2020 Soils and Land Use Test
Water Resource Management: Local Control and Local Solutions
Team ID _____

Page Score _____
Total Score _____/43

SOIL PROPERTIES

1) What are the 5 soil-forming factors in the acronym CLORPT? *(1 point each)*
   CLimate
   Organisms
   Relief
   Parent Material
   Time

2) What is parent material? *(1 point)*
   a) solid bedrock
   b) topsoil
   c) highly weathered rock fragments or freshly deposited sediments
   d) soils that disapprove of their younger counterparts

3) Ancient lake deposits are a type of soil parent material called: *(1 point)*
   a) lacustrine deposits
   b) outwash
   c) soil waves
   d) colluvium

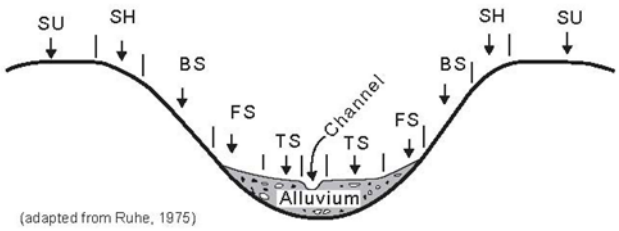
4) Where can you expect the rockiest soil types? *(1 point)*
   a) bottom of a hill
   b) ridgetop
   c) in a pond
   d) desert

5) Why would you expect soils to be rocky in your answer for question 4? *(1 point)*
   a) soil moisture
   b) magic
   c) erosion
   d) plant species

6) Pedogenesis refers to…? *(1 point)*
   a) crushing soil peds
   b) bedrock type
   c) fresh parent material
   d) soil formation, including ClORPT

7) Which landscape position (right) would likely be 1 percent slope? *(1 point)*
   a) shoulder
   b) backslope
   c) toeslope

Position	Code
summit	SU
shoulder	SH
backslope	BS
footslope	FS
toeslope	TS



d) none of the above

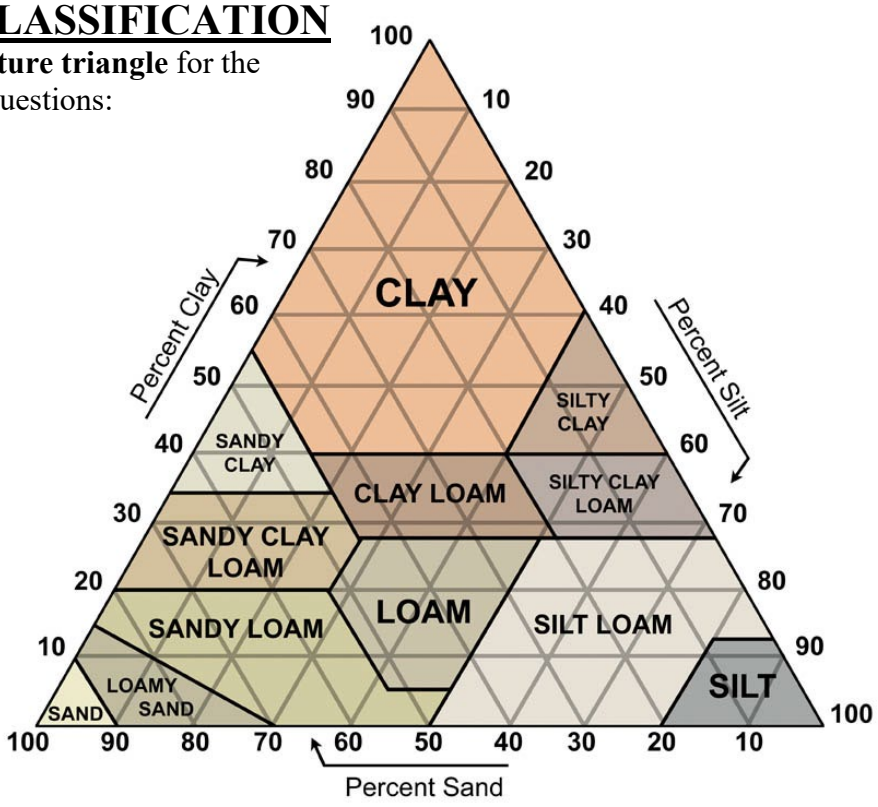
8) What does the term gleyed mean? *(1 point)*
   a) gray-colored soil resulting from saturation
   b) cracked, dried up soil
   c) a layer of roots within the soil
   d) iron concentrations in the soil

9) Saturated hydraulic conductivity of a soil is a measure of…? *(1 point)*
   a) pH
   b) permeability, or how easily water moves through soil
   c) the amount of water it takes to fill up all the pores in a soil
   d) soil slipperiness

10) Seasonal high watertable depth can be indicated by…? *(1 point)*
   a) soil structure
   b) rock fragment content
   c) redoximorphic features
   d) clay content

SOIL CLASSIFICATION

Use the **texture triangle** for the following questions:



11) What is the minimum percentage of silt that can be found in silt loam? *(1 point)*
   50% (48 to 52% accepted)

12) What texture describes a soil that has 30% sand and 35% clay? *(1 point)*
clay loam

13) What is the maximum amount of clay in a sandy clay loam? *(1 point)*
35% (33 to 37% accepted)

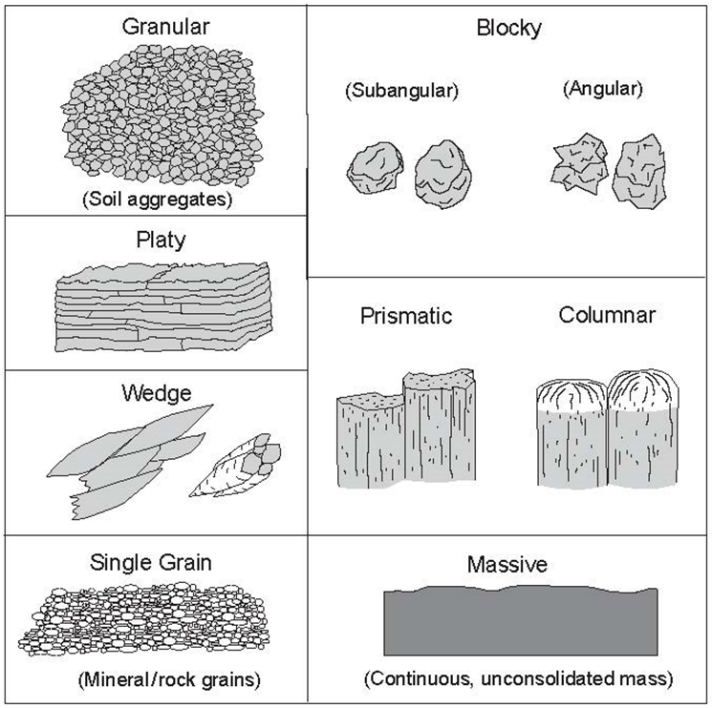
SOILS & LAND USE MANAGEMENT

14) Which practices decrease surface erosion on steep slopes? Select all that apply. *(2 points)*
a) keep the soil covered with mulch or vegetation
b) build water bars to disperse concentrated water flow
c) till the soil
d) remove all vegetation

15) Which of the following would increase a soil's saturated hydraulic conductivity (K_{sat})? *(1 point)*
a) increased compaction
b) increased clay
c) lower pH
d) increased living roots

16) Which soil structure (right) would you expect to drain the fastest? *(1 point)*
a) platy
b) granular
c) massive

17) Which soil structure (right) can be a result of compaction? *(1 point)*
a) blocky
b) single grain
c) granular
d) platy



18) Which are a result of soil surface compaction? Select all that apply. *(2 points)*
a) high organic material
b) decreased infiltration
c) increased runoff
d) low bulk density

19) Which soil texture can infiltrate or soak in the most water under normal conditions? *(1 point)*
a) sandy loam
b) clay

c) silt loam
d) solid bedrock

20) Place the following in order of driest to wettest soil type. *(3 points)*

A. brown topsoil with redoximorphic features at 30cm deep B___driest

B. brown topsoil, light brown subsoil A___

C. gray topsoil with redoximophic features at 10 cm deep C___wettest

21) What is the name of the soil tool to the right? *(1 point)*

a) shovel
b) bucket auger
c) penetrometer
d) spade

Use the measurements for fields A and B below to answer the following questions.

Field A: Lake County, OR: S1979OR037001								
Horizon	**Depth (cm)**	**Percent Sand**	**Percent Silt**	**Percent Clay**	**Percent Rock Fragments**	**pH**	**Percent Organic Carbon**	**Bulk Density**
A	0-8	33.4	31.3	35.3	17	6.7	2.18	1.39
Bt1	8-30	19.7	22.6	57.7	5	6.4	1.02	1.77
Bt2	30-45	17.5	21.1	61.4	10	6.0	0.62	1.88

Field B: Lake County, OR: S1979OR037004								
Horizon	**Depth (cm)**	**Percent Sand**	**Percent Silt**	**Percent Clay**	**Percent Rock Fragments**	**pH**	**Percent Organic Carbon**	**Bulk Density**
Ap	0-17	33.2	37.4	29.4	2	6.2	2.40	1.39
Bw1	17-33	41.7	32.6	25.7	2	6.5	1.07	1.32
Bw2	33-46	54.7	26.1	19.2	5	6.6	0.59	1.26

22) Using the textural triangle on page 2, what texture is the deepest layer in Field A? *(1 point)*
clay

23) Using the textural triangle on page 2, what texture is the deepest layer in Field B? *(1 point)*
sandy loam

24) Which field would likely be drier one day after it rains? *(1 point)*
Field B

25) Why did you choose your answer for question 24? *(1 point)*
a) horizon names
b) pH and percent rock fragments
c) organic carbon content
d) bulk density and texture

26) Which field would likely transmit more surface water to groundwater? *(1 point)*
Field B

SOIL SURVEY

Use the **Lake Albert Soil Maps** to answers the following questions:

27) At what scale was this soil survey mapped (see Map Information)? *(1 point)* 1:24,000

28) What is the Map Unit Name of map symbol 520? *(1 point)*
Playas

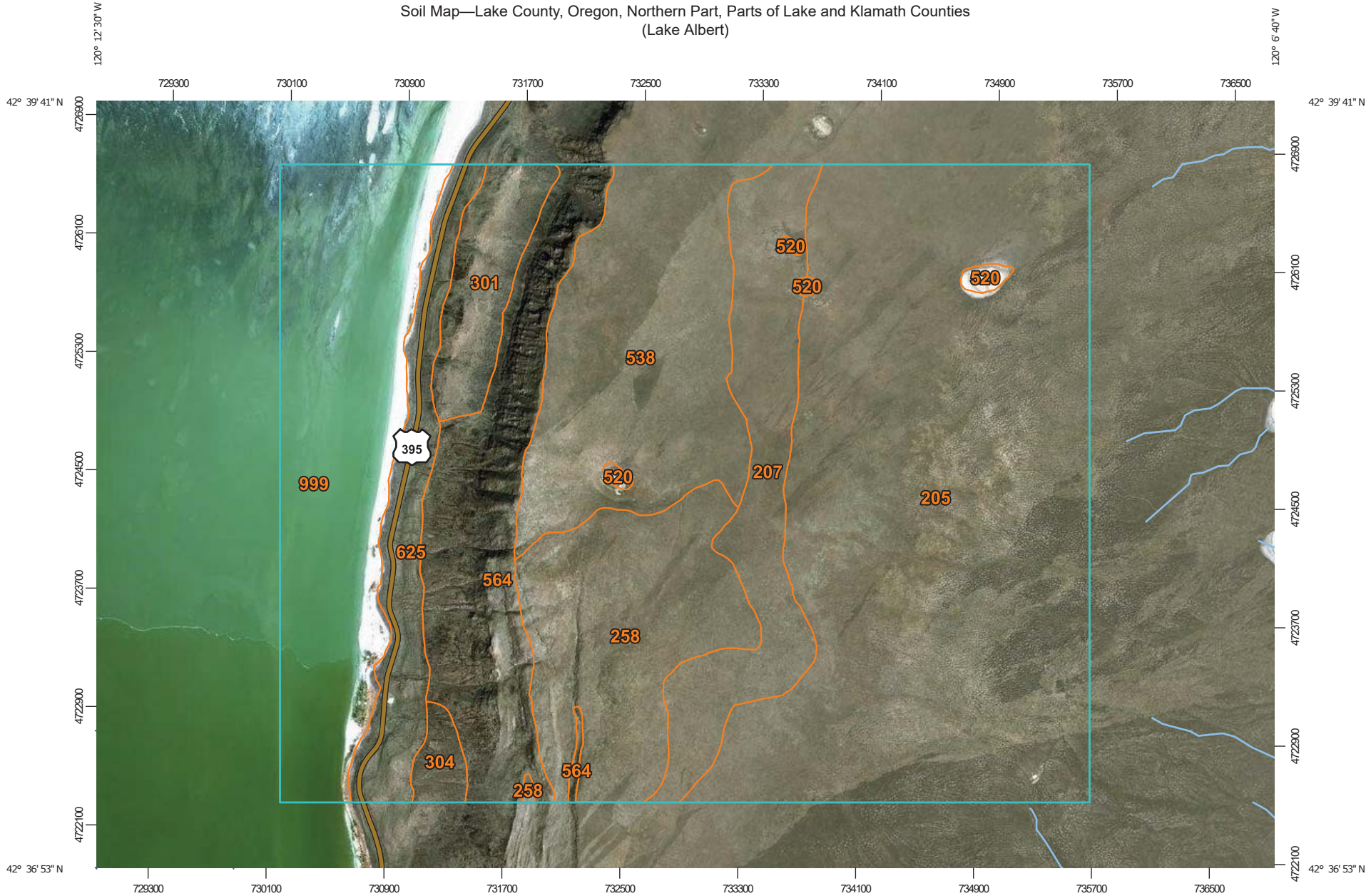
29) What is the saturated hydraulic conductivity (K_{sat}) in micrometers per second for map unit symbol 301? *(1 point)*
9.0000

30) Between soil map unit symbols 205 and 301, which is predicted to have higher pesticide runoff potential? *(1 point)*
301

31) What soil characteristics are likely to explain the different pesticide runoff potentials? *(3 points)*
Acceptable answers include mentions of slope, texture, rock fragment content, bedrock, infiltration, K_{sat}, percolation, ponding, flooding, etc.

32) Based on these soil data, would you treat the lands next to highway 395 with pesticides to combat invasive plant species? Why or why not? *(2 points)*
Acceptable answers include mentions of slope, texture, rock fragment content, bedrock, infiltration, K_{sat}, percolation, ponding, flooding, etc. "yes" or "no" both accepted if they back up their answer with soil data from the map or use creative stipulations like only in dry weather or a certain distance from water bodies. They might also mention that highways are common vectors for invasive species and good places to target treatment.

Soil Map—Lake County, Oregon, Northern Part, Parts of Lake and Klamath Counties
(Lake Albert)



Map Scale: 1:36,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 500 1000 2000 3000

Feet: 0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N 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
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

Soil Survey Area: Lake County, Oregon, Northern Part, Parts of Lake and Klamath Counties
Survey Area Data: Version 16, Sep 11, 2019

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

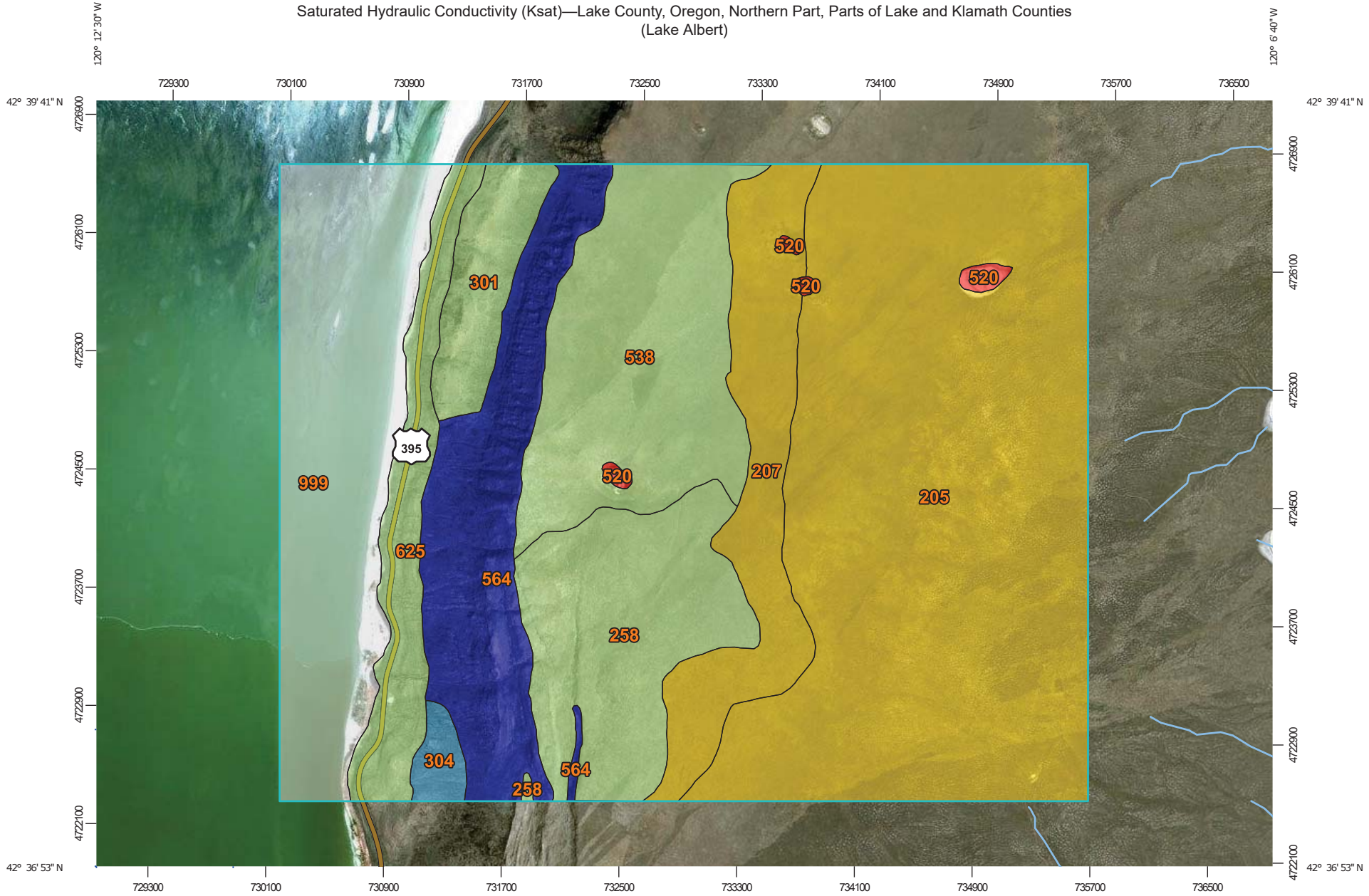
Date(s) aerial images were photographed: Oct 24, 2015—Aug 23, 2016

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
205	Anawalt-Freznik complex, 1 to 5 percent slopes	2,195.0	37.4%
207	Anawalt-Raz complex, 2 to 10 percent slopes	458.9	7.8%
258	Coztur sandy loam, 2 to 15 percent slopes	562.9	9.6%
301	Felcher-Fitzwater-Rock outcrop complex, 20 to 60 percent slopes	186.0	3.2%
304	Felcher-Rock outcrop complex, 15 to 45 percent south slopes	46.6	0.8%
520	Playas	24.4	0.4%
538	Raz-Brace complex, high precipitation, 2 to 20 percent slopes	712.4	12.1%
564	Rock outcrop-Xeric Haplocambids-Rubble land complex, 50 to 90 percent slopes	563.6	9.6%
625	Thompsoncabin-Wildhill complex, 20 to 60 percent slopes	286.8	4.9%
999	Water	837.6	14.3%
Totals for Area of Interest		**5,874.2**	**100.0%**

Saturated Hydraulic Conductivity (Ksat)—Lake County, Oregon, Northern Part, Parts of Lake and Klamath Counties
(Lake Albert)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 0.2100
- > 0.2100 and <= 4.2120
- > 4.2120 and <= 11.0000
- > 11.0000 and <= 13.4000
- > 13.4000 and <= 22.0000
- Not rated or not available

Soil Rating Lines

- <= 0.2100
- > 0.2100 and <= 4.2120
- > 4.2120 and <= 11.0000
- > 11.0000 and <= 13.4000
- > 13.4000 and <= 22.0000
- Not rated or not available

Soil Rating Points

- <= 0.2100
- > 0.2100 and <= 4.2120
- > 4.2120 and <= 11.0000
- > 11.0000 and <= 13.4000
- > 13.4000 and <= 22.0000
- 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 1:24,000.

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

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

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Survey Area Data: Version 16, Sep 11, 2019

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

Date(s) aerial images were photographed: Oct 24, 2015—Aug 23, 2016

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Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
205	Anawalt-Freznik complex, 1 to 5 percent slopes	4.2120	2,195.0	37.4%
207	Anawalt-Raz complex, 2 to 10 percent slopes	3.4920	458.9	7.8%
258	Coztur sandy loam, 2 to 15 percent slopes	10.3936	562.9	9.6%
301	Felcher-Fitzwater-Rock outcrop complex, 20 to 60 percent slopes	9.0000	186.0	3.2%
304	Felcher-Rock outcrop complex, 15 to 45 percent south slopes	13.4000	46.6	0.8%
520	Playas	0.2100	24.4	0.4%
538	Raz-Brace complex, high precipitation, 2 to 20 percent slopes	9.8000	712.4	12.1%
564	Rock outcrop-Xeric Haplocambids-Rubble land complex, 50 to 90 percent slopes	22.0000	563.6	9.6%
625	Thompsoncabin-Wildhill complex, 20 to 60 percent slopes	11.0000	286.8	4.9%
999	Water		837.6	14.3%
Totals for Area of Interest			**5,874.2**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

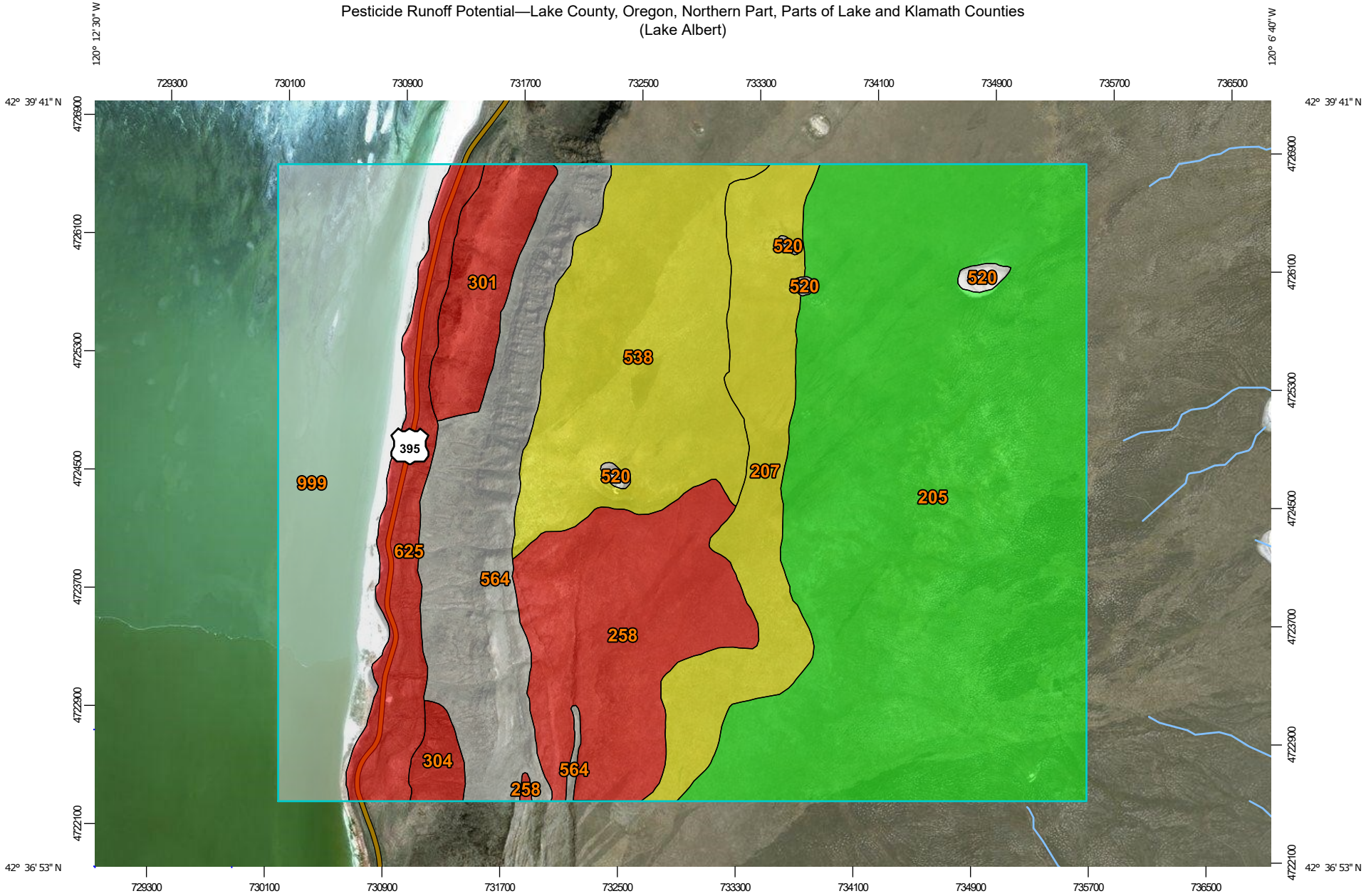
Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 25

Units of Measure: Centimeters

Pesticide Runoff Potential—Lake County, Oregon, Northern Part, Parts of Lake and Klamath Counties
(Lake Albert)



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 1:24,000.

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

Source of Map: Natural Resources Conservation Service
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Pesticide Runoff Potential

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
205	Anawalt-Freznik complex, 1 to 5 percent slopes	Not limited	Anawalt (45%)		2,195.0	37.4%
			Freznik (40%)			
			Sagehen (5%)			
207	Anawalt-Raz complex, 2 to 10 percent slopes	Somewhat limited	Raz (40%)	Excess runoff (0.50)	458.9	7.8%
			Ninemile (5%)	Excess runoff (0.50)		
			Arness (5%)	Excess runoff (0.50)		
			Locane (5%)	Excess runoff (0.50)		
258	Coztur sandy loam, 2 to 15 percent slopes	Very limited	Coztur (85%)	Excess runoff (1.00)	562.9	9.6%
301	Felcher-Fitzwater-Rock outcrop complex, 20 to 60 percent slopes	Very limited	Felcher, south (40%)	Excess runoff (1.00)	186.0	3.2%
			Fitzwater, north (30%)	Excess runoff (1.00)		
			Atlow (5%)	Excess runoff (1.00)		
			Westbutte (5%)	Excess runoff (1.00)		
304	Felcher-Rock outcrop complex, 15 to 45 percent south slopes	Very limited	Felcher, south (70%)	Excess runoff (1.00)	46.6	0.8%
			Fitzwater (5%)	Excess runoff (1.00)		
			Westbutte (5%)	Excess runoff (1.00)		
520	Playas	Not rated	Playas (95%)		24.4	0.4%
538	Raz-Brace complex, high precipitation, 2 to 20 percent slopes	Somewhat limited	Raz, high precipitation (50%)	Excess runoff (0.50)	712.4	12.1%
			Brace, high precipitation (35%)	Excess runoff (0.50)		
			Ninemile (5%)	Excess runoff (0.50)		
			Oreneva (5%)	Excess runoff (0.50)		
564	Rock outcrop-Xeric Haplocambids	Not rated	Rock outcrop (40%)		563.6	9.6%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	-Rubble land complex, 50 to 90 percent slopes		Rubble land (15%)			
625	Thompsoncabin-Wildhill complex, 20 to 60 percent slopes	Very limited	Thompsoncabin (55%)	Excess runoff (1.00)	286.8	4.9%
			Wildhill (30%)	Excess runoff (1.00)		
			Felcher (1%)	Excess runoff (1.00)		
999	Water	Not rated	Water (100%)		837.6	14.3%
Totals for Area of Interest					**5,874.2**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Not limited	2,195.0	37.4%
Somewhat limited	1,171.3	19.9%
Very limited	1,082.3	18.4%
Null or Not Rated	1,425.6	24.3%
Totals for Area of Interest	**5,874.2**	**100.0%**

Description

The ratings for Pesticide Loss Potential-Soil Surface Runoff are used for evaluating and determining the potential of the soil to transmit pesticides through surface runoff and the likelihood of the contamination of surface waters. Ratings are for soils in their natural condition and do not consider present land use. The properties that affect the pesticide loss potential include the occurrence of permafrost, surface ponding, flooding, and slope.

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 have low runoff potential. "Somewhat limited" indicates that the soil has features that are moderately rated for runoff potential. Some runoff can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable and surface runoff is high.

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 that listed for the map unit. The percent composition of each component in a particular map unit is given so that the user will realize the percentage of each map unit that has the specified rating.

A map unit may have other components with different ratings. 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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher