

**Exhibit H: Response to Clean Water Services Comments and Clean Water Services Site Assessment, including Oregon Department of State Lands Concurrence Reports (WD # 2017-0008 and WD #2018-0040)**

# Willamette Water Supply

Our Reliable Water

**DATE:** August 31, 2020

**TO:** Stacy Benjamin  
Clean Water Services (CWS)

**FROM:** Ethan Rosenthal, David Evans and Associates, Inc. (DEA)

**SUBJECT:** Response to CWS comments regarding Water Treatment Plant Service Provider Application (CWS File #20-0001896)

**CC:** Lindsey Obermiller (CWS); Christina Walter, Willamette Water Supply Program (WWSP); Matt Gribbins (WWSP); Corianne Burnett (WWSP); Suzanne Carey (DEA)

## Introduction

This memorandum provides a response to comments received from Clean Water Services (CWS) regarding the Service Provider Letter application submitted for the Willamette Water Supply Program (WWSP) Water Treatment Plant (WTP) (CWS file #20-0001896). CWS comments are provided in italic text with responses provided thereafter.

## Comment and Response

- 1) Please provide a slope analysis in accordance with Chapter 3.14.4 of our standards for the vegetated corridor along the west side of wetland G, and be sure the figure meets our standard scale requirements of 1 inch = 60 feet or less.*

A slope analysis is provided in the attached updated Figure 2, which now includes an overview figure similar to the previous submittal. In addition, Figure 2 sheets have been focused in so that 1 inch = 60 feet.

- 2) Please label the square feet of vegetated corridor to be permanently impacted adjacent to wetlands A, B, D, E and F on the proposed development figure.*

The requested information is provided on the revised Figure 3 (attached).

- 3) The project proposes permanent impact to Good condition vegetated corridor and is therefore required to address the Tier 2 alternatives analysis approval standards in Chapter 3.07.4b and c. You can keep the wetland functional analysis fairly brief since wetland impacts have already been permitted, but the Tier 2 analysis will need to include minimization for proposed encroachment for the educational overlook, and the project will also need to demonstrate a public benefit to water quality. One way that applicants can choose to provide this benefit is to provide VC mitigation above the minimum 1:1 required ratio.*

A Tier 2 alternatives analysis is provided in this memorandum after this Comment and Response section. As part of demonstrating public benefit to water quality related to the proposed vegetated corridor (VC) encroachment, the WWSP is proposing mitigation at just over a 1.5:1 ratio. Additional details are provided in the Tier 2 analysis.

- 4) *Can the proposed vegetated corridor mitigation area be moved closer to the impact location to provide a more meaningful buffer between the proposed development and the sensitive area?*

The proposed vegetated corridor mitigation area has been moved as requested and is shown on the revised Figure 3.

## Tier 2 Alternatives Analysis

The following Tier 2 alternatives analysis is provided for the proposed permanent impact (1,476 square feet) to the VC associated with Wetland G. The proposed impact is associated with a proposed forest overlook, which is intended to be used for environmental education purposes. Although the impact is sited in the outer portion of the VC, need for a Tier 2 analysis is triggered due to the VC currently being in "good" condition based on CWS rating criteria.

Tier 2 requirements are provided in italics text, with responses provided in non-italics text.

### 3.07.4 b. Submittal Requirements

*Unless specifically waived in writing by the District, the applicant shall submit the following information with the Standard Site Assessment required in Section 3.02.2:*

1. *Description of why the encroachment is needed including rejected alternatives that would result in less encroachment.*

The encroachment is needed to provide a forest overlook that will be used for environmental education purposes. The overlook is situated within unique Oregon oak (*Quercus garryana*) forest habitat bordering a large kolk pond/wetland associated with the historic ice age floods. The overlook is sited across from the proposed WTP offices and visitor reception area. The intent is to have interpretative signage that leads from the visitor reception area and to the forest overlook and describes the natural history of the area along with the story of the community's water supply system. The overlook has been designed to avoid disturbance to the larger trees in the area and minimize disturbance to the smaller trees.

Alternative locations for the forest overlook were considered but rejected as follows:

- Placement of the overlook closer to the kolk pond. The intent of this alternative was to provide an overlook of the kolk pond; however, this was rejected since it would have resulted in greater impact to high quality habitat adjacent to the kolk pond. This increased impact would have occurred due to the increased length of disturbance within the VC as well as due to more complicated construction since the overlook would have extended into very steep rocky terrain.
- Placement of the overlook further north along the VC edge. This alternative would have placed the overlook roughly in the area of the proposed mitigation shown in revised Figure 3. Although this would have mostly avoided the VC, it would have required impacts to several large oak trees and associated high quality habitat. In addition, placing the overlook further to the north would put it past the WTP security boundary and therefore would have put many more limitations on visitation by the public, with all visits requiring WTP staff escort. This was deemed impractical.

2. *Functional Analysis Report, as described in Section 3.14.7*

A wetland functional assessment was conducted for Wetland G as part of the wetland permitting efforts. The functional assessment used the Oregon Wetland Assessment Protocol (ORWAP). The results are provided as an attachment to this memorandum.

### *3.07.04.c. Criteria for Acceptance*

*Acceptance of the encroachment proposed as part of a Tier 2 Alternatives Analysis shall be based on meeting all the following criteria:*

- 3. The proposed encroachment area is mitigated in accordance with Section 3.08.2.*

The proposed mitigation meets this requirement. Mitigation will be on-site, which typically requires a 1:1 mitigation ratio for impacts to good condition VC. The WWSP is proposing mitigation at a ratio of 1.5:1 in order to provide additional public benefit.

- 4. The replacement mitigation protects the functions and values of the Vegetated Corridor and Sensitive Area.*

The proposed mitigation meets this requirement. Mitigation will protect an area of high-quality forest habitat adjacent to existing VC that provides additional buffering from the adjacent proposed WTP. Furthermore, mitigation will occur at a 1.5:1 ratio, which will further protect functions and values.

- 5. Enhancement of the replacement area, if not already in Good Corridor Condition, and either the remaining Vegetated Corridor on the site or the first 50 feet of width closest to the resource, whichever is less, to a Good Corridor Condition.*

The replacement mitigation area is already in good condition as is the existing VC surrounding Wetland G. Therefore, no additional enhancement activities are proposed.

- 6. A District Stormwater Connection Permit is likely to be issued based on proposed plans.*

The WWSP has coordinated with CWS stormwater staff and designed the WTP to meet CWS stormwater standards. Therefore, a stormwater connection permit is likely to be issued.

- 7. Location of development and site planning minimizes incursion into the Vegetated Corridor.*

The WWSP design team has gone through great lengths to completely avoid impacts to the VC associated with Wetland G as it relates to the primary components of the WTP. The only unavoidable incursion is due to the proposed forest overlook, which will provide an important public benefit. The forest overlook has been sited to reduce habitat impacts to the greatest extent possible, while still providing a safe, secure, and meaningful natural history learning experience.

- 8. No practicable alternative to the location of the development exists that will not disturb the Sensitive Area or Vegetated Corridor.*

As described in the various responses above, no practicable alternative to the location of the forest overlook exists that would not disturb Wetland G or its VC.

- 9. The proposed encroachment provides public benefits.*

The proposed encroachment provides the following public benefits:

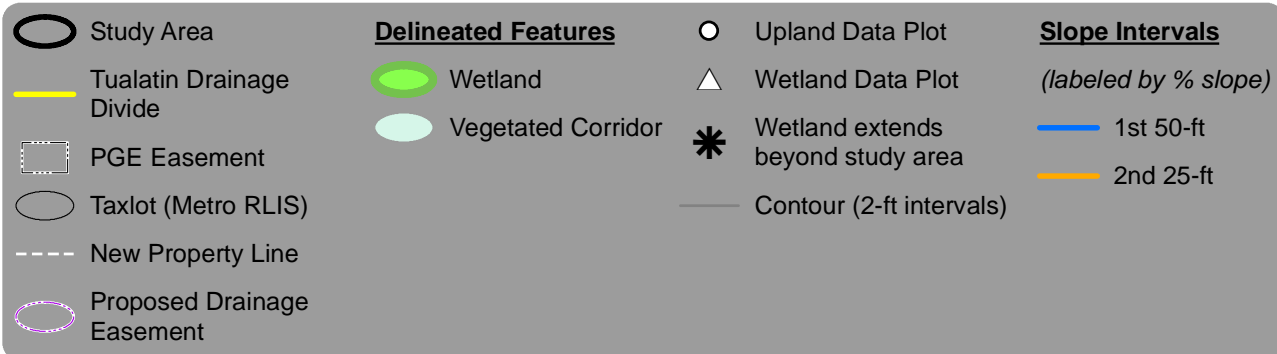
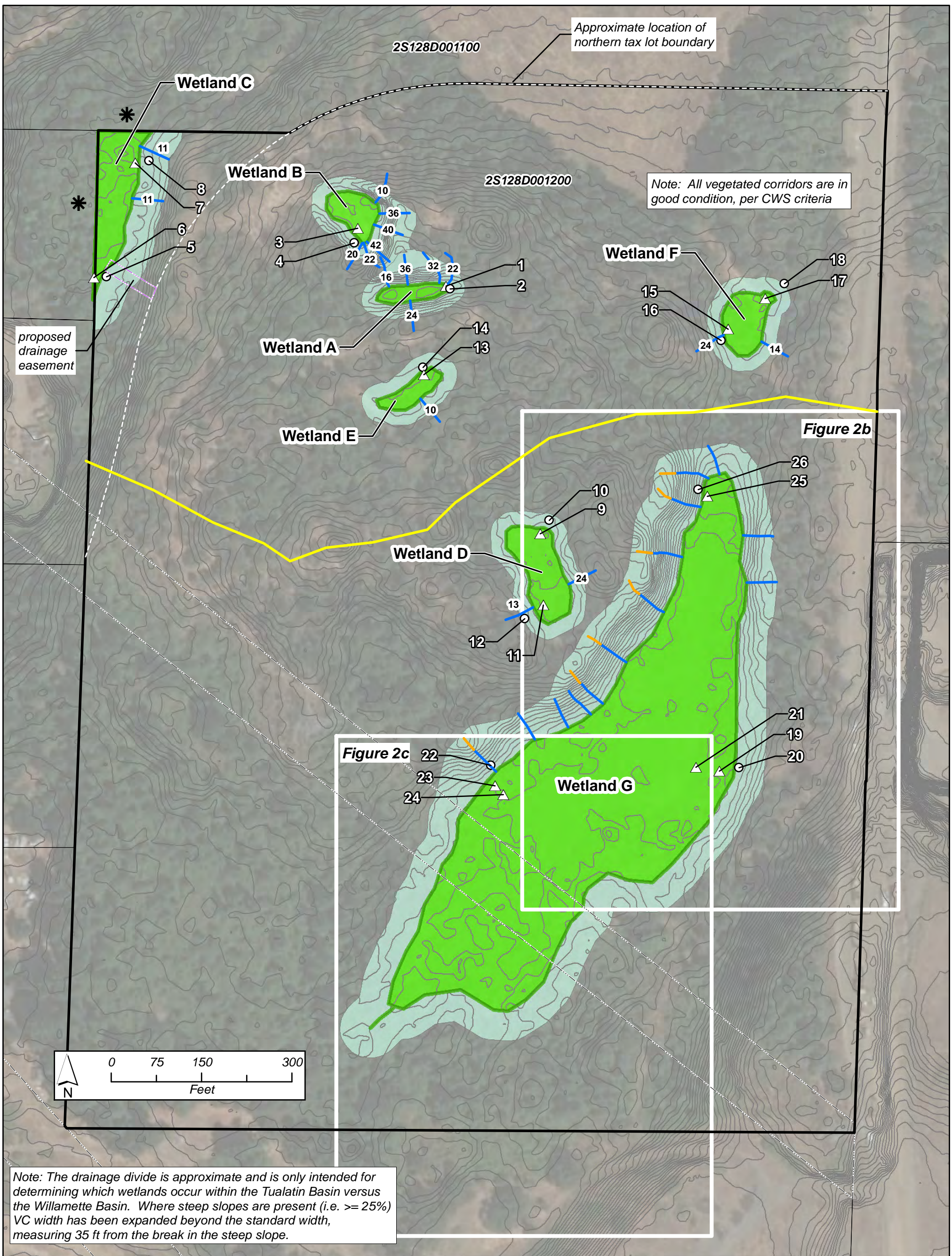
- Environmental education opportunity: The forest overlook will provide opportunities for the public, including school environmental education programs, to learn about the unique natural history of the site (e.g. unique landscape formed by the historic ice age floods).
- Increased water quality protection through a net increase in VC: The WWSP proposes to mitigate the permanent impact of 1,476 square feet of VC by expanding the VC by 2, 215 square feet (1.5:1 mitigation ratio). This will result in a net increase in the VC surrounding Wetland G, thereby, providing additional buffer protections to this unique type of wetland.



**Attachments:**

- Revised Figure 2 – Existing Conditions
- Revised Figure 3 – Proposed Conditions
- Wetland G Functional Assessment

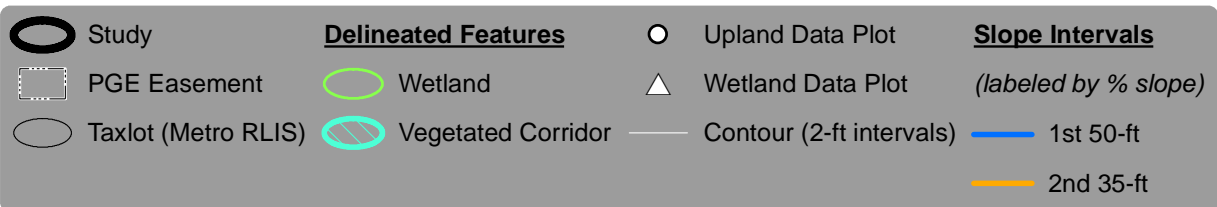
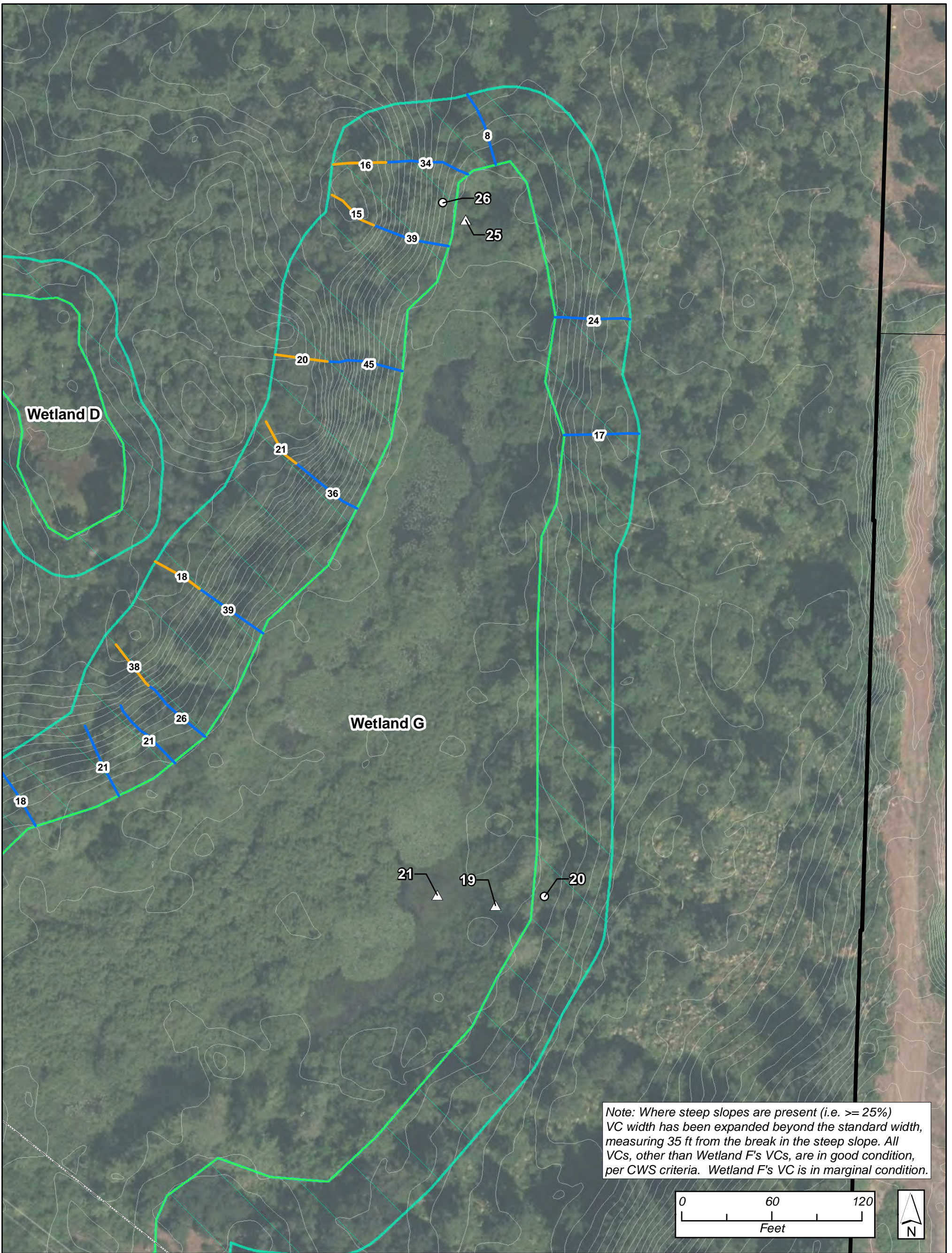




**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
CWS Site Assessment**

Figure 2a  
Existing Conditions



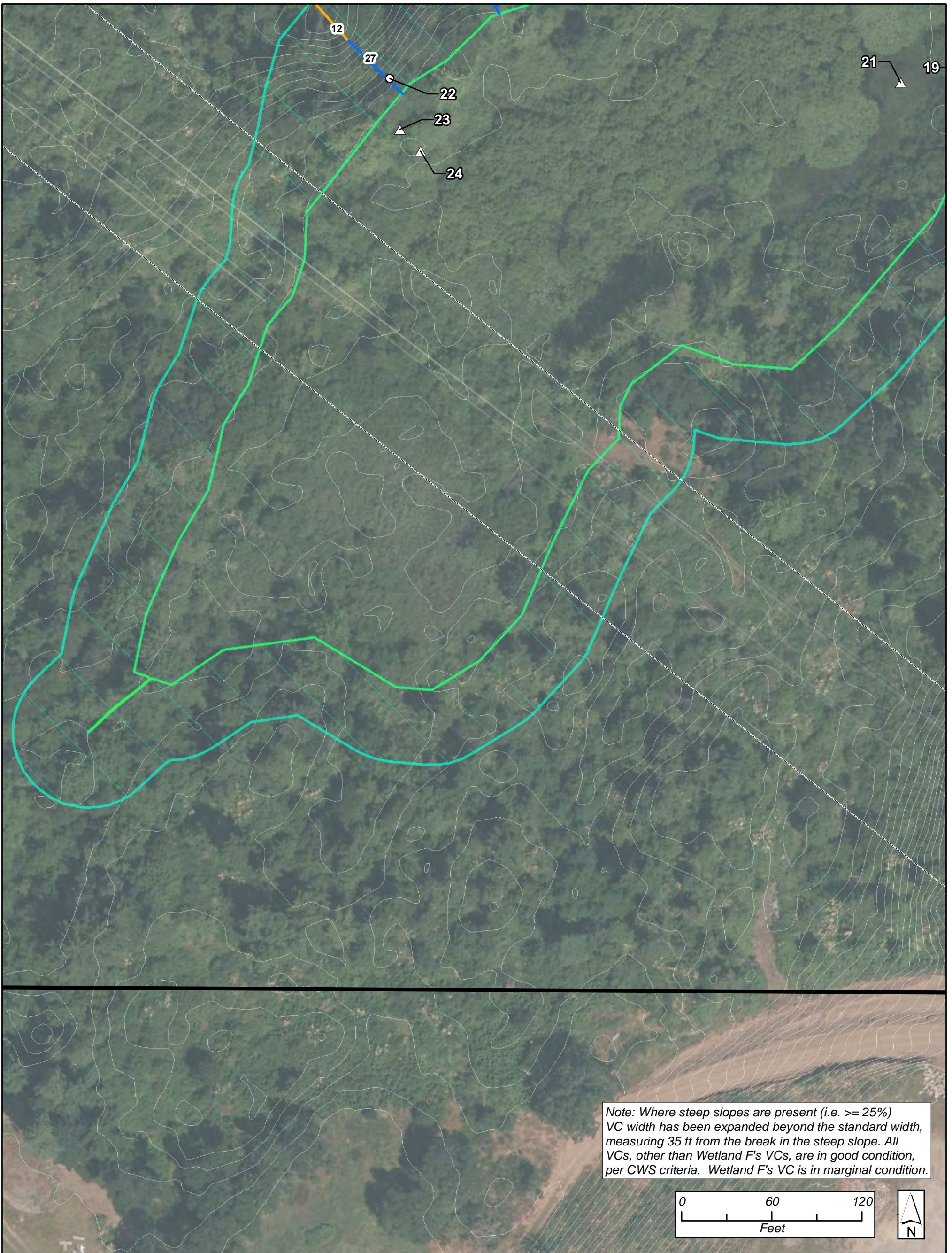


**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
CWS Site Assessment**

Figure 2b  
Existing Conditions - Wetland G

9/3/2020





Study Area		Delineated Features		Upland Data Plot		Slope Intervals	
	Study Area		Wetland		Upland Data Plot	<i>(labeled by % slope)</i>	
	PGE Easement		Vegetated Corridor		Wetland Data Plot		1st 50-ft
	Taxlot (Metro RLIS)		Contour (2-ft intervals)		2nd 35-ft		

**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
CWS Site Assessment**

Figure 2c  
Existing Conditions - Wetland G

9/3/2020



2S128D001100

Note: Development of Tax lot 2S128D001100 was reviewed and CWS SPL 20-000203 issued April 13, 2020, with the exception of the proposed drainage easement to Wetland C.

\* Note: Permanent impacts have been permitted for the entirety of Wetlands A, B, D, E, and F. Therefore, no vegetated corridors (VC) will remain and per CWS rules, VC mitigation is not required for these features. VC mitigation for permanent impacts to the VC around Wetland G is proposed as noted on this figure.

Note: There will be 1,154 sq ft of temporary impacts to the Wetland C Vegetated Corridor to construct the stormwater outfall/ditch; the area is to be replanted with native vegetation.

PROPOSED SW BLAKE STREET

SW 124TH AVE

Wetland B - VC Permanent Impact: 12,754 sq ft

Wetland A - VC Permanent Impact: 11,083 sq ft

Wetland F - VC Permanent Impact: 9,950 sq ft

Wetland E - VC Permanent Impact: 8,760 sq ft

Wetland C - VC Temporary Impact: 1,154 sq ft

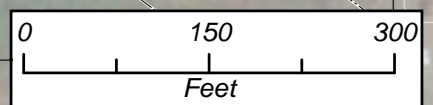
2S128D001200

Wetland D - VC Permanent Impact: 12,976 sq ft

Proposed 2,215 sq ft CWS VC Mitigation Area

Proposed Forest Overlook - VC Permanent Impact: 1,479 sq ft

Wetland G



Limits of Disturbance (LOD)		Delineated Features	
	Limits of Disturbance (LOD)		Wetland
	Design		Vegetated Corridor
	PGE Easement		Permanent Impact Area*
	Taxlot (Metro RLIS)		CWS VC Mitigation Area
	New Property Line		Area of Temporary Impact

**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
CWS Site Assessment**

Figure 3  
Proposed Development



**CoverPg: Basic Description of Assessment**

	<b>2012</b>
Site Name:	<b>WWSS WTP, Wetland G</b>
Investigator Name:	Vingiello, Macklin, Rosenthal
Date of Field Assessment:	11/4/2016
County:	Washington
Nearest Town:	Sherwood
Latitude (decimal degrees):	45.363544
Longitude (decimal degrees):	-122.808707
TRS, quarter/quarter section and tax lot(s)	T2S R1W S28, TL 100
Approximate size of the Assessment Area (AA, in acres)	4.7
AA as percent of entire wetland (approx.)	100
If delineated, DSL file number (WD #) if known	none
<b>Soil Map Units within the AA</b> (list these in approx. rank order by area, from WSS web site or published county survey; see manual)	Xerochrepts-Rock outcrop complex
<b>Soil Map Units surrounding and contiguous to the AA</b> (list all present in approx. rank order by area; see manual)	Saum silt loam, 7 to 12 percent slopes
	Saum silt loam, 20 to 30 percent slopes
<b>Cowardin Systems &amp; Classes</b> (indicate all present, based on field visit and/or aerial imagery): Systems: Palustrine =P, Riverine =R, Lacustrine =L, Estuarine =E Classes: Emergent =EM, Scrub-Shrub =SS, Forested =FO, Aquatic Bed (incl. SAV) =AB, Open Water =OW, Unconsolidated Bottom =UB, Unconsolidated Shore =US	PEM, PSS, PFO, PUB
HGM Class (Scores worksheet will suggest a class; see manual section 2.4.2)	Depressional
If tidal, the tidal phase during most of visit:	N/A
What percent (approx.) of the <b>wetland</b> were you able to visit?	75
What percent (approx.) of the <b>AA</b> were you able to visit?	75
Have you attended an ORWAP training session? If so, indicate approximate month & year.	Yes, greater than 5 years
How many wetlands have you assessed previously using ORWAP (approx.)?	36
Comments about the site or this ORWAP assessment (attach extra page if desired):	

<b>ORWAP SCORES SHEET</b>	<b>version 2.0.2 May 2012</b>
Site Name:	WWSS WTP, Wetland G
Investigator Name:	Vingiello, Macklin, Rosenthal
Date of Field Assessment:	11/4/2016

Specific Functions:	Relative Effectiveness of the Function	Relative Values of the Function
Water Storage & Delay (WS)	3.25	3.33
Sediment Retention & Stabilization (SR)	10.00	3.88
Phosphorus Retention (PR)	10.00	4.61
Nitrate Removal & Retention (NR)	10.00	4.36
Thermoregulation (T)	0.00	0.00
Carbon Sequestration (CS)	2.01	
Organic Matter Export (OE)	0.00	
Aquatic Invertebrate Habitat (INV)	7.95	7.20
Anadromous Fish Habitat (FA)	0.00	4.89
Non-anadromous Fish Habitat (FR)	6.02	6.67
Amphibian & Reptile Habitat (AM)	7.20	4.67
Waterbird Feeding Habitat (WBF)	4.89	4.67
Waterbird Nesting Habitat (WBN)	5.54	3.50
Songbird, Raptor, & Mammal Habitat (SBM)	5.28	4.67
Pollinator Habitat (POL)	7.88	3.06
Native Plant Diversity (PD)	6.18	7.00

GROUPED FUNCTIONS	Group Scores (functions)	Group Scores (values)	
Hydrologic Function (WS)	3.25	3.33	(identical to Water Storage and Delay function and value scores)
Water Quality Group (WQ)	10.00	4.61	(maximum of scores for SR, PR, NR, and T)
Carbon Sequestration (CS)	2.01		(identical to Carbon Sequestration score above)
Fish Support Group (FISH)	6.02	6.67	(maximum of scores for FA and FR)
Aquatic Support Group (AQ)	7.95	7.20	(maximum of scores for OE, AM, INV, WBF, and WBN)
Terrestrial Support Group (TERR)	7.88	7.00	(maximum of scores for PD, POL, and SBM)
Public Use & Recognition (PU)		10.00	(click on this cell to see this attribute defined)
Provisioning Services (PS)		0.00	(click on this cell to see this attribute defined)

OTHER ATTRIBUTES		
Wetland Ecological Condition (CQ)		7.22
Wetland Stressors (STR)		0.96
Wetland Sensitivity (SEN)		10.00

HGM Class - Relative Probabilities (select max)	
Estuarine	0.00
Riverine	0.50
Slope	2.50
Flat	4.32
Depressional	14.72
Lacustrine	0.00

**Willamette Water Supply**  
*Our Reliable Water*

# **WILLAMETTE WATER SUPPLY SYSTEM**

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## **Sensitive Areas and Vegetated Corridors Site Assessment Report**

**Water Treatment Plant Site**

*Prepared for:*

**Tualatin Valley Water District**  




*Prepared by:*



**David Evans and Associates, Inc.  
2100 SW River Parkway  
Portland, Oregon 97201**

**July 2020**



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## **1 INTRODUCTION**

The Willamette Water Supply System (WWSS) has been identified by the Tualatin Valley Water District (TVWD), the City of Beaverton (Beaverton), and the City of Hillsboro (Hillsboro) – collectively referred to as the Partners – as the next infrastructure project to deliver drinking water to municipalities in Washington County by developing the mid-Willamette River at Wilsonville as an additional water supply source. TVWD has been designated the Managing Agency for the WWSS Commission, and TVWD operates the Willamette Water Supply Program (WWSP) to plan, design, and construct the WWSS.

This report covers the study area for the proposed Willamette Water Supply System Water Treatment Plant (WWSS WTP or WTP), inclusive of the proposed Blake Street alignment on the north and west sides of the WTP site and a small drainage easement onto the adjacent tax lot. The site is located in Washington County, Oregon (Township 2 South, Range 1 West, Section 28D, Willamette Meridian; tax lot ID 2S128D001200). See Appendix A, Figure 1, Figure 2, and Figure 3. The site is within the city limits of Sherwood and regional Urban Growth Boundary. It is designated Employment Industrial on the City of Sherwood Comprehensive Plan and Zoning Map.

## **2 LANDSCAPE SETTING AND RESOURCE OVERVIEW**

The nearly 50-acre study area is located in the City of Sherwood, south of SW Tualatin-Sherwood Road, and between Dahlke Lane and SW 120<sup>th</sup> Avenue. SW 124<sup>th</sup> Avenue runs along the east property boundary and a farmed field lies north of the study area. A Portland General Electric (PGE) power line easement corridor crosses diagonally through the study area, appears to be maintained occasionally, and generally consists of shrub habitat. Several trails and local access routes are present on the WTP site, including some that were established to support past geotechnical work and other site development investigations.

The site resides along a drainage divide between tributaries of the Tualatin River Basin and tributaries to the Willamette River Basin (Appendix A, Figure 2). The northwestern portion of the site drains to a wetland that then drains north to an off-site tributary to Hedges Creek. Hedges Creek is a tributary to the Tualatin River. The southern and much of the eastern portions of the site drain southward to upland and a large kolk pond wetland that appears to be part of the Coffee Lake Creek subbasin. However, there is no direct surface water connection to Coffee Lake Creek. The Coffee Lake Creek subbasin drains to the Willamette River.

Much of the site is densely wooded with undulating topography and rocky outcroppings. Open areas, typically resulting from past disturbance, are vegetated by non-native grasses and Himalayan blackberry (*Rubus armeniacus*) thickets. Delineated wetlands were observed in depressions and are further described in Section 4.

Much of the site, particularly areas north of the PGE easement, is forested with native Oregon oak/madrone (*Quercus garryana*/*Arbutus menziesii*) forest, with patches of Douglas fir (*Pseudotsuga menziesii*). Poison oak (*Toxicodendron diversilobum*) is pervasive in the understory. Most of this forested area lies over very thin soils with depth to bedrock occurring two feet or less below the surface. This area of shallow soils is part of the Tonquin Scablands geologic formation, which developed as a result of historic ice age floods that stripped away top soil and carved out what are known as “kolk” wetland features in the general area roughly 15,000 years ago (Washington County 1983 and Metro 2013).

Washington County (1983) describes the site and general surroundings as follows:

*“This scoured upland east of the Rock Creek channel is the only major “scabland” not already destroyed by quarrying (northeast of the site) or committed to it by recent decisions (southeast). The parcels involved are ...2S1 28D tax lots 100 and 900...Again, the legal lots are not conterminous with the geologic feature, but do encompass it. The most prominent features –depressions and knobs—are located in the central eastern part of the described area. Small portions of the area have been quarried or otherwise significantly altered. The northern portion of this site has a 3 ½ acre wetland, apparently seasonal, below one of the flood spillways. It is located between two knolls, the western one having a dwarf oak and madrone woodland on cliffs above the seasonal pond...”*

Oak woodlands are a “strategy habitat” type for the Willamette Valley Ecoregion as part of the larger Oregon Conservation Strategy (ODFW 2016). This habitat type has become quite rare in the Willamette Valley, predominantly as a result of land clearing and fire suppression. Without fire, this habitat type often can eventually transition to dominance by Douglas fir. Historically, natural wildfire and fires set by native peoples helped to maintain more of this community type on the landscape by setting back successional processes. In the case of the subject property, it is believed that the very shallow soils have helped to maintain the oak woodland community, with only deeper soil areas showing a clear transition to Douglas fir dominated forest. The shallow soils are also believed to have resulted in the oak community taking on a stunted growth pattern, with many of the trees growing relatively short and narrow. However, some larger oaks with wide crown spread are present on-site, presumably where deeper soils allow for more typical growth patterns.

### **3 METHODS**

This section describes the methods used to conduct the site assessment work.

#### **3.1 WETLAND DELINEATION**

Wetland areas were delineated on November 3 and 4, 2016 following the Level 2 Routine On-Site Method described in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the USACE Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010). This method requires an area to possess a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology. Under

normal circumstances, positive indicators of each of these three parameters must be present for an area to satisfy the criteria for jurisdictional wetlands.

A follow up delineation was conducted on December 22, 2017 to cover a small portion of the site that was not accessible during the 2016 effort. The 2016 effort identified this area as having a potential wetland based on off-site methods (e.g., topographic depression shown Lidar contours); however, the 2017 delineation determined through on-site methods that this area lacked wetlands.

The Oregon Department of State Lands (DSL) reviewed the 2016 and 2017 delineation efforts and concurred with the findings. DSL concurrence letters (DSL identification WD2017-0008 and WD2018-0040, for 2016 and 2017 delineation field reviews respectively) are provided in Appendix B. Note that the WD2018-0040 concurrence includes other WWSS project areas beyond the WTP site, which are not relevant to this report. Relevant wetland delineation data sheets are provided in Appendix C.

### **3.2 CLEAN WATER SERVICES VEGETATED CORRIDORS**

Field work for the Clean Water Services (CWS) Vegetated Corridor documentation occurred during the same dates noted for the wetland delineation field work. CWS Vegetated Corridors were mapped based on guidance in CWS' design and construction standards Resolution & Order (R&O) 19-22 Chapter 3 – Sensitive Areas and Vegetated Corridors (CWS 2019). CWS guidance typically specifies a 50-foot buffer around most wetlands and waterways. However, if slopes greater than or equal to 25 percent are encountered, then the buffer is required to be extended to the top of slope, plus up to an additional 35 feet. The extension of the buffer due to steep slopes is required up to a maximum buffer width of 200 feet. Small isolated wetlands may only have a Vegetated Corridor width of 25 feet, unless steep slopes are present. Two-foot contour LIDAR topography was used.

## **4 WATER QUALITY SENSITIVE AREAS (WETLANDS AND WATERWAYS)**

Seven wetlands were delineated in the study area (Wetlands A, B, C, D, E, F, and G) and are described below. Their locations are shown on Figure 2 (Appendix A). No other waters (e.g., creeks) occur within the study area. Appendix D provides a photo log of wetland and Vegetated Corridor features.

### **4.1 WETLAND A**

Wetland A (0.1 acre) was delineated in the north central portion of the study area. The wetland is isolated in a depression, roughly half of which is surrounded by rocky slopes and rock overhangs. Wetland A would be classified as a palustrine scrub-shrub wetland with some forested canopy based on the Cowardin classification system (Cowardin et al. 1979). Wetland A is dominated by hardhack (*Spiraea douglassii*), Oregon ash (*Fraxinus latifolia*), Pacific crabapple (*Malus fusca*), and slough sedge (*Carex obnupta*). Also present in the wetland plant community were swamp rose (*Rosa pisocarpa*) and Pacific willow (*Salix lasiandra*).

## **4.2 WETLAND B**

Wetland B (0.1 acre) was delineated northwest of Wetland A in the northwest portion of the study area. The wetland is isolated in a depression, consists largely of unvegetated ponded water over 2 feet deep, and is surrounded by rocky outcroppings, steep rock faces, and boulders. Wetland B would be classified as a palustrine unconsolidated bottom wetland (Cowardin et al 1979). The vegetated portion of Wetland B was dominated by reed canarygrass (*Phalaris arundinacea*), colonial bentgrass (*Agrostis capillaris*), and swamp rose. Wetland vegetation generally occurred in patches of soil within the inundated perimeter.

## **4.3 WETLAND C**

Wetland C (0.3 acre) lies in the far northwest corner of the study area and continues off-site to the north and east. This wetland lies on the adjacent tax lot to the proposed water treatment plant. It appears to flow northeasterly (off-site) and constitutes “Oregon ash swale” habitat in some stretches. Wetland C would be classified as a palustrine forested and scrub-shrub wetland (Cowardin et al 1979). The wetland is dominated by Oregon ash trees and swamp rose, hardhack, and slough sedge. Standing water and saturation were present throughout the wetland during the site visit.

## **4.4 WETLAND D**

Wetland D (0.2 acre) occurs near the center of the study area and is a closed depression with standing water. Wetland D is a palustrine scrub-shrub wetland but also has a large palustrine unconsolidated bottom component of open water (Cowardin et al. 1979). The scrub-shrub component was dominated by hardhack, Pacific crabapple, and swamp rose.

## **4.5 WETLAND E**

Wetland E (0.1 acre) is located near the center of the study area and is an inundated closed depression. Wetland E would be classified as a palustrine scrub-shrub wetland (Cowardin et al. 1979). The wetland is dominated by hardhack with smaller amounts of Nootka rose (*Rosa nutkana*), Pacific crabapple, and Oregon white oak. Roughly 6 inches of ponded water was observed throughout much of the wetland during the site visit.

## **4.6 WETLAND F**

Wetland F (0.2 acre) occupies a closed depression in the northeast portion of the study area. It would be classified primarily as palustrine forested wetland, with some areas of palustrine scrub-shrub and emergent (Cowardin et al. 1979). Dominant plant species include Oregon ash, cluster rose (*Rosa pisocarpa*), Douglas spirea (*Spiraea douglasii*), snowberry (*Symphoricarpos albus*), colonial bentgrass (*Agrostis capillaris*), and toad rush (*Juncus bufonius*).

## 4.7 WETLAND G

Wetland G (4.7 acres) is a large depression with three different palustrine plant communities occurring in roughly concentric circles: forested along the wetland/upland boundary, scrub-shrub, and emergent vegetation in the central inundated areas. Dominant plant species included: Pacific willow, hardhack, swamp rose, Pacific crabapple, tall mannagrass (*Glyceria striata*), and cattail (*Typha latifolia*). Some portions of the center of Wetland G would be considered unconsolidated bottom (i.e., unvegetated seasonal open water). The deeper portions of the wetland are estimated to pond seasonally roughly 3 feet deep during the wet winter and spring months but may dry out during late summer. The boundary along the western side of the wetland had relatively steep rocky terrain with slopes up to 100% from between 5 and 30 feet from the wetland boundary. The remainder of the wetland had gentler slopes with wider wetland transition areas.

## 5 VEGETATED CORRIDORS

Vegetated Corridors are shown on Figure 2 (Appendix A), along with the slope measurements used to determine the outer edge of the corridors. Summary characteristics of each Vegetated Corridor, as identified by the associated wetland name, are provided in Table 1. Additional details follow thereafter.

**Table 1. Vegetated Corridor Characteristics Summary**

Vegetated Corridor's Associated Wetland	Minimum Width Rationale	Minimum Width (ft)	Extended for Steep Slopes?	Condition
Wetland A	<0.5 acres and isolated	25	Yes	Good
Wetland B	<0.5 acres and isolated	25	Yes	Good
Wetland C	Not isolated	50	No	Good
Wetland D	<0.5 acres and isolated	25	No	Good
Wetland E	<0.5 acres and isolated	25	No	Good
Wetland F	<0.5 acres and isolated	25	No	Marginal
Wetland G	>=0.5 acres	50	Yes	Good

The overall project site has two distinct plant community types: Oregon white oak woodland and Douglas fir forest. However, within the Vegetated Corridors, these communities were typically found mixed together and are therefore described as a single community – mixed oak/conifer woodland. A description of this plant community, along with a representative species list for each Vegetated Corridor area, is presented below.

### 5.1 MIXED OAK/CONIFER WOODLAND

This plant community occurs in all of the Vegetated Corridors, with some shifts in dominance between Oregon white oak and Douglas fir trees. Note that the tables below, based on findings at upland plot locations associated with the wetland delineation efforts, underrepresent the amount of poison oak found in the area due to the efforts to avoid dense patches of this hazardous plant

species. Species and their associated percent cover data, in the tables below, are taken directly from the associated wetland delineation plot data forms (Appendix C). Where more than one upland plot was used to delineate the wetland boundary, only the most representative plot of the overall Vegetated Corridor was used. An exception to this was for the Vegetated Corridor around Wetland G, which included two representative plots due to its large size. In a few instances, plot data from the wetland delineation report was modified to be more reflective of the overall plant community in the Vegetated Corridor. Areas where this occurred have been noted in table captions.

As represented in Tables 2 through 9, the Vegetated Corridors are almost all in good condition, having high percent tree canopy cover, high native species diversity and percent cover, and overall low percent cover by invasive species. An exception to this was the Vegetated Corridor around Wetland F, which rated as marginal due to percent cover of tree canopy being less than 50 percent. Vegetation was removed in a portion of this Vegetated Corridor to allow for geotechnical investigations by a prior property owner. Further afield from the wetlands and Vegetated Corridors, percent cover by invasive species tends to be low with the exception of areas adjacent to access routes and other previously disturbed areas where Himalayan blackberry (*Rubus armeniacus*) thickets can be found. In the tables below the stratum column refers trees (T), shrubs (S), and herbaceous (H) species.

**Table 2. Mixed Oak/Conifer Woodland (VC surrounding Wetland A, Plot 2)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Arbutus menziesii</i>	Pacific madrone	25	T	Native
<i>Crataegus douglasii</i>	Douglas hawthorne	10	T	Native
<i>Pseudotsuga menziesii</i>	Douglas fir	60	T	Native
<i>Gaultheria shallon</i>	Salal	35	S	Native
<i>Mahonia nervosa</i>	Oregon grape	30	S	Native
<i>Polypodium glycyrrhiza</i>	Licorice fern	5	H	Native
<i>Rubus ursinus</i>	Trailing blackberry	10	H	Native
<b>Total</b>		<b>175</b>		

Canopy Cover = 95%

Non-native, Noxious or Invasive = 0%

Condition = Good

Native = 100%

**Table 3. Mixed Oak/Conifer Woodland (VC surrounding Wetland B, Plot 4)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Pseudotsuga menziesii</i>	Douglas fir	40	T	Native
<i>Quercus garryana</i>	Oregon white oak	20	T	Native
<i>Amalanchier alnifolia</i>	Serviceberry	60	S	Native
<i>Toxicodendron diversilobum</i>	Poison oak	Trace	S	Native
<i>Geranium molle</i>	Dovefoot geranium	40	H	Non-native
<i>Polypodium glycyrrhiza</i>	Licorice fern	60	H	Native
<i>Rubus ursinus</i>	Trailing blackberry	5	H	Native
<b>Total</b>		<b>225</b>		

Canopy Cover = 60%

Non-native, Noxious or Invasive = 18%

Condition = Good

Native = 82%

**Table 4. Mixed Oak/Conifer Woodland (VC surrounding Wetland C, Plot 5)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Arbutus menziesii</i>	Pacific madrone	10	T	Native
<i>Prunus emarginata</i>	Bitter Cherry	35	T	Native
<i>Pseudotsuga menziesii</i>	Douglas fir	15	T	Native
<i>Corylus cornuta</i>	Hazelnut	10	S	Native
<i>Gaultheria shallon</i>	Salal	25	S	Native
<i>Holodiscus discolor</i>	Oceanspray	15	S	Native
<i>Symphoricarpos albus</i>	Snowberry	10	S	Native
<i>Geranium molle</i>	Dovefoot geranium	5	H	Non-native
<i>Rubus ursinus</i>	Trailing blackberry	10	H	Native
<b>Total</b>		<b>135</b>		

Tree Canopy Cover = 60%

Non-native, Noxious or Invasive = 4%

Condition = Good

Native = 96%



**Table 5. Mixed Oak/Conifer Woodland (VC surrounding Wetland D, Plot 10-modified for VC)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Arbutus menziesii</i>	Pacific madrone	25	T	Native
<i>Pseudotsuga menziesii</i>	Douglas fir	40	T	Native
<i>Quercus garryana</i>	Oregon white oak	15	T	Native
<i>Amalanchier alnifolia</i>	Serviceberry	10	S	Native
<i>Gaultheria shallon</i>	Salal	40	S	Native
<i>Holodiscus discolor</i>	Oceanspray	25	S	Native
<i>Malus fusca</i>	Crabapple	5	S	Native
<i>Geranium molle</i>	Dovefoot geranium	15	H	Non-native
<i>Polypodium glycyrrhiza</i>	Licorice fern	5	H	Native
<b>Total</b>		<b>180</b>		

Tree Canopy Cover = 80%

Non-native, Noxious or Invasive = 8%

Condition = Good

Native = 92%

**Table 6. Mixed Oak/Conifer Woodland (VC surrounding Wetland E, Plot 14-modified for VC)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Pseudotsuga menziesii</i>	Douglas fir	25	T	Native
<i>Quercus garryana</i>	Oregon white oak	30	T	Native
<i>Amalanchier alnifolia</i>	Serviceberry	30	S	Native
<i>Holodiscus discolor</i>	Oceanspray	30	S	Native
<i>Geranium molle</i>	Dovefoot geranium	30	H	Non-native
<i>Polypodium glycyrrhiza</i>	Licorice fern	15	H	Native
<b>Total</b>		<b>160</b>		

Tree Canopy Cover = 55%

Non-native, Noxious or Invasive = 19%

Condition = Good

Native = 81%

**Table 7. Mixed Oak/Conifer Woodland (VC surrounding Wetland F, Plot 18-modified for VC)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Fraxinus latifolia</i>	Oregon Ash	10	T	Native
<i>Prunus emarginata</i>	Bitter Cherry	20	T	Native
<i>Quercus garryana</i>	Oregon white oak	15	T	Native
<i>Amalanchier alnifolia</i>	Serviceberry	10	S	Native
<i>Fraxinus latifolia</i>	Oregon Ash	5	S	Native
<i>Arbutus menziesii</i>	Pacific madrone	10	S	Native
<i>Mahonia aquifolium</i>	Oregon grape	20	S	Native
<i>Rosa nutkana</i>	Nootka rose	15	S	Native
<i>Toxicodendron diversilobum</i>	Poison oak	15	S	Native
<i>Geranium molle</i>	Dovefoot geranium	30	H	Non-native
<i>Polypodium glycyrrhiza</i>	Licorice fern	20	H	Native
<b>Total</b>		<b>180</b>		

Tree Canopy Cover = 45%

Non-native, Noxious or Invasive = 17%

Condition = Marginal

Native = 83%

**Table 8. Mixed Oak/Conifer Woodland (VC surrounding Wetland G, Plot 20)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Arbutus menziesii</i>	Pacific madrone	50	T	Native
<i>Pseudotsuga menziesii</i>	Douglas fir	50	T	Native
<i>Amalanchier alnifolia</i>	Serviceberry	50	S	Native
<i>Corylus cornuta</i>	Hazelnut	20	S	Native
<i>Gaultheria shallon</i>	Salal	20	S	Native
<i>Mahonia aquifolium</i>	Oregon grape	20	S	Native
<i>Malus fusca</i>	Crabapple	10	S	Native
<i>Toxicodendron diversilobum</i>	Poison oak	20	S	Native
<i>Geranium molle</i>	Dovefoot geranium	20	H	Non-native
<i>Polystichum munitum</i>	Sword fern	30	H	Native
<i>Pteridium aquilinum</i>	Bracken fern	10	H	Native
<b>Total</b>		<b>300</b>		

Tree Canopy Cover = 100%

Non-native, Noxious or Invasive = 7%

Condition = Good

Native = 93%

**Table 9. Mixed Oak/Conifer Woodland (VC surrounding Wetland G, Plot 22-modified for VC)**

Scientific Name	Common Name	% Cover	Stratum	Status
<i>Arbutus menziesii</i>	Pacific madrone	15	T	Native
<i>Pseudotsuga menziesii</i>	Douglas fir	30	T	Native
<i>Quercus garryana</i>	Oregon white oak	50	T	Native
<i>Rhamnus pershiana</i>	Cascara	40	T	Native
<i>Amalanchier alnifolia</i>	Serviceberry	10	S	Native
<i>Corylus cornuta</i>	Hazelnut	50	S	Native
<i>Gaultheria shallon</i>	Salal	40	S	Native
<i>Rosa nutkana</i>	Nootka rose	10	S	Native
<i>Symphoricarpos albus</i>	Snowberry	10	S	Native
<i>Toxicodendron diversilobum</i>	Poison oak	5	S	Native
<i>Geranium molle</i>	Dovefoot geranium	15	H	Non-native
<i>Polypodium glycyrrhiza</i>	Licorice fern	5	H	Native
<i>Polystichum munitum</i>	Sword fern	30	H	Native
<b>Total</b>		<b>310</b>		

Tree Canopy Cover = 135%

Non-native, Noxious or Invasive = 5%

Condition = Good

Native = 95%

## **6 PROJECT IMPACTS AND MITIGATION**

### **6.1 IMPACTS**

The WWSP obtained permits from the USACE (permit ID: NWP-2015-0041) and DSL (permit ID: 60102RF Modified) to permanently impact the entirety of Wetlands A, B, D, E, and F. The Vegetated Corridors associated with these wetlands will also be permanently impacted in their entirety. Impacts to these resources were unavoidable in order to fit all the components of the WTP on the property. However, extensive effort was made to fully avoid impacts to the larger wetlands (Wetland C and G) and their diverse and intact Vegetated Corridors. The USACE and DSL permits allowed for impacts to Wetland C; however, based on design changes this impact is now avoided. Additional areas beyond the Vegetated Corridors were also avoided to the extent practicable to further protect valuable upland habitats (Preservation Areas East and West shown on Figure 3, Appendix A).

A minor temporary impact (1,154 square feet) to the Vegetated Corridor associated with Wetland C will occur and is shown on Figure 3 (Appendix A). This impact will result from construction of a stormwater outfall ditch. The disturbed area will be replanted with native forest species in accordance with CWS planting guidelines.

A minor permanent impact (1,476 square feet) will occur to the Vegetated Corridor associated with Wetland G. This will occur along the outer edge of the Vegetated Corridor and is a result of placement of a proposed forest overlook. The overlook is intended to provide educational opportunities about the unique habitats and geology of the area and will include interpretative signage. Alternate placement of this overlook was not feasible due to a combination of topographic constraints, desire to limit impacts to other high-quality upland or riparian (i.e. Vegetated Corridor) habitat. The overlook has also been sited close to the administrative building facilities to allow for easier access by the public, without having to travel through the treatment plant facilities.

## **6.2 MITIGATION FOR IMPACTS**

CWS does not require mitigation for permanently impacted Vegetated Corridors if the associated water quality sensitive area (e.g., wetland) will also be permanently impacted in its entirety. Therefore, no Vegetated Corridor mitigation is proposed for areas associated with Wetlands A, B, D, E, and F. Mitigation for impacts to these wetlands was conducted as part of the USACE and DSL permitting processes and included purchase of mitigation bank credits. The credits offset the loss of wetland functions, values, and acreage. Mitigation banks must undergo a thorough multi-agency review process and be well established before credits are available for sale. The mitigation credit purchase was approved by the Corps and DSL as acceptable mitigation under applicable federal and state statutes as documented in the respective permit authorizations (USACE permit ID: NWP-2015-0041 and DSL permit ID: 60102RF Modified).

Mitigation for the temporary impact to the Wetland C Vegetated Corridor will be in the form of restoring the temporarily disturbed area (1,154 square feet) with native forest vegetation in accordance with CWS standards. Species will be similar to those currently found on site. Landscape design drawings for the overall site are provided in Appendix E.

Mitigation for the permanent impacts to the Wetland G Vegetated Corridor will be provided by expanding the vegetated corridor by 1,548 square feet along its south side as shown on Figure 3, Appendix A.

## **6.3 REQUIRED ENHANCEMENT**

CWS standards 3.06.2 require enhancement of on-site Vegetated Corridors that will not be impacted. However, all remaining on-site Vegetated Corridors already meet the criteria for CWS “good condition” classification, and therefore do not require enhancement.

## **7 PREPARERS AND CONTRIBUTORS**

John Macklin, DEA Biologist, Tony Vingiello, DEA Biologist, and Ethan Rosenthal, DEA Ecologist, performed the site wetland delineations that supported this report. Mr. Rosenthal prepared this report and Mr. Macklin provided quality assurance review. Shawna Hale, DEA Deputy Project

Manager, provided editing assistance. Sara Gilbert, DEA Geographic Information System Specialist, prepared the report graphics.

## **8 LITERATURE CITATIONS**

Clean Water Services (CWS). 2019. Design and Construction Standards for Sanitary and Surface Water Management.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Oregon Department of Fish and Wildlife (ODFW). 2016. Oregon Conservation Strategy.

Cowardin, L.M, V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

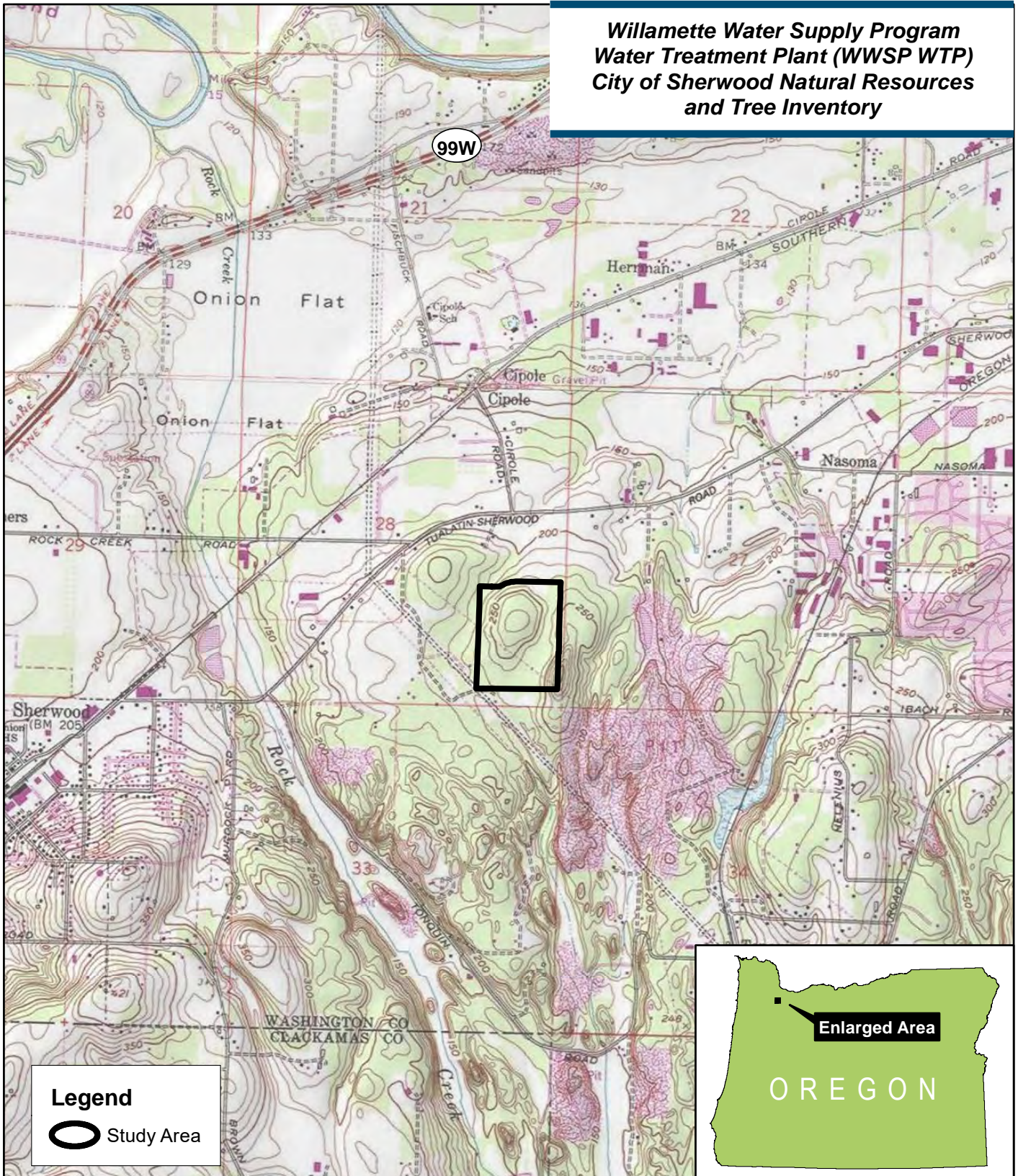
U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). Final Technical Report ERDC/EL TR-10-3, May, 2010. US Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg Mississippi.


## ***APPENDICES***

## ***APPENDIX A: FIGURES***



**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
City of Sherwood Natural Resources  
and Tree Inventory**

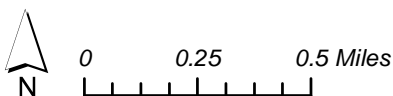


**Legend**  
 Study Area

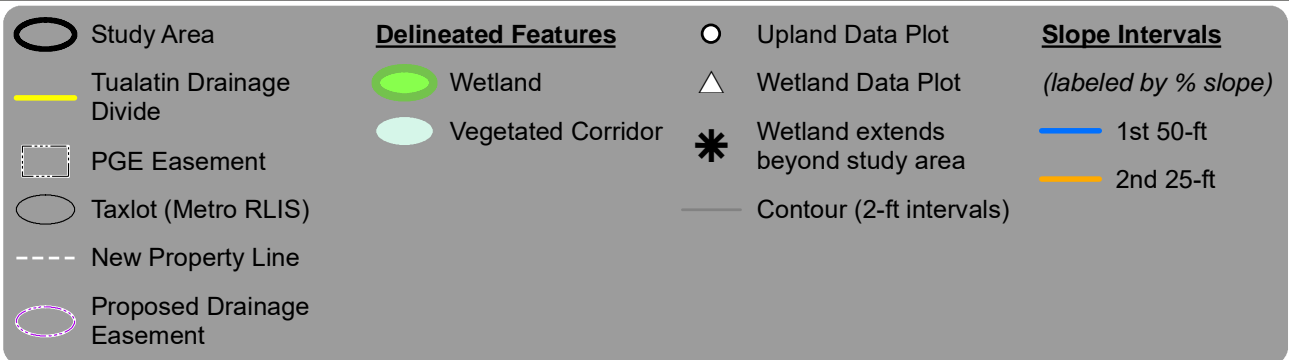
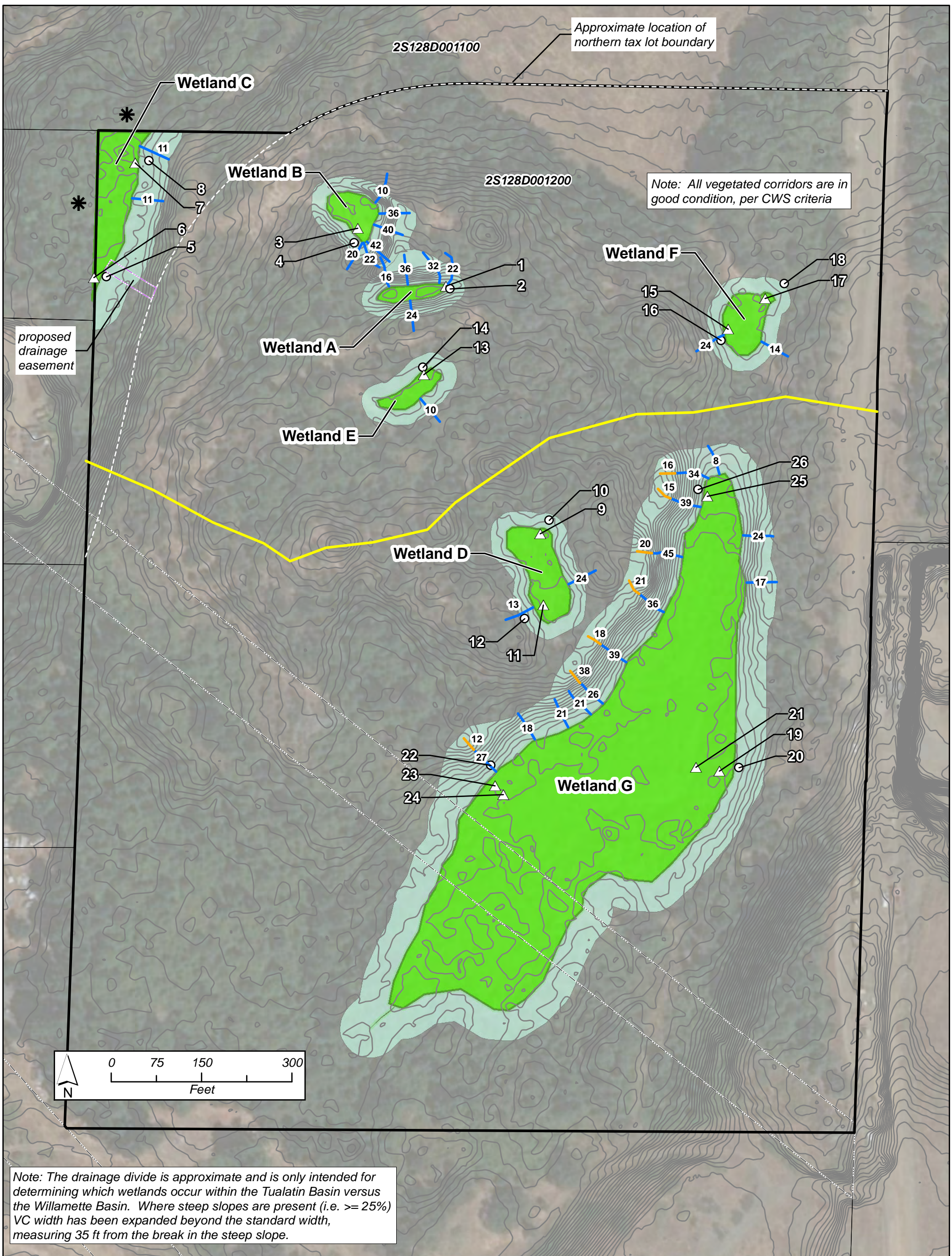


ESRI, ArcGIS Online, USA Topographic Maps. 30x60 GRID Quadrangles

Figure 1  
Vicinity Map







**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
CWS Site Assessment**

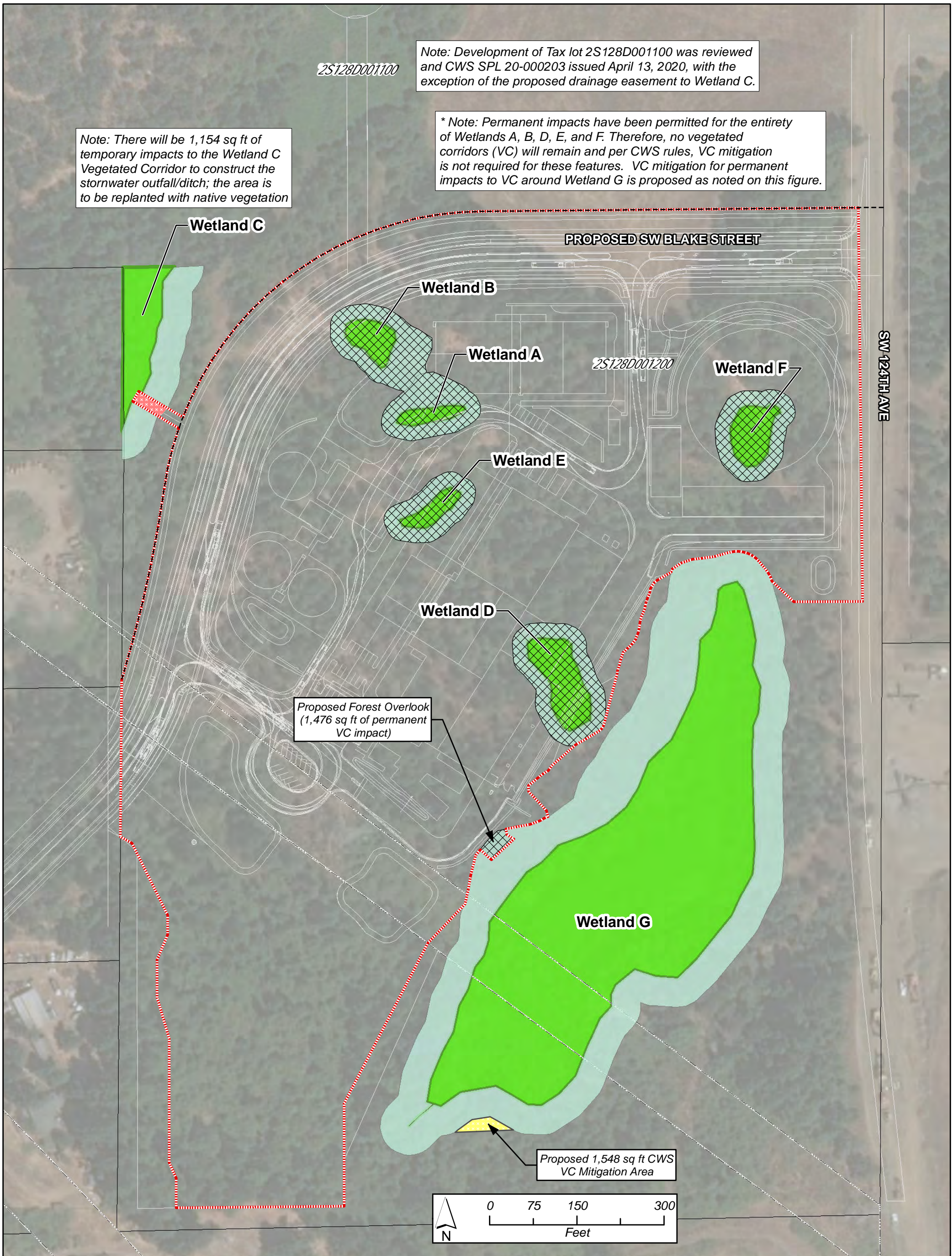
Figure 2  
Existing Conditions



Note: Development of Tax lot 2S128D001100 was reviewed and CWS SPL 20-000203 issued April 13, 2020, with the exception of the proposed drainage easement to Wetland C.

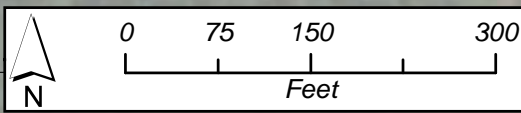
Note: There will be 1,154 sq ft of temporary impacts to the Wetland C Vegetated Corridor to construct the stormwater outfall/ditch; the area is to be replanted with native vegetation

\* Note: Permanent impacts have been permitted for the entirety of Wetlands A, B, D, E, and F. Therefore, no vegetated corridors (VC) will remain and per CWS rules, VC mitigation is not required for these features. VC mitigation for permanent impacts to VC around Wetland G is proposed as noted on this figure.



Proposed Forest Overlook (1,476 sq ft of permanent VC impact)

Proposed 1,548 sq ft CWS VC Mitigation Area



— Design	<b>Delineated Features</b>
□ PGE Easement	Wetland
○ Taxlot (Metro RLIS)	Vegetated Corridor
--- New Property Line	Permanent Impact Area*
	CWS VC Mitigation Area
	Area of Temporary Impact

**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
CWS Site Assessment**

Figure 3  
Proposed Development



## ***APPENDIX B: DSL CONCURRENCE LETTERS***



# Oregon

Kate Brown, Governor

## Department of State Lands

775 Summer Street NE, Suite 100

Salem, OR 97301-1279

(503) 986-5200

FAX (503) 378-4844

[www.oregon.gov/dsl](http://www.oregon.gov/dsl)

State Land Board

Kate Brown

Governor

March 29, 2017

City of Hillsboro Water Department

Attn: Niki Iverson

150 E. Main Street

Hillsboro, OR 97123-4028

Re: WD # 2017-0008 Wetland Delineation Report for the  
Proposed Water Treatment Plant for the Willamette Water  
Supply Program Project  
Washington County; T2S R1W Sec. 28D, Portion of Tax Lot 100

Dennis Richardson

Secretary of State

Tobias Read

State Treasurer

Dear Ms. Iverson:

The Department of State Lands has reviewed the wetland delineation report prepared by David Evans and Associates, Inc. for the site referenced above. Please note that the study area includes only a portion of the tax lot described above (see the attached map). Based upon the information presented in the report, we concur with the wetland boundaries as mapped in Figure 6 of the report. Within the study area, seven delineated wetlands and one potential wetland (Wetland PW\_H) were identified, totaling approximately 6.0 acres.

The wetlands are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands. In addition, due to access issues Wetland PW-H was mapped using offsite wetland determination methods including interpretation of Lidar generated contour topography. Because offsite determination methods are not suitable for removal-fill permitting, it will be necessary to use onsite methods and delineate this area prior to project construction. If subsequent onsite wetland delineation work changes the areas of wetland and wetland impact appreciably, the Department may require an addendum wetland report and a revised permit application.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you

work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,

  
Peter Ryan, PWS  
Jurisdiction Coordinator

Approved by   
Kathy Verble, CPSS  
Aquatic Resource Specialist

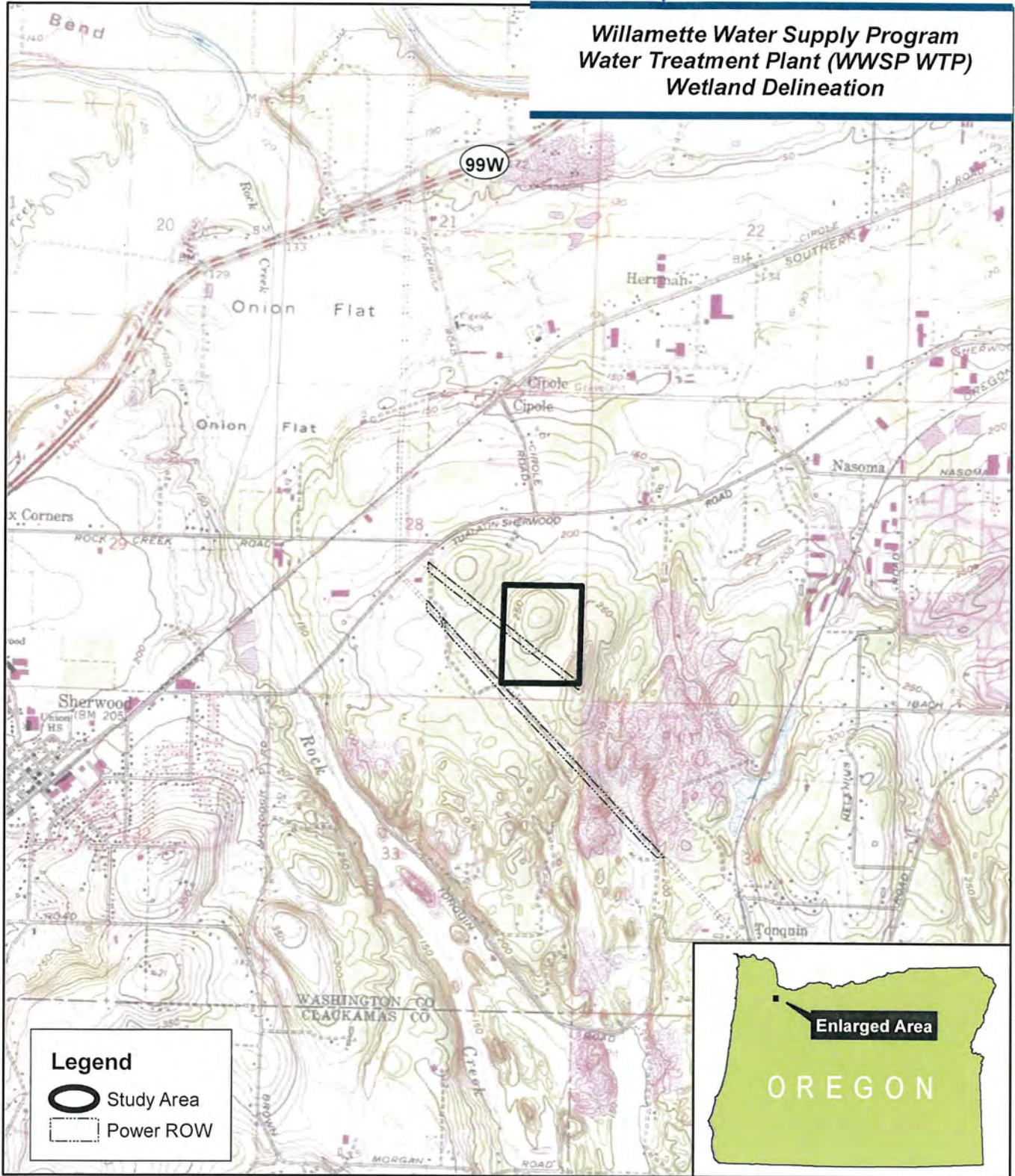
Enclosures

ec: John Macklin, David Evans and Associates, Inc.  
Washington County Planning Department  
Jaimee Davis, Corps of Engineers  
Amber Wierck, Clean Water Services  
Anita Huffman, DSL



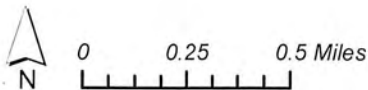
WD2017-0008

# Willamette Water Supply Program Water Treatment Plant (WWSP WTP) Wetland Delineation



ESRI, ArcGIS Online, USA Topographic Maps. 30x60 GRID Quadrangles

Figure 1  
Vicinity Map



SE 1/4 SECTION 28 T2S R1W W.M.

WASHINGTON COUNTY OREGON

SCALE 1"=200'

2S 1 28D  
TUALATIN

SEE MAP  
2S 1 28A

CANCELLED TAX LOTS  
101.

124TH AVENUE

SEE MAP  
2S 1 27C

88-13

*Portion Tax Lot  
100*

FOR ASSESSMENT  
PURPOSES ONLY  
DO NOT RELY ON  
FOR ANY OTHER USE



WD2017-0008  
TUALATIN  
2S 1 28D

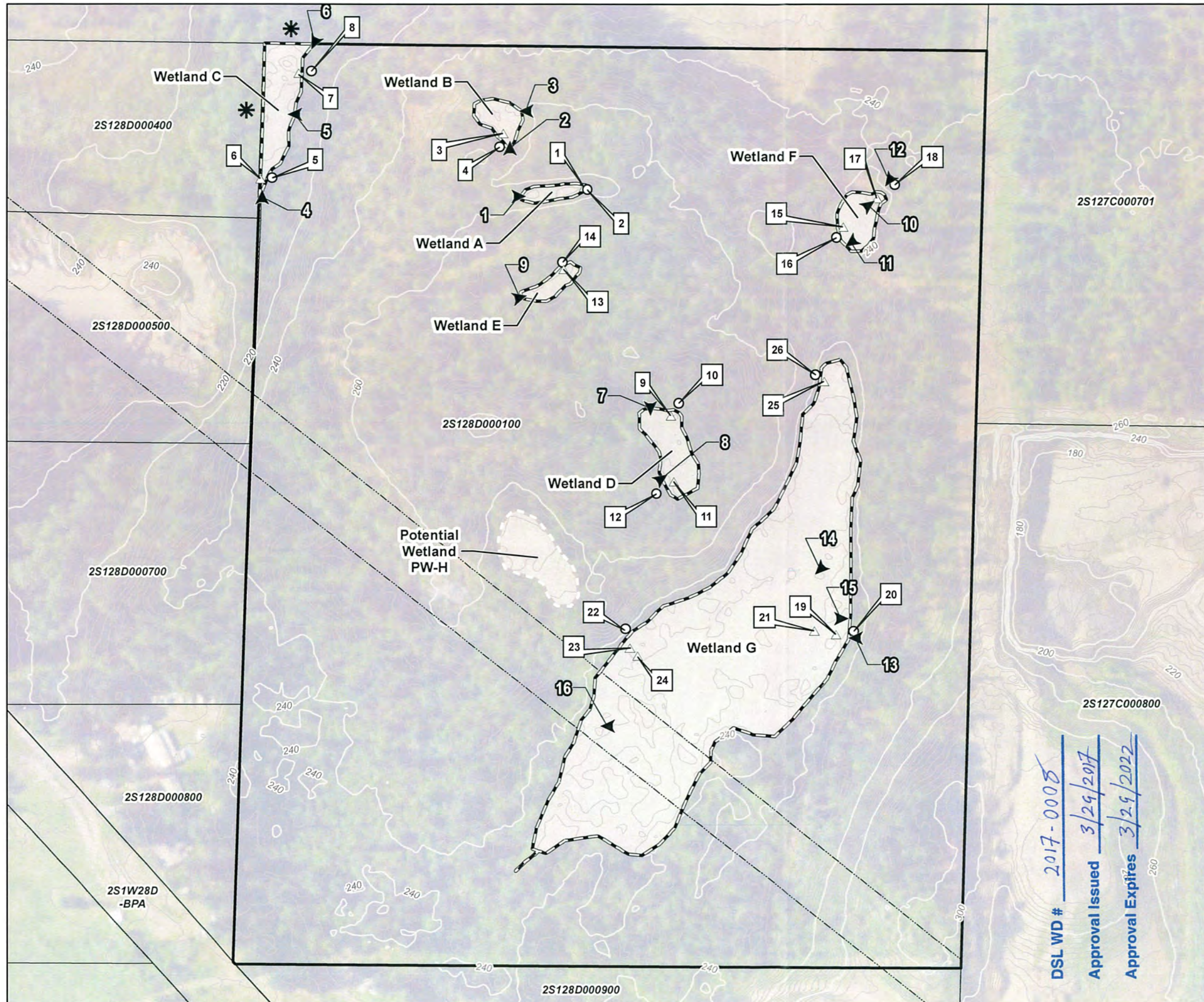
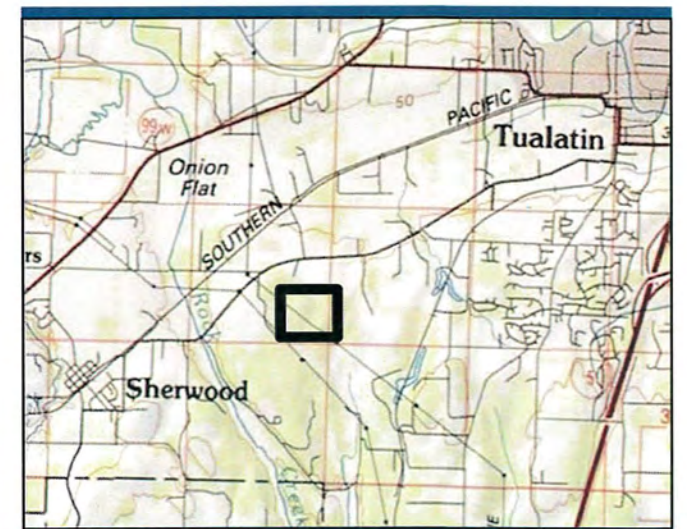
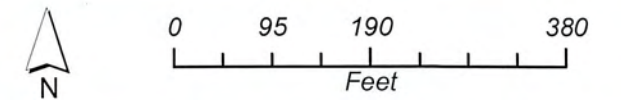


**Willamette Water Supply Program  
Water Treatment Plant (WWSP WTP)  
Wetland Delineation**

**Figure 6  
Delineated Wetlands**

Delineated Features	
	Wetland
	Potential Wetland
	Wetland Area
	Study Area
	Photo location and direction
	Wetland extends beyond study area
	Upland Data Plot
	Wetland Data Plot
	Power ROW
	Taxlot
	Contour (20 ft intervals)
	Contour (2 ft intervals)

On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Off-site boundaries are approximate and were mapped based on field review from adjacent public right of way and aerial photo interpretation. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off site. Only taxlots which intersect the study area are labeled. Imagery: USDA NAIP 2016.



DSL WD # 2017-0005  
Approval Issued 3/29/2017  
Approval Expires 3/29/2022





# Oregon

Kate Brown, Governor

## Department of State Lands

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[www.oregon.gov/dsl](http://www.oregon.gov/dsl)

**State Land Board**

April 17, 2018

City of Hillsboro Water Department  
Attn: Niki Iverson, Water Resource Manager  
150 E. Main Street  
Hillsboro, OR 97123-4028

Kate Brown  
Governor

Dennis Richardson  
Secretary of State

Re: WD #2018-0040 Wetland Delineation Report for Additional Area  
Reviews for the Proposed Willamette Water Supply Program  
Clackamas and Washington Counties;  
Portions of Multiple Townships, Ranges, Sections and Tax lots  
APP #60102

Tobias Read  
State Treasurer

Dear Ms. Iverson:

The Department of State Lands has reviewed the wetland delineation report prepared by David Evans and Associates for the sites referenced above. Please note that the report includes seven study areas and these areas include only a portion of the tax lots shown on the attached maps. Based upon the information presented in the report and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in the revised delineation map figures (Figure 6, Site A - F, and the WTP Site Update). Please replace all copies of the preliminary wetland maps with these final Department-approved maps.

Within the seven study areas, four wetlands (Wetland W-M1-1, W-W1-2, W-M5-9, and F), totaling approximately 0.27 acres, and segments of four waterways [S-M1-1 (Coffee Lake Creek), S-B-1 (tributary to the Tualatin River), S-W2-2 (Rock Creek), and S-4-2 (Beaverton Creek)], were identified. The wetlands and waterways, are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2-year recurrence interval flood elevation if OHWL cannot be determined). However, Beaverton and Rock Creeks are both essential salmonid streams; therefore, fill or removal of any amount of material below their OHWL's or within hydrologically-connected wetlands (Wetland F) may require a state permit.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will determine jurisdiction for purposes of the Clean Water Act. This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

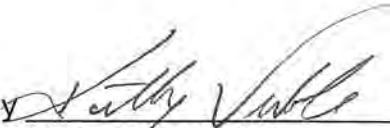
Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,



Peter Ryan, PWS  
Jurisdiction Coordinator

Approved by



Kathy Verble, CPSS  
Aquatic Resource Specialist

Enclosures

ec: Phil Rickus, David Evans and Associates  
Clackamas County Planning Department  
Washington County Planning Department  
Kinsey Friesen, Corps of Engineers  
Lindsey Obermiller, Clean Water Services  
Anita Huffman, DSL



**WETLAND DELINEATION / DETERMINATION REPORT COVER FORM**

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report. A single PDF attachment of the completed cover form and report may be e-mailed to [Wetland\\_Delineation@dsl.state.or.us](mailto:Wetland_Delineation@dsl.state.or.us).

<input checked="" type="checkbox"/> Applicant <input type="checkbox"/> Owner Name, Firm and Address: <b>Niki Iverson, Water Resource Manager</b> <b>City of Hillsboro Water Department</b> <b>150 E. Main Street</b> <b>Hillsboro, OR 97123-4028</b>	Business phone # <b>(503) 615-6770</b> Mobile phone # (optional) E-mail: <b>niki.iverson@hillsboro-oregon.gov</b>
<input checked="" type="checkbox"/> Authorized Legal Agent, Name and Address: <b>Niki Iverson, Water Resource Manager</b> <b>City of Hillsboro Water Department</b>	Business phone # <b>(503) 615-6770</b> Mobile phone # (optional) E-mail: <b>niki.iverson@hillsboro-oregon.gov</b>
I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact. Typed/Printed Name: <u>Niki Iverson</u> Signature: Date: <u>1/23/18</u> Special instructions regarding site access: _____	

**Project and Site Information** (using decimal degree format for lat/long., enter centroid of site or start & end points of linear project)

Project Name: <b>Willamette Water Supply Program</b>	Latitude: <b>See Attachment</b>	Longitude: <b>See Attachment</b>
Additional Areas: <b>Winter 2017</b>		
Proposed Use: <b>Pipeline Installation</b>	Tax Map # <b>See Attachment</b>	
Project Street Address (or other descriptive location): <b>7 Sites between Wilsonville and Hillsboro/Beaverton- See Figure 1</b>	Township	Range Section QQ
	Tax Lot(s) <b>See Attachment</b>	
	Waterway: <b>Many</b>	River Mile: <b>N/A</b>
City: <b>See Attachment</b>	County: <b>See Attachment</b>	NWI Quad(s): <b>Several</b>

**Wetland Delineation Information**

Wetland Consultant Name, Firm and Address: <b>Phil Rickus</b> <b>David Evans and Associates</b> <b>2100 SW River Parkway</b> <b>Portland, OR 97201</b>	Phone # <b>503-223-6663</b> Mobile phone # E-mail: <b>pr@dealinc.com</b>
The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.	
Consultant Signature:	Date: <b>January 16, 2018</b>

Primary Contact for report review and site access is  Consultant  Applicant/Owner  Authorized Agent

Wetland/Waters Present?  Yes  No Study Area size: **See Attachment** Total Wetland Acreage: **See Attachment**

**Check Box Below If Applicable:**

**Fees:**

<input checked="" type="checkbox"/> R-F permit application submitted	<input checked="" type="checkbox"/> Fee payment submitted \$ <b>437</b>
<input type="checkbox"/> Mitigation bank site	<input type="checkbox"/> Fee (\$100) for resubmittal of rejected report
<input type="checkbox"/> Wetland restoration/enhancement project (not mitigation)	<input type="checkbox"/> No fee for request for reissuance of an expired report
<input type="checkbox"/> Industrial Land Certification Program Site	
<input type="checkbox"/> Reissuance of a recently expired delineation	
Previous DSL # _____ Expiration date _____	

**Other Information:**

Has previous delineation/application been made on parcel?	Y N	<input checked="" type="checkbox"/> <input type="checkbox"/> If known, previous DSL # <b>See Report</b>
Does LWI, if any, show wetland or waters on parcel?	<input checked="" type="checkbox"/> <input type="checkbox"/>	<b>See Report</b>

**For Office Use Only**

DSL Reviewer: <u>PR</u>	Fee Paid Date: ___ / ___ / ___	DSL WD # <u>2018-0040</u>
Date Delineation Received: <u>1 / 30 / 18</u>	DSL Project # _____	DSL Site # _____
Scanned <input checked="" type="checkbox"/> Final Scan: <input type="checkbox"/>	DSL WN # _____	DSL App. # _____

Electronic Submittal

WWSP ADDITIONAL AREAS WD2018-0040  
 UPDATED DELINEATION INFORMATION TABLES

Site	Latitude	Longitude	PLSS	City	County	Study Area Size (acreage)	Wetland Acreage	Water Acreage
A	45.300856	-122.780067	T3S R1W S22, 23	Wilsonville	Clackamas	4.58	0.08	0.03
B	45.470328	-122.897936	T1S R2W S23	--	Washington	0.25	0.08	0.001
C	45.431823	-122.878706	T2S R2W S1	Beaverton	Washington	0.92	0.05	
D	45.467799	-122.893679	T1S R2W S23	--	Washington	0.37	--	--
E	45.525420	-122.901504	T1N R2W S35	Hillsboro	Washington	0.91	--	0.01
F	45.496684	-122.829843	T1S R1W S8	Beaverton	Washington	2.06	0.06	0.03
WTP	45.363563	-122.808718	T2S R1W S28	--	Washington	2.35	--	--

Site	Work Package ID #	Previous WD #	Reason for Second Look
A	PLM 1.0	2017-0026	Received Access
B	PLW 1.0	2017-0027	Received Access
C	PLM 5.0	2017-0024	Received Access
D	PLW 1.0	2017-0027	Received Access
E	PLW 2.0	2017-0007	Received Access
F	PLE 1.0	2017-0025	Alignment Shifted
WTP	WTP 1.0	2017-0008	Received Access



Table 1: Summary of Water Resources



Site ID	ID <sup>1</sup>	Size in Study Area <sup>2</sup>	Assumed Corps JD	Assumed DSL JD	Cowardin Class <sup>3</sup>	HGM Class <sup>4</sup>	Data Plot ID	Notes
A	W-M1-1	0.08 acres	Yes	Yes	PEM	Riverine	A-1	Reed canarygrass wetland located below OHWM of Coffee Lake Cr. Extends offsite.
A	S-M1-1	0.03 acres	Yes	Yes	--	--	--	Coffee Lake Creek- OHWM approximately 25' from steep banks, drift lines.
B	W-W1-2	0.08 acres	Yes	Yes	PEM	Slope	B-1	Swale wetland in SW corner of parcel. Extends offsite.
B	S-B-1	0.001 acres	Yes	Yes	--	--	--	Fully vegetated man-made shallow ditch within a wetland swale that is 1 foot wide. No scour or OHW visible. Flows offsite to north.
C	W-M5-9	0.05 acres	Yes	Yes	PEM	Slope	C-1	Swale wetland between SW Tile Flat Rd and SW Kobbe Dr. Extends offsite.
E	S-W2-2	0.01 acres	Yes	Yes	--	--	--	<u>Rock Creek</u> . Incised stream, OHWM approximately 25' from steep banks, drift lines. (ESH)
F	S-4-2	0.03 acres	Yes	Yes	--	--	--	<u>Beaverton Creek</u> . OHWM approximately 25' from steep banks, drift lines, water staining on culverts. Lies on both sides of SW Millikan Rd. (ESH)
F	Wetland F	0.06 acres	Yes	Yes	PEM	DEP	F-1	Low area adjacent to railroad tracks. Extends offsite.

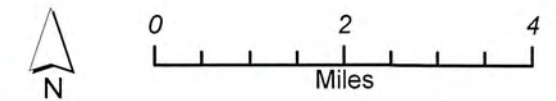
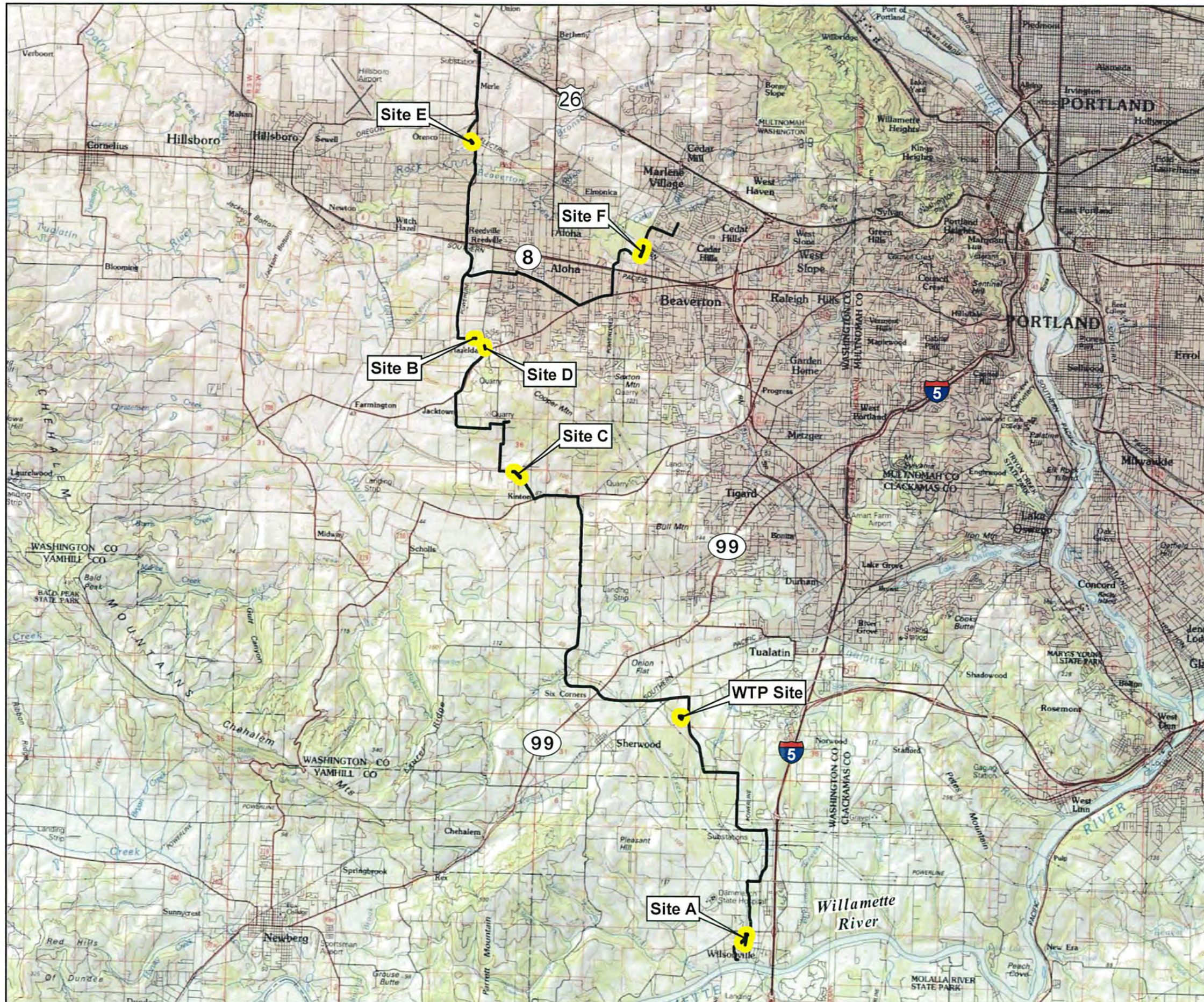
1-W = wetland feature, S = stream feature  
 2-Size in study area is given in acres for wetlands and streams  
 3-Cowardin Class: PEM=palustrine emergent  
 4-HGM Class: Slope=slope, DEP=depressional, Riverine=riverine flow-through



Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation

Figure 1  
Vicinity Map

 Study Area Site (2017)  
 WWSP Alignment



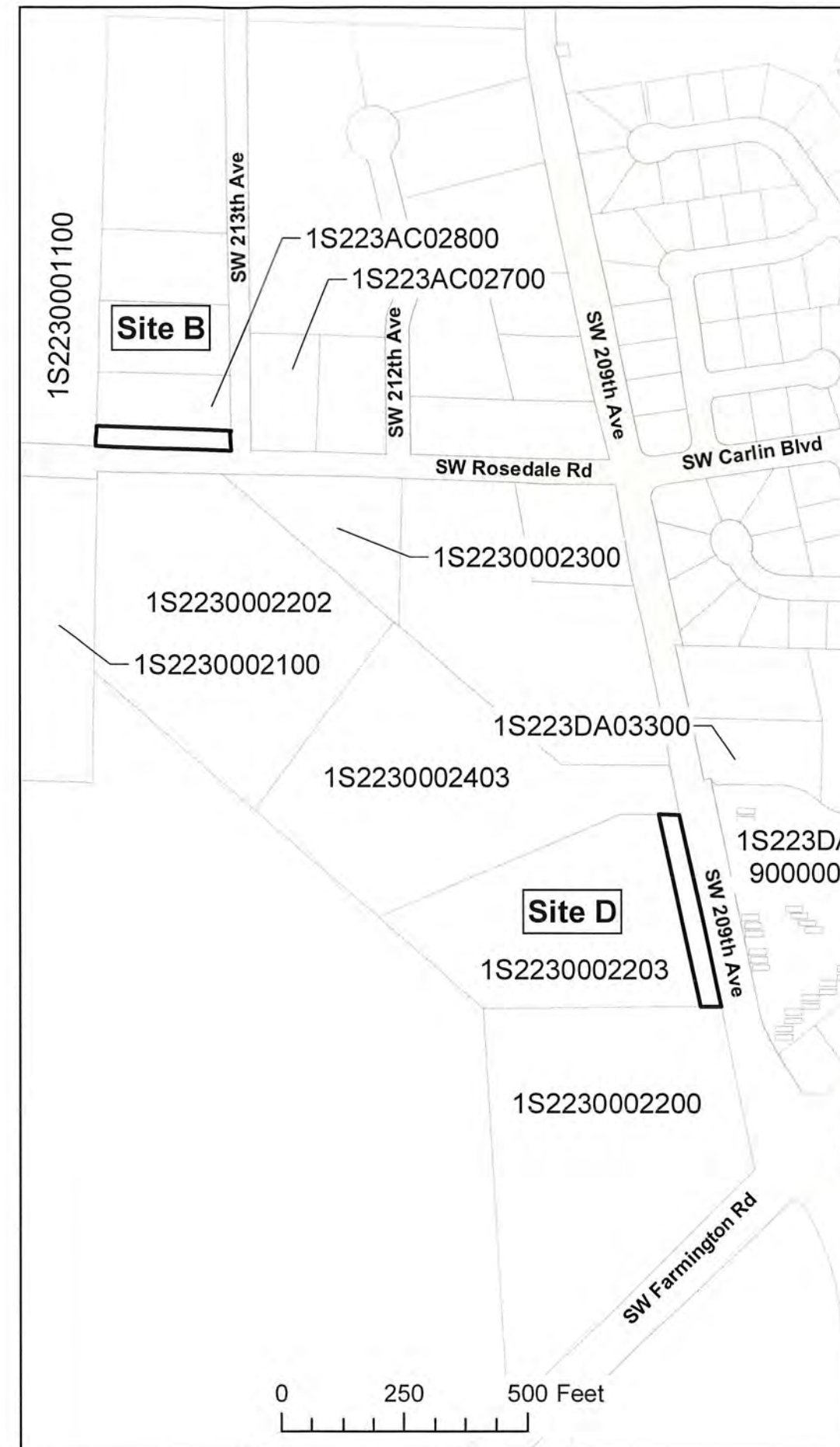
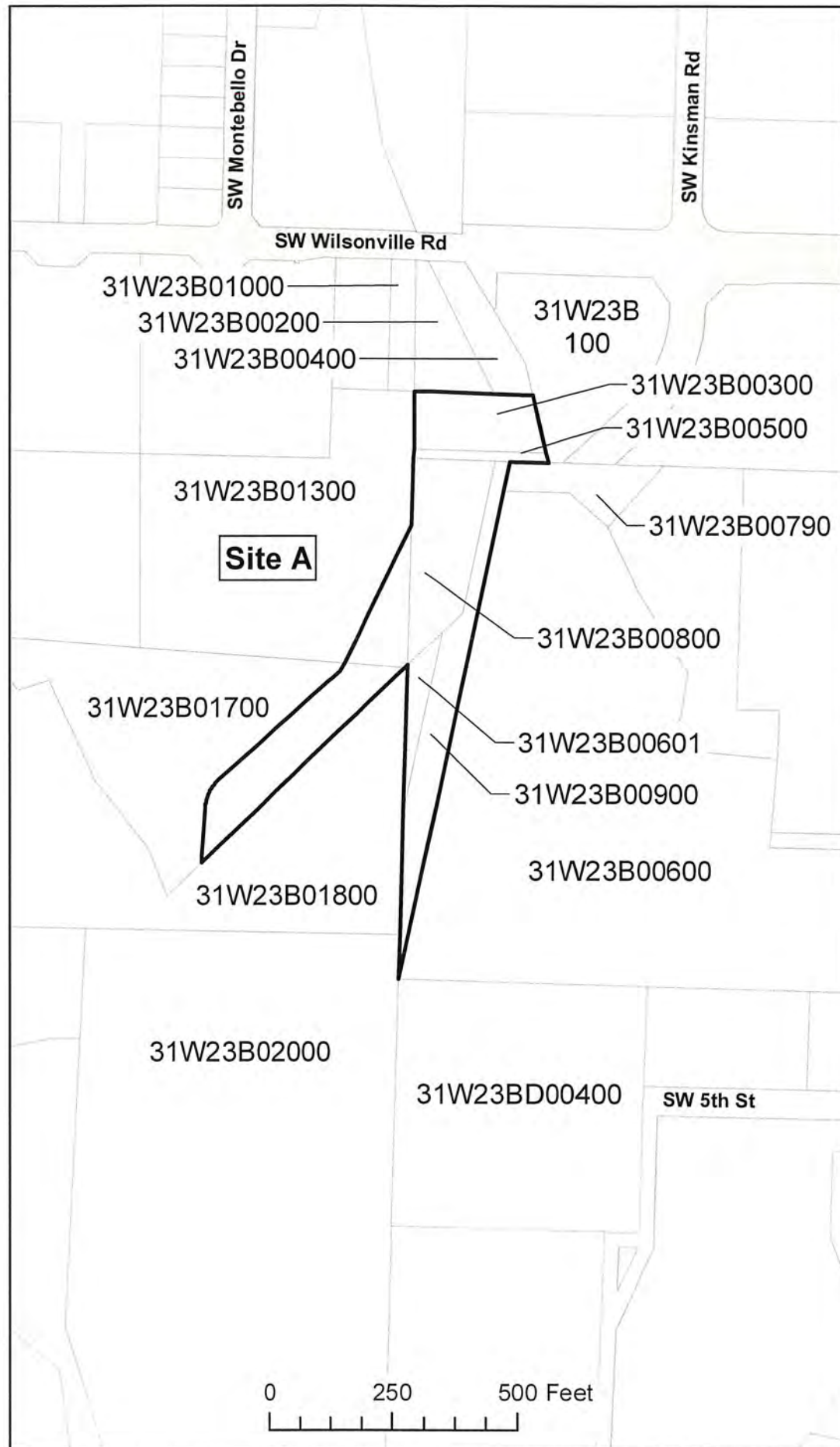


Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation

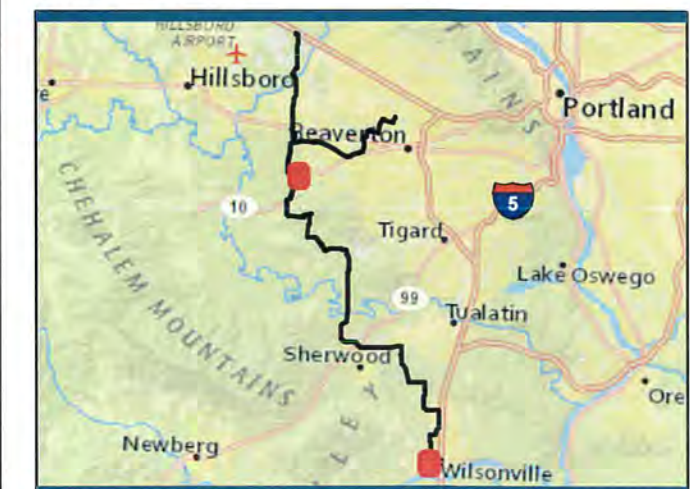
Figure 2, Sheet 1 of 3  
Tax Lots

Legend

- Study Area (2017)
- Tax Lot



Metro RLIS GIS Data, 2017.

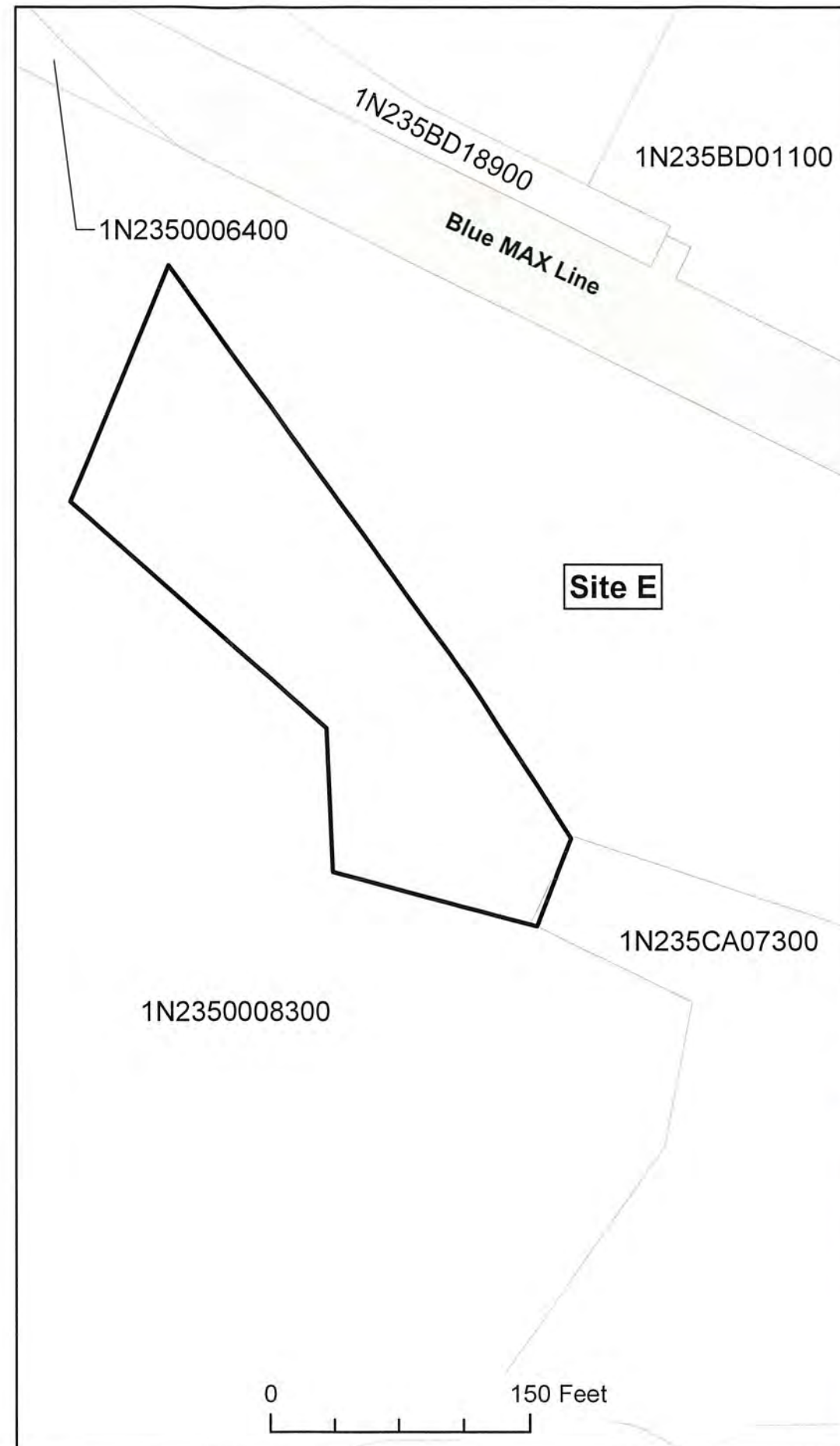
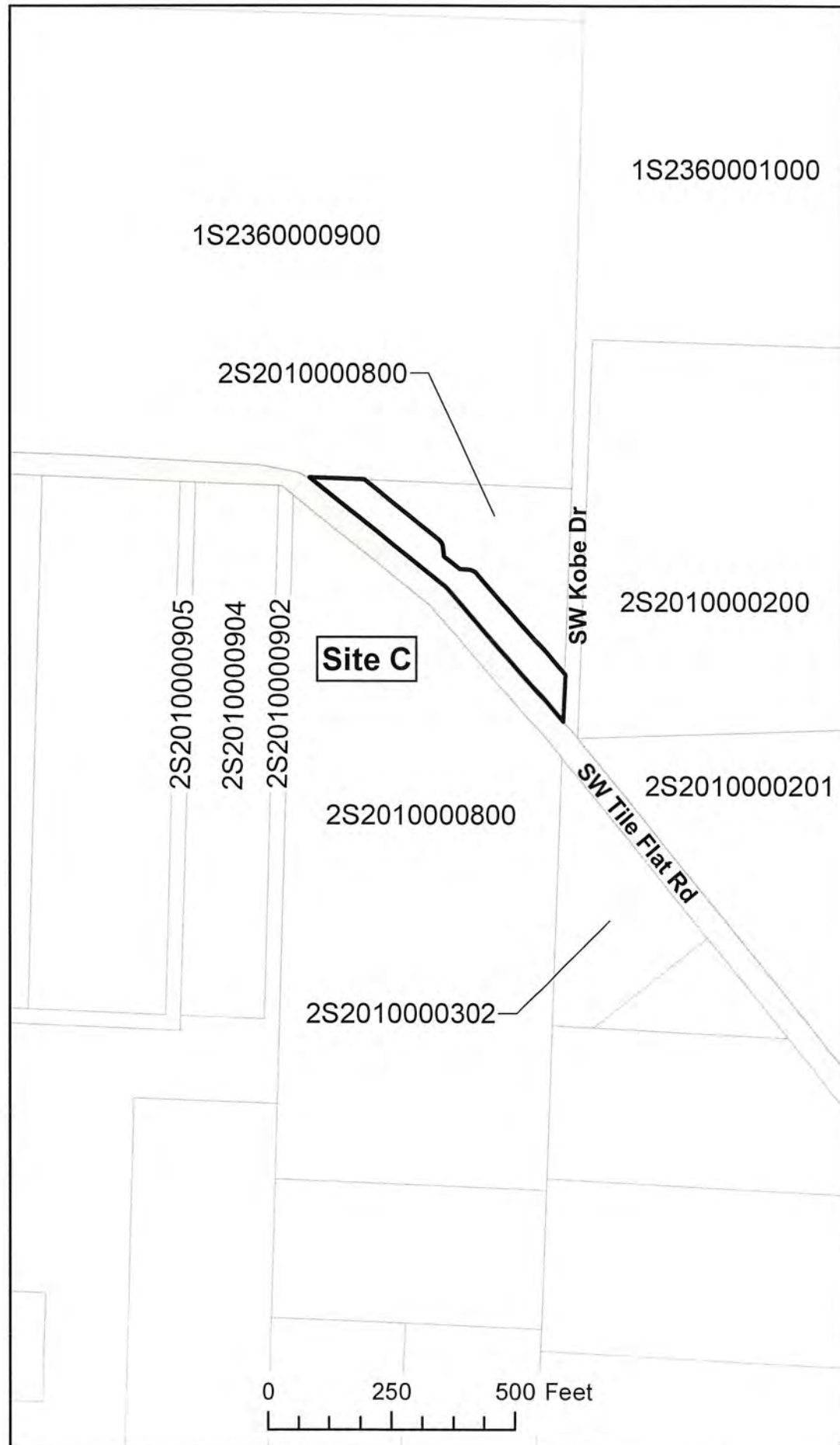


Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation

Figure 2, Sheet 2 of 3  
Tax Lots

Legend

- Study Area (2017)
- Tax Lot



Metro RLIS GIS Data. 2017.









**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, Site A, Sheet 1 of 3**  
Delineated Wetlands  
PLM 1.0, WD2017-0026  
Access provided



	Study Area (2017)		Study Area with Access (2016)
<b>Delineated Features</b>			
	Ordinary High Water (OHW) line		Upland Data Plot
	Wetland Boundary		Wetland Data Plot
	Water Quality Swale		Feature extends beyond study area
	Culvert		Flow Direction
	Culvert		Photo Location and Direction
	Catch Basin		Taxlot
	Wetland Area		Power ROW
	Ordinary High Water (OHW) Area		Fence
			10-ft wide Mitigation Enhancement Strip

On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Linework outside the 2017 study area was delineated by David Evans and Associates in Fall 2016. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off-site. Only taxlots which intersect the 2017 study area are labeled. Imagery: Bing Maps Aerial.

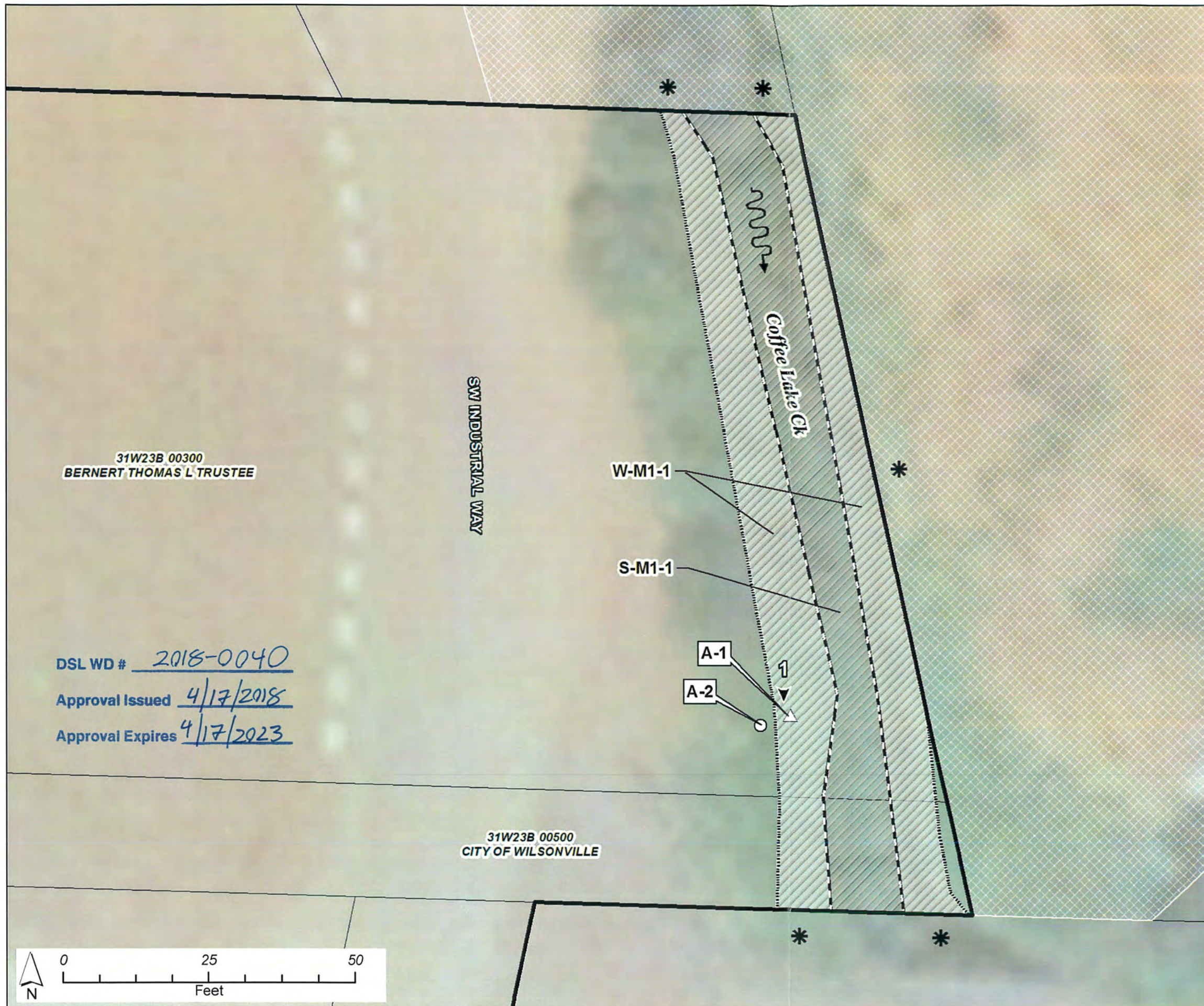
DSL WD # 2018-0040  
Approval Issued 4/17/2018  
Approval Expires 4/17/2023





**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, Site A, Sheet 2 of 3**  
Delineated Wetlands  
PLM 1.0, WD2017-0026  
Access provided



Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) line	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) area	Fence
	10-ft wide Mitigation Enhancement Strip

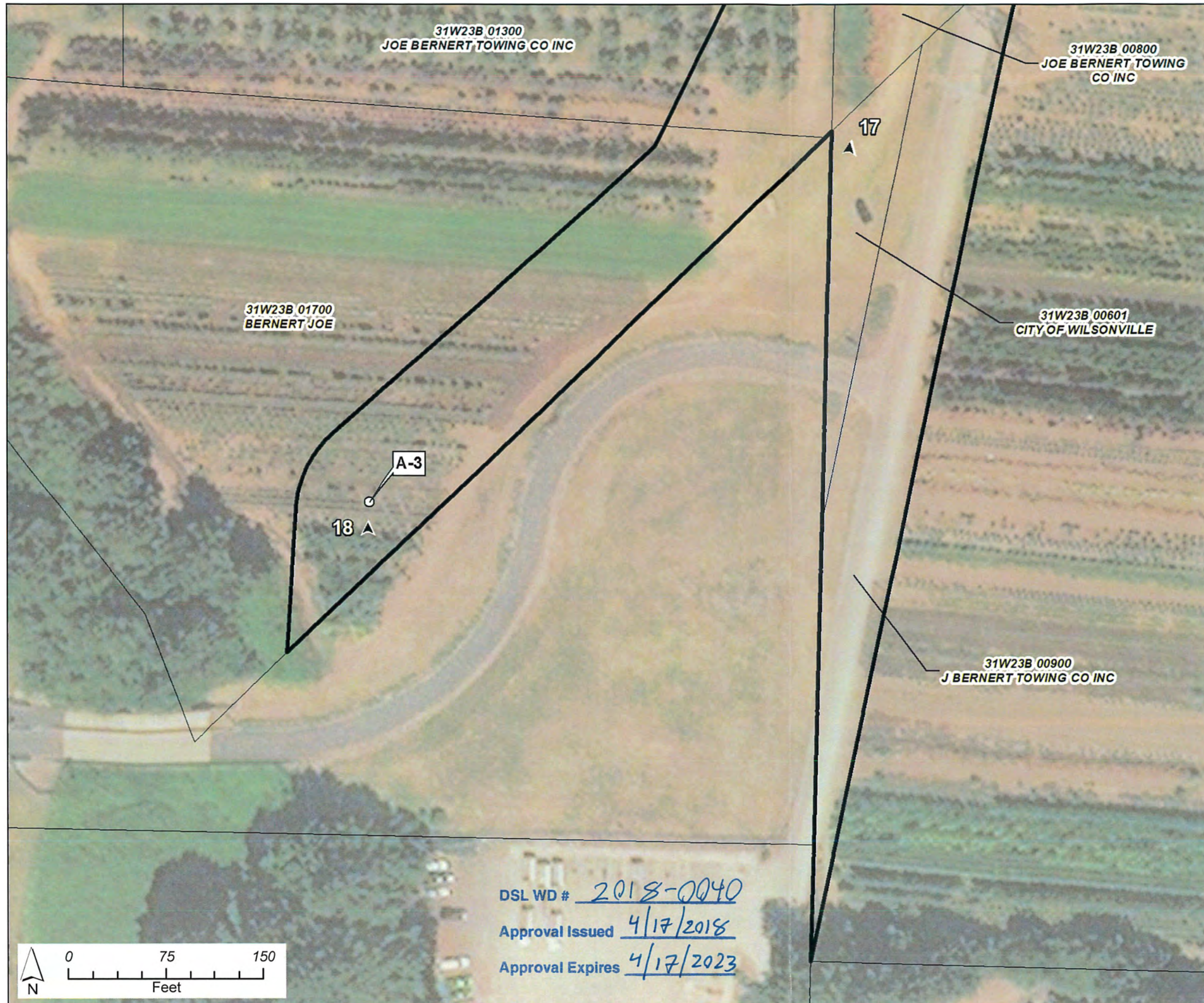
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**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, Site A, Sheet 3 of 3**  
Delineated Wetlands  
PLM 1.0, WD2017-0026  
Access provided



Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) Line	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) Area	Fence
	10-ft wide Mitigation Enhancement Strip

On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Linework outside the 2017 study area was delineated by David Evans and Associates in Fall 2016. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off-site. Only taxlots which intersect the 2017 study area are labeled. Imagery: Bing Maps Aerial.

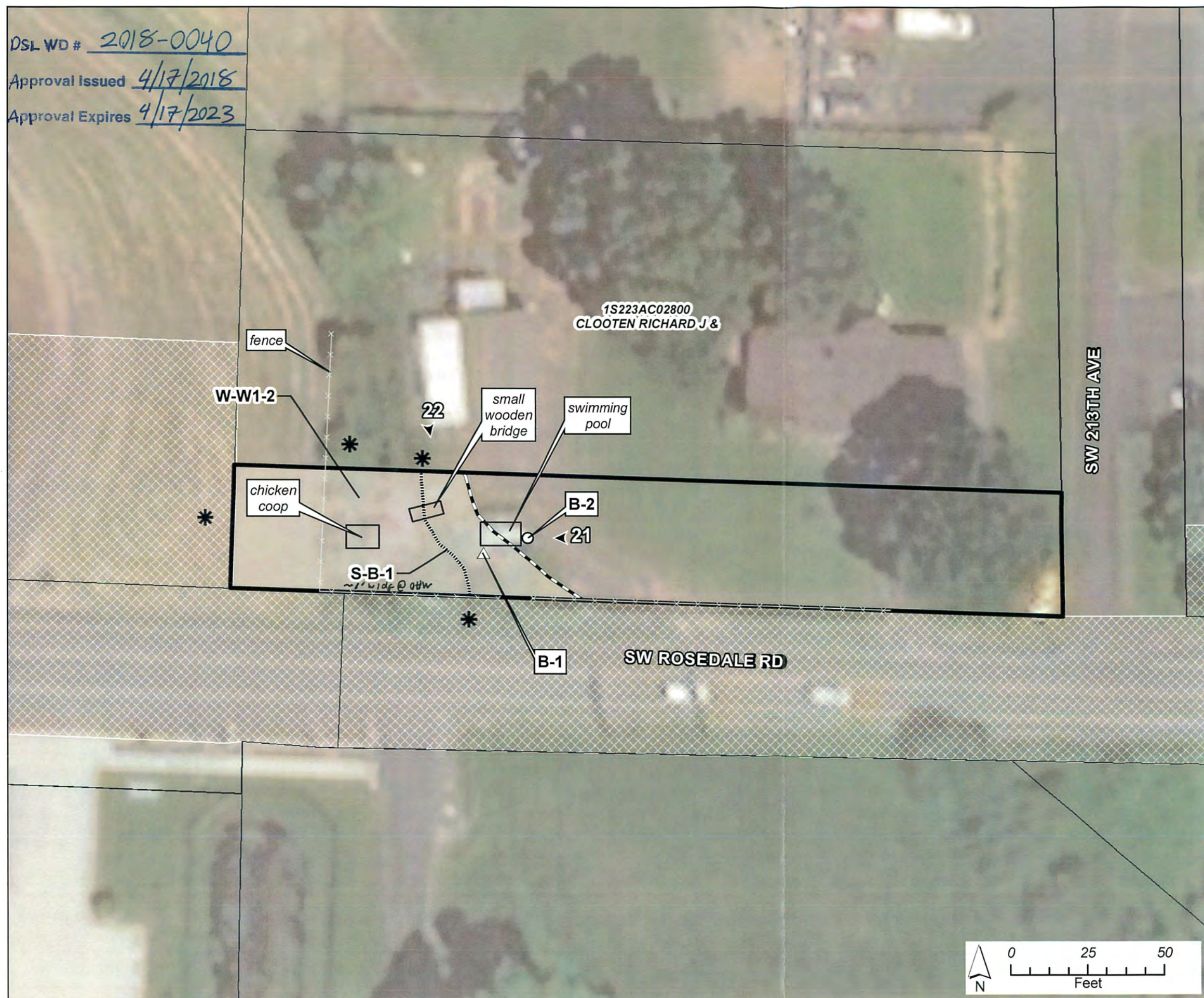




DSL WD # 2018-0040  
 Approval Issued 4/17/2018  
 Approval Expires 4/17/2023

**Willamette Water Supply Program  
 Additional Areas Winter 2017  
 Wetland Delineation**

**Figure 6, Site B**  
 Delineated Wetlands  
 PLW 1.0, WD2017-0027  
 Access provided



**Legend**

Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) Line	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) Area	Fence
	10-ft wide Mitigation Enhancement Strip

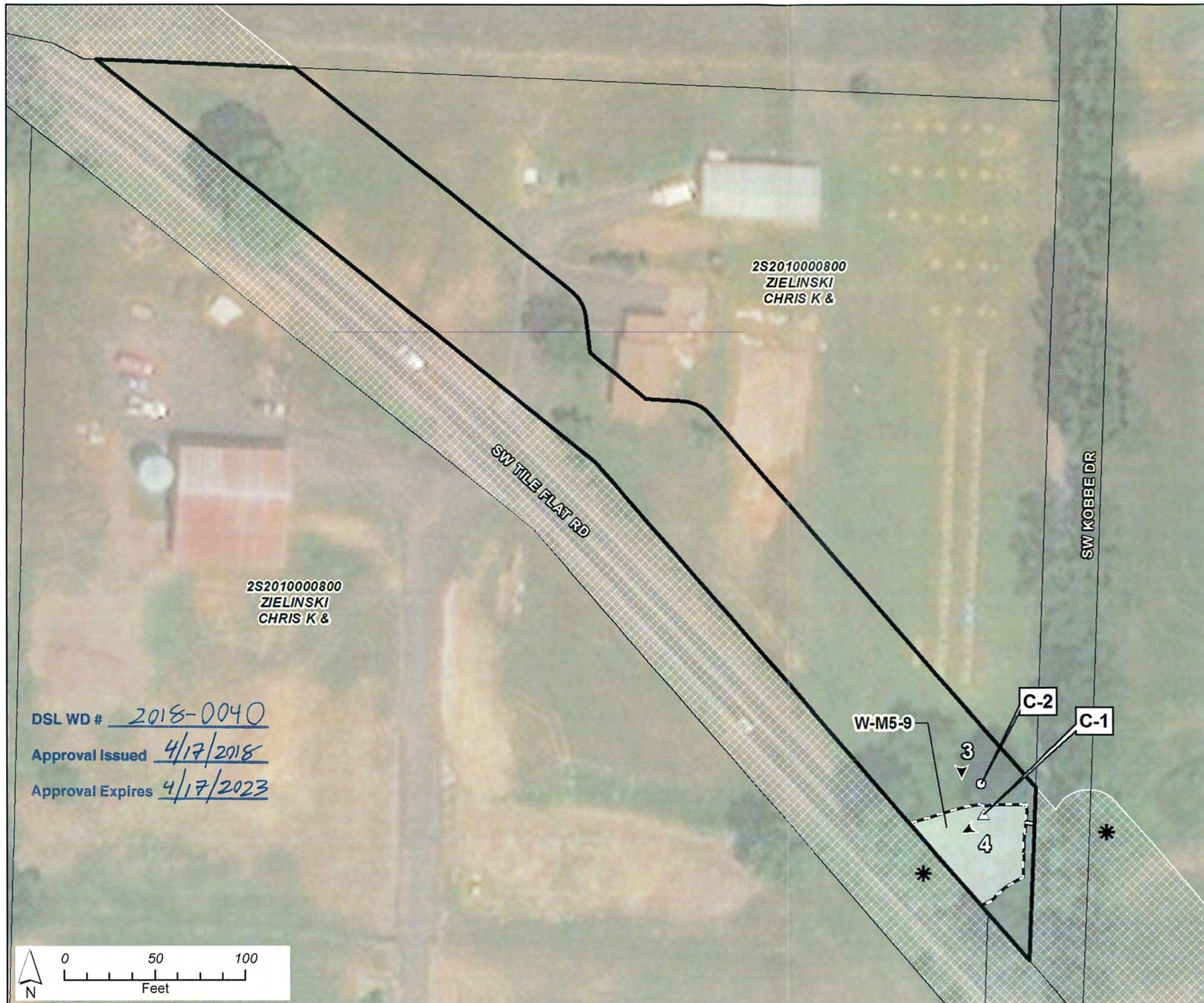
On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Linework outside the 2017 study area was delineated by David Evans and Associates in Fall 2016. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off-site. Only taxlots which intersect the 2017 study area are labeled. Imagery: Bing Maps Aerial.





**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, Site C**  
Delineated Wetlands  
PLM 5.0, WD2017-0024  
Access provided



Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) line	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) area	Fence
	10-ft wide Mitigation Enhancement Strip

On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Linework outside the 2017 study area was delineated by David Evans and Associates in Fall 2016. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off-site. Only taxlots which intersect the 2017 study area are labeled. Imagery: Bing Maps Aerial.

DSL WD # 2018-0040  
Approval Issued 4/17/2018  
Approval Expires 4/17/2023

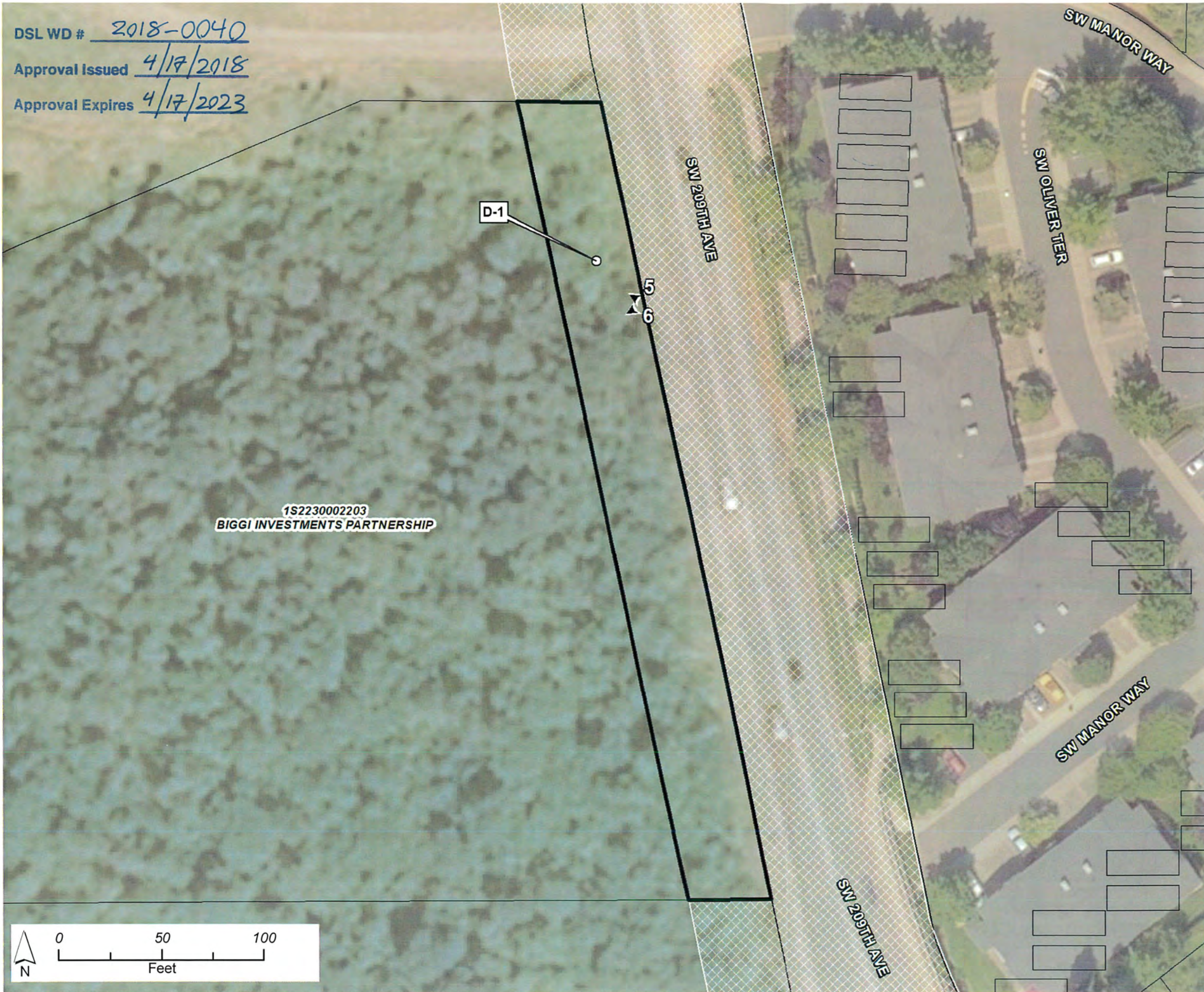




DSL WD # 2018-0040  
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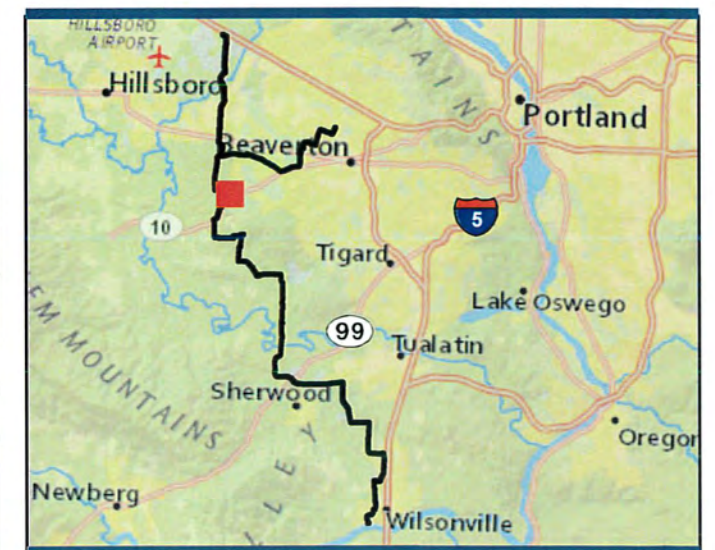
**Willamette Water Supply Program  
 Additional Areas Winter 2017  
 Wetland Delineation**

**Figure 6, Site D  
 Delineated Wetlands  
 PLW 1.0, WD2017-0027  
 Access provided**



Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) <i>IMB</i>	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) <i>ORPA</i>	Fence
	10-ft wide Mitigation Enhancement Strip

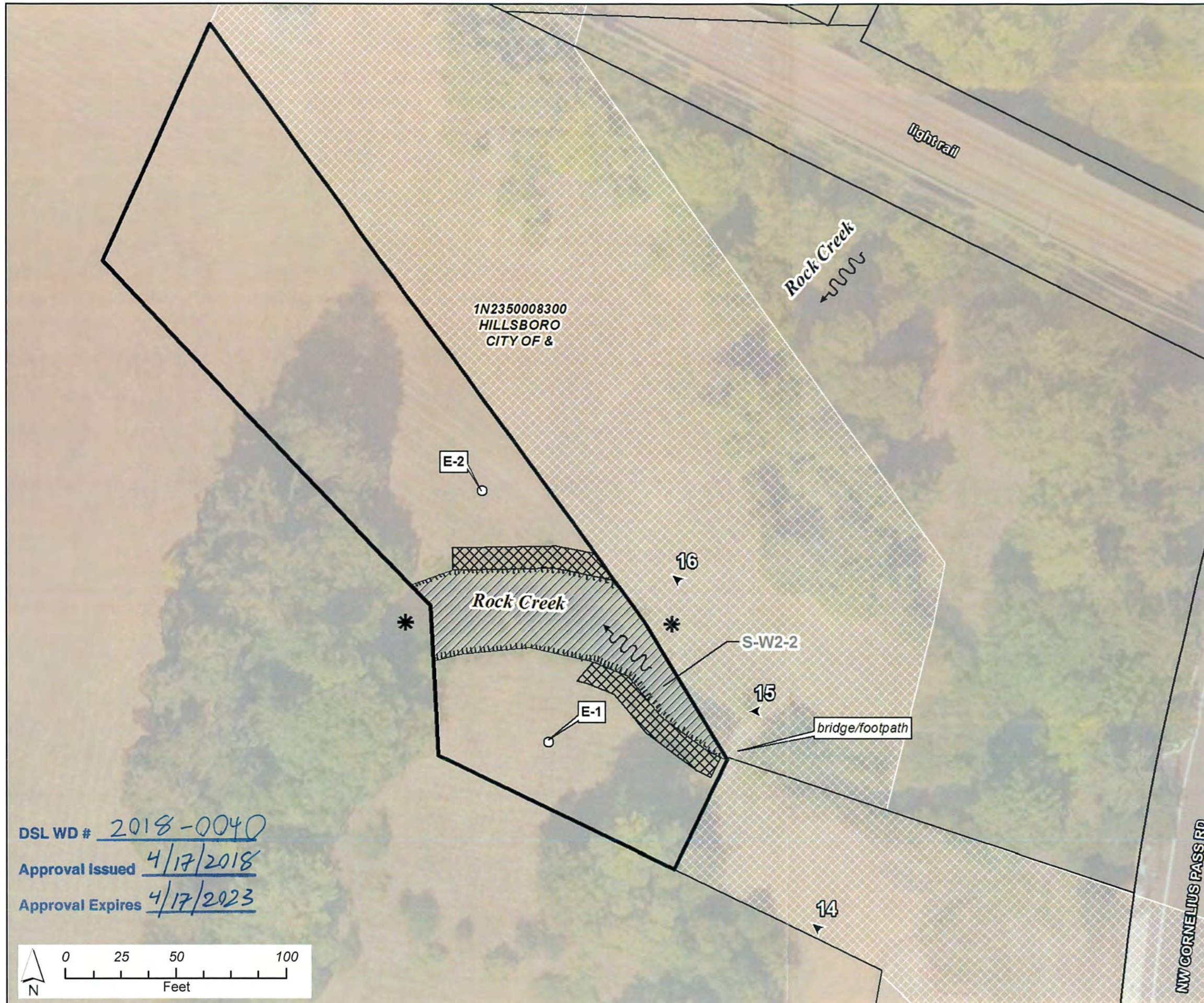
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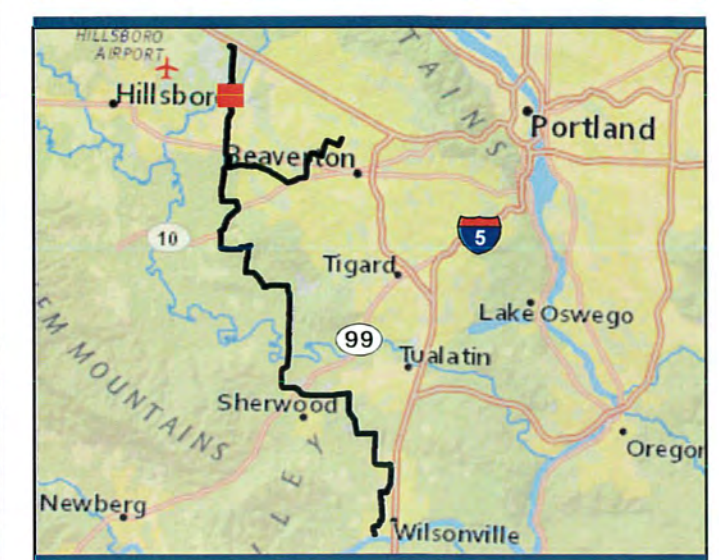
**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, Site E**  
Delineated Wetlands  
PLW 2.0, WD2017-0007  
Alignment change

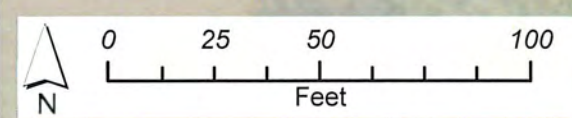


Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) line	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) Area	Fence
	10-ft wide Mitigation Enhancement Strip

On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Linework outside the 2017 study area was delineated by David Evans and Associates in Fall 2016. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off-site. Only taxlots which intersect the 2017 study area are labeled. Imagery: Bing Maps Aerial.



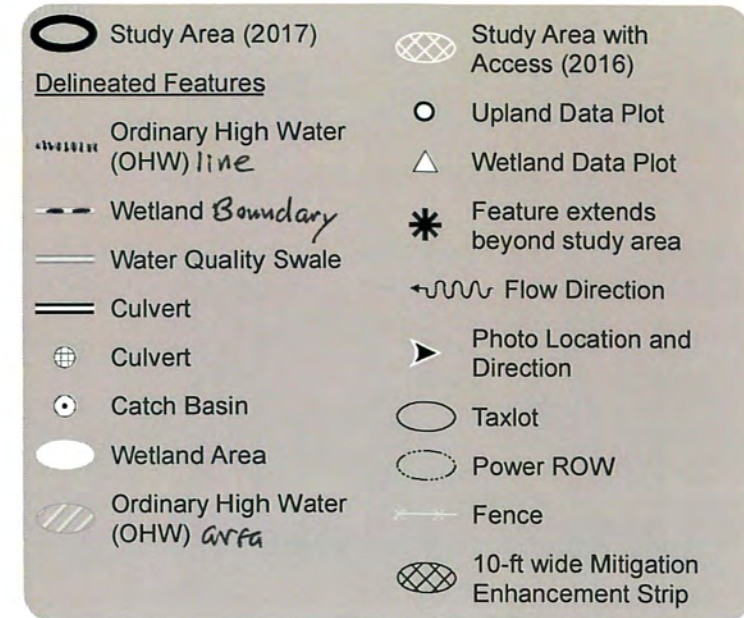
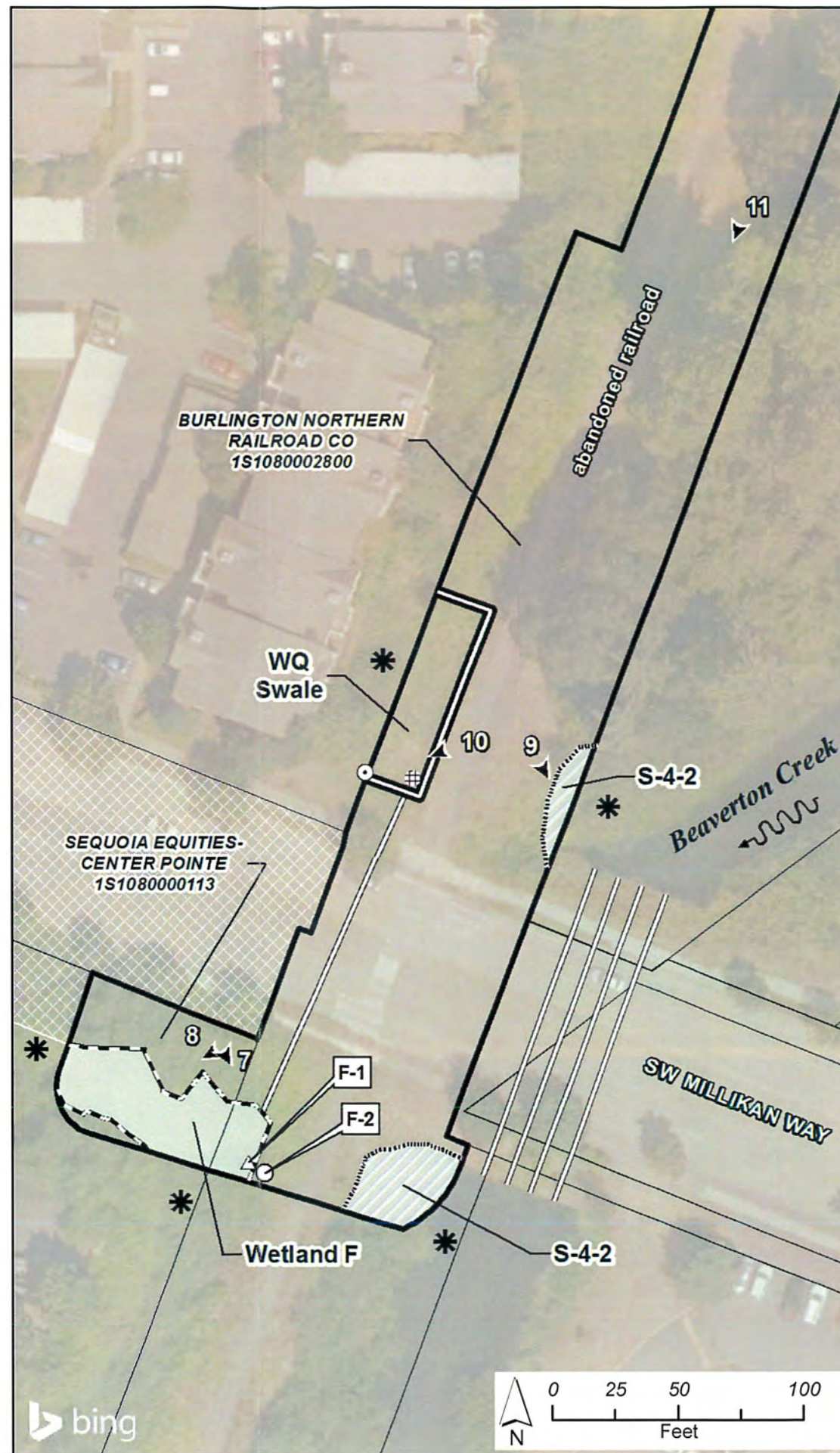
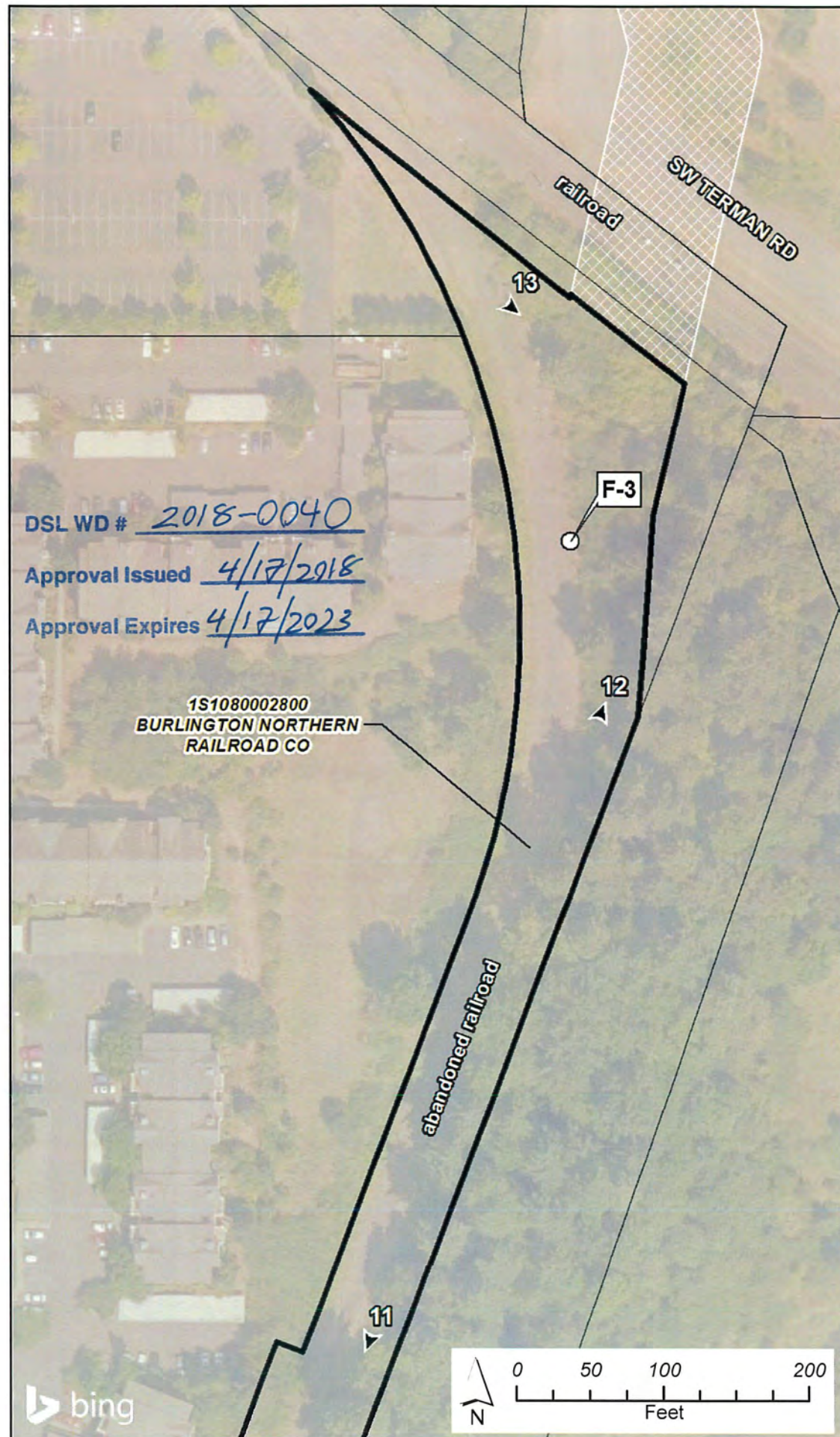
DSL WD # 2018-0040  
Approval Issued 4/17/2018  
Approval Expires 4/17/2023





**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, Site F**  
Delineated Wetlands  
PLE 1.0, WD2017-0025  
Access provided



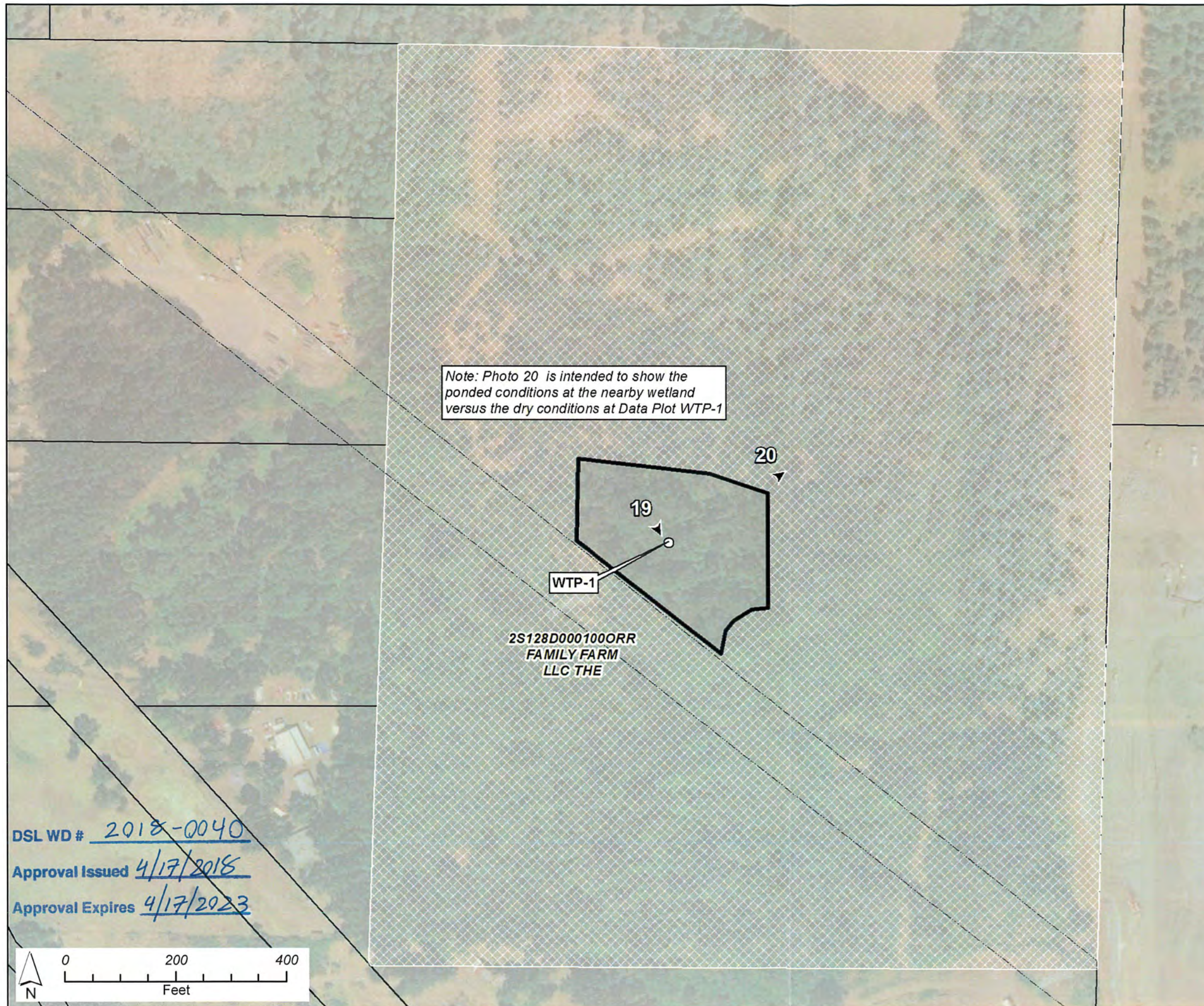
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**Willamette Water Supply Program  
Additional Areas Winter 2017  
Wetland Delineation**

**Figure 6, WTP Site Update**  
Delineated Wetlands  
WTP 1.0, WD2017-0008  
Access possible through poison oak



Study Area (2017)	Study Area with Access (2016)
<b>Delineated Features</b>	
Ordinary High Water (OHW) line	Upland Data Plot
Wetland Boundary	Wetland Data Plot
Water Quality Swale	Feature extends beyond study area
Culvert	Flow Direction
Culvert	Photo Location and Direction
Catch Basin	Taxlot
Wetland Area	Power ROW
Ordinary High Water (OHW) area	Fence
	10-ft wide Mitigation Enhancement Strip

On-site features (wetlands, ditches, streams, culverts, and data plots) were mapped with a Trimble Pathfinder GEO XH receiver with typical accuracy of 3 feet or better. Linework outside the 2017 study area was delineated by David Evans and Associates in Fall 2016. An asterisk was included where jurisdictional features, with the exclusion of upland ditches, extend off-site. Only taxlots which intersect the 2017 study area are labeled. Imagery: Bing Maps Aerial.





## ***APPENDIX C: DATA SHEETS***

# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 1  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: See spreadsheet  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 10  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Wetland plot in Wetland A at toe of slope. Precipitation is high for water year.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus latifolia</u>	25	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Malus fusca</u>	10	Y	FACW	
3. _____				
4. _____				
35 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30 ft</u> )				
1. <u>Spiraea douglasii</u>	40	Y	FACW	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
2. <u>Rosa pisocarpa</u>	10	N	FAC	
3. <u>Salix lasiandra</u>	5	N	FACW	
4. _____				
5. _____				
55 = Total Cover				
Herb Stratum (Plot size: <u>5 ft</u> )				
1. <u>Carex obnupta</u>	20	Y	OBL	<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
20 = Total Cover				
Woody Vine Stratum (Plot size: <u>30 ft</u> )				
1. _____				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>80</u>				
Remarks:				



**SOIL**

Sampling Point: Plot 1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-18	10YR 3/1	100	--	--	--	--	Mucky Loam	Histic with peaty inclusions

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

Some fibrous peaty nodules present (1"). Large rocks occasionally present in matrix, but less restrictive than in upland plots.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): <sup>6</sup> \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): <sup>4</sup> \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Plot is 10 feet from ponded water in concave wetland.



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 2  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: See spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 20  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Plot 2 is 2 ft. higher than Plot 1 and on face of slope. Precipitation is high for water year.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pseudotsuga menziesii</u>	60	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20</u> (A/B)
2. <u>Arbutus menziesii</u>	25	Y	UPL	
3. <u>Crataegus douglasii</u>	10	N	FAC	
4. _____				
95 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
Sapling/Shrub Stratum	(Plot size: <u>30</u> )			
1. <u>Gaultheria shallon</u>	35	Y	FACU	
2. <u>Mahonia nervosa</u>	30	Y	FACU	
3. <u>Rubus ursinus</u>	10	N	FACU	
4. _____				
5. _____				
75 = Total Cover				
Herb Stratum	(Plot size: <u>5</u> )			
1. <u>Polypodium glycyrrhiza</u>	5	Y	UPL	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
5 = Total Cover				
Woody Vine Stratum	(Plot size: <u>30</u> )			
1. _____				
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>95</u>				

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No

Remarks:



**SOIL**

Sampling Point: Plot 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10/YR 2/1	100	--	--	--	--	Organic	moderately decomposed litter
2-7	10YR 3/3	100	--	--	--	--	Loam	
7-18+	7.5YR 4/4	100	--	--	--	--	Loam	
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.								
<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>						<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>		
<input type="checkbox"/> Histosol (A1)		<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> 2 cm Muck (A10)				
<input type="checkbox"/> Histic Epipedon (A2)		<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Red Parent Material (TF2)				
<input type="checkbox"/> Black Histic (A3)		<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)		<input type="checkbox"/> Very Shallow Dark Surface (TF-12)				
<input type="checkbox"/> Hydrogen Sulfide (A4)		<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Other (Explain in Remarks)				
<input type="checkbox"/> Depleted Below Dark Surface (A11)		<input type="checkbox"/> Depleted Matrix (F3)						
<input type="checkbox"/> Thick Dark Surface (A12)		<input type="checkbox"/> Redox Dark Surface (F6)						
<input type="checkbox"/> Sandy Mucky Mineral (S1)		<input type="checkbox"/> Depleted Dark Surface (F7)						
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Redox Depressions (F8)						
						<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<b>Restrictive Layer (if present):</b>								
Type: _____								
Depth (inches): _____								
						<b>Hydric Soil Present?</b> Yes _____ No <input checked="" type="checkbox"/>		
Remarks:								

**HYDROLOGY**

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		
<b>Field Observations:</b>		
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes _____ No <input checked="" type="checkbox"/>
Water Table Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 3  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): rocky depression Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year; Plot representative of Wetland B	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rosa pisocarpa</u>	25	Y	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
25 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Phalaris arundinacea</u>	50	Y	FACW	
2. <u>Agrostis capillaris</u>	15	Y	FAC	
3. <u>Geranium molle</u>	T	N	UPL	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
65 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>35</u>				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No \_\_\_\_\_

Remarks:  
 Plots reshaped to avoid open water; wetland vegetation inclusions are typical within defined rocky depression.



**SOIL**

Sampling Point: Plot 3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/2	100	--	--	--	--	Loamy Sandy Gvl	Histic muck
6+							bedrock	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Rock  
 Depth (inches): 6

Hydric Soil Present? Yes  No

Remarks:

Underlain by rock, not mineral soil; soils similar to Plot 1 in color and texture

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 1  
 Saturation Present? Yes  No  Depth (inches): surface  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 4  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): rocky hillslope Local relief (concave, convex, none): none Slope (%): 3  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pseudotsuga menziesii</u>	40	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. <u>Quercus garryana</u>	20	Y	FACU	
3. _____				
4. _____				
60 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Amalanchier alnifolia</u>	60	Y	FACU	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
2. <u>Toxicodendron diversilobum</u>	Trace	N	FAC	
3. _____				
4. _____				
5. _____				
60 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Polypodium glycyrrhiza</u>	60	Y	UPL	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Geranium molle</u>	40	Y	UPL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
100 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rubus ursinus</u>	5	Y	FACU	<b>Hydrophytic Vegetation Present?</b> Yes _____ No <input checked="" type="checkbox"/>
2. _____				
5 = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks:



**SOIL**

Sampling Point: Plot 4

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 2/2	100	--	--	--	--	Organic	duff and leaf litter over rock

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Rock  
 Depth (inches): 4

Hydric Soil Present? Yes  No

Remarks:

no significant moisture between solid rock layer and surface.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Clear wetland boundary defined by hydrology; rock present at varying depths in upland areas surrounding depressions



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 5  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year. Upland plot for Wetland C.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Prunus emarginata</u>	35	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>9</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. <u>Pseudotsuga menziesii</u>	15	Y	FACU	
3. <u>Arbutus menziesii</u>	10	Y	UPL	
4. _____				
60 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
1. <u>Gaultheria shallon</u>	25	Y	FACU	
2. <u>Holodiscus discolor</u>	15	Y	FACU	
3. <u>Rubus ursinus</u>	10	Y	FACU	
4. <u>Symphoricarpos albus</u>	10	Y	FACU	
5. <u>Corylus cornuta</u>	10	Y	FACU	
70 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Geranium molle</u>	5	Y	UPL	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
5 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes _____ No <input checked="" type="checkbox"/>
1. _____				
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>95</u>				

Remarks:  
 Bare ground cover is leaf litter



**SOIL**

Sampling Point: Plot 5

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-9	10YR 3/2	100	--	--	--	--	Silt Loam	
9-12	7.5YR 4/4	98	7.5YR 5/6	2	C	M	Silt Loam	
12-20	7.5YR 5/6	95	7.5YR 5/6	5	C	M	Loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> )	<input type="checkbox"/> Very Shallow Dark Surface (TF-12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes _____    No <input checked="" type="checkbox"/>
--	---

Remarks:

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
<b>Primary Indicators (minimum of one required; check all that apply)</b>	<b>Secondary Indicators (2 or more required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> )
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

<b>Field Observations:</b> Surface Water Present?    Yes _____    No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes _____    No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes _____    No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes _____    No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 6  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): concave Slope (%): <3  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Plots 6 and 7 are representative of Wetland C.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus latifolia</u>	80	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
80 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Rosa pisocarpa</u>	10	Y	FAC	
2. <u>Spiraea douglasii</u>	5	Y	FACW	
3. _____				
4. _____				
5. _____				
15 = Total Cover				
<b>Herb Stratum (Plot size: <u>5 ft</u>)</b>				
1. <u>Carex obnupta</u>	15	Y	OBL	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
15 = Total Cover				
<b>Woody Vine Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Rubus ursinus</u>	Trace	N	FACU	
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>85</u>				

Remarks:  
 Bare ground is leaf litter and inundated substrate.



**SOIL**

Sampling Point: Plot 6

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 2/1	100	--	--	--	--	S. Mucky Loam	Histic
10-12	10YR 3/1	100	--	--	--	--	Clay Loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Rock  
 Depth (inches): 12

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 2  
 Water Table Present? Yes  No  Depth (inches): surface  
 Saturation Present? Yes  No  Depth (inches): surface  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 7  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Plots 6 and 7 are representative of Wetland C which continues off-site.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus latifolia</u>	15	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)
2. _____				
3. _____				
4. _____				
15 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Spiraea douglasii</u>	20	Y	FACW	
2. <u>Rosa pisocarpa</u>	20	Y	FAC	
3. <u>Fraxinus latifolia</u>	10	Y	FACW	
4. <u>Symphoricarpos albus</u>	5	N	FACU	
5. _____				
55 = Total Cover				
<b>Herb Stratum (Plot size: <u>5 ft</u>)</b>				
1. <u>Carex obnupta</u>	50	Y	OBL	<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
50 = Total Cover				
<b>Woody Vine Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Rubus ursinus</u>	10	Y	FACU	
2. _____				
10 = Total Cover				
% Bare Ground in Herb Stratum <u>50</u>				
Remarks: Bare ground cover is inundated substrate and leaf litter.				







# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 8  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year but did not alter indicators. 10 feet east of Wetland C boundary.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. <u>Prunus emarginata</u>	30	Y	FACU	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)														
2. <u>Corylus cornuta</u>	15	Y	FACU															
3. <u>Pseudotsuga menziesii</u>	10	N	FACU															
4. _____				Total Number of Dominant Species Across All Strata: <u>5</u> (B)														
	55	= Total Cover		Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20</u> (A/B)														
Sapling/Shrub Stratum (Plot size: <u>30 ft</u> )				Prevalence Index worksheet:														
1. <u>Populus balsamifera</u>	10	Y	FAC	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Total % Cover of:</td> <td style="width: 50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species _____ x 1 = _____</td> <td></td> </tr> <tr> <td>FACW species <u>5</u> x 2 = <u>10</u></td> <td></td> </tr> <tr> <td>FAC species <u>10</u> x 3 = <u>30</u></td> <td></td> </tr> <tr> <td>FACU species <u>60</u> x 4 = <u>240</u></td> <td></td> </tr> <tr> <td>UPL species _____ x 5 = _____</td> <td></td> </tr> <tr> <td>Column Totals: <u>75</u> (A)</td> <td><u>280</u> (B)</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____ x 1 = _____		FACW species <u>5</u> x 2 = <u>10</u>		FAC species <u>10</u> x 3 = <u>30</u>		FACU species <u>60</u> x 4 = <u>240</u>		UPL species _____ x 5 = _____		Column Totals: <u>75</u> (A)	<u>280</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____ x 1 = _____																		
FACW species <u>5</u> x 2 = <u>10</u>																		
FAC species <u>10</u> x 3 = <u>30</u>																		
FACU species <u>60</u> x 4 = <u>240</u>																		
UPL species _____ x 5 = _____																		
Column Totals: <u>75</u> (A)	<u>280</u> (B)																	
2. <u>Mahonia aquifolium</u>	5	Y	FACU															
3. <u>Malus fusca</u>	5	Y	FACW															
4. _____																		
5. _____																		
	20	= Total Cover		Prevalence Index = B/A = <u>3.73</u>														
Herb Stratum (Plot size: <u>5 ft</u> )				Hydrophytic Vegetation Indicators:														
1. <u>Geranium molle</u>	1	N	UPL	<input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
	1	= Total Cover		<b>Hydrophytic Vegetation Present?</b> Yes _____ No <input checked="" type="checkbox"/>														
Woody Vine Stratum (Plot size: <u>30 ft</u> )																		
1. _____																		
2. _____																		
	0	= Total Cover																
% Bare Ground in Herb Stratum <sup>99</sup> _____																		

Remarks:  
 Bare ground cover is leaf litter







# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 9  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year but did not alter indicators.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Malus fusca</u>	5	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>5</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Spiraea douglasii</u>	40	Y	FACW	
2. <u>Malus fusca</u>	20	Y	FACW	
3. <u>Rosa pisocarpa</u>	15	Y	FAC	
<u>75</u> = Total Cover				
<b>Herb Stratum (Plot size: <u>5 ft</u>)</b>				
1. <u>Carex obnupta</u>	10	Y	OBL	<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>10</u> = Total Cover				
<b>Woody Vine Stratum (Plot size: <u>30 ft</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>90</u>				

Remarks:  
 Bare ground cover is leaf litter







# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 4, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 10  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 10  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Pseudotsuga menziesii</u>	70	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)	
2. <u>Arbutus menziesii</u>	30	Y	UPL		
3. _____					
4. _____					
	100	= Total Cover			
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30 ft</u> )					
1. <u>Gaultheria shallon</u>	40	Y	FACU	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____	
2. <u>Holodiscus discolor</u>	25	Y	FACU		
3. <u>Amalanchier alnifolia</u>	10	N	FACU		
4. <u>Malus fusca</u>	5	N	FACW		
5. _____					
	80	= Total Cover			
<b>Herb Stratum</b> (Plot size: <u>5 ft</u> )					
1. <u>Geranium molle</u>	95	Y	UPL		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
	5	= Total Cover			
<b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )					
1. <u>Rubus ursinus</u>	20	Y	FACU		
2. _____					
	20	= Total Cover			
% Bare Ground in Herb Stratum <u>95</u>					

Remarks:





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 11  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year but did not alter indicators.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Fraxinus latifolia</u>	5	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5 _____ = Total Cover					
<b>Sapling/Shrub Stratum (Plot size: <u>30 ft</u>)</b>					
1. _____	_____	_____	_____	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
0 _____ = Total Cover					
<b>Herb Stratum (Plot size: <u>5 ft</u>)</b>					
1. <u>Geranium molle</u>	Trace	N	UPL		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
1 _____ = Total Cover					
<b>Woody Vine Stratum (Plot size: <u>30 ft</u>)</b>					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
0 _____ = Total Cover					
<b>% Bare Ground in Herb Stratum <sup>99</sup></b>					

Remarks:  
 Bare ground cover is inundated substrate

**SOIL**

Sampling Point: Plot 11

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 2/1	100	--	--	--	--	Silt Loam	
2-14	10YR 2/1	100	--	--	--	--	Mucky SCL	Histic muck
14-18+	10YR 4/4	95	10YR 5/6	5	C	M	Loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 6  
 Water Table Present? Yes  No  Depth (inches): surface  
 Saturation Present? Yes  No  Depth (inches): surface  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:









# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 13  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Representative of Wetland E.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Spiraea douglasii</u>	100	Y	FACW	
2. <u>Rosua nutkana</u>	10	N	FAC	
3. <u>Malus fusca</u>	3	N	FACW	
4. <u>Quercus garryana</u>	3	N	FACU	
5. _____	_____	_____	_____	
116 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
0 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>100</u>				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 1 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
--

Remarks:  
 Bare ground cover is inundated substrate





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 14  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pseudotsuga menziesii</u>	25	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. <u>Quercus garryana</u>	10	Y	FACU	
3. _____				
4. _____				
	35	= Total Cover		<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
Sapling/Shrub Stratum	(Plot size: <u>30 ft</u> )			
1. <u>Amalancier alnifolia</u>	30	Y	FACU	
2. <u>Holodiscus discolor</u>	30	Y	FACU	
3. <u>Mahonia aquilifolium</u>	Trace	N	FACU	
4. <u>Populus balsamifera</u>	Trace	N	FAC	
5. _____				
	60	= Total Cover		
Herb Stratum	(Plot size: <u>5 ft</u> )			<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Geranium molle</u>	95	Y	UPL	
2. <u>Polypodium glycyrrhiza</u>	15	N	UPL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	110	= Total Cover		
Woody Vine Stratum	(Plot size: <u>30 ft</u> )			
1. _____				
2. _____				
	0	= Total Cover		
% Bare Ground in Herb Stratum <u>95</u>				

Remarks:  
 Bare ground cover is leaf litter





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 15  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): <3  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Plot is representative of west side of Wetland F.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus latifolia</u>	75	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
2. _____				
3. _____				
4. _____				
75 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Rosa pisocarpa</u>	20	Y	FAC	
2. <u>Spiraea douglasii</u>	15	Y	FACW	
3. <u>Symphoricarpos albus</u>	10	Y	FACU	
4. _____				
5. _____				
45 = Total Cover				
<b>Herb Stratum (Plot size: <u>5 ft</u>)</b>				<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
0 = Total Cover				
<b>Woody Vine Stratum (Plot size: <u>30 ft</u>)</b>				
1. <u>Rubus ursinus</u>	5	Y	FACU	
2. _____				
5 = Total Cover				
% Bare Ground in Herb Stratum <u>55</u>				

Remarks:





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 16  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): hillslope towards swale Local relief (concave, convex, none): none Slope (%): 10  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Upslope of Plot 15.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Mahonia aquifolium</u>	35	Y	FACU	
2. <u>Arbutus menziesii</u>	25	Y	UPL	
3. <u>Quercus garryana</u>	5	N	FACU	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
65 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Geranium molle</u>	60	Y	UPL	
2. <u>Polypodium glycyrrhiza</u>	30	Y	UPL	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
5 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Toxicodendron diversilobum</u>	30	Y	FAC	
2. _____	_____	_____	_____	
30 = Total Cover				
% Bare Ground in Herb Stratum <sup>95</sup> _____				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 4 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

<b>Hydrophytic Vegetation Present?</b>	Yes _____	No <input checked="" type="checkbox"/>
--	-----------	--

Remarks:  
 Bare ground cover is leaf litter

**SOIL**

Sampling Point: Plot 16

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 2/2	100	--	--	--	--	Loam	
2-18	10YR 3/3	100	--	--	--	--	Silt Loam	Gravels at 15"

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)
- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 17  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Representative of Wetland F.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus latifolia</u>	10	Y	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
10 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Agrostis capillaris</u>	20	Y	FAC	
2. <u>Juncus bufonius</u>	10	Y	FACW	
3. <u>Leucanthemum vulgare</u>	5	N	FACU	
4. <u>Cirsium arvense</u>	5	N	FAC	
5. <u>Verbascum thapsus</u>	5	N	FACU	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
45 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>55</u>				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
--

Remarks:  
 Bare ground cover is leaf litter.





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 18  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Prunus emarginata</u>	10	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. <u>Fraxinus latifolia</u>	10	Y	FAC	
3. <u>Quercus garryana</u>	10	Y	FACU	
4. _____				
30 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>30 ft</u> )				
1. <u>Rosa nutkana</u>	20	Y	FAC	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
2. <u>Amalanchier alnifolia</u>	10	Y	FACU	
3. <u>Fraxinus latifolia</u>	5	N	FACW	
4. _____				
5. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5 ft</u> )				
1. <u>Geranium molle</u>	70	Y	UPL	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Polypodium glycyrrhiza</u>	5	N	UPL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
5 = Total Cover				
Woody Vine Stratum (Plot size: <u>30 ft</u> )				
1. _____				<b>Hydrophytic Vegetation Present?</b> Yes _____ No <input checked="" type="checkbox"/>
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>95</u>				

Remarks:  
 Bare ground cover is leaf litter

**SOIL**

Sampling Point: Plot 18

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 2/2	100	--	--	--	--	Loam	surface thin layer fallen leaves/litter
12+							rock	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (**except MLRA 1**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF-12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: rock  
 Depth (inches): 12

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stressed Plants (D1) (**LRR A**)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) (**LRR A**)
- Frost-Heave Hummocks (D7)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 19  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year . Representative of Wetland G shrub layer.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Malus fusca</u>	30	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. <u>Fraxinus latifolia</u>	20	Y	FACW		
3. _____					
4. _____					
	50	= Total Cover			
<b>Sapling/Shrub Stratum</b> (Plot size: <u>30 ft</u> )					
1. <u>Spiraea douglasii</u>	80	Y	FACW	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____	
2. <u>Salix lasiandra</u>	80	Y	FACW		
3. _____					
4. _____					
5. _____					
	160	= Total Cover			
<b>Herb Stratum</b> (Plot size: <u>5 ft</u> )					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
	0	= Total Cover			
<b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )					
1. _____					
2. _____					
	0	= Total Cover			
<b>% Bare Ground in Herb Stratum</b> <u>0</u>					

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No \_\_\_\_\_

Remarks:





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 20  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 10  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Arbutus menziesii</u>	50	Y	UPL	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>17</u> (A/B)
2. <u>Pseudotsuga menziesii</u>	50	Y	FACU	
3. _____				
4. _____				
100 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
Sapling/Shrub Stratum	(Plot size: <u>30 ft</u> )			
1. <u>Amalanchier alnifolia</u>	50	Y	FACU	
2. <u>Corylus cornuta</u>	20	N	FACU	
3. <u>Gaultheria shallon</u>	20	N	FACU	
4. <u>Mahonia aquifolium</u>	20	N	FACU	
5. <u>Malus fusca</u>	10	N	FACU	
120 = Total Cover				
Herb Stratum	(Plot size: <u>5 ft</u> )			<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Polystichum munitum</u>	30	Y	FACU	
2. <u>Geranium molle</u>	20	Y	FACU	
3. <u>Glyceria striata</u>	10	N	FACW	
4. <u>Pteridium aquilinum</u>	10	N	FACU	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
70 = Total Cover				
Woody Vine Stratum	(Plot size: <u>30 ft</u> )			
1. <u>Toxicodendron diversilobum</u>	20	Y	FAC	
2. _____				
20 = Total Cover				
% Bare Ground in Herb Stratum <u>30</u>				

Remarks:  
 Bare ground cover is leaf litter





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 21  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year . Representative of deeper inundated part of Wetland G.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Glyceria striata</u>	50	Y	FACW	
2. <u>Typha latifolia</u>	30	Y	OBL	
3. <u>Nuphar advena</u>	20	N	OBL	
4. <u>Polygonum hydropiperoides</u>	15	N	OBL	
5. <u>Veronica americana</u>	5	N	OBL	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
120 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
<u>% Bare Ground in Herb Stratum</u> 0 _____				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
--	--

Remarks:





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 22  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): hillslope toward wetland fringe Local relief (concave, convex, none): none Slope (%): 40  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year. Southwest side of Wetland G; immediately north of powerlines.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus garryana</u>	90	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>17</u> (A/B)
2. <u>Rhamnus purshiana</u>	50	Y	FAC	
3. <u>Arbutus menziesii</u>	20	N	UPL	
4. _____				
160 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
Sapling/Shrub Stratum	(Plot size: <u>30 ft</u> )			
1. <u>Corylus cornuta</u>	60	Y	FACU	
2. <u>Gaultheria shallon</u>	50	Y	FACU	
3. <u>Rosa nutkana</u>	10	N	FAC	
4. <u>Amalanchier alnifolia</u>	10	N	FACU	
5. <u>Symphoricarpos albus</u>	10	N	FACU	
150 = Total Cover				
Herb Stratum	(Plot size: <u>5 ft</u> )			
1. <u>Polystichum munitum</u>	30	Y	FACU	
2. <u>Geranium molle</u>	20	Y	UPL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
50 = Total Cover				
Woody Vine Stratum	(Plot size: <u>30 ft</u> )			
1. _____				
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>50</u>				

Remarks:  
 Bare ground cover is leaf litter





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 23  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year. Plot at southwest part of Wetland G near boundary. Paired with upland plot 22.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Malus fusca</u>	70	Y	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____	70	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
1. <u>Salix lasiandra</u>	90	Y	FACW	
2. <u>Spiraea douglasii</u>	40	Y	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____	130	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Carex obnupta</u>	20	Y	OBL	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____	20	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
% Bare Ground in Herb Stratum <u>80</u>				0 = Total Cover

Remarks:  
 Bare ground cover is leaf litter





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 24  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): wetland depression Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year Represents inundated portion of west side of Wetland G.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Spiraea douglasii</u>	60	Y	FACW	
2. <u>Salix lasiandra</u>	50	Y	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
110 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
0 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks: Bare ground is inundated organic substrate	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____
--	--





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 25  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 5  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No _____
Remarks: Precipitation is high for water year.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Rosa pisocarpa</u>	60	Y	FAC	
2. <u>Spiraea douglasii</u>	30	Y	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
90 = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
0 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>100</u>				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
--

Remarks:  
 Bare ground cover is leaf litter and inundated substrate.





# WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: WWSS WTP Site City/County: Washington Co. Sampling Date: November 3, 2016  
 Applicant/Owner: Tualatin Valley Water District and City of Hillsboro State: OR Sampling Point: Plot 26  
 Investigator(s): John Macklin, Tony Vingiello Section, Township, Range: see spreadsheet  
 Landform (hillslope, terrace, etc.): hillslope toward wetland fringe Local relief (concave, convex, none): none Slope (%): 100  
 Subregion (LRR): A- Northwest Forests and Coast Lat: See spreadsheet Long: See spreadsheet Datum: NAVD88  
 Soil Map Unit Name: See spreadsheet NWI classification: See spreadsheet

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Remarks: Precipitation is high for water year Adjoins Wetland G.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus garryana</u>	90	Y	FACU	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>17</u> (A/B)
2. <u>Rhamnus purshiana</u>	50	Y	FAC	
3. <u>Arbutus menziesii</u>	20	N	UPL	
4. _____				
160 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
Sapling/Shrub Stratum				
(Plot size: <u>30 ft</u> )				
1. <u>Corylus cornuta</u>	60	Y	FACU	
2. <u>Gaultheria shallon</u>	50	Y	FACU	
3. <u>Rosa nutkana</u>	10	N	FAC	
4. <u>Amalanchier alnifolia</u>	10	N	FACU	
5. <u>Symphoricarpos albus</u>	10	N	FACU	
150 = Total Cover				
Herb Stratum				
(Plot size: <u>5 ft</u> )				
1. <u>Polystichum munitum</u>	30	Y	FACU	
2. <u>Geranium molle</u>	20	Y	UPL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
50 = Total Cover				
Woody Vine Stratum				
(Plot size: <u>30 ft</u> )				
1. _____				
2. _____				
0 = Total Cover				
% Bare Ground in Herb Stratum <u>50</u>				
Remarks: Bare ground cover is leaf litter and moss covered rock.				

**SOIL**

Sampling Point: Plot 26

<b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-1	10YR 2/2	100	--	--	--	--	Org. litter	moderately decomposed
1-5	10YR 2/2	100	--	--	--	--	Loam	
5+							rock	



## ***APPENDIX D: SITE PHOTOGRAPHS***



**Photo 1: Facing east at the inundated portion of Wetland A (November 3, 2016).**



**Photo 2: Facing north at Wetland B (November 3, 2016).**





**Photo 3: Facing west at Wetland B (November 3, 2016).**



**Photo 2: Facing north at the west side of the Wetland C boundary marked by orange flagging. (November 3, 2016).**





**Photo 5: Facing west towards Wetland C (November 3, 2016)**



**Photo 6: Facing southwest along the Wetland C boundary. (November 3, 2016).**





**Photo 7: Facing south toward the inundated portion of Wetland D (November 3, 2016).**



**Photo 8: Facing northeast at Wetland D (November 3, 2016).**





**Photo 9: Facing east at the western end of Wetland E (November 3, 2016).**



**Photo 10: Facing northwest toward the northern boundary of Wetland F (November 3, 2016).**





**Photo 11: Facing southwest at the southern end of Wetland F (November 3, 2016).**



**Photo 12: Facing southwest toward the northern boundary of Wetland F (November 3, 2016).**





**Photo 13: Facing west at the eastern boundary of Wetland G (November 4, 2016).**



**Photo 14: Facing southwest toward the center of Wetland G (November 4, 2016).**





**Photo 15: Facing east from the eastern boundary of Wetland G toward Plot 20 (November 4, 2016).**

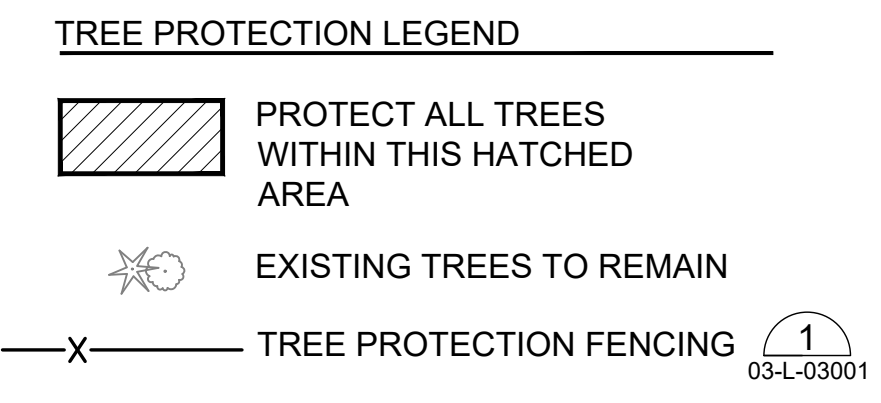
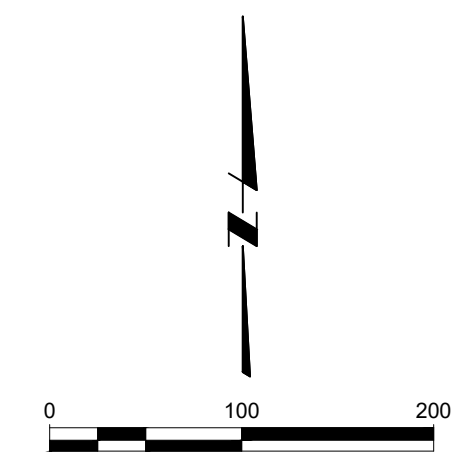
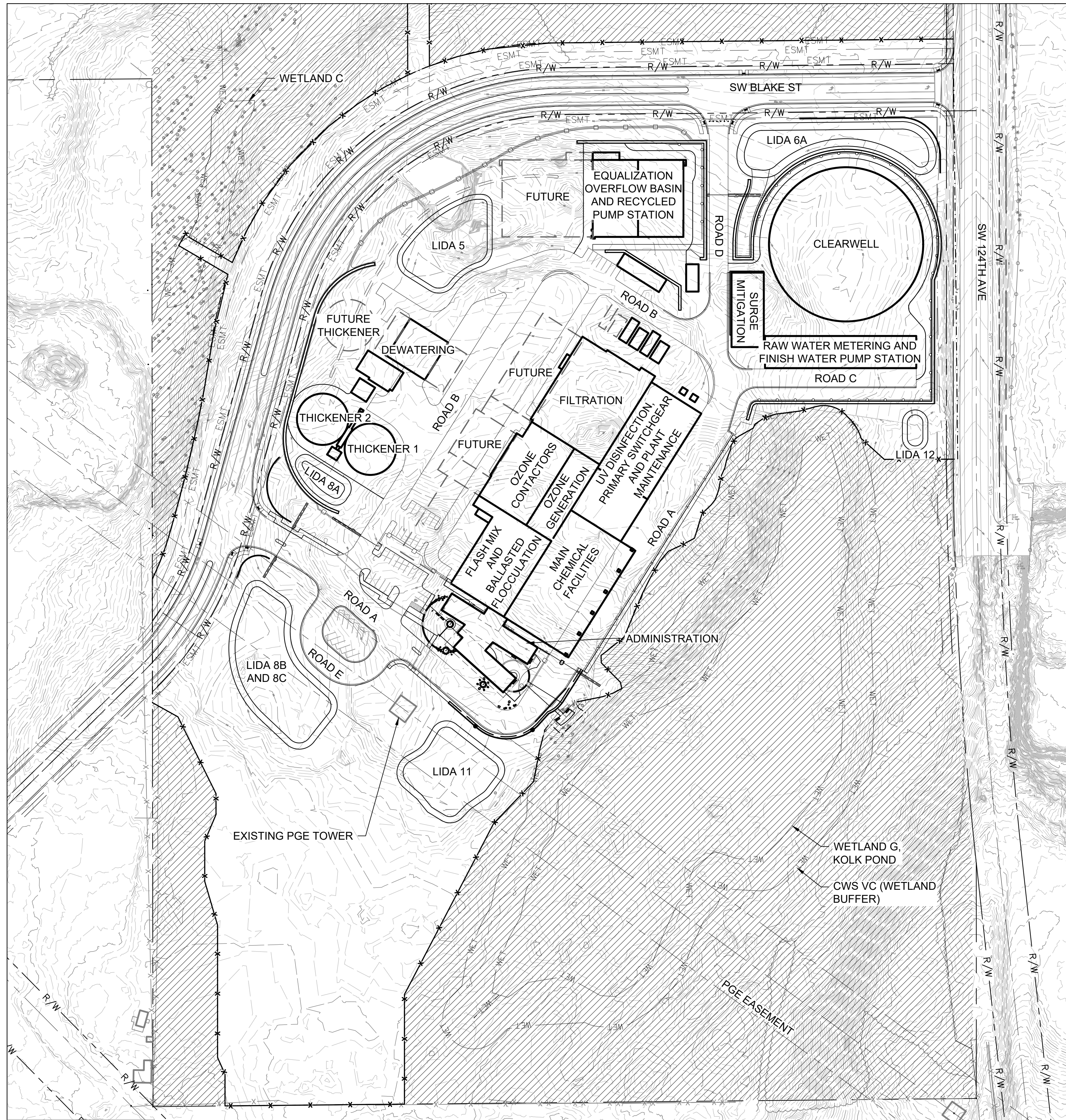


**Photo 16: Facing west from within Wetland G toward the western boundary (November 4, 2016).**

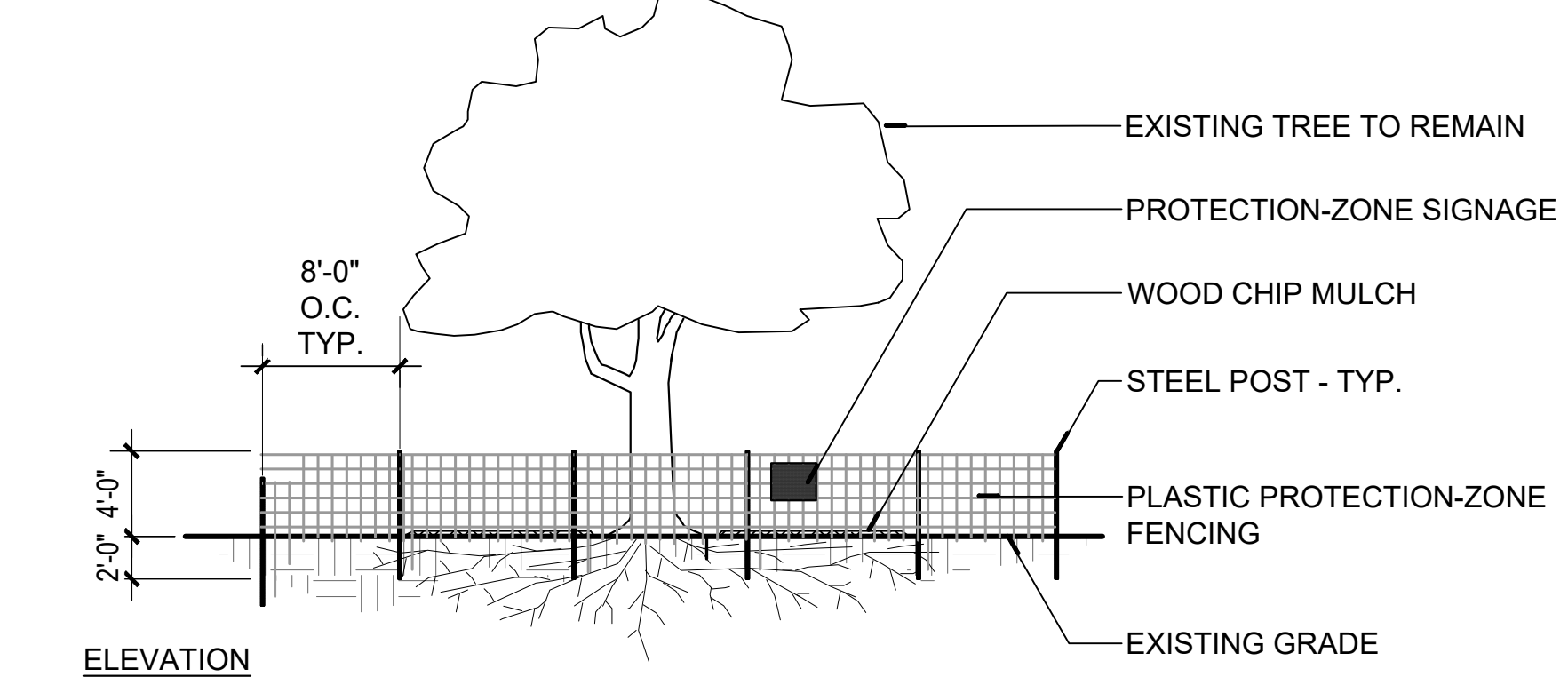
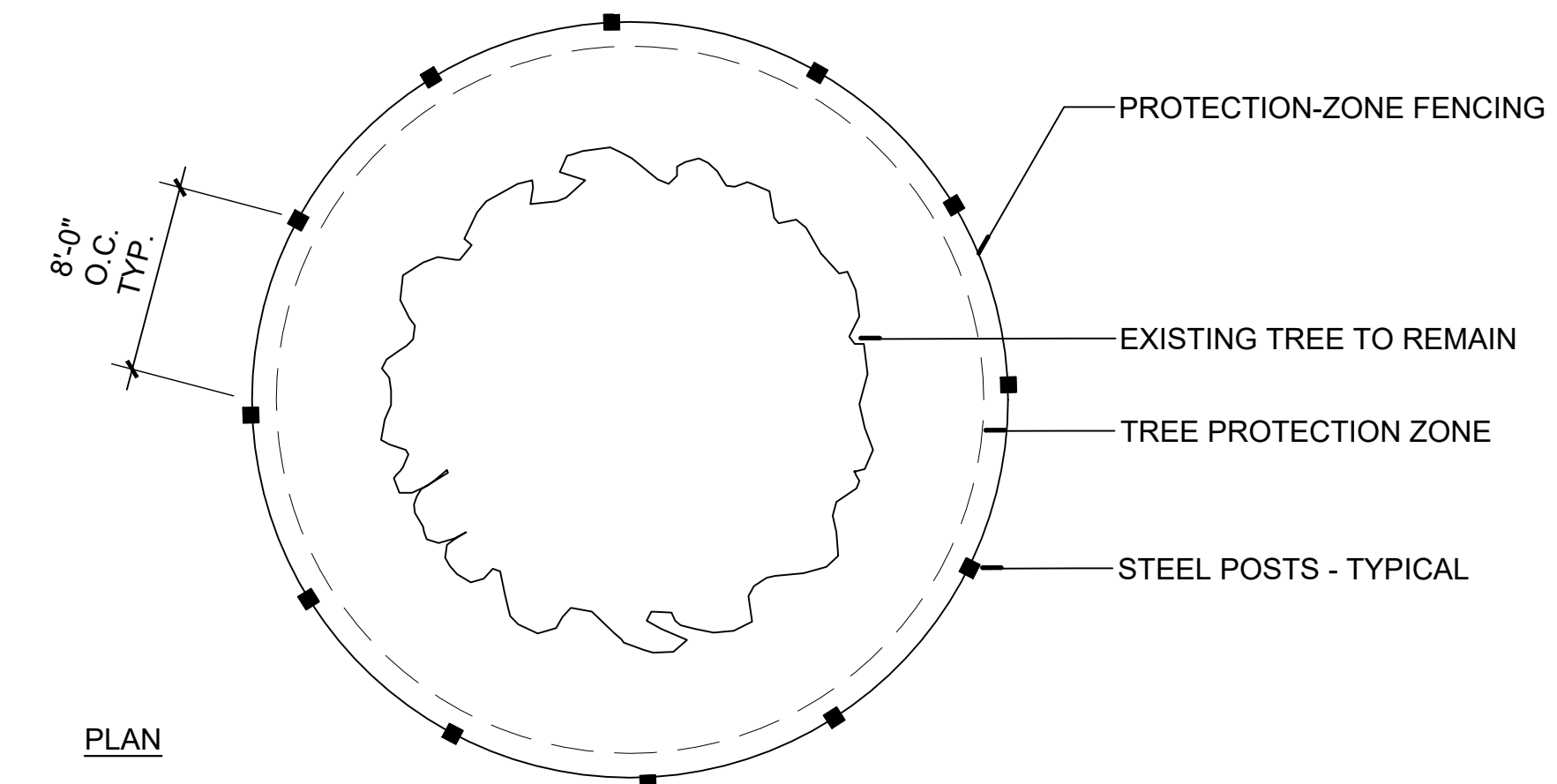
## ***APPENDIX E: LANDSCAPE DESIGN SHEETS***



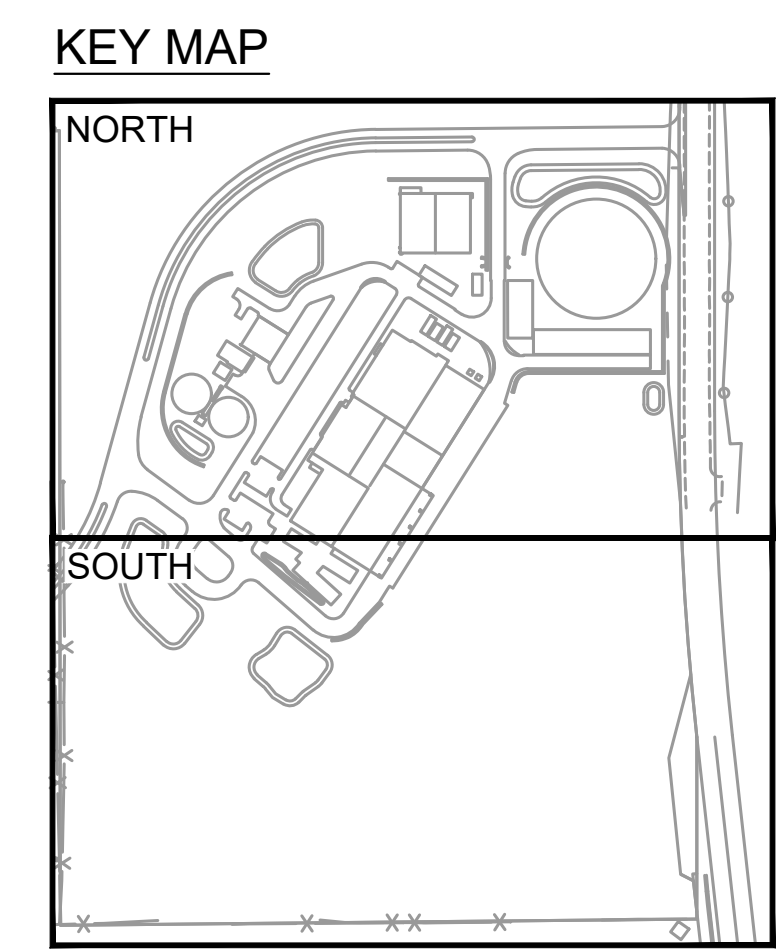
# FOR LAND USE PERMITTING



- NOTES:**
- MANY EXISTING TREES TO REMAIN ARE NOT REPRESENTED ON THE SITE SURVEY. CONTRACTOR IS RESPONSIBLE FOR PRESERVING AND PROTECTING ALL TREES WITHIN HATCHED AREA.
  - REFER TO SHEET 03-C-2208 FOR TREE REMOVAL PLAN.



- NOTES:**
- DO NOT INSTALL ANY COMPONENT OF TREE PROTECTION FENCING WITHIN TREE PROTECTION ZONES UNLESS INDICATED ON THE DRAWINGS OTHERWISE.
  - THE FOLLOWING PRACTICES ARE PROHIBITED WITHIN TREE PROTECTION ZONES: STORAGE OF CONSTRUCTION MATERIALS, DEBRIS, OR EXCAVATED MATERIAL; CLEANING OF MATERIALS OR EQUIPMENT; MOVING OR PARKING VEHICLES OR EQUIPMENT; FOOT TRAFFIC; ERECTION OF STRUCTURES; IMPOUNDMENT OF WATER; EXCAVATION OR OTHER DIGGING UNLESS OTHERWISE INDICATED; ATTACHMENT OF SIGNS TO OR WRAPPING MATERIALS AROUND TREES; USE OF FASTENERS OF ANY TYPE INTO THE TREE.
  - THE CITY OF SHERWOOD SHALL BE NOTIFIED WITHIN 24 HOURS OF ANY SUSPECTED DAMAGE TO EXISTING TREES WITHIN THE PROJECT AREA THAT WERE NOT IDENTIFIED AND APPROVED FOR REMOVAL OR RELOCATION. IF DAMAGE OCCURS DURING CONSTRUCTION, THE CONSTRUCTION APPLICANT SHALL HAVE THE TREE RESTORED WITHIN 24 HOURS BY A CERTIFIED ARBORIST.



**TREE PROTECTION FENCING**  
NOT TO SCALE

**TREE PROTECTION OVERALL PLAN**  
OVERALL PLAN  
SCALE: 1" = 100'-0"

DSGN	B DEAN								
DR	B DEAN								
CHK	D WALTERS								
APVD	M FAHA	NO.	DATE	REVISION	BY	APVD			

VERIFY SCALE  
BAR IS ONE INCH ON ORIGINAL DRAWING.  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

**GREENWORKS**  
GreenWorks, P.C.  
Landscape Architecture  
Environmental Design  
24 NW 2nd Avenue, Suite 100  
Portland, Oregon 97209  
PH: (503) 222-5810 / F: (503) 222-2283  
Email: info@greenworkspc.com



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Our Reliable Water  
WILLAMETTE WATER SUPPLY PROGRAM  
WATER TREATMENT PLANT\_1.0

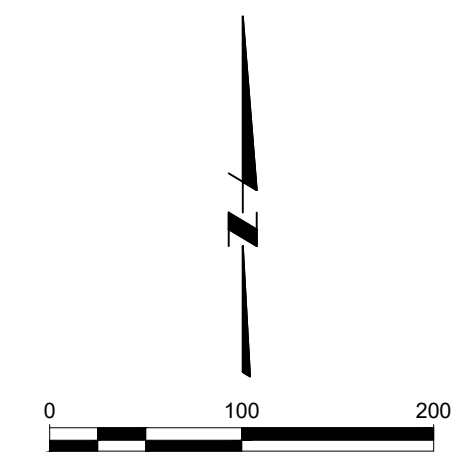
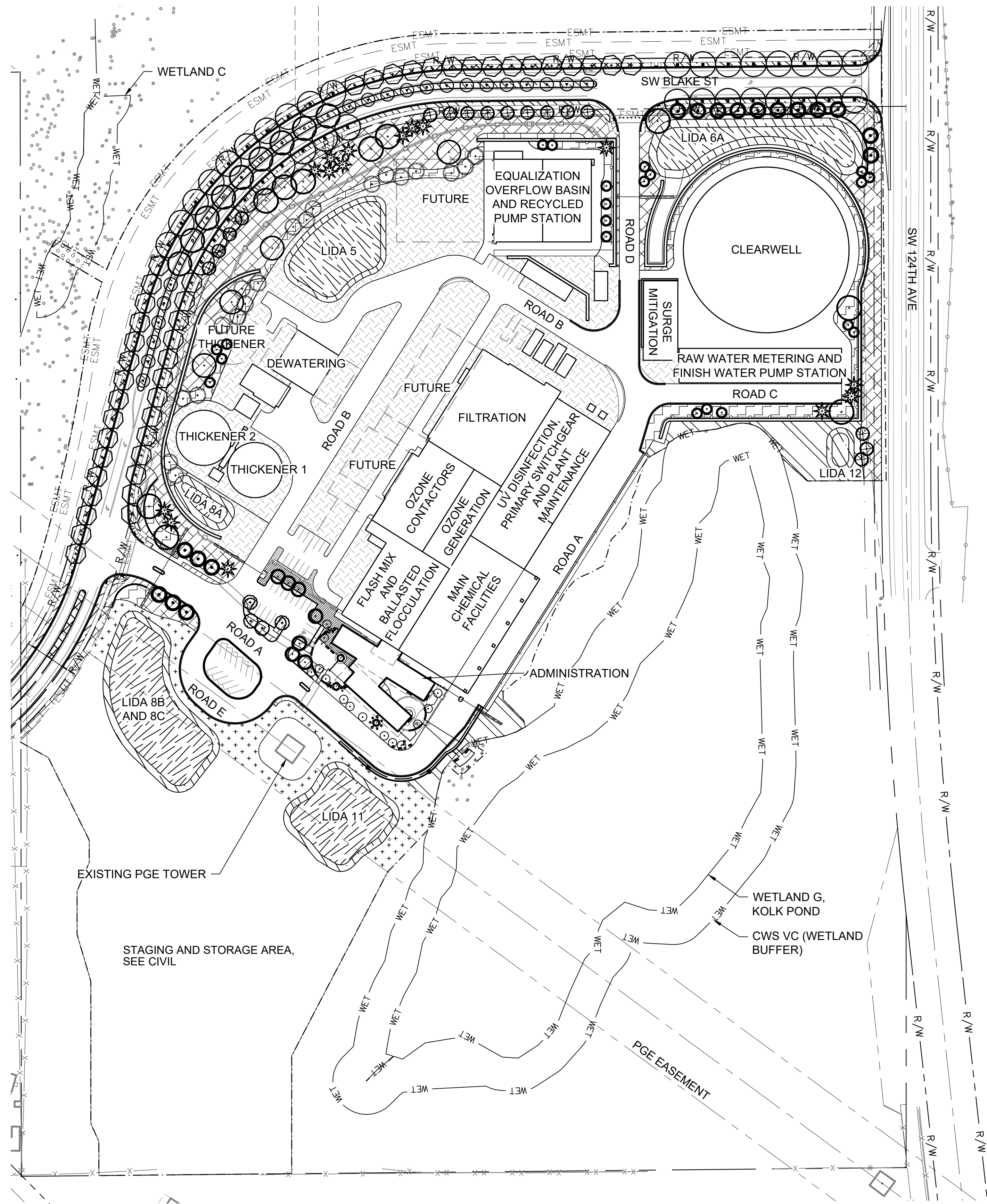
**CDM Smith**  
1220 SW Morrison Street, Suite 200  
Portland, OR 97205  
Tel: (503) 232-1800

SITE  
LANDSCAPE ARCHITECTURE  
TREE PROTECTION  
OVERALL PLAN, LEGEND & NOTES

SHEET	DWG #	03-L-03001
DATE	06/12/2020	
PROJ	WTP_1.0	



# FOR LAND USE PERMITTING



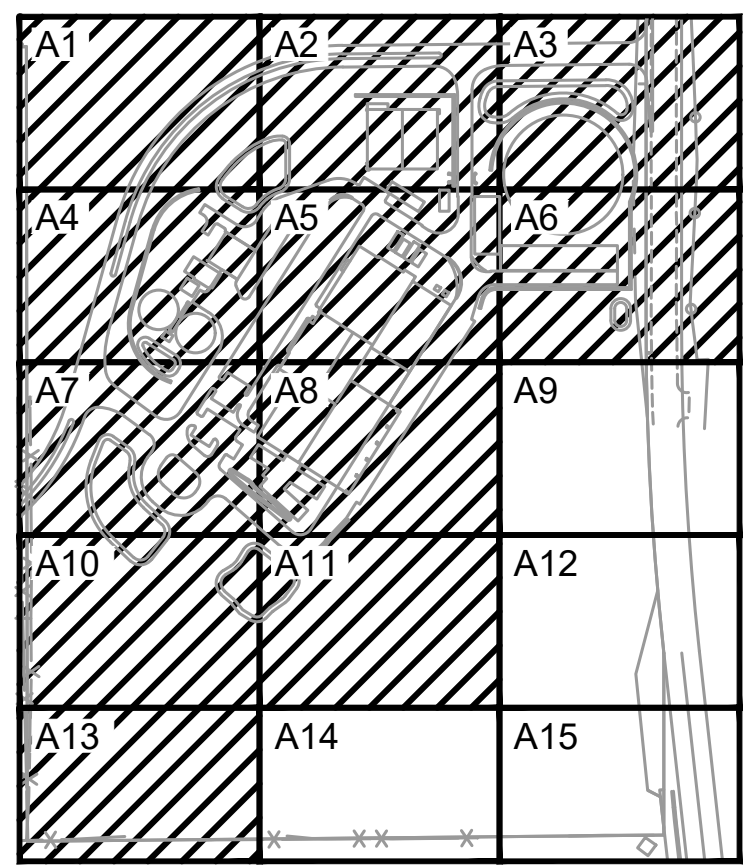
**PLANTING LEGEND SUMMARY**

- WATER QUALITY TREATMENT AREA PLANTING
- WATER QUALITY SIDE SLOPE PLANTING
- HABITAT RESTORATION PLANTING
- PGE CORRIDOR RESTORATION PLANTING
- WETLAND C PLANTING
- LOW MAINTENANCE SHRUB PLANTING
- RIGHT-OF-WAY LANDSCAPE
- ENHANCED LANDSCAPE
- LOW MAINTENANCE FIELD GRASS
- INTERIOR SITE

**SHEET NOTES:**

1. SEE SHEET 03-L-22013 AND 03-L-22014 FOR PLANT LEGEND AND NOTES.

**KEY MAP**



**OVERALL PLAN**  
SCALE: 1" = 100'-0"

## PLANTING OVERALL PLAN

DSGN	STOECKLEIN					
DR	STOECKLEIN					
CHK	D WALTERS					
APVD	M FAHA	NO.	DATE	REVISION	BY	APVD

VERIFY SCALE  
BAR IS ONE INCH ON  
ORIGINAL DRAWING.  
IF NOT ONE INCH ON  
THIS SHEET, ADJUST  
SCALES ACCORDINGLY.

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WATER TREATMENT PLANT\_1.0

**CDM Smith**  
1220 SW Morrison Street, Suite 200  
Portland, OR 97205  
Tel: (503) 232-1800

SITE  
LANDSCAPE ARCHITECTURE  
PLANTING OVERALL PLAN

SHEET	DWG #	03-L-22001
DATE		06/12/2020
PROJ		WTP_1.0

90% DESIGN - NOT FOR CONSTRUCTION



# FOR LAND USE PERMITTING

## PLANTING SCHEDULE

### SITE TREES

2 7 8 9 1  
90-L-50008 90-L-50008 90-L-50008 90-L-50008 90-L-50009

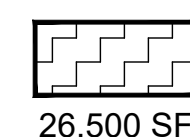
BOTANICAL NAME	COMMON NAME	SIZE & TYPE	SPACING	QTY.
ACER CIRCINATUM	VINE MAPLE	5 GAL. CONT.	AS SHOWN	
ACER TRIFLORUM	ROUGH BARK MAPLE	2" CAL., B&B	AS SHOWN	
ACER MACROPHYLLUM	BIGLEAF MAPLE	2" CAL., B&B	AS SHOWN	
CALOCEDRUS DECURRENS	INCENSE CEDAR	6' HT. MIN., B&B	AS SHOWN	
CERCIS CANADENSIS	MULTI-TRUNK EASTERN REDBUD	2" CAL., B&B	AS SHOWN	
CORNUS FLORIDA 'EDDIES WHITE WONDER'	FLOWERING DOGWOOD	2" CAL., B&B	AS SHOWN	
PINUS PONDEROSA WILLAMETTENSIS	WILLAMETTE VALLEY PONDEROSA PINE	6' HT. MIN., B&B	AS SHOWN	
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	6' HT. MIN., B&B	AS SHOWN	
QUERCUS GARRYANA	OREGON OAK	2" CAL., B&B	AS SHOWN	
RHAMNUS PURSHIANA	CASCARA	2" CAL., B&B	AS SHOWN	

### STREET TREES

GLEDITSIA TRIACANTHOS INERMIS	THORNLESS HONEYLOCUST	2" CAL., B&B	AS SHOWN	
NYSSA SYLVATICA	BLACK TUPELO	2" CAL., B&B	AS SHOWN	
QUERCUS PALUSTRIS	PIN OAK	2" CAL., B&B	AS SHOWN	
ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE SAWLEAF ZELKOVA	2" CAL., B&B	AS SHOWN	

### SITE PLANTING

1 2 4 5 6  
90-L-50008 90-L-50008 90-L-50008 90-L-50008 90-L-50008



**LOW MAINTENANCE SHRUB PLANTING**  
INSTALL THE FOLLOWING PLANTS IN GROUPS OF 7, 9 OR 11 - GROUPS TO BE EVENLY DISTRIBUTED THROUGHOUT PLANTING ZONE.

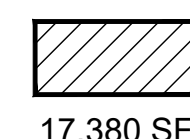
BOTANICAL NAME	COMMON NAME	SIZE & TYPE	SPACING	QTY.
ARCTOSTAPHYLOS MANZANITA 'ST. HELENA'	ST. HELENA MANZANITA	2 GAL. CONT.	36" O.C.	
CEANOTHUS THYRSIFLORUS 'OREGON MIST'	OREGON MIST WILD LILAC	2 GAL. CONT.	36" O.C.	
HOLODISCUS DISCOLOR	OCEANSPRAY	1 GAL. CONT.	24" O.C.	
MAHONIA AQUIFOLIUM	OREGON GRAPE	1 GAL. CONT.	24" O.C.	
MYRICA CALIFORNICA	PACIFIC WAX MYRTLE	2 GAL. CONT.	36" O.C.	
PHILADELPHUS LEWISII 'BLIZZARD'	BLIZZARD MOCK ORANGE	2 GAL. CONT.	36" O.C.	
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	2 GAL. CONT.	36" O.C.	
RIBES SANGUINEUM	RED FLOWERING CURRANT	2 GAL. CONT.	36" O.C.	
ROSA GYMNOCARPA	BALDHIP ROSE	2 GAL. CONT.	36" O.C.	
SYMPHORICARPUS ALBUS	SNOWBERRY	1 GAL. CONT.	24" O.C.	

APPLY SUNMARK SEEDS NATIVE ECO PRAIRIE SEED MIX TO ACHIEVE FULL COVERAGE 1.5 LBS/SQ. FT.



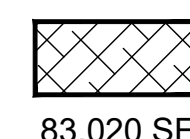
### RIGHT-OF-WAY LANDSCAPE

BOTANICAL NAME	COMMON NAME	SIZE & TYPE	SPACING	QTY.
CISTUS X HYBRIDUS	ROCK ROSE	1 GAL. CONT.	24" O.C.	
CORNUS SERICEA 'KELSEY'	KELSEY DOGWOOD	1 GAL. CONT.	24" O.C.	
DESCHAMPSIA CESPITOSA	TUFTED-HAIR GRASS	1 GAL. CONT.	24" O.C.	
GAILLARDIA X 'ARIZONA SUN'	ROZANNE CRANESBILL	1 GAL. CONT.	24" O.C.	
IRIS TENAX	OREGON IRIS	1 GAL. CONT.	12" O.C.	
PINUS MUGO 'SHERWOOD COMPACT'	COMPACT MUGO PINE	2 GAL. CONT.	24" O.C.	



### ENHANCED LANDSCAPE

BOTANICAL NAME	COMMON NAME	SIZE & TYPE	SPACING	QTY.
ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	1 GAL. CONT.	24" O.C.	
CORNUS SERICEA 'KELSEY'	KELSEY DOGWOOD	1 GAL. CONT.	24" O.C.	
DESCHAMPSIA CESPITOSA	TUFTED HAIR GRASS	1 GAL. CONT.	24" O.C.	
IRIS SIBERICA	SIBERIAN IRIS	1 GAL. CONT.	24" O.C.	
MUHLENBERGIA CAPILLARIS	PINK MUHLY GRASS	1 GAL. CONT.	24" O.C.	
RIBES SANGUINEUM	RED-FLOWERING CURRANT	2 GAL. CONT.	36" O.C.	
CEANOTHUS X PALLIDUS 'MINMARI'	MARIE BLEU NEW JERSEY TEA	2 GAL. CONT.	24" O.C.	



### LOW MAINTENANCE FIELD GRASS

SUNMARK SEEDS: NATIVE UPLANDS SEED MIX 43.71 LBS/ACRE

### OTHER



### INTERIOR SITE

SEE SHERWOOD CITY CODE

## PLANTING LEGEND AND NOTES 1

NO.	DATE	REVISION	BY	APVD

VERIFY SCALE  
BAR IS ONE INCH ON ORIGINAL DRAWING.  
0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



**GreenWorks, P.C.**  
Landscape Architecture  
Environmental Design  
24 NW 2nd Avenue, Suite 100  
Portland, Oregon 97209  
PH: 503.222.5810 / F: 503.222.2283  
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WATER TREATMENT PLANT\_1.0

**CDM Smith**  
1220 SW Morrison Street, Suite 200  
Portland, OR 97205  
Tel: (503) 232-1800

SITE  
LANDSCAPE ARCHITECTURE  
PLANTING LEGEND AND NOTES 1

SHEET
DWG # 03-L-22013
DATE 06/12/2020
PROJ WTP_1.0

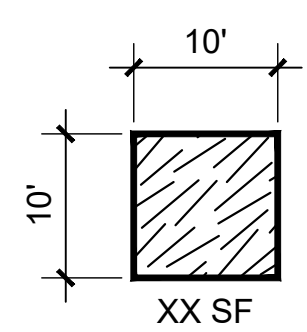
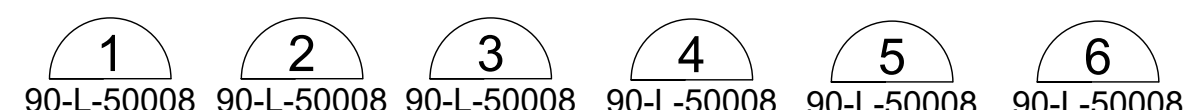
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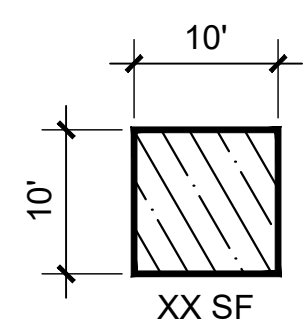
# FOR LAND USE PERMITTING

## PLANTING SCHEDULE

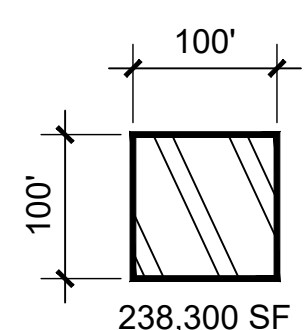
### WATER QUALITY, RESTORATION PLANTING AND SEED AREAS



BOTANICAL NAME	COMMON NAME	SIZE & TYPE	# PER PLOT	SPACING	TOTAL QTY
<b>WATER QUALITY TREATMENT AREA PLANTING</b>					
CAREX Densa	SEDE SEDGE	1" PLUG		6 / SF	
CAREX OBNUPTA	SLOUGH SEDGE	1" PLUG		6 / SF	
JUNCUS EFFUSUS VAR. PACIFICUS	SOFT RUSH	1" PLUG		6 / SF	
JUNCUS PATENS	CALIFORNIA GRAY RUSH	1" PLUG		6 / SF	
SCIRPUS MICROCARPUS	SMALL-FRUITED BULLRUSH	1" PLUG		6 / SF	

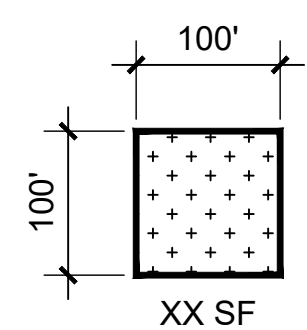


BOTANICAL NAME	COMMON NAME	SIZE & TYPE	# PER PLOT	SPACING	TOTAL QTY
<b>WATER QUALITY SIDE SLOPE PLANTING</b>					
CORNUS SERICEA	RED-OSIER DOGWOOD	2 GAL CONT			
PHILADELPHUS LEWISII	MOCK ORANGE	2 GAL CONT			
ROSA PISOCARPA	SWAMP ROSE	1 GAL CONT			
SPIRAEA DOUGLASII	DOUGLAS' SPIRAEA	1 GAL CONT			
SYMPHORICARPOS ALBUS	SNOWBERRY	1 GAL CONT			
APPLY SUNMARK SEEDS NATIVE RIPARIAN SEED MIX TO ACHIEVE FULL COVERAGE 1 LB/1,000 SF					

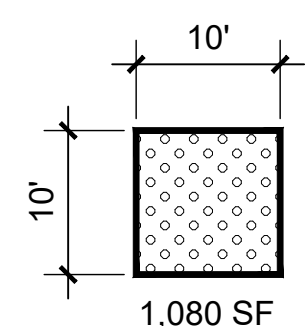


<b>HABITAT RESTORATION PLANTING</b>					
<b>TREES</b>					
ACER CIRCINATUM	VINE MAPLE	2 GAL CONT			
ACER MACROPHYLLUM	BIGLEAF MAPLE	2 GAL CONT			
AMELANCHIER X GRANDIFLORA	APPLE SERVICEBERRY	2 GAL CONT			
ARBUTUS MENZIESII	PACIFIC MADRONE	2 GAL CONT			
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	2 GAL CONT			
QUERCUS GARRYANA	OREGON OAK	2 GAL CONT			
RHAMNUS PURSHIANA	CASCARA	2 GAL CONT			

<b>SHRUBS</b>					
HOLIDISCUS DISCOLOR	OCEANSPRAY	1 GAL CONT.			
MAHONIA AQUIFOLIUM	OREGON GRAPE	1 GAL CONT.			
RIBES SANGUINEUM	RED-FLOWERING CURRANT	2 GAL CONT.			
ROSA NUTKANA	NOOTKA ROSE	2 GAL CONT.			
SYMPHORICARPOS ALBUS	SNOWBERRY	1 GAL CONT.			
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	2 GAL CONT.			
APPLY SUNMARK SEEDS NATIVE MEADOW MIX TO ACHIEVE FULL COVERAGE 1 LB/1,000 SF					



<b>PGE CORRIDOR RESTORATION PLANTING</b>					
HOLIDISCUS DISCOLOR	OCEANSPRAY	1 GAL CONT.			
MAHONIA AQUIFOLIUM	OREGON GRAPE	1 GAL CONT.			
RIBES SANGUINEUM	RED-FLOWERING CURRANT	2 GAL CONT.			
ROSA NUTKANA	NOOTKA ROSE	2 GAL CONT.			
SYMPHORICARPOS ALBUS	SNOWBERRY	1 GAL CONT.			
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	2 GAL CONT.			
APPLY SUNMARK SEEDS NATIVE MEADOW MIX TO ACHIEVE FULL COVERAGE 1 LB/1,000 SF					



<b>WETLAND C PLANTING</b>					
<b>TREES</b>					
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	2 GAL CONT., 3' MIN.	1	25' O.C.	11
<b>SHRUBS</b>					
HOLIDISCUS DISCOLOR	OCEANSPRAY	1 GAL CONT., 1.5' MIN.	2	2.5' O.C.	22
RIBES SANGUINEUM	RED FLOWERING CURRANT	1 GAL CONT., 1.5' MIN.	2	2.5' O.C.	22
ROSA GYMNOCARPA	BALDHIP ROSE	1 GAL CONT., 1.5' MIN.	1	2.5' O.C.	11
APPLY SUNMARK SEEDS NATIVE UPLANDS MIX TO ACHIEVE FULL COVERAGE 1 LB/1,000 SF					

### WATER QUALITY AND RESTORATION PLANTING NOTES

- PRIOR TO INSTALLING PLANTING SOIL, VERIFY SUBGRADE IS SET AT PROPER ELEVATIONS TO ACCOMMODATE FULL PLANTING SOIL AND MULCH DEPTHS. CONFIRM SUBGRADE MEETS ALL REQUIRED CONDITIONS INCLUDING DEBRIS AND STONE REMOVAL, COMPACTION LEVELS, SCARIFICATION, ETC.
- CONTRACTOR SHALL PROVIDE PLANTING SOIL TO ALL PLANTING AREAS TO DEPTHS SHOWN IN THE DETAILS. APPLY MULCH TO ALL PLANTING AREAS EXCEPT THE TREATMENT AREA AT A DEPTH OF 3" AND 18" DIAMETER TO ALL SHRUBS AND TREES INSTALLED.
- FOR TREATMENT AREA, DETENTION/MID-SLOPE AREA, AND FREEBOARD AREA PLANTING ZONES, TILL THE SUBGRADE TO A DEPTH OF 4". INSTALL 12 INCH DEPTH OF PLANTING SOIL. PLANTING SOIL SHALL BE A BLEND OF LOAMY SOIL, SAND AND COMPOST THAT IS 30-40% COMPOST (BY VOLUME).
- FOR UPSLOPE AND UPLAND AREA PLANTING ZONES, TILL THE SUBGRADE TO A DEPTH OF AT LEAST 4 INCHES. INCORPORATE CLEAN COMPOST WITH TOPSOIL (TO MAKE PLANTING SOIL) AND INSTALL TO A DEPTH OF 12 INCHES PER CLEAN WATER SERVICE'S STANDARDS, APPENDIX A, PLANTING REQUIREMENTS.
- ALL PLANTS SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS PROVIDED AS PART OF THE CONSTRUCTION DOCUMENT PACKAGE. WATER QUALITY FACILITIES SHALL BE PLANTED PER CWS R&O 19-5 Appendix A 2.3.c-e. & 2.5a-c & 2.6b,c,d,e 2.4a-f.
- QUANTITIES ARE LISTED FOR THE CONTRACTOR'S CONVENIENCE ONLY. ALL COUNTS MUST BE VERIFIED BY THE CONTRACTOR. IN THE CASE OF A DISCREPANCY BETWEEN THE LEGEND AND THE PLAN, PLANTS INDICATED ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN THE LEGEND.
- DEEP ROOTING TREES AND SHRUBS (E.G. WILLOW) SHALL NOT BE PLANTED ON TOP OF CONCRETE PIPES, OR WITHIN 10 FEET OF RETAINING WALLS, INLET/OUTLET STRUCTURES OR OTHER CULVERTS. ACTUAL DEPTH AND LOCATION OF UNDERGROUND OR OVERHEAD UTILITIES MAY VARY BASED ON THE PLANS. PLANTING CONFLICTS THAT ARISE IN THE FIELD SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- LARGE TREES OR SHRUBS SHALL NOT BE PLANTED ON BERMS OVER FOUR FEET TALL THAT IMPOUND WATER. SMALL TREES OR SHRUBS WITH FIBROUS ROOT SYSTEMS MAY BE INSTALLED ON BERMS THAT IMPOUND WATER AND ARE LESS THAN FOUR FEET TALL. PLANTING CONFLICTS THAT ARISE IN THE FIELD SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- ALL PLANTING AREAS TO BE SERVICED WITH TEMPORARY IRRIGATION.

### PLANTING NOTES

- CONTRACTOR SHALL PROVIDE PLANTING SOIL, SOIL AMENDMENTS, AND BARK MULCH TO THE COMPOSITION AND DEPTHS IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS OF THE CONTRACT DOCUMENTS.
- ALL PLANTS SHALL BE INSTALLED IN ACCORDANCE WITH THE DRAWINGS AND THE SPECIFICATIONS PROVIDED AS PART OF THE CONTRACT DOCUMENTS.
- QUANTITIES ARE LISTED FOR THE CONTRACTOR'S CONVENIENCE ONLY. ALL COUNTS MUST BE VERIFIED BY THE CONTRACTOR. IN THE CASE OF A DISCREPANCY BETWEEN THE LEGEND AND THE PLAN, PLANTS INDICATED ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN THE LEGEND.
- UTILITY LOCATIONS SHOWN ON PLANS MAY DIFFER FROM FIELD CONDITIONS. CONTRACTOR TO FIELD VERIFY ALL UTILITIES BEFORE INSTALLATION. CONFLICTS BETWEEN ANY EXISTING AND PROPOSED UTILITIES ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- ALL EDGES BETWEEN SEEDED AND MULCH AREAS TO BE SHOVEL-CUT. SEE DETAIL 2/90-L-50009.

### WETLAND C VEGETATED CORRIDOR PLANTING RATE CALCULATION

PLANT COMMUNITY	PLANT TYPE	PLANTING AREA (SF)	PLANTING DENSITY (# PER SF)	PLANT QTY.	# OF SPECIES
UPLAND FOREST	TREES	1,080	0.010	11	1
UPLAND FOREST	SHRUBS	1,080	0.050	54	3

## PLANTING LEGEND AND NOTES 2

DSGN	STOECKLEIN					
DR	STOECKLEIN					
CHK	D WALTERS					
APVD	M FAHA	NO.	DATE	REVISION	BY	APVD

VERIFY SCALE  
BAR IS ONE INCH ON ORIGINAL DRAWING.  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



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Email: info@greenworkspc.com



Willamette Water Supply  
Our Reliable Water  
WILLAMETTE WATER SUPPLY PROGRAM  
WATER TREATMENT PLANT\_1.0

CDM Smith  
1220 SW Morrison Street, Suite 200  
Portland, OR 97205  
Tel: (503) 232-1800

SITE  
LANDSCAPE ARCHITECTURE  
PLANTING LEGEND AND NOTES 2

SHEET	
DWG #	03-L-22014
DATE	06/12/2020
PROJ	WTP_1.0

90% DESIGN - NOT FOR CONSTRUCTION