

## **APPENDIX C: CRITICAL AREAS REPORTS FOR DOCKET AND ALTERNATIVE SITES**



# CLARK COUNTY RURAL INDUSTRIAL LANDS BANK

## SITE 1 CRITICAL AREAS EXISTING CONDITIONS, OPPORTUNITIES, AND CONSTRAINTS

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## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION AND OVERVIEW .....</b>	<b>1</b>
1.1	Overall Project Purpose Summary .....	1
1.2	Purpose of This Report .....	2
<b>2</b>	<b>OVERVIEW OF APPLICABLE REGULATIONS AND MAPPED RESOURCES.....</b>	<b>4</b>
2.1	Clark County Critical Areas Code .....	4
2.1.1	Critical Aquifer Recharge (Chapter 40.410) .....	4
2.1.2	Flood Hazard Areas .....	5
2.1.3	Geologic Hazard Areas .....	5
2.1.4	Habitat Conservation .....	5
2.1.5	Wetland Protection—Including Ratings and Buffer Determinations.....	6
2.1.6	Shoreline Management Plan.....	7
2.2	Water Quality and Stormwater .....	7
2.2.1	Water Quality .....	7
2.2.2	Stormwater Management.....	7
2.3	Other Potentially Applicable County Regulations and Requirements .....	8
2.3.1	Forest Practices .....	8
2.3.2	Conservation Areas .....	8
2.4	ESA or Priority Habitat Species Considerations.....	8
<b>3</b>	<b>SITE 1 CRITICAL AREAS AND EXISTING HABITAT CONDITIONS .....</b>	<b>10</b>
3.1	Site Setting .....	10
3.2	Critical Area, Habitat, and Existing Conditions .....	13
3.2.1	Critical Aquifer Recharge Areas .....	13
3.2.2	Geologic Hazards .....	13
3.2.3	Wetlands .....	13
3.2.3.1	Condition and Classification of Potential Wetland Areas .....	14
3.2.4	Presence of Other Important Habitat Types.....	15
3.3	Surface Water .....	17
3.4	Identification of ESA or Priority Species Presence .....	17
<b>4</b>	<b>OPPORTUNITIES AND CONSTRAINTS BASED ON CRITICAL AREAS CONDITIONS AND CURRENT REGULATORY REQUIREMENTS.....</b>	<b>18</b>

**5 REFERENCES .....21**

**List of Tables**

Table 1 Species Presence Noted on Site 1 ..... 12  
 Table 2 Tree Species Identified in Northeast Corner of Site 1 ..... 16

**List of Figures**

Figure 1 Location Map  
 Figure 2 Environmental Constraints Map  
 Figure 3 Critical Aquifer Recharge Areas Map  
 Figure 4 Catchments Map  
 Figure 5 Proposed Conservation Acquisition Areas Map  
 Figure 6 Treatment Lagoons Map  
 Figure 7 Existing Conditions Map

**List of Appendices**

Appendix A USFWS IPAC Species List  
 Appendix B USDA Soils Report

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## LIST OF ACRONYMS AND ABBREVIATIONS

CARA	Critical Aquifer Recharge Area
CCC	Clark County Code
County	Clark County
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
FPA	Forest Practice Application
IPaC	Information, Planning, and Conservation System
LiDAR	Light Detection and Ranging
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetland Inventory
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
RILB	rural industrial land bank
UGA	Urban Growth Area
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington State Department of Fish and Wildlife

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## **1 INTRODUCTION AND OVERVIEW**

This document provides an overview of existing habitat conditions at Site 1 to determine the presence of any designated or potential critical areas in support of the environmental review of Site 1 for the potential establishment of a rural industrial land bank (RILB) in Clark County (County), Washington. Site 1 comprises two properties separated by SR 503, which runs north/south between the properties (Figure 1). The property on the east of SR 503 is 378.71 acres (Lagler Property), and the property to the west of SR 503 is 234 acres (Ackerland Property). Each property comprises a number of parcels that range from 5 to more than 100 acres. Zoning and land use designations for the properties are fully described in the Draft De-Designation Checklist (Berk 2014).

On Tuesday, December 23, 2014, Anchor QEA scientists visited Site 1 (Ackerland and Lagler Properties) for the purposes of documenting existing conditions of habitat and natural resources to perform a Critical Areas Assessment per Clark County Code. The site visit was informed by publicly available information and maps showing potential environmental features and critical areas present on Site 1, as well as a review of County natural resource-focused regulations that may influence the classification or categorization of certain habitat features that may be present on Site 1 (e.g., wetlands and other critical areas and species). The County provides a map of “environmental constraints” for developers that identifies many of these critical areas and habitat features. The County environmental constraints map for the area of Site 1 is shown in Figure 2.

### **1.1 Overall Project Purpose Summary**

The County is considering the establishment of a rural industrial land bank as provided in the Growth Management Act under Revised Code of Washington (RCW) 36.70A.367. The County received a docket application to establish the RILB on Site 1 within the Vancouver Urban Growth Area (UGA).

Presently, the zoning for both properties is Agriculture (AG-20). The zoning requested for approval is Light Industrial. Key steps in this process include identifying locations suited to major industrial use due to proximity to transportation or resource assets, identifying maximum size of the bank area, developing a programmatic environmental review with an

inventory of developable land and alternative sites inside and outside of UGAs, and development of comprehensive plan amendments and development regulations for the land bank.

## **1.2 Purpose of This Report**

This document supports the development of the programmatic environmental review required as part of the evaluation of suitable lands for de-designation as agricultural and inclusion in the UGA as industrial lands. This document provides a description of existing site conditions based on a combination of information gathered during the December 23, 2014 site visit as well as review of other available information. This document also provides an overview of the existing conditions and determines if they would qualify for applicable elements of the County's current critical areas and water quality-related ordinances.

Section 2 summarizes the applicable County critical areas and water quality regulations and standards relevant to Site 1 that would regulate the classification of certain natural resources that may be present on the site, including wetlands and other types of regulated critical areas. This section also identifies the probable critical areas that are mapped on or near the site, based on information from the County (MapsOnline), and describes the information used by the County to create the map information.

Section 3 of this report describes existing habitat conditions encountered at Site 1 during the field visit on December 23, 2014. The determination of habitat and existing conditions encountered during the site visit was further verified with additional information sources (including the De-Designation Checklist and Inventory documents prepared for the RILB). The site visit also provided the opportunity to field-verify the presence of the critical areas that are shown in Figure 2.

Section 4 provides a summary analysis of potential opportunities and constraints for development of Site 1 based on the existing site conditions, including presence of potential critical areas.

This report is intended to support further County planning activity. It provides preliminary information about the presence and absence of potential critical areas and existing conditions of habitat on Site 1. It does not provide a formal wetland delineation, nor does it provide evaluation of local soils for the purposes of establishing feasibility of construction or engineering stability.

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## **2 OVERVIEW OF APPLICABLE REGULATIONS AND MAPPED RESOURCES**

Site 1 is located in Clark County, just outside of the Urban Growth Area (Figure 1). Based on review of the information compiled about Site 1 for the purposes of the De-Listing Checklist (Berk 2014), it was determined that although some critical areas were present on the site, mainly potential wetlands, the presence of other types of critical areas was likely to be low. For example, based on available information, it was presumed that Site 1 had a low potential for providing habitat to Endangered Species Act (ESA)-listed species. For these reasons, and additional site constraints identified for other areas being considered for de-listing, Site 1 was identified as likely having the least constraints.

Applicable regulations considered in the determination of existing conditions included the Clark County Critical Areas Code; surface water quality regulations, including stormwater management requirements; County tree protection requirements; and ESA/Priority Habitat and species presence in the County from lists developed by the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service, and Washington State Department of Fish and Wildlife (WDFW).

### **2.1 Clark County Critical Areas Code**

The Clark County Critical Areas and Shorelines are addressed in Subtitle 40.4 of the Clark County Code (CCC). The Critical Areas Code contains information pertaining to identification of critical aquifer recharge areas (Chapter 40.410), identification of flood hazard areas (Chapter 40.420) and geologically hazardous areas (Chapter 40.430), habitat conservation for fish and wildlife (Chapter 40.440), wetland protection (Chapter 40.450), and the Shoreline Master Program (Chapter 40.460). Because Site 1 consists primarily of disturbed agricultural lands the most pertinent aspects of the Critical Areas Code for the purposes of the existing conditions determination for Site 1 were determined to be wetlands.

#### **2.1.1 Critical Aquifer Recharge (Chapter 40.410)**

The requirements in Chapter 40.410 regulate the types of activities that can be conducted in Critical Aquifer Recharge Areas (CARA). The CARA Category 1 and 2 lands on and around Site 1 were mapped as shown in Figure 3. According to the County map source information,

CARA Category 1 and 2 lands are based on hydrologic soils from U.S. Geological Survey and Group A Zones of Contribution around public well heads.

### **2.1.2 Flood Hazard Areas**

Frequently flooded areas (flood hazard areas) were not identified via available maps for Site 1.

### **2.1.3 Geologic Hazard Areas**

No geologic hazard areas were identified by County GIS to occur on or immediately adjacent to Site 1, although liquefaction may be a concern in the peat soils in the northeast corner of the eastern property of Site 1 (Su [Semiahmoo muck] Soils—See Appendix B for the U.S. Department of Agriculture [USDA] soil report map and data prepared for Site 1).

### **2.1.4 Habitat Conservation**

Habitat conservation areas subject to regulation under Chapter 40.440 are mapped on a countywide basis. The habitat areas pertinent to Site 1 include Riparian Priority Habitat and areas within 1,000 feet of individual species point sites (i.e., Priority Species Buffer). These areas are shown in Figure 2.

Two Riparian Priority Habitat areas are located near Site 1 with small areas of overlap due to buffers. The nearest mapped Riparian Priority Habitat area overlaps slightly with the southeast corner of the property, and is based on buffer widths for open water habitats (Figure 2). The open water habitat is a maintained pond on separate property on the other side of NE 132nd Avenue. The other Riparian Priority Habitat area mapped in the vicinity of Site 1 is connected or adjacent to tributaries to Salmon Creek near the intersection of SR 503 and the railroad tracks on the northern portion of the site (Figure 2). Similar to the southeastern area, this area is separated from Site 1 by a road, NE 149<sup>th</sup> Avenue.

The Priority Species Buffer conservation area shown in Figure 2 is a 1,000-foot buffer around a bald eagle nesting site identified by WDFW. The nest is located on separate adjacent property north of the forested area in the northeast corner of Site 1. The 1,000-foot buffer for this nest is shown to slightly overlap with Site 1 (Figure 2).

### **2.1.5 Wetland Protection—Including Ratings and Buffer Determinations**

Wetlands protection is implemented through CCC 40.450 at the county level. The wetlands identified by County GIS sources are based on the USFWS National Wetland Inventory (NWI). The NWI reports the extent and characterization of the nation's wetlands and deep water habitats based on a combination of Light Detection and Ranging (LiDAR) data and soil information. According to County staff, the County's wetland dataset is primarily derived from NWI data and is the primary resource used for initial determination of potential wetland impacts for development applications. This dataset is updated and supported by field verifications, delineations, and inventories conducted at the local level, such as the 1999 update by the County targeting specific areas of development or conservation (Renfrow 2014). The wetlands mapped by the County's updated NWI dataset are shown as part of the environmental constraints for the site in Figure 2 and do not include any wetlands that have been field verified. The soils for Site 1 were mapped in a soils report prepared by USDA (Appendix B) and were used as a reference for reviewing the wetland maps and site conditions.

CCC 40.450.020 requires the use of Washington State Department of Ecology's (Ecology) 2004 rating system. However, Ecology issued 2014 wetland rating forms for use in western Washington, effective January 1, 2015. Because CCC specifically states that the 2004 rating system is to be used, Ecology will accept use of the 2004 rating system for the County. For the purposes of this evaluation, both the 2004 and 2014 rating forms will be used to evaluate existing conditions of potential wetland areas for purposes of completeness.

In CCC, the classification of the wetland along with the functions provided by the wetland and the class of land use in the vicinity of the wetland are considered in the determination of the appropriate buffer width for wetlands (as in CCC Tables 40.450.030-2, -3 and -4). CCC provides further information about mitigation requirements based on the wetland rating and extent of the wetland buffer. The goal is to compensate for wetland impacts that will occur, after efforts to minimize impacts have been exhausted. The County's preference is for mitigation to occur on site, within the same watershed, or through the purchase of approved

and appropriate mitigation banking credits. The standard wetland mitigation ratios are provided in CCC 40, Table 40.450.040-1.

### **2.1.6 Shoreline Management Plan**

Salmon Creek is northwest of Site 1 and has shorelines managed under the County's Shoreline Management Plan (Contained in Chapter 40.460). The shoreline management areas are generally shown as part of the environmental constraints for the site (Figure 2). None of the designated shoreline zones of Salmon Creek overlap with Site 1.

## **2.2 Water Quality and Stormwater**

Management of water quality and stormwater contributions may be a consideration for development within Site 1. Factors to be considered regarding water quality and stormwater include the presence of CARA Category 2 lands on site (Figure 3); the extensive drainage features of the eastern property within the China Ditch watershed; and the surface water contribution of the western property to Salmon Creek, which is designated critical habitat for ESA-listed salmonids.

### **2.2.1 Water Quality**

CCC Chapter 13.26A governs surface water quality in the County and applies to the discharge of contaminants to surface water, stormwater, and groundwater and requires certain sites and activities to utilize best management practices as set forth in CCC Section 13.26A.035 and stormwater facility maintenance practices set forth in Section 13.26A.040. Based on review of aerial imagery from Google Earth, ponded water often occurs within vegetated pastures of the eastern property. County, state, and federal maps show a drainage connection from the secondary lagoon of the eastern property to the drainage district 5 (China Ditch) ditches. Figure 4 shows the lagoons relative to the local drainage catchments, and Figure 6 shows the connection which appears on the County's maps.

### **2.2.2 Stormwater Management**

CCC Chapter 40.385 (update will be Chapter 40.386) covers stormwater and erosion control and applies to all new development, redevelopment, land disturbing activities, and drainage

projects. The goal of this chapter is to protect surface and groundwater quality for drinking water supply, recreation, fishing, and other beneficial uses. The County will be updating its stormwater code in the next year to comply with its National Pollutant Discharge Elimination System (NPDES) permit. The County indicates that it is pursuing updates, including making low impact development<sup>1</sup> the mandatory approach for stormwater management in site development (Clark County 2014).

## **2.3 Other Potentially Applicable County Regulations and Requirements**

### **2.3.1 Forest Practices**

Forest Practice Applications (FPAs) are regulated through the Washington State Forest Practices Act in RCW 76.09 and CCC 40.260.080. These codes are used to prevent potential adverse impacts from logging on critical areas. The forest practices permit may be applicable to any clearing or development resulting in removal of large stands of trees.

### **2.3.2 Conservation Areas**

County GIS data shows that a portion of the western property has been identified as a potential acquisition for conservation purposes (Figure 5). The data used by the County for this map indicates that this area is based on “Conservation Real Estate Excise Tax (REET) areas identified through overlays of floodplain, wetlands, and priority habitat data” and was documented in 2006 (Clark County GIS 2006). There was no indication found in publicly available County GIS or comprehensive planning documents that an active planning process is in place to move forward with acquisition for conservation purposes.

## **2.4 ESA or Priority Habitat Species Considerations**

A list of ESA-listed and sensitive or priority species known to occur or having the potential to occur in the County was obtained through the USFWS IPaC (Information, Planning, and Conservation System) website. This is a preliminary list of species that should be considered for any development action proposed to occur in the County and not necessarily a list of

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<sup>1</sup> From the updated Stormwater Manual (Clark County 2014; Chapter 40.386): “Low impact development” means a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial, and industrial settings.

species that would likely occur at Site 1 (Appendix A). A preliminary review of this list, based on known habitat requirements for these species, leads to the conclusion that none of the species identified in this list would occur on Site 1. Designated critical habitat for ESA-listed salmon species occurs in Salmon Creek to the north of Site 1.

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### **3 SITE 1 CRITICAL AREAS AND EXISTING HABITAT CONDITIONS**

Prior to completing the site visit, Anchor QEA reviewed the mapping provided in the De-designation checklist, as well as maps created from the County's GIS mapping service (MapsOnline) and Google Earth aerial imagery. The site visit was completed on Tuesday, December 23, 2014. Significant rainfall occurred in the Portland-Vancouver region over the preceding weekend, and ponded water was evident in certain locations throughout the eastern property and, to a lesser extent, the western property.

#### **3.1 Site Setting**

Site 1 is an active dairy, with associated operations occurring on both the eastern and western properties. The dairy operation includes several hundred adult cows, none of which were utilizing pasture during the time of the visit due to wet field conditions. Most of the land in Site 1 is undeveloped and has been in use as a dairy for at least 50 years. The existing buildings and structures on Site 1 properties include buildings related to dairy operations and residences.

There are multiple natural resource areas surrounding Site 1 that were noted but not evaluated as part of this effort. The County has mapped riparian conservation habitat along Salmon Creek, roughly located north and west of Site 1 (Figure 2). This riparian conservation habitat is associated with the shoreline management area and mapped consistent with the County's critical area ordinance habitat conservation areas and shoreline management plan. The area was established to provide riparian and upland habitats for migratory birds, threatened and endangered species, fish, and other resident wildlife. An active bald eagle roost site is adjacent to the forested area in the northeast corner of the eastern property, and the regulated buffer for this site slightly overlaps Site 1 in this northeast corner. In addition, WSDOT owns a stormwater management feature just off site of the southern portion of the parcel on the eastern side of SR 503 (Figure 4).

The land within Site 1 consists of varied subtle topography, with the eastern parcel having more varied topography approaching SR 503, and the western parcel being more predominantly flat. The site elevations range from approximately 290 feet at the eastern edge to 294 feet at the western edge. The properties of Site 1 drain to two different drainage basins; the western property drains to the Salmon Creek watershed, and the eastern property primarily drains to the

China Ditch system. As previously mentioned, SR 503 runs generally north-south and divides the two properties. There is a railroad line that bisects the western property on an approximately north-south alignment. No other right of way or public roads bisect the properties, but there are access paths created by farm equipment through ongoing use.

The vegetation present around Site 1 is generally typical of land that has been in cultivation or utilized as livestock pasture for decades. The eastern and western properties are operated together as the Lagler dairy. The Lagler dairy provides its milk products to the Tillamook Cooperative. The western (Ackerland) property provides hay/silage for animal feed, and the dairy operations, hay production, and pasturing occurs on the eastern (Lagler) property. The vegetation across all of Site 1 is predominantly cultivated species used for pasture, hay, and silage. There is a small, forested area in the northeast corner of the eastern property, which is described in more detail in Section 3.2.4. A few trees and primarily weedy non-natives (e.g., blackberry) are growing in the ditches alongside SR 503 and the railroad alignment.

Many of the adjacent or neighboring parcels to the north, west, and east are either active farmlands, large parcel residences, or other open space. These parcels have similar, or better, natural habitat values. The cultivated fields and pasture areas of Site 1 and surrounding areas likely provide habitat for a typical suite of mammals associated with rural and agricultural lands, including mice, voles, skunk, raccoon, coyote, and opossum. Deer, songbirds, raptors, waterfowl, and small mammals likely utilize Site 1, as well as adjacent and surrounding agricultural lands, for foraging and resting or as travel corridors between habitat associated with Salmon Creek and larger wetland areas. Properties to the south are generally more developed because they are in or near the urban growth boundary and are, therefore, less likely to provide similar habitat value.

Concentrations of waterfowl may be found throughout the region at certain times of the year, and some of these bird species may also make use of the agricultural fields, wet areas, ponds, and drainage ditches on and adjacent to Site 1.

Table 1 identifies wildlife species identified through visual observation, calls, or other evidence noted during the site visit.

**Table 1**  
**Species Presence Noted on Site 1**

<b>Common Name</b>	<b>Species Scientific Name</b>
Canada Goose	<i>Branta canadensis</i>
Mallard	<i>Anas platyrhynchos</i>
Northern Pintail	<i>Anas acuta</i>
Green-winged Teal	<i>Anas crecca</i>
Northern Harrier	<i>Circus cyaneus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Wilson's Snipe	<i>Gallinago delicata</i>
Rock Pigeon	<i>Columba livia</i>
Mourning Dove	<i>Zenaida macroura</i>
Anna's Hummingbird	<i>Calypte anna</i>
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>
American Kestrel	<i>Falco sparverius</i>
Western Scrub-Jay	<i>Aphelocoma californica</i>
Northwestern Crow	<i>Corvus caurinus</i>
Common Raven	<i>Corvus corax</i>
Barn Swallow	<i>Hirundo rustica</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>
Bushtit	<i>Psaltriparus minimus</i>
Pacific Wren	<i>Troglodytes pacificus</i>
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
European Starling	<i>Sturnus vulgaris</i>
Spotted Towhee	<i>Pipilo maculatus</i>
Song Sparrow	<i>Melospiza melodia</i>
Dark-eyed Junco	<i>Junco hyemalis</i>

<b>Evidence of Species</b>	<b>Species Scientific Name</b>
Coyote scat and fur	<i>Canis latrans</i>
Owl pellets (Barred or Great Horned due to size)	<i>Strix varia/Bubo virginianus</i>
Deer scat	<i>Odocoileus hemionus columbianus</i>
Deer browse and tree rubs	<i>Odocoileus hemionus columbianus</i>
Nutria burrows	<i>Myocastor coypus</i>

## **3.2 Critical Area, Habitat, and Existing Conditions**

This section discusses the critical areas that were mapped on Site 1, as well as other important features relevant to determining existing conditions. Regulated critical areas that were not mapped to occur on Site 1 are not specifically described here (such as frequently flooded areas).

### **3.2.1 Critical Aquifer Recharge Areas**

The pastures and fields of Site 1 are extensively managed to control surface water through drain tile in certain parcels (per description provided by property owner) and maintenance of the District 5 drainage system on the eastern property. The property owner also actively manages nutrients through containment and reapplication of manure on site according to permitted conditions. The property owner acknowledged use of herbicides on the pasture and hay-growing fields, which should be further evaluated for impacts in future site investigations. Site 1 land use appears to be consistent with requirements for the Category 2 designated CARA lands.

### **3.2.2 Geologic Hazards**

As mentioned in Section 2, liquefaction may be a concern in the peat soils (Semiahmoo muck) in the northeast corner of Site 1 (as shown in soil maps in Appendix B). The presence of these soils in this area was confirmed during the site visit by visual observation of vegetation community patterns as well as soil augering to a depth of 46 inches.

### **3.2.3 Wetlands**

The County wetland mapping (Figure 2) identified numerous wetland features on both parcels of Site 1. The eastern property, in particular, is actively managed to limit the ponding of surface water and promote drainage through soil leveling and clearing drainage ditches. There are also drainage features located on the western property, but these appear to require less maintenance.

Based on the high level of disturbance throughout Site 1 due to ongoing agricultural practices and management of surface water through drainage ditches and drain tile, most of the

wetland areas identified from the County via NWI sources and presented in Figure 2 did not appear to have wetland soils, hydrology, or vegetation during the site visit, nor upon review of several years' worth of aerial imagery. Additional data collection or formal delineations should be conducted to confirm presence or absence of wetlands and determination of wetland boundaries.

Two large ponded water areas exist on the eastern property near the barns and are shown in Figure 2 as the largest wetland area. These ponded areas are associated with manure management practices, which the property owner indicated is essentially a closed loop system, with water and solids being reapplied to fields or other on-site uses. The smaller of the ponded areas serves as the primary treatment lagoon, and the larger is the secondary treatment lagoon (Figure 4). The property owner indicated that the secondary lagoon was initially a pond that was excavated prior to use decades ago and that the bottom is entirely clay, preventing any infiltration. The primary treatment lagoon is a man-made feature, constructed more recently. It is an elevated containment basin, configured to allow for lining material (clay material sources on site) and placement above the water table. Water from the lagoons may be utilized for flushing the manure from the barns and may also be applied to pasture lands. Solids from the treatment lagoons are excavated every other year and applied to pasture and hay fields. Prior to conveyance to the treatment lagoons, some manure solids bypass the lagoons and are composted, for use on site or for sale. The secondary lagoon may have a connection to the drainage ditches of China Ditch/Drainage District 5 based on mapping (Figure 6), but no visual connection was observed during the site visit

### *3.2.3.1 Condition and Classification of Potential Wetland Areas*

As previously mentioned, due to the intensity of land management at Site 1, wetlands as mapped in the NWI and County dataset appeared significantly different than conditions encountered in the field, where the distribution of potential wetland areas appeared much more limited.

Based on the conditions encountered during the field visit, the Site 1 USDA soils report (Appendix B) was used to further inform the identification of areas that were more likely to

have wetland characteristics. Isolated patches of Semiahmoo muck are found within the parcel east of SR 503. McBee Silt Loam is very common and borders most of the muck patches. As noted in the USDA soils report in Appendix B, McBee Silt Loam is suitable for agriculture if well drained or modified, and the site visit and communication with the property owner indicate that this area is both drained and modified. The property owner identified parcels where drain tiles had been installed, and these correspond to most of the McBee Silt Loam areas mapped in the soils report.

Figure 7 identifies areas that appeared to have potential wetland features based on the information gathered during the field visit, information on soil types, and review of aerial imagery. There may be potential wetlands associated with muck soils on the eastern property adjacent to drainage ditches. These would likely be categorized as Depressional Category III wetlands (46 points using the 2004 rating system; 18 points using the 2014 rating system<sup>2</sup>). Potential wetland areas associated with McBee Silt Loam and not connected to ditches as shown in Figure 7 would likely be categorized as Depressional Category III wetlands (36 points using the 2004 rating system; 16 points using the 2014 rating system). None of the potential wetlands identified in Figure 7 would rate well for habitat function or water quality. However, these ratings are preliminary and subject to change based on a formal delineation of the site and additional information, such as the downstream basin flood regime. Further site study will be required to make definitive determinations on wetland presence or absence, as well as potential wetland boundaries for the determination of wetland buffer widths.

The open water ponds utilized for manure management should also be delineated and rated separately. This process would be supported through more definitive information about their underlying soils, drainage, and overall function.

### **3.2.4 Presence of Other Important Habitat Types**

The forested area in the northeast corner of the eastern property is a mature forest, which includes a number of deciduous and coniferous tree species (Table 2). Most of the tree

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<sup>2</sup> As previously noted, both the 2004 and 2014 rating forms were used based on the codified requirement to use the 2004 wetland rating version.

species are native species that would likely occur at this location and some tree species were planted by the property owner. Within the mature forest patch is a grove of Oregon white oaks (*Quercus garryana*). The number of oak trees and the size of some of the oaks (greater than 25-inches diameter at breast height) may qualify this area as an oak woodland and possibly a Non-Riparian Priority Habitat and Species (PHS) area as defined by WDFW.

The size and number of conifers present in the northeast corner of the eastern property of Site 1 may require a Forest Practices Permit for future development actions, and the species composition and individual tree size and condition should be documented in a future site assessment. The size of these trees may also trigger mitigation requirements for removal if they are determined to be located within a wetland buffer. There is also a grove of oak trees adjacent to and within this stand that requires additional assessment and survey because the size of the individual trees would trigger a preservation/mitigation plan if they were proposed to be removed.

**Table 2**  
**Tree Species Identified in Northeast Corner of Site 1**

<b>Species Common Name</b>	<b>Species Scientific Name</b>
Big-leaf maple	<i>Acer macrophyllum</i>
Red alder	<i>Alnus rubra</i>
Cottonwood	<i>Populus trichocarpa/balsamifera</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
Oregon white oak	<i>Quercus garryana</i>
Redwood	<i>Sequoia sempervirens</i>
Giant sequoia	<i>Sequoiadendron gigantea</i>
Western red cedar	<i>Thuja plicata</i>
Western hemlock	<i>Tsuga heterophylla</i>

This forested area likely provides nesting and denning habitat to birds and small mammals and is likely used by other wildlife as it presents refuge and foraging opportunities along potential movement, foraging, or migration corridors. This area may be strongly suited for potential use as a mitigation area for other on-site impacts.

### **3.3 Surface Water**

According to the property owner, the site is extensively drained as noted above. Drain tiles may be located under most of the McBee Silt Loam and muck soils in the north and east of the eastern property. Drain tiles were also installed in one drainage swale of the western property. The area managed with drain tiles, as described by the property owner during the field visit, is shown in Figure 7. Ponded water was noted particularly in paddocks on the eastern parcel, where cattle compaction of soils might be an issue.

Nutria burrows and potential dens were observed in and near the Drainage District ditches. Nutria may have a detrimental impact to water quality and native plants due to erosion and contribution of additional soils to the runoff from adjacent wetlands and uplands.

### **3.4 Identification of ESA or Priority Species Presence**

No ESA or priority species are known to utilize habitat in Site 1 for breeding or roosting habitat based on PHS mapping. As noted in Section 2, a bald eagle nest is shown on PHS maps occurring in a stand of trees to the north of Site 1 (off site; Figure 2), and this was noted by the property owner. A list of the species noted during the site visit is provided in Table 1.

The western property of Site 1 drains to the Salmon Creek basin, which is designated critical habitat for ESA-listed salmon species. Drainage swales and culverts were noted during the site visit, and the connection to Salmon Creek appears to remain intact. Development within the western property, particularly development that creates new impervious surface with runoff, may trigger ESA Section 7 review due to this hydrological connection.

---

#### **4 OPPORTUNITIES AND CONSTRAINTS BASED ON CRITICAL AREAS CONDITIONS AND CURRENT REGULATORY REQUIREMENTS**

Based on the review of available information about the site and the conditions encountered in the field, existing conditions of Site 1 are generally consistent with conditions expected to be encountered in a well-maintained operational agricultural site. The primary potential impact to critical areas and existing habitat from development at Site 1 would be the fill of wetlands and development of impervious surfaces draining to Salmon Creek. The existing conditions of some potential wetland areas identified during the site visit indicate that certain wetland areas on Site 1 would be well suited to restoration; therefore, on-site mitigation of potential wetland impacts could be considered, and implementation of low impact development standards and other stormwater best management practices could limit any potential concerns related to Salmon Creek.

While the County wetlands mapping shows numerous depressional wetland features scattered across much of the site, it is likely that actual delineated wetland area may be significantly less concentrated throughout the site, as shown in Figure 6; however, the extent of wetlands on Site 1 cannot be determined without completion of a full wetland delineation. Filling wetlands and wetland buffers at Site 1 would impact surface water quality and, to a lesser extent, habitat functions. Due to classification of the wetlands that would likely be delineated for Site 1 (Category III), wetland buffers of 40 to 60 feet would likely be established based on current site use. Mitigation would be required for future development-related impacts to wetlands and wetland buffers. It is possible, given site conditions, that impacts to wetlands on the site could be minimized through site design considerations, pursuant to the requirements of CCC. Unavoidable impacts can be offset through compensatory mitigation.

The wetland/forest area in the northeast corner of Site 1 is highly suited for restoration and could provide an opportunity to offset impacts to wetlands elsewhere on site, particularly given the County's preference for on-site mitigation. In addition, there are numerous wetland mitigation banks in southwest Washington and the County, with additional banks in the planning stages. While CCC indicates a preference for compensatory mitigation of wetland impacts to occur on site, there would likely be wetland mitigation banks with

suitable credits available for purchase at the time of future development and a combination of on-site and bank credits would likely fulfill mitigation requirements.

Should the future development plans for Site 1 include clearing or other disturbance within the northeast forested area, additional regulatory review may be required and certain characteristics of this area may need to be more fully described and documented to determine whether this area contains Priority Habitat based on WDFW and County definitions. The County's initial review indicated the following:

1. The northeastern patch of forest is approximately 6.9 acres in size; therefore, it does not meet the size threshold to meet the definition of Old Growth/Mature Forest Priority Habitat. The understory can be characterized as degraded as a result of grazing. This grazing has altered the area to the extent that the forested area does not meet the County's definition of Biodiversity Areas and Corridors.
2. The western portion of this forest is likely to contain wetland buffers, which would be protected critical areas.
3. In "Urbanizing Areas," individual oaks of significant size or in a mature age class, or groups of oaks that form stands with at least 25% canopy cover of Oregon White Oak, meet the definition of Oregon White Oak Woodlands Priority Habitat. Other tree species that are associated with Oregon White Oaks or White Oak stands may also be included in the habitat area. Based on the proximity of the site to the UGA and the purpose of the study, WDFW would likely classify the site as an "urbanizing area" for the purpose of designating Oregon White Oak Woodland Priority Habitat.
4. Any forest practice on the site would likely be classified as a Class IV G, which would need to comply with the County's Critical Areas ordinances; unless the property is in, and intended to remain in, either Designated Forest Land or Current Use Timber property tax status.

Based upon the County's characterization, this area should be more fully surveyed for tree size and canopy cover to determine whether the site may be designated Oregon White Oak Woodland Priority Habitat and to determine the appropriate compliance requirements under the County's Critical Areas ordinances.

Future development in Site 1 that creates new impervious surfaces may be subject to implementation of low impact development standards for the management of stormwater contributions. The County is currently preparing updates to their NPDES stormwater municipal permit manual, and the County's stormwater municipal permit is in effect through 2018. There may be an opportunity to maintain the existing manure management lagoon system and utilize it for stormwater management, pending a formal delineation and rating of these features.

Development in the western property that results in new impervious surface may trigger ESA Section 7 consultation due to the hydrologic connections to Salmon Creek, which is designated critical habitat for protected salmon species. On-site treatment and infiltration of stormwater may be preferable on this property, pending requirements associated with the County's stormwater manual as well as requirements related to CARA Category 2 lands that occur on this property.

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## 5 REFERENCES

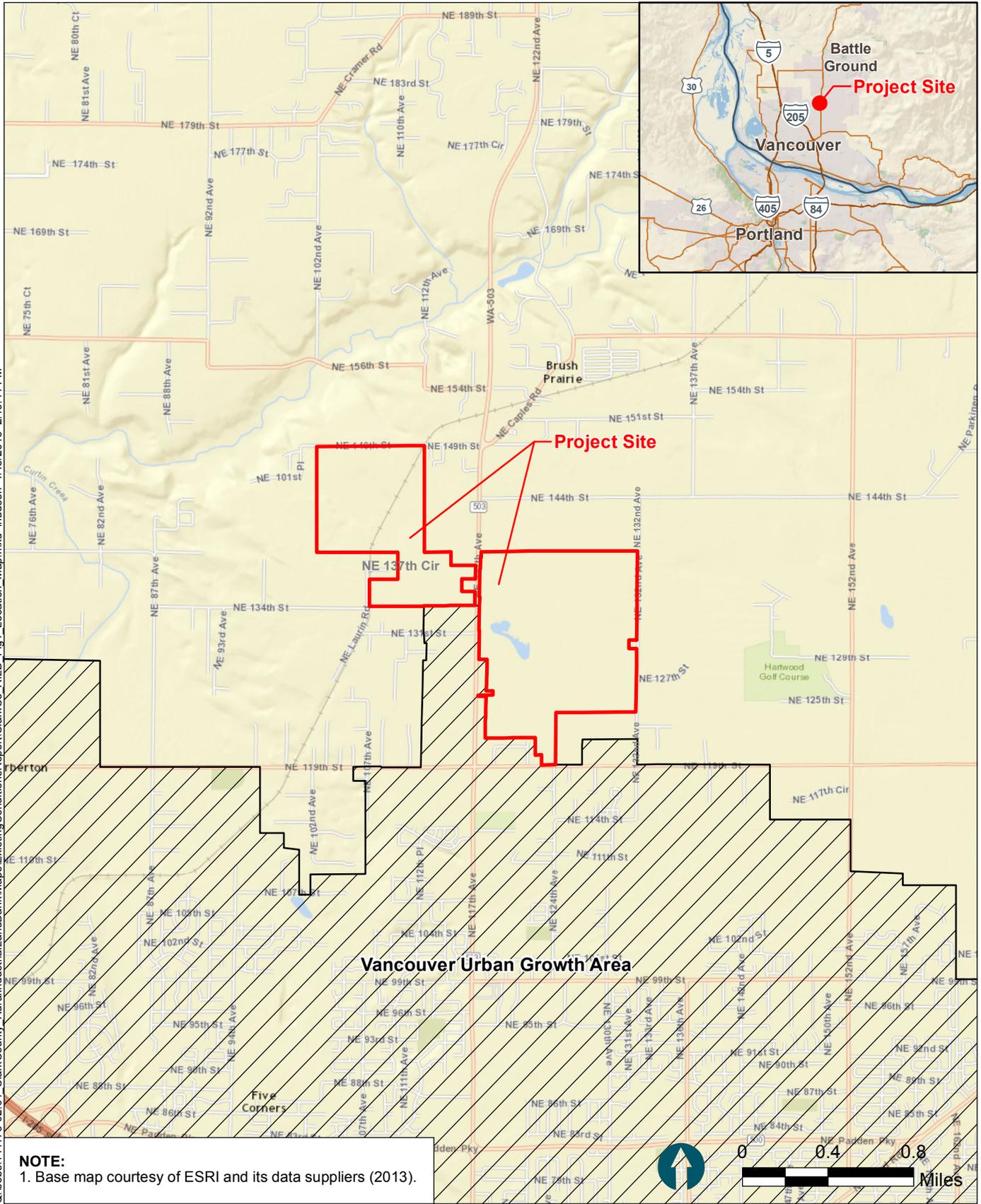
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- Renfrow, Brent, 2014, YEAR. Personal communication with Joe Pursley, Anchor QEA. Brush Prairie, Washington, STATE.



# FIGURES

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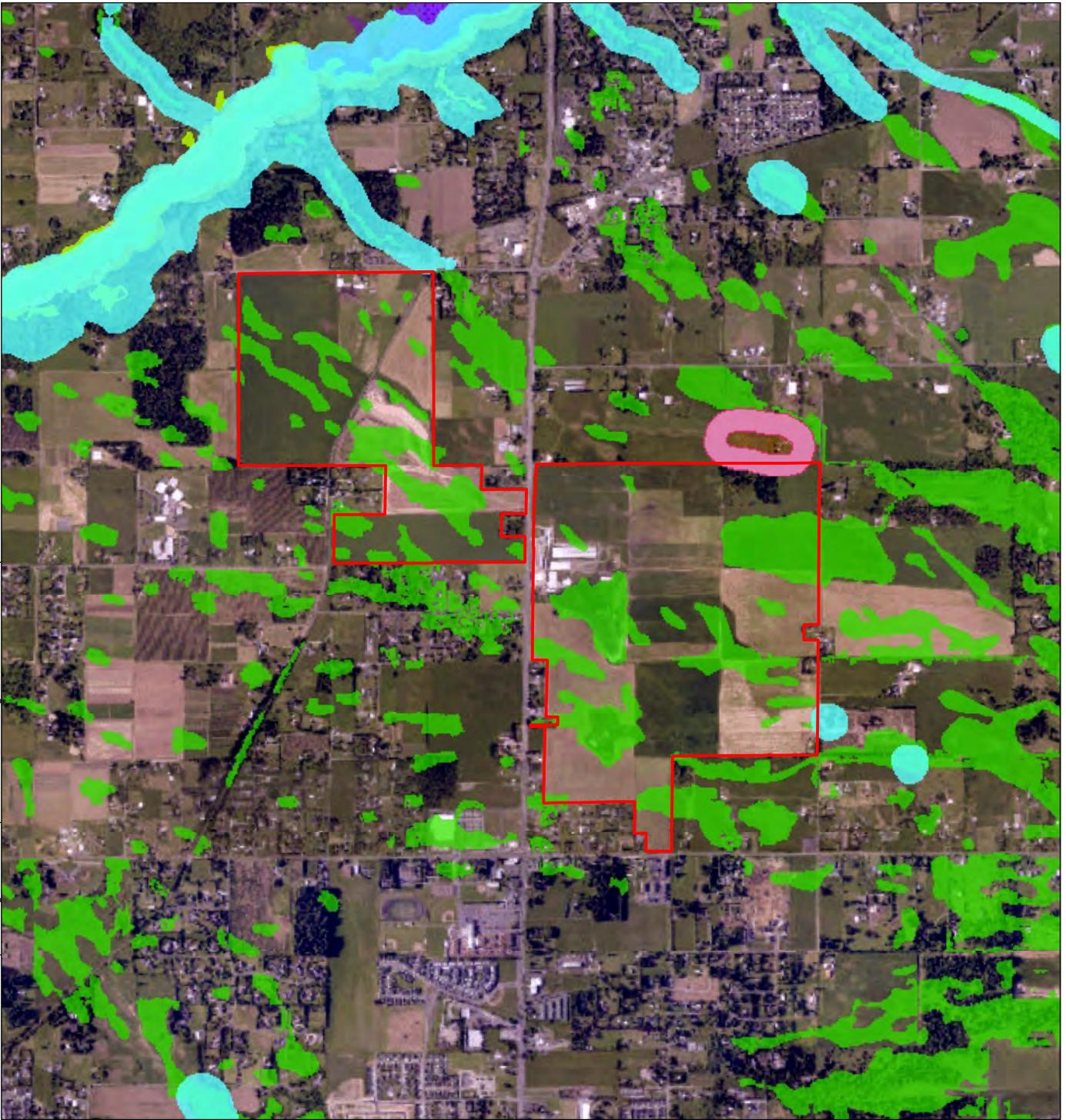


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**Figure 1**  
Location Map  
Site 1 Existing Conditions Report  
Clark County Rural Industrial Lands Bank

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- Project Site Boundary
- Wetlands Presence
- Priority Species Buffer

**Priority Habitat and Species**

- Non-Riparian Habitat Conservation Area
- Species Area
- Riparian Habitat Conservation Area

**Shoreline Designation**

- Rural Conservancy Residential
- Rural Conservancy Resource Land

**NOTE:**  
 1. Background image acquired from Clark County, WA. GIS "Maps Online" website (accessed January 2015). Map image is georeferenced.

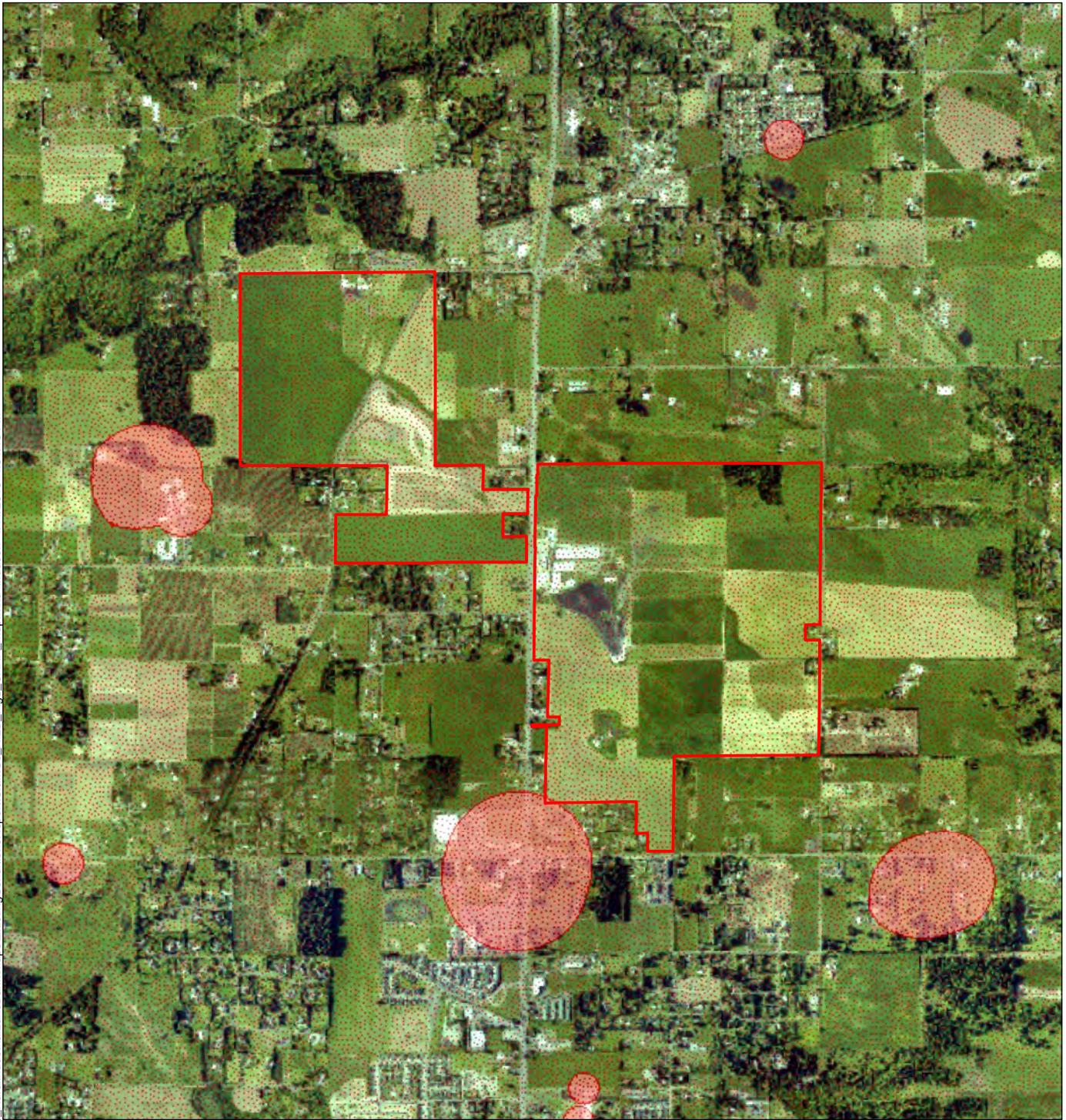


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**Figure 2**  
 Environmental Constraints Map  
 Site 1 Existing Conditions Report  
 Clark County Rural Industrial Lands Bank

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 Project Site Boundary

**Critical Aquifer Recharge Area**

 Category 1 Recharge Area

 Category 2 Recharge Area

**NOTE:**

1. Background image acquired from Clark County, WA. GIS "Maps Online" website (accessed January 2015). Map image is georeferenced.



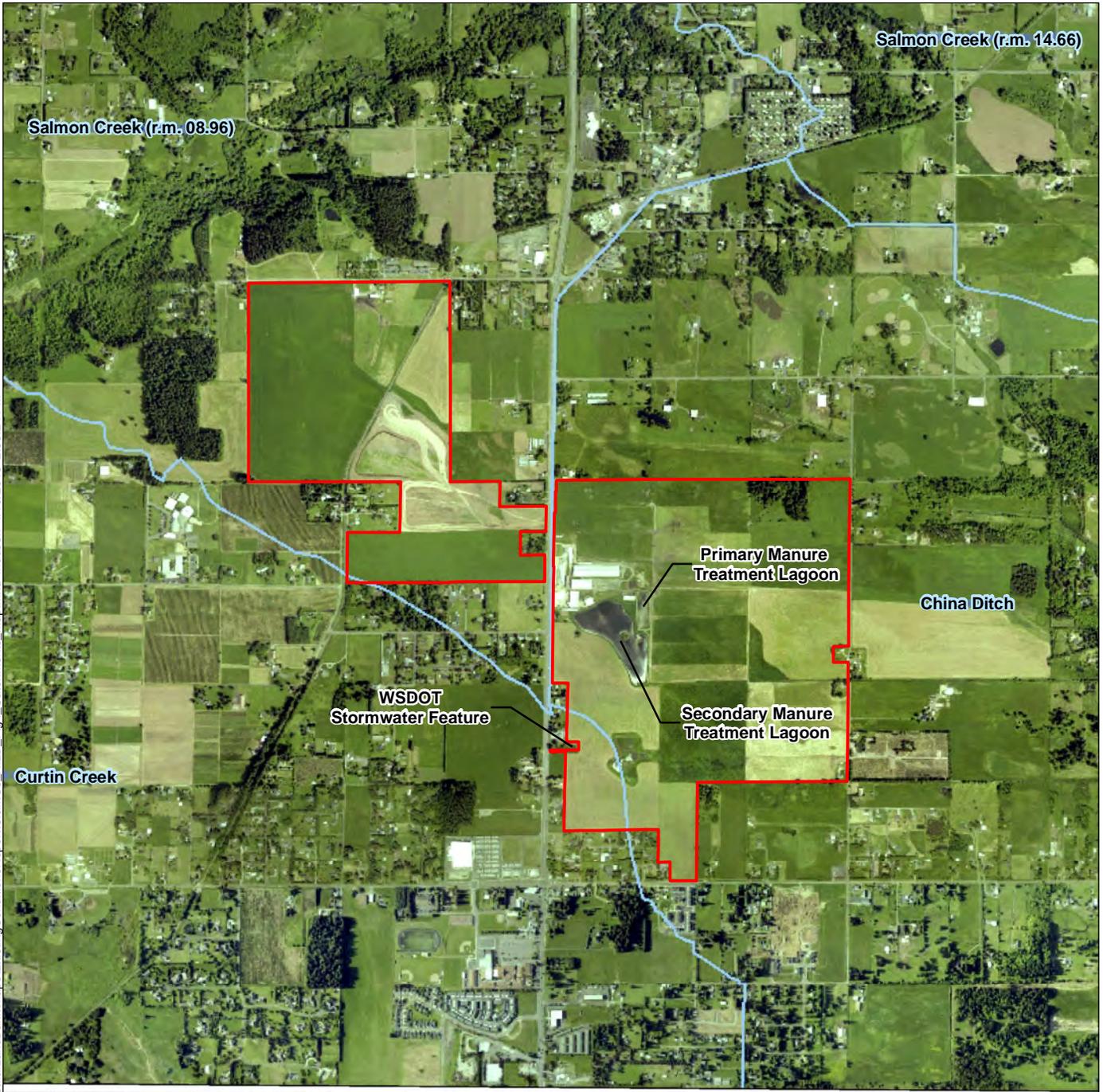
0 0.25 0.5  
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**Figure 3**  
Critical Aquifer Recharge Areas Map  
Site 1 Existing Conditions Report  
Clark County Rural Industrial Lands Bank

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Miles

This map was generated by Clark County. Clark County does not warrant the accuracy, reliability, or completeness of this map, and shall not be held liable for any errors or omissions.

- Project Site Boundary
- Sub-Watershed

**NOTE:**  
 1. Background image acquired from Clark County, WA. GIS "Maps Online" website (accessed January 2015). Map image is georeferenced.

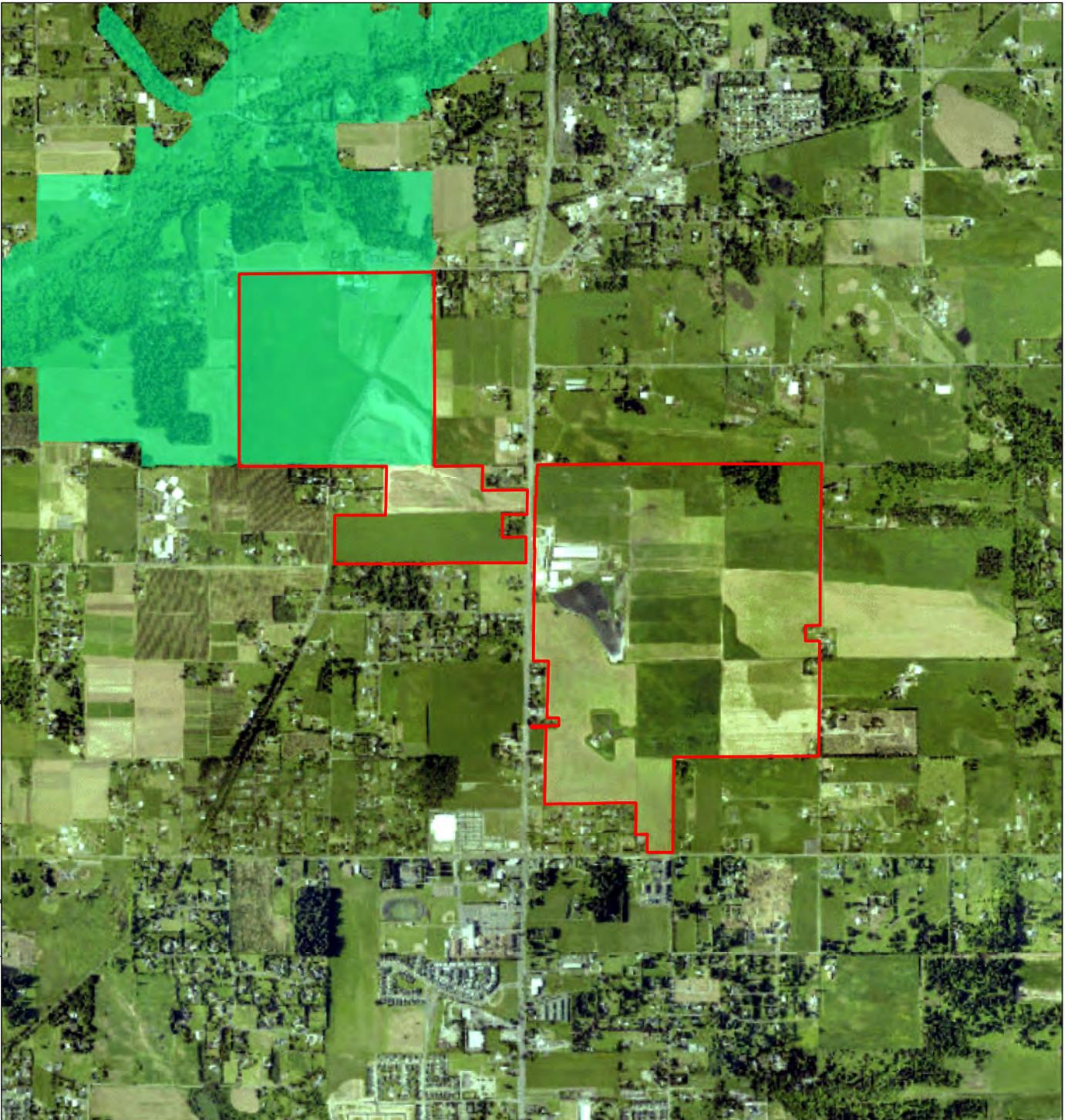


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**Figure 4**  
 Catchments Map  
 Site 1 Existing Conditions Report  
 Clark County Rural Industrial Lands Bank

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-  Project Site Boundary
-  Conservation Plan Acquisition

**NOTE:**  
1. Background image acquired from Clark County, WA. GIS "Maps Online" website (accessed January 2015). Map image is georeferenced.

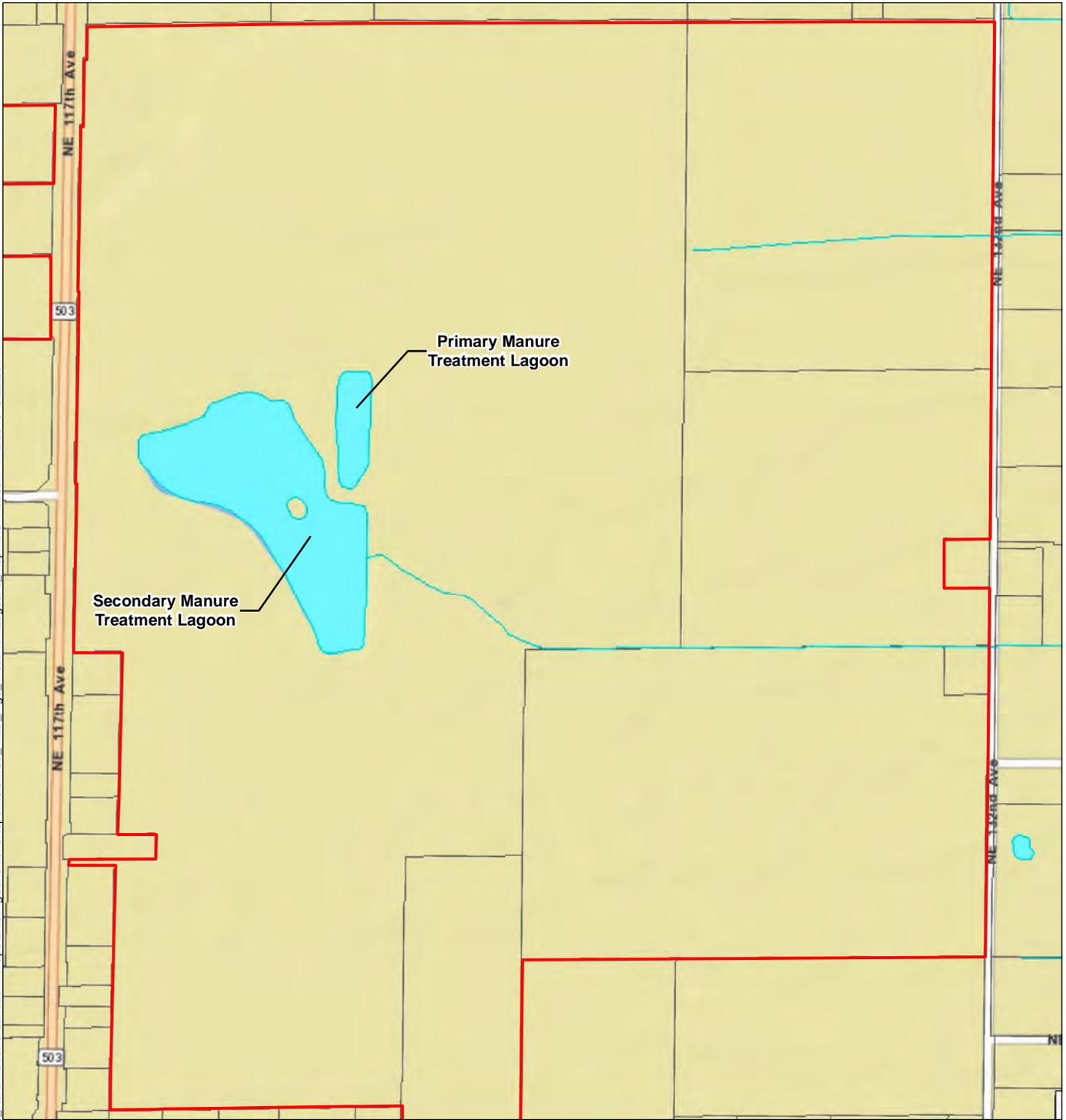


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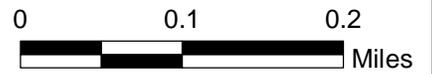
**Figure 5**  
Proposed Conservation Acquisition Areas Map  
Site 1 Existing Conditions Report  
Clark County Rural Industrial Lands Bank

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-  Project Site Boundary
-  Treatment Lagoon
-  Stream

**NOTE:**  
1. Background image acquired from Clark County, WA. GIS "Maps Online" website (accessed January 2015). Map image is georeferenced.

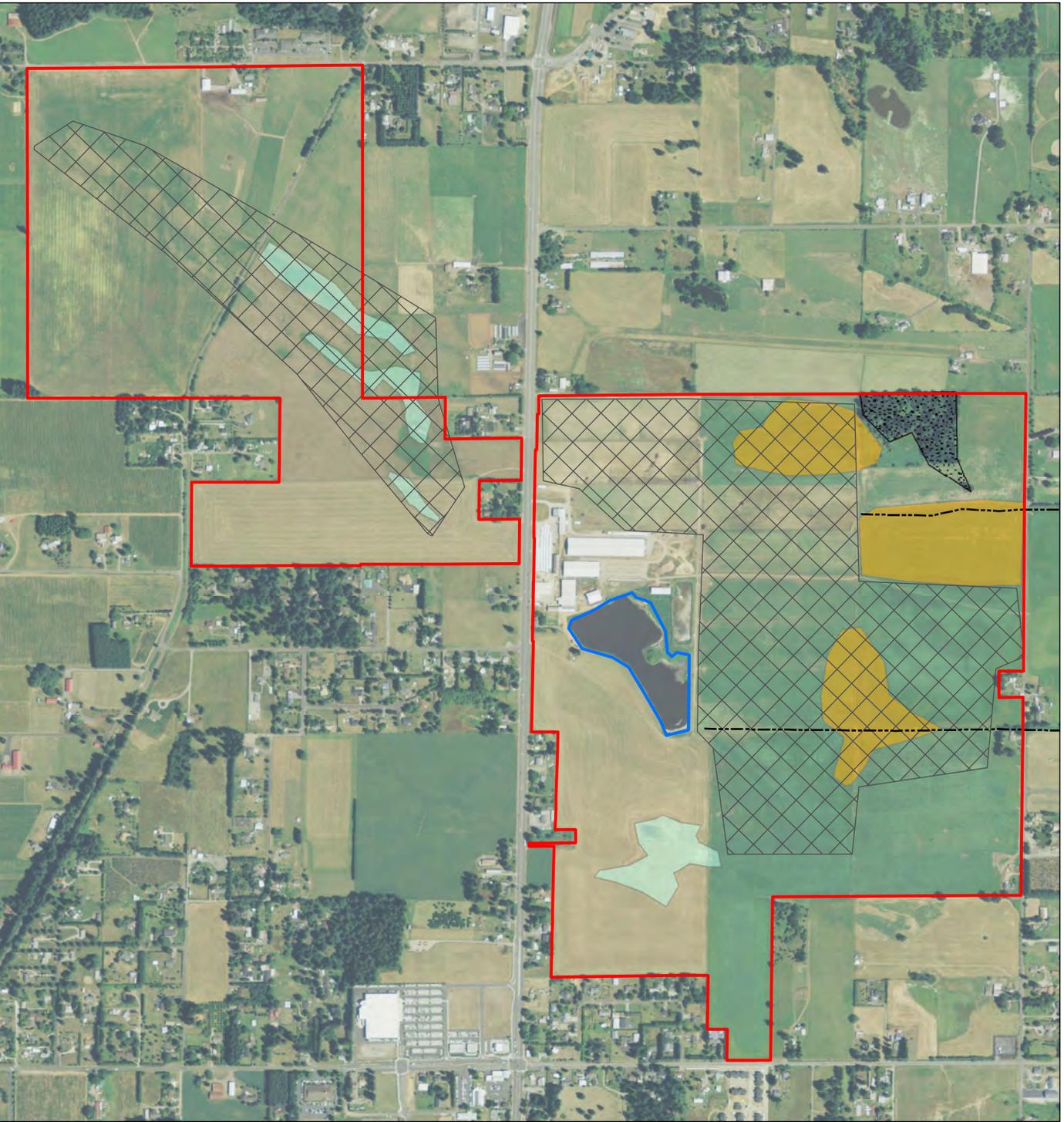


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**Figure 6**  
Treatment Lagoons Map  
Site 1 Existing Conditions Report  
Clark County Rural Industrial Lands Bank

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- |                       |  |                                   |
|-----------------------|--|-----------------------------------|
| Project Site Boundary | Approximate Sub-Surface Drain Tile Field | Potential Wetland                 |
| Drainage Ditch        | Mature Forest/White Oak Grove            | Potential Wetland with Muck Soils |
| Historic Pond/Wetland | Potential Wetland with Muck Soils        |                                   |

**NOTE:**  
1. Aerial imagery acquired from USDA NAIP (2013).



**DRAFT**



**Figure 7**  
Existing Conditions Map  
Site 1 Existing Conditions Report  
Clark County Rural Industrial Lands Bank

APPENDIX A  
USFWS IPAC SPECIES LIST

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U.S. Fish and Wildlife Service

## Trust Resources List

**This resource list is to be used for planning purposes only — it is not an official species list.**

**Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:**

**Washington Fish and Wildlife Office**  
510 DESMOND DRIVE SE, SUITE 102  
LACEY, WA 98503  
(360) 753-9440  
<http://www.fws.gov/wafwo/>

***Project Name:***

Clark County RILB



U.S. Fish and Wildlife Service

## Trust Resources List

### *Project Location Map:*



### *Project Counties:*

Clark, WA

### *Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):*

MULTIPOLYGON (((-122.5742135 45.7269152, -122.5353322 45.7264958, -122.5365338 45.7078555, -122.5746383 45.7078555, -122.5742135 45.7269152)))

### *Project Type:*

Land - Clearing



## Trust Resources List

### ***Endangered Species Act Species List (USFWS Endangered Species Program).***

There are a total of 9 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

#### **Species that should be considered in an effects analysis for your project:**

Amphibians	Status		Has Critical Habitat	Contact
Oregon Spotted frog ( <i>Rana pretiosa</i> )	Threatened	<a href="#">species info</a>	<a href="#">Proposed critical habitat</a>	Washington Fish And Wildlife Office
<b>Birds</b>				
Streaked Horned lark ( <i>Eremophila alpestris strigata</i> ) Population:	Threatened	<a href="#">species info</a>	<a href="#">Final designated critical habitat</a>	Washington Fish And Wildlife Office
Yellow-Billed Cuckoo ( <i>Coccyzus americanus</i> ) Population: Western U.S. DPS	Threatened	<a href="#">species info</a>	<a href="#">Proposed critical habitat</a>	Washington Fish And Wildlife Office
<b>Fishes</b>				
Bull Trout ( <i>Salvelinus confluentus</i> ) Population: U.S.A., conterminous, lower 48 states	Threatened	<a href="#">species info</a>	<a href="#">Final designated critical habitat</a>	Washington Fish And Wildlife Office
<b>Flowering Plants</b>				
Bradshaw's desert-parsley ( <i>Lomatium bradshawii</i> )	Endangered	<a href="#">species info</a>		Washington Fish And Wildlife Office



## Trust Resources List

Golden Paintbrush ( <i>Castilleja levisecta</i> )	Threatened	<a href="#">species info</a>		Washington Fish And Wildlife Office
Water howellia ( <i>Howellia aquatilis</i> )	Threatened	<a href="#">species info</a>		Washington Fish And Wildlife Office
Mammals				
Columbian White-Tailed deer ( <i>Odocoileus virginianus leucurus</i> ) Population: Columbia River DPS	Endangered	<a href="#">species info</a>		Washington Fish And Wildlife Office
Gray wolf ( <i>Canis lupus</i> ) Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, VA, VT, WI and WV; those portions of AZ, NM, and TX not included in an experimental population; and portions of OR, UT, and WA. Mexico.	Endangered	<a href="#">species info</a>		Washington Fish And Wildlife Office

### Critical habitats within your project area:

*There are no critical habitats within your project area.*

### ***FWS National Wildlife Refuges ([USFWS National Wildlife Refuges Program](#)).***

*There are no refuges found within the vicinity of your project.*

### ***FWS Migratory Birds ([USFWS Migratory Bird Program](#)).***

The protection of birds is regulated by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec.



## Trust Resources List

10.12 and 16 U.S.C. Sec. 668(a)). The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. For more information regarding these Acts see: <http://www.fws.gov/migratorybirds/RegulationsandPolicies.html>.

All project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project. To meet these conservation obligations, proponents should identify potential or existing project-related impacts to migratory birds and their habitat and develop and implement conservation measures that avoid, minimize, or compensate for these impacts. The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

For information about Birds of Conservation Concern, go to: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html>.

To search and view summaries of year-round bird occurrence data within your project area, go to the Avian Knowledge Network Histogram Tool links in the Bird Conservation Tools section at: <http://www.fws.gov/migratorybirds/CCMB2.htm>.

For information about conservation measures that help avoid or minimize impacts to birds, please visit: <http://www.fws.gov/migratorybirds/CCMB2.htm>.

### **Migratory birds of concern that may be affected by your project:**

There are **11** birds on your Migratory birds of concern list. The underlying data layers used to generate the migratory bird list of concern will continue to be updated regularly as new and better information is obtained. User feedback is one method of identifying any needed improvements. Therefore, users are encouraged to submit comments about any questions regarding species ranges (e.g., a bird on the USFWS BCC list you know does not occur in the specified location appears on the list, or a BCC species that you know does occur there is not appearing on the list). Comments should be sent to the [ECOS Help Desk](#).

Species Name	Bird of Conservation Concern (BCC)	Species Profile	Seasonal Occurrence in Project Area
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Yes	<a href="#">species info</a>	Year-round
Brewer's Sparrow ( <i>Spizella breweri</i> )	Yes	<a href="#">species info</a>	Breeding
Caspian Tern ( <i>Hydroprogne caspia</i> )	Yes	<a href="#">species info</a>	Breeding
Fox Sparrow ( <i>Passerella liaca</i> )	Yes	<a href="#">species info</a>	Breeding, Wintering



## Trust Resources List

Olive-Sided flycatcher ( <i>Contopus cooperi</i> )	Yes	<a href="#">species info</a>	Breeding
Peregrine Falcon ( <i>Falco peregrinus</i> )	Yes	<a href="#">species info</a>	Breeding
Purple Finch ( <i>Carpodacus purpureus</i> )	Yes	<a href="#">species info</a>	Year-round
Rufous hummingbird ( <i>selasphorus rufus</i> )	Yes	<a href="#">species info</a>	Breeding
Short-eared Owl ( <i>Asio flammeus</i> )	Yes	<a href="#">species info</a>	Year-round
Vesper Sparrow ( <i>pooecetes gramineus ssp. affinis</i> )	Yes	<a href="#">species info</a>	Breeding
Willow Flycatcher ( <i>Empidonax traillii</i> )	Yes	<a href="#">species info</a>	Breeding

### ***NWI Wetlands (USFWS National Wetlands Inventory).***

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate [U.S. Army Corps of Engineers District](#).

### **Data Limitations, Exclusions and Precautions**

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work



## Trust Resources List

conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

**Exclusions** - Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

**Precautions** - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

### The following wetland types intersect your project area in one or more locations:

Wetland Types	NWI Classification Code	Total Acres
Freshwater Emergent Wetland	<a href="#">PEMCh</a>	2.3011
Freshwater Emergent Wetland	<a href="#">PEMA</a>	48.2861
Freshwater Emergent Wetland	<a href="#">PEM/ABH</a>	16.2616
Freshwater Emergent Wetland	<a href="#">PEMC</a>	25.9453
Freshwater Forested/Shrub Wetland	<a href="#">PSSC</a>	3.9459
Freshwater Pond	<a href="#">PUBF</a>	0.2996

APPENDIX B  
USDA SOILS REPORT

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United States  
Department of  
Agriculture

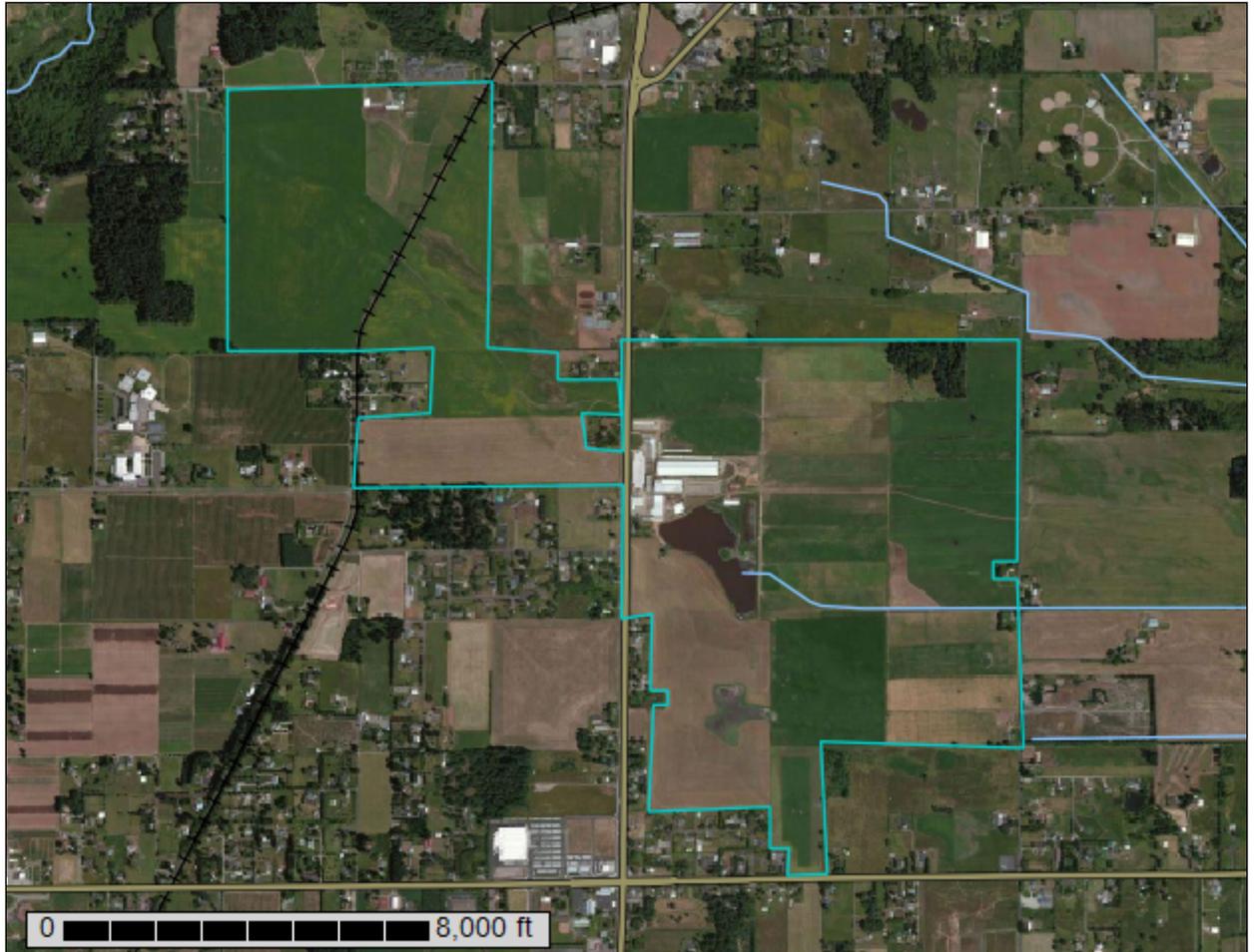
**NRCS**

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 **Clark County, Washington**

## Rural Industrial Land Bank



# Preface

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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](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

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

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

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

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

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

# Contents

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<b>Preface</b> .....	2
<b>How Soil Surveys Are Made</b> .....	5
<b>Soil Map</b> .....	7
Soil Map.....	8
Legend.....	9
Map Unit Legend.....	10
Map Unit Descriptions.....	10
Clark County, Washington.....	12
CvA—Cove silty clay loam, 0 to 3 percent slopes.....	12
CwA—Cove silty clay loam, thin solum, 0 to 3 percent slopes.....	12
DoB—Dollar loam, 0 to 5 percent slopes.....	13
HIA—Hillsboro silt loam, 0 to 3 percent slopes.....	14
HIB—Hillsboro loam, 3 to 8 percent slopes.....	15
LgB—Lauren gravelly loam, 0 to 8 percent slopes.....	16
MIA—McBee silt loam, coarse variant, 0 to 3 percent slopes.....	16
Sr—Semiahmoo muck.....	17
Su—Semiahmoo muck, shallow variant.....	18
W—Water.....	19
<b>Soil Information for All Uses</b> .....	20
Suitabilities and Limitations for Use.....	20
Land Classifications.....	20
Farmland Classification (Rural Industrial Land Bank Farmland Classification).....	20
<b>References</b> .....	26

# **How Soil Surveys Are Made**

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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

## Custom Soil Resource Report

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.

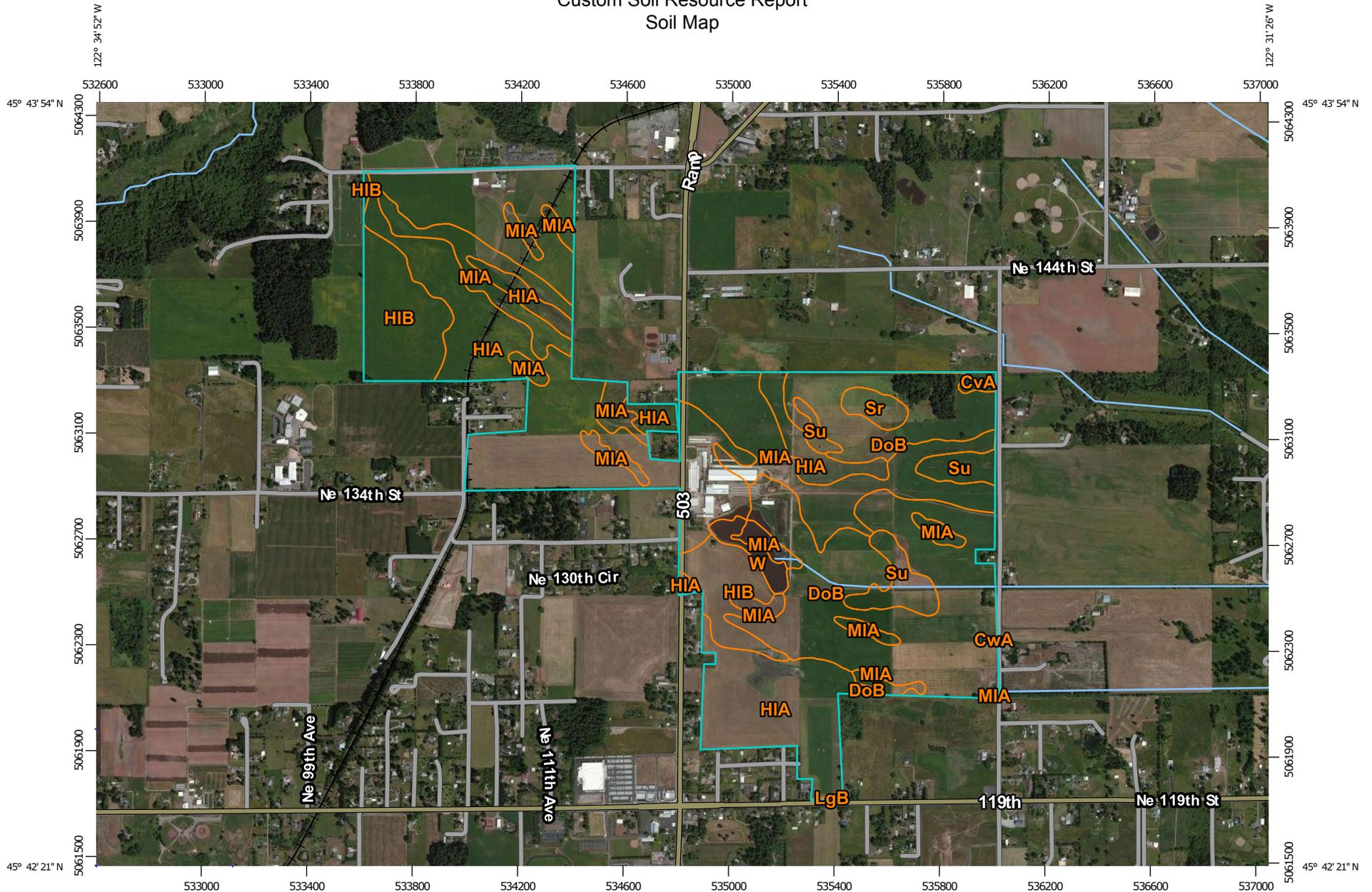
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

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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: 1:20,300 if printed on A landscape (11" x 8.5") sheet.



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 1:20,000.

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: Clark County, Washington  
 Survey Area Data: Version 10, Dec 9, 2013

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

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

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

Clark County, Washington (WA011)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CvA	Cove silty clay loam, 0 to 3 percent slopes	2.4	0.4%
CwA	Cove silty clay loam, thin solum, 0 to 3 percent slopes	0.2	0.0%
DoB	Dollar loam, 0 to 5 percent slopes	163.8	26.9%
HIA	Hillsboro silt loam, 0 to 3 percent slopes	242.4	39.8%
HIB	Hillsboro loam, 3 to 8 percent slopes	56.8	9.3%
LgB	Lauren gravelly loam, 0 to 8 percent slopes	0.3	0.0%
MIA	McBee silt loam, coarse variant, 0 to 3 percent slopes	108.0	17.7%
Sr	Semiahmoo muck	6.5	1.1%
Su	Semiahmoo muck, shallow variant	22.7	3.7%
W	Water	6.0	1.0%
<b>Totals for Area of Interest</b>		<b>609.1</b>	<b>100.0%</b>

## 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

## Custom Soil Resource Report

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.

## Clark County, Washington

### **CvA—Cove silty clay loam, 0 to 3 percent slopes**

#### **Map Unit Setting**

*National map unit symbol:* 2dwz  
*Elevation:* 100 to 2,500 feet  
*Mean annual precipitation:* 18 to 60 inches  
*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 140 to 210 days  
*Farmland classification:* Not prime farmland

#### **Map Unit Composition**

*Cove and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### **Description of Cove**

##### **Setting**

*Landform:* Flood plains

##### **Typical profile**

*H1 - 0 to 4 inches:* silty clay loam  
*H2 - 4 to 36 inches:* clay  
*H3 - 36 to 60 inches:* gravelly silty clay loam

##### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Very poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 in/hr)  
*Depth to water table:* About 0 to 12 inches  
*Frequency of flooding:* Occasional  
*Frequency of ponding:* None  
*Available water storage in profile:* High (about 9.7 inches)

##### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6w  
*Hydrologic Soil Group:* D  
*Other vegetative classification:* Unnamed (G002XV102WA)

### **CwA—Cove silty clay loam, thin solum, 0 to 3 percent slopes**

#### **Map Unit Setting**

*National map unit symbol:* 2dx0  
*Elevation:* 100 to 2,500 feet  
*Mean annual precipitation:* 18 to 60 inches  
*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 140 to 210 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Cove and similar soils: 100 percent*

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

**Description of Cove**

**Setting**

*Landform: Flood plains*

**Typical profile**

*H1 - 0 to 14 inches: silty clay loam*

*H2 - 14 to 21 inches: clay*

*H3 - 21 to 60 inches: silt loam*

**Properties and qualities**

*Slope: 0 to 3 percent*

*Depth to restrictive feature: More than 80 inches*

*Natural drainage class: Poorly drained*

*Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)*

*Depth to water table: About 0 to 12 inches*

*Frequency of flooding: Occasional*

*Frequency of ponding: None*

*Available water storage in profile: High (about 11.7 inches)*

**Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 6w*

*Hydrologic Soil Group: D*

*Other vegetative classification: Unnamed (G002XV102WA)*

**DoB—Dollar loam, 0 to 5 percent slopes**

**Map Unit Setting**

*National map unit symbol: 2dx1*

*Mean annual precipitation: 50 inches*

*Mean annual air temperature: 50 degrees F*

*Farmland classification: All areas are prime farmland*

**Map Unit Composition**

*Dollar and similar soils: 100 percent*

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

**Description of Dollar**

**Setting**

*Landform: Terraces*

*Parent material: Alluvium*

**Typical profile**

*H1 - 0 to 6 inches: loam*

*H2 - 6 to 32 inches: loam*

*H2 - 32 to 60 inches: loam*

**Properties and qualities**

*Slope:* 0 to 5 percent  
*Depth to restrictive feature:* 20 to 40 inches to fragipan  
*Natural drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Low (about 5.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3w  
*Hydrologic Soil Group:* C  
*Other vegetative classification:* Unnamed (G002XV202WA)

**HIA—Hillsboro silt loam, 0 to 3 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 2dxh  
*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 54 degrees F  
*Frost-free period:* 165 to 210 days  
*Farmland classification:* All areas are prime farmland

**Map Unit Composition**

*Hillsboro and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Hillsboro**

**Setting**

*Landform:* Terraces  
*Parent material:* Alluvium

**Typical profile**

*H1 - 0 to 7 inches:* loam  
*H2 - 7 to 36 inches:* loam  
*H3 - 36 to 48 inches:* sandy loam  
*H4 - 48 to 60 inches:* sand

**Properties and qualities**

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* 40 to 59 inches to strongly contrasting textural stratification  
*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

*Available water storage in profile:* Moderate (about 8.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 1

*Hydrologic Soil Group:* B

*Other vegetative classification:* Unnamed (G002XV502WA)

## HIB—Hillsboro loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2dxj

*Mean annual precipitation:* 40 to 50 inches

*Mean annual air temperature:* 54 degrees F

*Frost-free period:* 165 to 210 days

*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Hillsboro and similar soils:* 100 percent

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

### Description of Hillsboro

#### Setting

*Landform:* Terraces

*Parent material:* Alluvium

#### Typical profile

*H1 - 0 to 7 inches:* loam

*H2 - 7 to 36 inches:* loam

*H3 - 36 to 48 inches:* sandy loam

*H4 - 48 to 60 inches:* sand

#### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* 40 to 59 inches to strongly contrasting textural stratification

*Natural drainage class:* Well drained

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

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Moderate (about 8.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2e

*Hydrologic Soil Group:* B

*Other vegetative classification:* Unnamed (G002XV502WA)

## **LgB—Lauren gravelly loam, 0 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2dy8  
*Mean annual precipitation:* 48 inches  
*Mean annual air temperature:* 50 degrees F  
*Farmland classification:* All areas are prime farmland

### **Map Unit Composition**

*Lauren and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Lauren**

#### **Setting**

*Landform:* Terraces  
*Parent material:* Alluvium with volcanic ash

#### **Typical profile**

*H1 - 0 to 6 inches:* gravelly medial loam  
*H2 - 6 to 33 inches:* very gravelly medial loam  
*H3 - 33 to 44 inches:* very gravelly coarse sandy loam  
*H4 - 44 to 60 inches:* very gravelly loamy coarse sand

#### **Properties and qualities**

*Slope:* 0 to 8 percent  
*Depth to restrictive feature:* 40 to 59 inches to strongly contrasting textural stratification  
*Natural drainage class:* Somewhat excessively drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Low (about 4.6 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2e  
*Hydrologic Soil Group:* B  
*Other vegetative classification:* Unnamed (G002XV402WA)

## **MIA—McBee silt loam, coarse variant, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2dyj  
*Mean annual precipitation:* 50 inches

## Custom Soil Resource Report

*Mean annual air temperature:* 50 to 54 degrees F  
*Frost-free period:* 165 to 210 days  
*Farmland classification:* Prime farmland if drained

### Map Unit Composition

*Mcbee variant and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Mcbee Variant

#### Setting

*Landform:* Depressions, drainageways  
*Parent material:* Alluvium

#### Typical profile

*H1 - 0 to 11 inches:* silt loam  
*H2 - 11 to 19 inches:* loam  
*H3 - 19 to 44 inches:* gravelly fine sandy loam  
*H4 - 44 to 62 inches:* very gravelly loamy sand

#### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Somewhat poorly drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.57 to 1.98 in/hr)  
*Depth to water table:* About 0 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water storage in profile:* Moderate (about 6.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6w  
*Hydrologic Soil Group:* B/D  
*Other vegetative classification:* Unnamed (G002XV102WA)

## Sr—Semiahmoo muck

### Map Unit Setting

*National map unit symbol:* 2dzt  
*Elevation:* 10 to 1,300 feet  
*Mean annual precipitation:* 35 to 70 inches  
*Mean annual air temperature:* 46 to 50 degrees F  
*Frost-free period:* 125 to 250 days  
*Farmland classification:* Prime farmland if drained

### Map Unit Composition

*Semiahmoo and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Semiahmoo

### Setting

*Landform:* Depressions

*Parent material:* Herbaceous organic material

### Typical profile

*H1 - 0 to 13 inches:* muck

*H2 - 13 to 15 inches:* fine sand

*H3 - 15 to 60 inches:* muck

### Properties and qualities

*Slope:* 0 to 1 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Very poorly drained

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

*Depth to water table:* About 18 to 36 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water storage in profile:* Very high (about 18.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3w

*Hydrologic Soil Group:* C

*Other vegetative classification:* Unnamed (G002XV102WA)

## Su—Semiahmoo muck, shallow variant

### Map Unit Setting

*National map unit symbol:* 2dzv

*Elevation:* 10 to 1,300 feet

*Mean annual precipitation:* 35 to 70 inches

*Mean annual air temperature:* 46 to 50 degrees F

*Frost-free period:* 125 to 250 days

*Farmland classification:* Prime farmland if drained

### Map Unit Composition

*Semiahmoo variant and similar soils:* 100 percent

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

## Description of Semiahmoo Variant

### Setting

*Landform:* Depressions

*Parent material:* Herbaceous organic material

### Typical profile

*H1 - 0 to 13 inches:* muck

*H2 - 13 to 30 inches:* muck

*H3 - 30 to 60 inches:* very fine sandy loam

## Custom Soil Resource Report

*H4 - 60 to 65 inches: mucky peat*

### **Properties and qualities**

*Slope: 0 to 1 percent*

*Depth to restrictive feature: More than 80 inches*

*Natural drainage class: Very poorly drained*

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

*Depth to water table: About 0 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Available water storage in profile: Very high (about 12.9 inches)*

### **Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 6w*

*Hydrologic Soil Group: C/D*

*Other vegetative classification: Unnamed (G002XV102WA)*

## **W—Water**

### **Map Unit Composition**

*Water: 100 percent*

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

### **Description of Water**

#### **Setting**

*Landform: Alluvial cones*

# **Soil Information for All Uses**

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## **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**

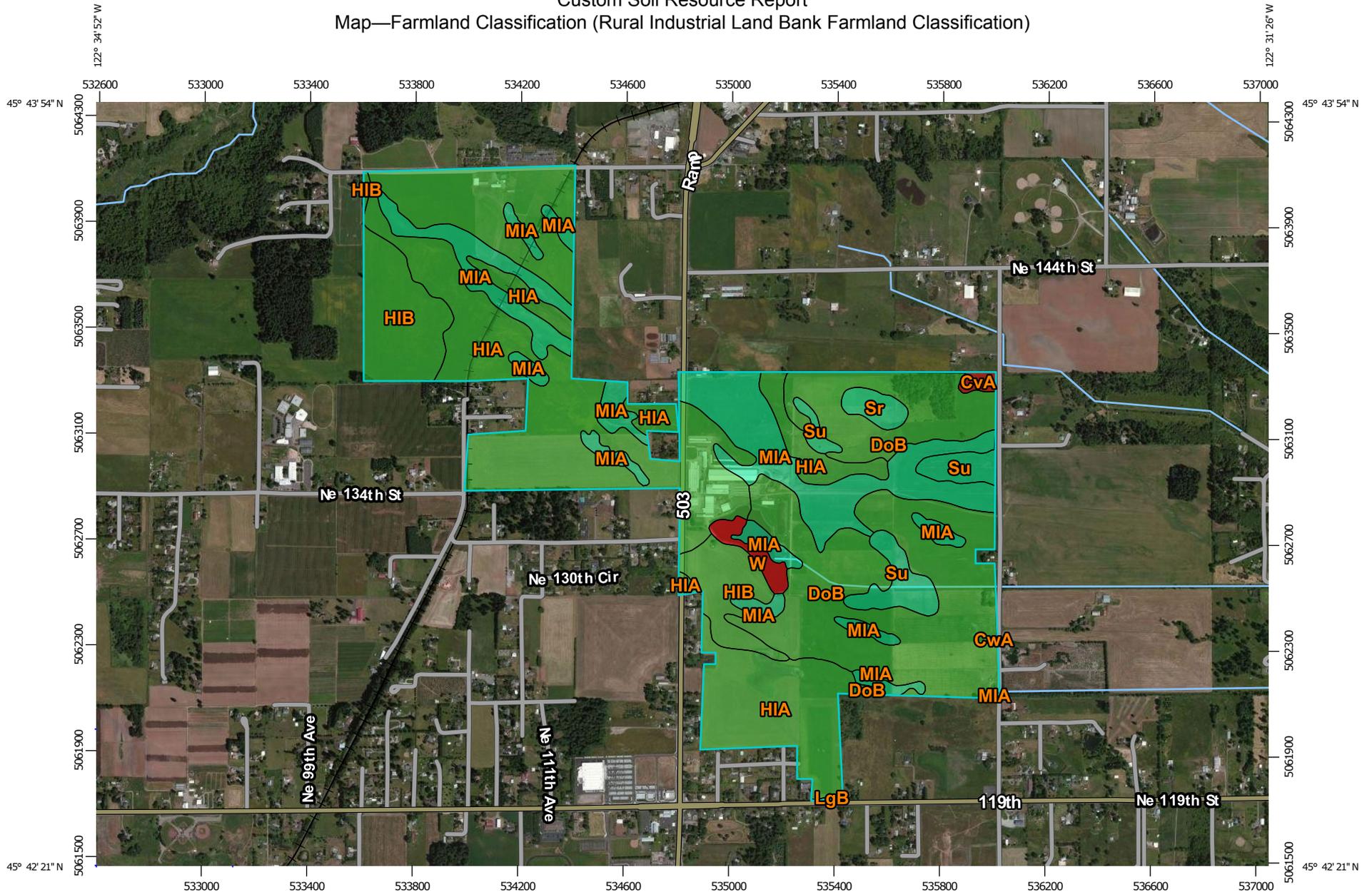
Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications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

## **Farmland Classification (Rural Industrial Land Bank Farmland Classification)**

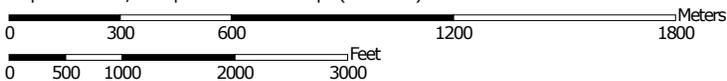
Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime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

# Custom Soil Resource Report

## Map—Farmland Classification (Rural Industrial Land Bank Farmland Classification)



Map Scale: 1:20,300 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

# Custom Soil Resource Report

## 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
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  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 1:20,000.

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: Clark County, Washington  
Survey Area Data: Version 10, Dec 9, 2013

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

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

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—Farmland Classification (Rural Industrial Land Bank Farmland Classification)**

Farmland Classification— Summary by Map Unit — Clark County, Washington (WA011)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CvA	Cove silty clay loam, 0 to 3 percent slopes	Not prime farmland	2.4	0.4%
CwA	Cove silty clay loam, thin solum, 0 to 3 percent slopes	Not prime farmland	0.2	0.0%
DoB	Dollar loam, 0 to 5 percent slopes	All areas are prime farmland	163.8	26.9%
HIA	Hillsboro silt loam, 0 to 3 percent slopes	All areas are prime farmland	242.4	39.8%
HIB	Hillsboro loam, 3 to 8 percent slopes	All areas are prime farmland	56.8	9.3%
LgB	Lauren gravelly loam, 0 to 8 percent slopes	All areas are prime farmland	0.3	0.0%
MIA	McBee silt loam, coarse variant, 0 to 3 percent slopes	Prime farmland if drained	108.0	17.7%
Sr	Semiahmoo muck	Prime farmland if drained	6.5	1.1%
Su	Semiahmoo muck, shallow variant	Prime farmland if drained	22.7	3.7%
W	Water	Not prime farmland	6.0	1.0%
<b>Totals for Area of Interest</b>			<b>609.1</b>	<b>100.0%</b>

**Rating Options—Farmland Classification (Rural Industrial Land Bank Farmland Classification)**

*Aggregation Method:* No Aggregation Necessary

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

## Custom Soil Resource Report

The majority of soil attributes are associated with a component of a map unit, and such an attribute has to be aggregated to the map unit level before a thematic map can be rendered. Map units, however, also have their own attributes. An attribute of a map unit does not have to be aggregated in order to render a corresponding thematic map. Therefore, the "aggregation method" for any attribute of a map unit is referred to as "No Aggregation Necessary".

*Tie-break Rule:* Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

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## MEMORANDUM

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**To:** Lisa Grueter, BERK Consulting **Date:** June 15, 2015

**From:** Valerie Oster and Joe Pursley,  
Anchor QEA, LLC **Project:** 141176-02.01

**Cc:** Greg Summers, Anchor QEA, LLC

**Re:** Candidate Alternative Site Tour

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On June 3, 2015, Anchor QEA, LLC, scientists, along with Clark County (County) staff and consultants, participated in a site tour “windshield review” of candidate alternative sites to provide additional information in support of the Clark County Rural Industrial Land Bank environmental evaluation process. Currently, the County is considering the Docket Site (Site 1) and requested a comparison of this site to candidate Alternative Sites 2, 3, and 4 (candidate alternative sites), which were identified as meeting a stipulated set of criteria regarding land use, transportation accessibility, parcel size and configuration, and environmental constraints.

Anchor QEA scientists reviewed publicly available environmental information (aerial imagery, Washington Department of Fish and Wildlife Priority Habitat and Species lists, critical habitat area mapping, etc.) for the candidate alternative sites in advance of touring the sites via a County vehicle. The objectives of the site tour were to provide additional understanding of the ecological and geographical baseline conditions of mapped critical areas and identify unmapped potential site constraints at the candidate alternative sites. All visual evaluations were made from the vehicle or from the public rights-of-way. Detailed maps and information on each of the candidate alternative sites are available in other documents developed for the de-designation and inventory completed for Site 1.

This summary of the June 3, 2015, site tour provides commentary on the ecological conditions visible at each candidate alternative site and reflects the environmental constraints noted in maps and other available information. Example photographs taken of each site are provided at the end of this Memorandum. No physical property access was

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available; therefore, the site tour was limited to stops at several reference sites identified along public roads and rights-of-way.

## **Site 2**

The following list describes environmental conditions noted for Site 2 (Photographs 1 and 2).

- Site 2 is 412 acres and is located north of the Ridgefield Urban Growth Area (UGA) along Interstate-5 (I-5). Its topography is diverse and related to the presence of perennial streams and rolling hills.
- Land use appears to be consistent with descriptions within previously completed inventories.
- Based on views from public roads at the southern and eastern boundaries of the site, identified riparian habitat conservation areas and biodiversity areas located throughout the site likely are comprised of mature forest (age of more than 100 years), with a complex understory of sub-canopy, shrub, and herbaceous layers.
- Riparian areas that were visible from the public roads appear contiguous and would be expected to provide good or excellent quality habitat and contribute to the health of tributaries within the site that may support salmonids or other native fish and wildlife species.
- Interior oak and Oak Woodland conservation areas at the north of the site appear to be in good condition but may lack oak regeneration and propagation due to intensive agricultural land use.
- Wetlands are likely to be associated with jurisdictional tributaries and are therefore jurisdictional; buffer areas and jurisdictional waterways may expand under the new (2015) Washington State Department of Ecology (Ecology) rules and Clean Water Act (CWA) definitions of Waters of the United States.

## **Site 3**

The following list describes environmental conditions noted for Site 3 (Photographs 3 and 4).

- Site 3 is 764 acres and lies between the Vancouver and Ridgefield UGAs on either side of I-5 at State Road 502 (NE 219th Street).
  - Site topography is relatively flat.
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- Numerous tributaries to Gee Creek exist throughout the site. Based on example locations viewed during the site tour, riparian habitat buffer areas appear to be in moderate to good condition. Gee Creek is a salmon-bearing stream (as shown on PHS maps).
- Potential unmapped seasonal tributaries were noted during the site tour west and east of I-5 but north of NE 219th Street.
- Stream buffers are currently limited in width (likely less than standards required by Ecology) due to impervious surface (I-5 interchange) adjacent to streams.
- Buffer areas for wetlands and jurisdictional waterways may expand under the new (2015) Ecology rules and CWA definitions of Waters of the United States.

#### **Site 4**

The following list describes environmental conditions noted for Site 4(Photographs 5 and 6).

- Site 4 is adjacent eastward of the Vancouver city limits. The site is 366 acres and lies east of the Vancouver UGA and NE 162nd Avenue.
- The site is topographically very flat; the water table is high and perched on Troutdale Formation basalt, which may contribute to the exceptionally wide mapped floodway and floodplain area and large riparian-associated wetlands mapped on the site (as shown on PHS and National Wetlands Inventory mapping).
- Two streams flowing to the south are potentially salmon-bearing streams with semi-intact riparian corridor habitat (as shown on PHS mapping).
- The central habitat conservation area was confirmed to be interior oaks and oak woodland as mapped (PHS maps). Due to cattle grazing and intensive agricultural practices oak regeneration and propagation may be limited on site.
- Buffers on streams and wetlands as well as floodway development restrictions and the presence of a Bonneville Power Administration utility corridor would likely significantly limit buildable acreage at the site.
- Buffer areas for wetlands and jurisdictional waterways may expand under the new (2015) Ecology rules and CWA definitions of Waters of the United States.

In summary, based on the site tour completed for the candidate alternative sites, the mapped environmental constraints at each of these sites appear to be more significant than those

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mapped for Site 1, in particular due to topographical features, the presence of mapped fish bearing streams, and mapped floodways that are not present on Site 1. While each site contains mapped wetlands, the wetland features of the candidate alternative sites are more directly adjacent to mapped streams or other wetland features and exist within less disturbed or undeveloped habitat, whereas wetlands that may exist within Site 1 would all occur within agricultural lands. The available environmental information and visible site characteristics at the candidate alternative sites support the premise that development potential is more environmentally constrained at these sites than at Site 1.

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**Photograph 1**

**Site 2: Typical riparian corridor with a very mature mixed forest**



**Photograph 2**

**Site 2: Typical agricultural lands bordering existing streams and wetlands**

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**Photograph 3**

**Site 3: Ponded stream water at Gee Creek and NE 209th Street**



**Photograph 4**

**Site 3: Looking north from NE 209th Street at Gee Creek and associated potential wetlands**

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**Photograph 5**

**Site 4: Bonneville Power Administration power line corridor and dairy farm buildings east of NE 162nd Avenue**



**Photograph 6**

**Site 4: Oak woodlands and typical agricultural fields just east of NE 162nd Avenue**

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