loamy till

Typical profile

A - 0 to 5 inches: loam
Bk - 5 to 20 inches: clay loam
C - 20 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 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
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Thin Loamy (R054XY038ND)
Other vegetative classification: Limy Upland (G054XY400ND)
Hydric soil rating: No

Description of Williams

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

A - 0 to 6 inches: loam
Bt1 - 6 to 10 inches: clay loam
Bt2 - 10 to 15 inches: clay loam
Btk - 15 to 24 inches: clay loam
Bk - 24 to 36 inches: clay loam
C - 36 to 60 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Loam (G054XY100ND)
Hydric soil rating: No

Minor Components

Max

Percent of map unit: 14 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Loam (G054XY100ND)
Hydric soil rating: No

Bowbells

Percent of map unit: 10 percent
Landform: Swales
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Loam (G054XY100ND)
Hydric soil rating: No

Reeder

Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Loamy (R054XY031ND)
Other vegetative classification: Droughty Loam (G054XY120ND)
Hydric soil rating: No

Chama

Percent of map unit: 3 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Limy Residual (R054XY046ND)
Other vegetative classification: Limy Upland (G054XY400ND)
Hydric soil rating: No

Wabek, gravelly

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Very Shallow (R054XY035ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: No

E4139A—Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: d33b
Elevation: 1,650 to 3,600 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Korchea, channeled,frequently flooded, and similar soils: 52 percent
Fluvaquents, channeled, frequently flooded, and similar soils: 40 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Korchea, Channeled,frequently Flooded

Setting

Landform: Flood plains on river valleys
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified fine-loamy alluvium derived from sedimentary rock

Typical profile

A - 0 to 6 inches: loam
C - 6 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
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: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B
Ecological site: Loamy Overflow (R054XY023ND)
Other vegetative classification: Overflow (G054XY500ND)
Hydric soil rating: No

Description of Fluvaquents, Channeled, Frequently Flooded

Setting

Landform: Channels on flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium

Typical profile

A - 0 to 10 inches: fine sandy loam
Cg - 10 to 80 inches: stratified loamy sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.60 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent

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: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A
Ecological site: Non-site (R054XY999ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: Yes

Minor Components

Velva, channeled,frequently flooded

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Overflow (R054XY023ND)
Other vegetative classification: Loam (G054XY100ND)
Hydric soil rating: No

Lallie, frequently flooded

Percent of map unit: 3 percent
Landform: Oxbows on flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Wet Land (R054XY036ND)
Other vegetative classification: Not suited (G054XY000ND)
Hydric soil rating: Yes

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.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Dwellings Without Basements

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper.

The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification of the soil. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use.

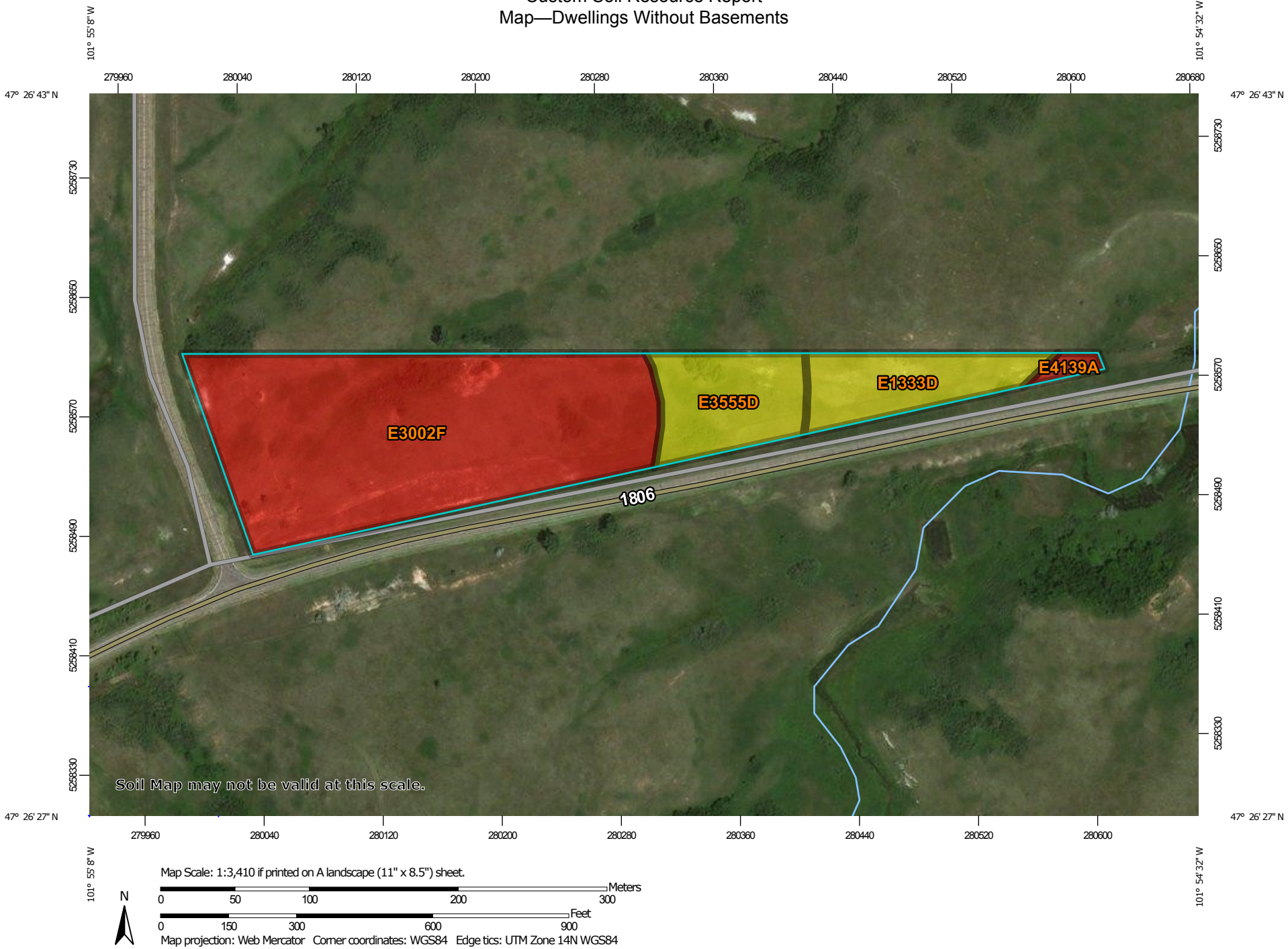
"Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Dwellings Without Basements



Map Scale: 1:3,410 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Mercer County, North Dakota
Survey Area Data: Version 24, Oct 2, 2017

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

Date(s) aerial images were photographed: Sep 6, 2014—Sep 10, 2016

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.

Tables—Dwellings Without Basements

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
E1333D	Vebar-Cohagen fine sandy loams, 9 to 15 percent slopes	Somewhat limited	Vebar (52%)	Slope (0.63)	1.5	13.1%
			Cohagen (20%)	Slope (0.63)		
				Depth to soft bedrock (0.50)		
			Flasher (10%)	Slope (0.63)		
				Depth to soft bedrock (0.50)		
			Tally (8%)	Slope (0.37)		
			Amor (3%)	Slope (0.63)		
			Zahl (2%)	Slope (0.63)		
E3002F	Ringling-Cabba complex, 9 to 35 percent slopes	Very limited	Ringling, channery (60%)	Large stones (1.00)	7.9	70.9%
				Slope (1.00)		
			Cabba (20%)	Slope (1.00)		
				Depth to soft bedrock (0.50)		
			Dogtooth (4%)	Shrink-swell (1.00)		
				Slope (0.37)		
E3555D	Zahl-Williams loams, 9 to 15 percent slopes	Somewhat limited	Zahl (45%)	Slope (0.63)	1.6	14.6%
			Williams (22%)	Slope (0.63)		
				Shrink-swell (0.11)		
			Max (14%)	Slope (0.63)		
			Bowbells (10%)	Shrink-swell (0.01)		
			Reeder (4%)	Slope (0.63)		
				Shrink-swell (0.50)		
			Wabek, gravelly (2%)	Slope (0.63)		
E4139A	Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded	Very limited	Korchea, channeled,frequently flooded (52%)	Flooding (1.00)	0.2	1.4%
			Fluvaquents, channeled, frequently flooded (40%)	Ponding (1.00)		
				Flooding (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Velva, channeled,frequently flooded (5%)	Flooding (1.00)		
			Lallie, frequently flooded (3%)	Ponding (1.00)		
				Flooding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
Totals for Area of Interest					**11.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	8.0	72.3%
Somewhat limited	3.1	27.7%
Totals for Area of Interest	**11.1**	**100.0%**

Rating Options—Dwellings Without Basements

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Vegetative Productivity

Vegetative productivity includes estimates of potential vegetative production for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture and rangeland. In the underlying database, some states maintain crop yield data by individual map unit component. Other states maintain the data at the map unit level. Attributes are included for both, although only one or the other is likely to contain data for any given geographic area. For other land uses, productivity data is shown only at the map unit component level. Examples include potential crop yields under irrigated and nonirrigated conditions, forest productivity, forest site index, and total rangeland production under of normal, favorable and unfavorable conditions.

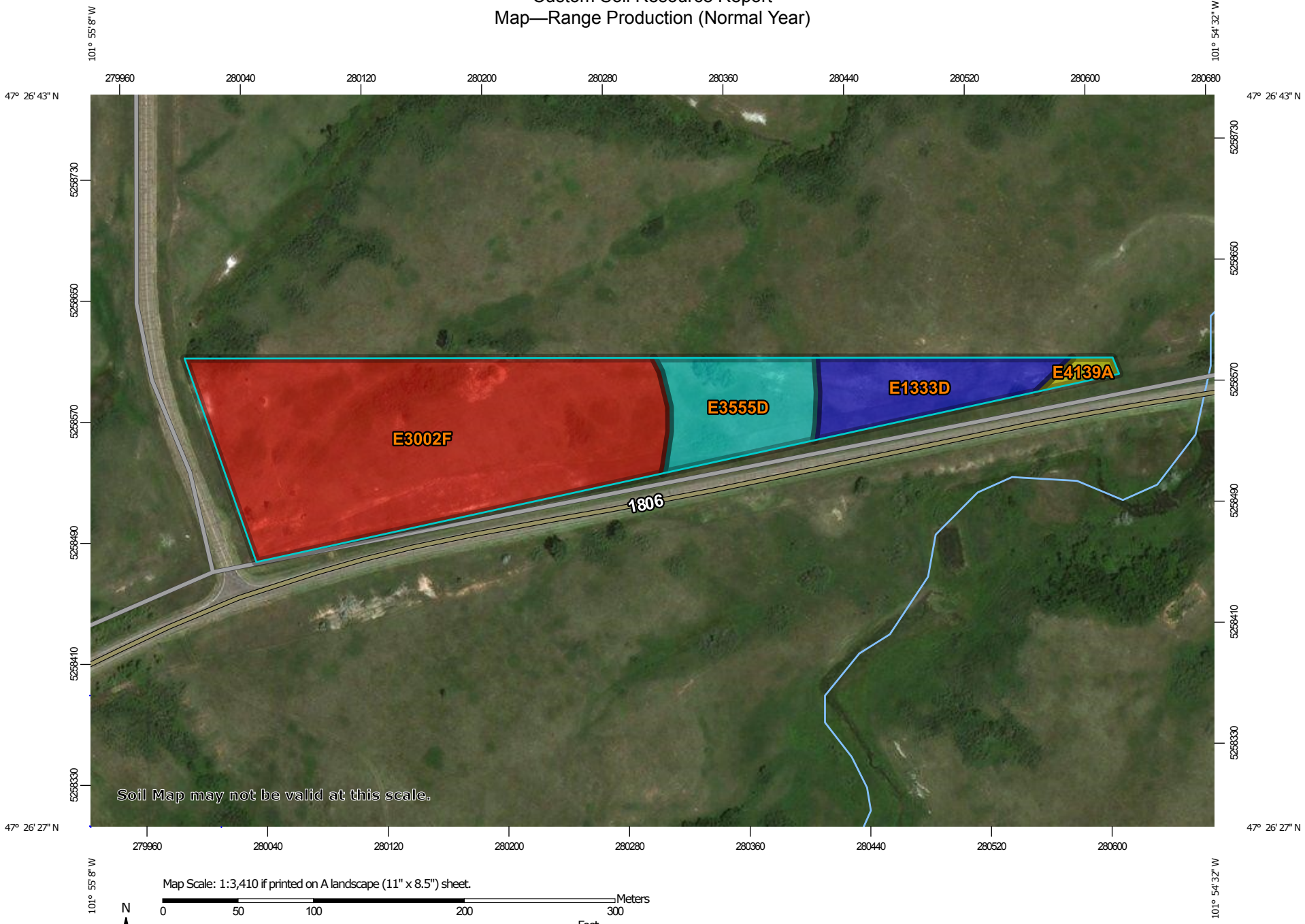
Range Production (Normal Year)

Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing

animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In a normal year, growing conditions are about average. Yields are adjusted to a common percent of air-dry moisture content.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Custom Soil Resource Report
Map—Range Production (Normal Year)



Map Scale: 1:3,410 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- <= 1004
- > 1004 and <= 2001
- > 2001 and <= 2041
- > 2041 and <= 2126
- Not rated or not available

Soil Rating Lines
- <= 1004
- > 1004 and <= 2001
- > 2001 and <= 2041
- > 2041 and <= 2126
- Not rated or not available

Soil Rating Points
- <= 1004
- > 1004 and <= 2001
- > 2001 and <= 2041
- > 2041 and <= 2126
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Date(s) aerial images were photographed: Sep 6, 2014—Sep 10, 2016

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

Table—Range Production (Normal Year)

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
E1333D	Vebar-Cohagen fine sandy loams, 9 to 15 percent slopes	2126	1.5	13.1%
E3002F	Ringling-Cabba complex, 9 to 35 percent slopes	1004	7.9	70.9%
E3555D	Zahl-Williams loams, 9 to 15 percent slopes	2041	1.6	14.6%
E4139A	Korchea-Fluvaquents complex, channeled, 0 to 2 percent slopes, frequently flooded	2001	0.2	1.4%
Totals for Area of Interest			**11.1**	**100.0%**

Rating Options—Range Production (Normal Year)

Units of Measure: pounds per acre per year

Aggregation Method: Weighted Average

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: Yes