Appendix B

Wetland Delineation Report

Wetland Delineation Report
Westport Water Supply Project

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Photo on cover: view of sample plot SP2 Wetland A at Knapp Springs with Rhyacotriton kezeri *in foreground*

Acronyms and Abbreviations

CAD	computer aided drafting
Corps	U.S. Army Corps of Engineers
CFR	Code of Federal Regulations
cfs	cubic foot per second
DSL	Department of State Lands (Oregon)
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
FEMA	Federal Emergency Management Agency
GIS	geographic information system
HGM	Hydrogeomorphic
HUC	hydrologic unit code
LRR	Land Resource Region
LWI	Local Wetlands Inventory
NI	No indicator
NL	Not listed
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWS	National Weather Service
OAR	Oregon Administrative Rules
OBL	Obligate
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
OHWL	Ordinary High Water Line
ORNHIC	Oregon Natural Heritage Information Center
ORS	Oregon Revised Statutes
OWRD	Oregon Water Resources Department
PEM	Palustrine emergent
PEMC	Palustrine emergent seasonally flooded
PFO	Palustrine forested
PSS	Palustrine scrub-shrub
PVC	Polyvinyl chloride
SP	Sample plot
UPL	Upland Obligate
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMVC	Western Mountains, Valleys, and Coast
WSO	Weather Service Office

INTRODUCTION

The Federal Emergency Management Agency (FEMA) is proposing to support the Westport Water Association by providing partial funding for a project to expand an existing domestic water supply system in Clatsop County, Oregon. Severe storms in the region in December 2007 caused extensive flooding, landslides, and mudslides. A presidential disaster was declared in the region on December 8, 2007, making funds available to public entities for damage repairs. The purpose of the proposed project is to provide FEMA Public Assistance funding to the Westport Water Association to construct and operate new water supply connections to existing water supply facilities currently owned by the neighboring Wauna Water District. Westport has a need to provide domestic water supply to approximately 250 households in Westport, Oregon.

The purpose of this wetland delineation report is to determine the current presence, location, and size of federal and state jurisdictional wetlands and other waters of the U.S. Once verified by the appropriate agencies, this wetland delineation will allow FEMA, Westport Water Association, and Wauna Water District to accurately understand specific impacts on waters of the U.S. or waters of the state, including wetlands associated with the proposed project. FEMA uses the Eight-Step Planning Process to meet the requirements for complying with Executive Order 11990 on Protection of Wetlands as required by regulation 44 Code of Federal Regulations (CFR) Part 9. This report complies with Executive Order 11990. If permits associated with the Oregon Removal-Fill Law (Oregon Revised Statutes [ORS] 196.795-990) and Section 404 of the Clean Water Act are required, Westport Water Association is responsible for compliance with those regulations as well as any local permit requirements. This wetland delineation report follows the format in Oregon Administrative Rules (OAR) 141-090-0035 (1-22) and guidance from the Oregon Department of State Lands (DSL).

A. LANDSCAPE SETTING AND LAND USE

OAR 141-090-035(7)(a)

AECOM conducted a wetland delineation on August 12-14, 2009, for the Westport Water Supply Project, near Westport, Oregon (Township 8 North, Range 6 West, Section 34, Willamette Meridian (Figures 1a and 1b in Appendix A). For this wetland delineation, the study area extends 25 feet from the proposed project footprint. The study area includes the location of two springs (Knapp Springs and Peterson Springs) and associated facilities, and a linear pipeline corridor connecting the two spring sites with existing Wauna Water District infrastructure (Figure 1b). The study area is in the Northwest Forest and Coast subregion (Land Resource Region [LRR] A) of the Western Mountains, Valleys, and Coast Region (Environmental Laboratory 2008). The study area is on portions of Tax Lots 2900 (Tax Map 8-6), 100, 200, 400, 500, 600, and 700 (Tax Map 8-6-34A) (Figure 2). The study area lies within the Coast Range ecoregion and is approximately 2.9 acres. It is located within the McFarlane Creek drainage within the Lower Columbia River subbasin. The 5th field hydrologic unit code (HUC) for this area is 1708000306 (Plympton Creek watershed). The 6th field HUC for the study area is 170800030602 (Hunt Creek subwatershed). The northern portion of the study area is on private land, and the southern portion of the study area is on state-owned Oregon Department of Forestry (ODF) land within the Clatsop State Forest. Topography slopes downward from the south to the north. Elevation drops from approximately 420 feet at the top of Peterson Springs on the southern boundary of the study area to 140 feet on McFarlane Creek on the northern boundary of the study area (USGS 1985).

The study area is primarily forested land (USDA 2006). The site is accessed from a gravel road from Oklahoma Hill Road, south of U.S. Highway 30. Current land uses include timber management by ODF, undeveloped private land, and Wauna Water District facilities. Wauna Water District maintains a water tank reservoir that collects water from Peterson Springs. A second spring, Knapp Springs, is located in the study area and includes water collection infrastructure that is not currently functioning and has no connection to the Wauna Water District water tank reservoir. According to the Oregon Water Resources Department (OWRD) records, Wauna Water District facilities were developed in 1972 (OWRD 2009).

A.1 Existing Data Review

NWI Map

National Wetlands Inventory (NWI) (Figure 3) data indicate that no wetlands are mapped in the study area (USFWS 2009). The closest mapped wetland is approximately 500 feet north and is classified as palustrine emergent seasonally flooded (PEMC). At the time of this investigation, a Local Wetland Inventory (LWI) had not been conducted in the project vicinity (DSL 2009).

Soil Survey

The study area soils are associated with the Alstony-Scaponia-Braun general soil map unit (NRCS 1988). The general soil map unit is moderately deep to deep, well-drained soils, on mountains. The study area detailed soil map units consist of Alstony gravelly loam, 30 to 60 percent slopes, and Braun-Scaponia silt loams, 3 to 30 percent slopes (Figure 4) (NRCS 2009a). Neither of these map units are listed as hydric or have hydric soil inclusions (NRCS 2007). Most of the study area is mapped as Braun-Scaponia silt loams, 3 to 30 percent slopes. Only a small portion of the study area is mapped as Alstony gravelly loam, 30 to 60 percent.

The following description of the Alstony-Scaponia-Braun general soil map unit is an excerpt from the Clatsop County Soil Survey (NRCS 1988):

> *Alstony soils are deep and well drained. The upper layer is dark reddish brown gravelly loam. Below this are reddish brown very gravelly loam and dark brown extremely cobbly loam over fractured basalt. Scaponia soils are deep and well drained. The upper layer is dark brown silt loam. Below this is dark yellowish brown and yellowish brown silt loam over fractured siltstone. Braun soils are moderately deep and well drained. The upper layer is very dark grayish brown silt loam. The next layer is dark yellowish brown silt loam. Below this is brown and strong brown silt loam over fractured siltstone.*

Recent Aerial Photographs

An aerial photograph taken through the U.S. Department of Agriculture Aerial Photography Field Office in 2006 depicts the study area and vicinity as primarily forested lands (Figure 4). Figure 5 is an aerial photograph taken by WAC Corp and is a stock photo that was taken on May 6, 2001. A transmission line corridor is located approximately 500 feet north and is maintained to keep vegetation low and trees on the outer edge of the corridor. Further interpretation of the aerial photograph indicates that the study area is dominated by hardwood forest with scattered conifers near Knapp Springs, and a younger stand of conifers east of Peterson Springs. Logging roads are

scattered in the general vicinity. However, logging roads are not currently active in the study area. Rural residences are located north of the transmission line corridor.

Additional Resources

A fisheries resource evaluation was conducted by the Oregon Department of Fish and Wildlife (ODFW) in the study area. ODFW district fish biologist confirmed that only cutthroat trout (*Oncorhynchus clarki*) and sculpin (*Cotus* spp.) use McFarlane Creek, within the reach from Knapp Springs downstream north of Taylorville Road (pers. comm., T. Murtagh). The study area is in the ODFW North Willamette Watershed District - Clackamas Office, Columbia River tributaries (Hunt Creek to St. Helens). The preferred in-water work period for the study area is July 15 to September 15; fall-run Chinook salmon (*O. tshawystscha*) and winter-run steelhead (*O. mykiss*) (not located in or near study area) are the primary basis for these general timing guidelines (ODFW 2008).

AECOM contacted the Oregon Natural Heritage Information Center (ORNHIC) to request a data system search for rare, threatened, and endangered plant and animal records within a 2-mile radius of the project site (ORNHIC 2009). Based on the ORNHIC data system search, evaluation of potential habitat in the project vicinity, and field observations, no rare, threatened, and endangered plant and animal species are likely to occur in the study area.

B. SITE ALTERATION

OAR 141-090-0035(7)(c)

Site alterations include logging, development of a water system on Peterson Springs, installation of the Peterson Springs pipeline, and development of a water collection system on Knapp Springs.

Logging

Forests in the study area and vicinity were logged approximately 30 to 40 years ago. Old logging roads are scattered in the study area and vicinity. The portion of the study area on Clatsop State Forest land consists of an even-aged conifer forest stand. The portions of the study area on private land are mixed hardwood-conifer forest. Many of the old logging roads in the study area have been abandoned and are overgrown. One main logging road has been maintained as an access road to Peterson Springs and for the water pipeline corridor. Logging has had numerous effects on the natural ecology of the landscape including soil, vegetation, and hydrology disturbance.

Peterson Springs

In the early 1970s, Peterson Springs was developed to distribute water for the Wauna Water District. Water system facilities installed to distribute water include a spring box and collection pipes at Peterson Springs, an outlet pipe to a junction box, a junction box, a buried distribution pipe under the access road to a reservoir tank, a reservoir tank, vaults, and additional buried pipe leading to existing Wauna Water District infrastructure. The area around the junction box was cleared and graded. Most of the pipe was buried to a depth of 36 inches, but its depth may have become more shallow over the years because of erosion. The existing access road was used as the water pipeline corridor. Site alterations in the study area from development of the water system on Peterson Springs include vegetation clearing around water system facilities, soil excavation from the installation of

distribution pipes, soil compaction from road construction, and water diversion and displacement associated with the water system.

Knapp Springs

Water collection facilities construction at Knapp Springs occurred in the late 1960s. Alteration of the slopes surrounding the spring and the west bank of McFarlane Creek included the installation of a pump house, intake boxes at two spring locations, and associated pipes. Site alterations in the study area from the development of the water system on Knapp Springs include vegetation clearing around water system facilities. Knapp Springs is not operational and no water is being diverted.

C. PRECIPITATION DATA AND ANALYSIS

OAR 141-090-0035(7)(i)

Precipitation data were collected from the closest weather station, the National Weather Service (NWS) Astoria Climatologically Data Site (NWS 2009). Growing season data are provided in Section D.3 *Hydrology*. The Astoria Data Site is approximately 20 miles west of the study area at the Astoria airport. Climate data were used from the Astoria Data Site because its weather pattern is similar to the study area. Precipitation on the day of and 2 weeks before the dates of the field investigation are provided in Table 1. Based on these data, 0.27 inch, 0.02 inch, and a trace amount of rain fell at the station during the August 12, 13, and 14, 2009 visit, respectively. Rainfall at the end of July and beginning of August 2009 was minimal, with a total of 0.47 inch of precipitation recorded during the previous 2 weeks (July 28 to August 11, 2009).

Table 1: Precipitation on the day of and approximately 1- 2 weeks before the dates of the field investigation.

Month	Day	Precipitation (inches)[a]
July	28	0
	29	0
	30	0.01
August	1	0
	2	0
	3	0
	4	0
	5	0
	6	Trace
	7	0.02
	8	0.01
	9	0.02
	10	0.15
	11	0.26
	12[b]	0.27
	13[b]	0.02
	14[b]	Trace

a = NWS 2009.
b = Dates of Field Investigation.

The NRCS WETS data for the Astoria Weather Service Office (WSO) Airport station, Oregon, are summarized in Tables 2 and 3. Detailed climate data are provided in Appendix D. May 2009 was a wet month, above the normal range (30th to 70th percentile). June 2009 was a drier month, below the normal range, 15 percent of the monthly average. July and August were below the monthly precipitation average but within the normal range. Percent of normal rainfall for the water year to date for May, June, and July 2009 is 97, 93, and 93 percent, respectively (NRCS 2009b). Based on these factors, the amount of rainfall was not likely to affect the location of delineated boundaries in the study area.

Table 2: Monthly normal and observed precipitation in inches.

Date	1971-2000 Monthly Average[a]	Normal Range[a]		Precipitation Observed[b]	Percent of Monthly Normal
		30th Percentile	70th Percentile		
May 2009	3.28	2.22	3.91	5.83	178
June 2009	2.57	1.70	3.08	0.39	15
July 2009	1.16	0.51	1.42	0.61	53
August 2009	1.21	`0.62	1.48	0.92	76

a = NRCS 2002.
b = NWS 2009.

Table 3: Water year to date normal and observed rainfall in inches.

Date	1971-2000 Water Year to Date Average[a]	Normal Range Water Year to Date[a]		Water Year to Date Observed[bc]	Percent of Water Year Normal
		30th Percentile	70th Percentile		
May 2009	59.57	41.96	70.54	57.63	97
June 2009	62.14	43.66	73.62	58.02	93
July 2009	63.30	44.17	75.04	58.63	93
August 2009	64.51	44.79	76.52	59.55	92

a = NRCS 2002.
b = NWS 2009.
c = NRCS 2009b.

D. METHODS

OAR 141-090-0030, OAR 141-090-0035(7)(d-e), (g-h), (16)(a-b), (f), (d) or (g), OAR 141-090-0035(17), & (19-20)

The wetland delineation methods used during this investigation follow criteria outlined in the *1987 U.S. Army Corps of Engineers Wetland Delineation Manual* (1987 Manual) (Environmental Laboratory 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*, issued April of 2008 (WMVC supplement) (Environmental Laboratory 2008). These methods require the prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology. Under normal circumstances, positive

indicators of each of these parameters must be present for an area to satisfy the criteria for jurisdictional wetlands. Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Classification of Wetland and Deepwater Habitat of the United States (Cowardin et al. 1979), commonly referred to as Cowardin class. Classification also follows the Guidebook for Hydrogeomorphic (HGM)–based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles (Adamus 2001), commonly referred to as HGM class.

Wetlands were delineated within the study area using the "routine" methods recommended in the 1987 Manual and the WMVC Supplement. Based on this guidance, wetlands or other waters that have been disturbed through natural or anthropogenic alteration of vegetation, soil, or hydrology do not necessarily exist under normal circumstances. However, understanding that logging and water system development have modified the landscape, circumstances currently exist that would require an atypical approach to a wet area near Peterson Springs. Methods for the wet area followed the procedures outlined in the 1987 Manual in Section F. Atypical Situations (Man-Induced Wetlands).

A general field reconnaissance was conducted on July 22, 2009, and the wetland delineation investigation was conducted on August 12-14, 2009. Data were collected from sample plots that best represent each wetland and adjacent non-wetland(s). Paired sample plots were located close enough to either side of the wetland boundary to substantiate boundary location. In total, 27 sample plots were documented in this wetland investigation. In addition to these 27 sample plots, test pit data were collected and characterized in field notes and integrated into the wetland report narrative and the representative sample plots. Data forms for all sample plots are included in Appendix B.

D.1 Vegetation

The presence of hydrophytic vegetation was determined at each potential wetland location using the methods outlined in the 1987 Manual and WMVC Supplement for a routine wetland delineation. Chapter 2 of the WMVC Supplements details the procedures for using hydrophytic vegetation indicators. In most cases, the following indicator was used to determine the presence of hydrophytic vegetation in the study area:

- Indicator 1: Dominance Test. Description: More than 50 percent of the dominant plant species across all strata are rated OBL, FACW, or FAC (as defined below).

Absolute percent cover of each plant species was visually estimated. A nested plot system was used to collect vegetation occurrence and cover data: a larger plot for trees and a smaller plot nested within the larger plot for other plant species. Generally a 5-foot radius plot was used to identify shrub/sapling, herbaceous, and woody vine strata. The plot was enlarged to a 15-foot radius plot to estimate the tree stratum. Plot sizes and shapes were modified and adjusted to avoid overlapping boundaries and extending into adjacent communities. The absolute cover for each species was visually estimated and then summed for each of the vegetation layers. The relative cover was then calculated for each species in a layer, and dominance was calculated as per the 50/20 rule (Environmental Laboratory 1987). The number of dominant species across all layers was totaled and divided into the number of species with an indicator status of FAC or wetter to obtain the percentage of FAC, FACW, and OBL species growing in the sample plot. Potential wetland sites are considered to have positive indicators of hydrophytic vegetation if greater than 50 percent of the dominant plant species include FAC, FACW, or OBL species (Reed 1988, 1994).

The regional wetland indicator list was used to determine the status of each plant in sample plots. Plant species wetland indicator status is a rating that indicates the probability that a particular plant species will occur in a wetland. Indicator status was assigned using the National List of Plant Species that Occur in Wetlands, Northwest Region 9 (Reed 1988, 1994). Indicator status categories are defined as follows:

- **Obligate (OBL) –** Almost always occurs in wetlands (>99 percent probability of occurring in wetlands).
- **Facultative Wetland (FACW) –** Usually occurs in wetlands (67-99 percent probability of occurrence in wetlands).
- **Facultative (FAC) –** Equally likely to occur in wetlands or non-wetlands (34-66 percent of occurrence in wetlands).
- **Facultative Upland (FACU) –** Usually occurs in non-wetlands, but occasionally occurs in wetlands (1-33 percent of occurrence in wetlands).
- **Obligate Upland (UPL) –** Almost never occurs in wetlands (1 percent probability of occurrence in wetlands).
- **Not Listed (NL) –** Are considered non-wetland plants for the purpose of wetland delineations.
- **No Indicator (NI) –** No status assigned because information is lacking.

D.2 Soils

The presence of hydric soil was determined at each potential wetland location using the methods outlined in the 1987 Manual and WMVC Supplement for a routine wetland delineation. Soil pits were dug to a depth of 20 inches, when not hindered by cobble, hardpan, or inundation. Soil color was categorized using the Munsell Soil Color Chart (Kollmorgen Instruments 1992). Soils on the access road/water pipeline corridor are disturbed. Potential hydric soils on old logging roads were likely imported. Rocky soil substrate throughout the study area consisted of native siltstone that was brownish yellow to reddish yellow in color and commonly fractured in the sample pits.

Chapter 3 of the WMVC Supplement details the procedures for using hydric soil indicators. In most cases, the following indicator was used to determine the presence of hydric soils in the study area:

- Indicator F6: Redox Dark Surface. Description: A layer that is at least 4 inches thick, is entirely within the upper 12 inches of the mineral soil, and has a:
    - Matrix value of 3 or less and chroma of 1 or less and 2 percent or more distinct or prominent redoximorphic (redox) concentrations occurring as soft masses or pore linings, or
    - Matrix value of 3 or less and chroma of 2 or less and 5 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

Methods for identifying wetland indicators for problematic hydric soils followed procedures outlined in Chapter 5 of the WMVC Supplement. In most of these cases, the following problem occurred in soils with faint or no indicators:

- Dark Parent Material. Description: Soils formed in dark parent materials often do not exhibit easily recognizable redox features.

D.3 Hydrology

The presence of wetland hydrology was determined at each potential wetland location using the methods outlined in the 1987 Manual and WMVC Supplement for a routine wetland delineation. The growing season for the study area is from February 15 to December 11 based on the NRCS WETS table data for Astoria Airport station, Oregon (NRCS 2002). The Astoria Airport is the closest data collection station and has similar weather patterns to the study area. Saturation to the surface must occur for a minimum of 15 consecutive days (5 percent) during the growing season, or more likely for 37.5 consecutive days (12.5 percent) of the 300-day growing season for the area, for wetland hydrology to occur (Environmental Laboratory 1987). Potential wetland hydrology on the access road/water pipeline corridor above the buried water pipes is a result of road building and compaction.

Chapter 4 of the WMVC Supplement details the procedures for using wetland hydrology indicators. In most cases, the following indicators were used to determine the presence of wetland hydrology in the study area:

- Group A - Observation of Surface Water or Saturated Soils
    - Indicator A1: Surface Water
    - Indicator A2: High Water Table
    - Indicator A3: Saturation
- Group B - Evidence of Recent Inundation
    - Indicator B10: Drainage Patterns
- Group C - Evidence of Current or Recent Soil Saturation
    - Indicator C2: Dry Season Water Table
- Group D - Evidence from Other Site Conditions or Data
    - Indicator D2: Geomorphic Position
    - Indicator D3: Shallow Aquitard
    - Indicator D5: FAC-Neutral Test

Methods for identifying wetland indicators for wetlands that periodically lack indicators of wetland hydrology followed procedures outlined in Chapter 5 of the WMVC Supplement. In most of these cases, the following steps were used:

1. Verify that indicators of hydrophytic vegetation and hydric soil are present, or are absent due to disturbance or other problem situations. If so, proceed to step 2.

2. Verify that the area is in a landscape position that is likely to collect or concentrate water. Appropriate settings are listed below.
    a. Concave surface (e.g., depression or swale)

b. Active floodplain or low terrace
c. Level or nearly level area (e.g., 0 to 3 percent slope)
d. Toe slope or an area of convergent slopes
e. Fringe of another wetland or water body
f. Area with a restrictive soil layer or aquitard within 24 inches (60 cm) of the surface
g. Area where groundwater discharges (e.g., a seep)
h. Other (explain in field notes why this area is likely to be inundated or saturated for long periods)

For nonwetland waters of the U.S. and state, the ordinary high water line (OHWL) was flagged using such indicators as bank scouring, debris lines, vegetation lines, and water marks and follows ORS 274.005.

E. DESCRIPTION OF ALL WETLANDS AND OTHER NON-WETLAND WATERS

OAR 141-090-0035(2), (7)(b), & (17)

Five wetlands (A, B, B-1, C, and D) and two streams (McFarlane Creek and Creek 1) were identified during the field investigation. Figures 6a through 6d show the location of each feature. Representative site photographs are included in Appendix C.

E.1 Wetlands

Wetland A is associated with Knapp Springs. Wetlands B and B-1 are associated with the unnamed tributary to McFarlane Creek referred to in this report as Creek 1. Wetland C is associated with Peterson Springs at the headwaters of McFarlane Creek. Wetland D is a linear wetland located in the southern portion of the study area. The description for each wetland includes a brief explanation of hydrophytic vegetation indicators, hydric soil indicators, wetland hydrology indicators, and boundary determination.

E.1.1 Wetland A

Wetland A extends from Knapp Springs to the OHWL of McFarlane Creek. Wetland A is approximately 851 square feet in size (Figure 6b). This wetland does not extend off site. Wetland A sample plots include SP2 and SP4; paired upland sample plots include SP1 and SP3, respectively. Data forms for all sample plots are included in Appendix B. Cowardin class for this wetland is palustrine scrub-shrub. HGM class for this wetland is slope.

Vegetation

Vegetation in the area was cleared in the early 1970s during construction of the spring collector boxes. Since construction, native vegetation has re-established. Dominant vegetation in the shrub stratum consisted of salmonberry (*Rubus spectabilis*, FAC) and thimbleberry (*Rubus parviflorus*, FAC). The obligate plant Pacific golden saxifrage (*Chrysosplenium glechomifolium*, OBL) was dominant in the herbaceous stratum. A strong presence of hydrophytic vegetation, indicated by 100 percent of the dominant species being OBL, FACW, or FAC, satisfies Indicator 1: Dominance Test, thereby meeting the hydrophytic vegetation criteria of the WMVC Supplement.

Soils

Many large boulders and cobble are present near the ground surface in the vicinity of Knapp Springs. These boulders represent dark parent material. The boulders were likely disturbed and redistributed during development of Knapp Springs. The substrate has become naturalized with native wetland vegetation under the current perennial flow regime. This mix of rocky substrate consisted of 60 to 80 percent of the soil pit. Soil samples were collected from wide interstitial spaces between large boulders and cobble. Matrix color was very dark brown and black (7.5YR 2.5/2 and 10YR 2/1) with no redox features. Wetland sample plot SP2 between 8 and 18 inches from the surface had a matrix color of very dark brown (7.5YR 2.5/3) and 5 percent prominent redox concentrations of dark reddish brown. The interstitial soils are perennially saturated and filled with coarse gravel, which made assessment of the mineral soil components and the indicators for hydric soils problematic.

These soils did not exhibit any of the hydric soil indicators presented in Chapter 3 of the WMVC Supplement. However, since indicators of hydrophytic vegetation and wetland hydrology were present, and the area is problematic because of disturbance, the methods for identifying wetland indicators for problematic hydric soils (as described in Chapter 5 of the WMVC Supplement) were followed. Additional requirements including dark parent material, area where ground water discharges, strong presence of hydrophytic vegetation, and perennial hydrology are present, thereby meeting the hydric soil criteria of the WMVC Supplement.

Hydrology

Wetland hydrology for this area is supported by groundwater discharge associated with Knapp Springs. There is some diversion and retention of water because of the collection boxes, but the pump is not operational. There are several flowing paths through the wetland, although the majority of the wetland substrates are saturated due to capillary infiltration. Because of the perennial spring, this area is likely saturated for long periods during the growing season. Saturation to the surface was observed and satisfies Indicator A3: Saturation, thereby meeting the wetland hydrology criteria of the WMVC Supplement.

Boundary Determination and Adjacent Uplands

Wetland A is distinguished from adjacent upland habitat on the ground by an abrupt change in topographic position and by the distinctive, wedge-shaped seep outflow and associated wetland vegetation patterns. Upland habitats abutting Wetland A supported a prevalence of hydrophytic vegetation that included red alder (*Alnus rubra*, FAC), salmonberry (FAC), thimbleberry (FAC), youth on age (*Tolmiea menziesii*, FAC), Scouler's fumewort (*Corydalis scouleri*, FAC), and coastal manroot (*Marah oreganus*, NL). This mesic alder forest vegetation is supported on a steep slope with a strong north aspect. There were no positive indicators of wetland hydrology or hydric soils adjacent to Wetland A.

E.1.2 Wetland B

Wetland B occurs adjacent to Creek 1, an unnamed tributary to McFarlane Creek. The portion of Wetland B within the defined study area is approximately 4,092 square feet in size (Figure 6c). It should be noted that Wetland B-1 was delineated (and as described below) as separate from Wetland B because of disturbance associated with the road and water pipeline. Wetland B occurs in a convex valley bottom. This wetland extends off site to the northeast (downstream) and to the east/southeast, upslope within a broad, shallow depressional area supporting red alder. Wetland B sample plots include SP6, SP7, SP10, SP12, SP13, and SP14; paired upland sample plots include SP9, SP11, SP15, and SP16 (Figure 6c). The Cowardin class for this wetland is palustrine scrub-shrub/forested. The HGM class for this wetland is riverine.

Vegetation

The dominant plant species in Wetland B included stinging nettle (*Urtica dioica*, FAC), reed canarygrass (*Phalaris arundinacea*, FACW), and creeping buttercup (*Ranunculus repens*, FACW). These species form a dense understory overtopped by red alder (FAC). Presence of hydrophytic vegetation is indicated by greater than 50 percent of the dominant species being OBL, FACW, or FAC and satisfies Indicator 1: Dominance Test, thereby meeting the hydrophytic vegetation criteria of the WMVC Supplement.

Soils

Matrix colors were generally very dark brown (10YR 2/2) to very dark grayish brown (10YR 3/2), with prominent yellowish brown and yellowish red redox features at least 4 inches thick in the upper 12 inches of the soil profile. The dark surface layer generally occurred over a dripping wet subsoil (SP10), above a relatively hard siltstone layer in transitional wetland habitats (SP12, SP14), or over sand and gravel deposits deeper within the wetland depression (SP6, SP7). Sample plot SP13 was in transitional wetland habitat that had compacted soils with chunks of the siltstone along with various mixed overburden that may have been an old road pullout. Sample plots SP6 and SP7 had hydric soil characteristics believed to be associated with both natural conditions (shallow water table in natural depression) and man-made conditions (compaction and pooling).

A layer that is at least 4 inches thick, entirely within the upper 12 inches of the soil profile, and has a matrix value of 3 or less and chroma of 2 or less and 5 percent or more of prominent redox concentrations is present in sample plots SP6, SP7, SP10, SP12, SP13, and SP14, and satisfies Indicator F6: Redox Dark Surface; thereby meeting the hydric soil criteria of the WMVC Supplement.

Hydrology

Wetland hydrology in this area is supported by surface flows and shallow groundwater associated, respectively, with Creek 1 and the wide, relatively flat valley bottom. Wetland hydrology near the edges of the valley bottom is further assisted by the semi-permeable siltstone layer and by compacted surfaces associated with man-made disturbance, both of which collect precipitation and slow infiltration at or near the surface. Saturation was observed in sample plots SP6 and SP10 and was at the surface to 2 inches deep. Secondary indicators of drainage patterns, geomorphic position,

and/or a shallow aquitard were observed in sample plots SP7, SP12, SP13, and SP14. Creek 1 is diverted through a culvert under the access road; it is apparent that the creek frequently overflows its banks and saturates Wetland B. Saturation to the surface was observed and satisfies Indicator A3: Saturation. Plots without saturation to the surface satisfy Indicator B10: Drainage Patterns, Indicator D2 Geomorphic Position, and/or Indicator D3: Shallow Aquitard; thereby meeting the wetland hydrology criteria of the WMVC Supplement.

Boundary Determination and Adjacent Uplands

The wetland boundary was distinguished from upland habitat on the ground based on the orientation and depressional characteristics of the valley bottom along with the observed presence of wetland indicators for vegetation, hydrology, and soils. In portions of Wetland B disturbed by road building, the boundary was further determined by estimating the pre-disturbance edge of the natural valley bottom (interpolated topography); a primary assumption using this method of delineation for disturbed habitats is that natural wetland conditions occurred here prior to construction of the current road and buried pipeline.

Upland habitats abutting Wetland B supported mesic forest that included red alder (FAC), Douglas-fir (*Pseudotsuga menziesii*, FACU), Himalayan blackberry (*Rubus armeniacus*, FACU), vine maple (*Acer circinatum*, FAC), red elderberry (*Sambucus racemosa*, FACU), salmonberry (FAC), thimbleberry (FAC), youth on age (FAC), sword fern (*Polystichum munitum*, FACU), redwood sorrel (*Oxalis oregana*, NL), rough hedgenettle (*Stachys rigida*, FACW), creeping buttercup (FACW), and stinging nettle (FAC). Three of the four upland sample plots had a prevalence of hydrophytic plant species. However, none of the four sample plots had positive indicators of wetland hydrology or hydric soils.

E.1.3 Wetland B-1

Wetland B-1 is on the existing access road and buried Peterson Springs pipeline. This area is approximately 901 square feet (Figure 6c). Cowardin class for this wetland is palustrine emergent. HGM class for this wetland is riverine.

Vegetation

This area is represented by sample plot SP8. Dominant vegetation is reed canarygrass (FACW) and creeping buttercup (FACW). Vegetation was disturbed from road construction. The presence of hydrophytic vegetation is indicated by 100 percent of dominant species being OBL, FACW, or FAC and satisfied Indicator 1: Dominance Test, thereby meeting the hydrophytic vegetation criteria of the WMVC Supplement.

Soils

This area consists of compacted soils with chunks of siltstone along with various mixed overburden. Hydric soils were likely imported from the adjacent wetland (Wetland B) during road construction in the early 1970s. A buried water pipeline is likely contributing to the development of hydric soil indicators. Matrix soils were very dark grayish brown (10YR 3/2) in the upper 4 inches with yellowish red (5YR 4/6) prominent redox features (10 percent), a dark gray (5Y 4/1) matrix from 4

to 11 inches, and very dark gray (5Y 3/1) matrix from 11 to 20 inches. These data include a 4-inch thick layer with a matrix value of 3 and chroma of 2 and 10 percent of prominent redox concentrations and satisfies Indicator F6: Redox Dark Surface, thereby meeting the hydric soil criteria of the WMVC Supplement.

Hydrology

Secondary indicators of geomorphic position and shallow aquitard were observed in the area. This plot satisfies wetland hydrology Indicator D2 Geomorphic Position and Indicator D3: Shallow Aquitard, thereby meeting the wetland hydrology criteria of the WMVC Supplement.

Boundary Determination and Adjacent Uplands

The wetland boundary was distinguished using observations of geomorphic position and drainage patterns. Upland habitats abutting Wetland B-1 supported mesic forest that included red alder (FAC), Douglas-fir (FACU), Himalayan blackberry (FACU), vine maple (FAC), red elderberry (FACU), salmonberry (FAC), thimbleberry (FAC), youth on age (FAC), sword fern (FACU), redwood sorrel (NL), rough hedgenettle (FACW), creeping buttercup (FACW), and stinging nettle (FAC).

Summary Discussion

This area was separated from Wetland B because of significant disturbance to soil and hydrology. It should be noted that soils were previously disturbed during road construction and may have been imported, and wetland hydrology is primarily supported by the buried water pipeline and may have been artificially created from uplands. However, other indicators such as the natural slope and topography, position in the valley bottom, and presence of wetland hydrology in the adjacent Wetland B are evidence that there likely were wetlands in the area prior to road construction. Natural wetland conditions occurred here prior to construction of the current road and buried pipeline and the wetland was likely part of Wetland B. Wetland B-1 exhibited hydrophytic vegetation dominance, hydric soils indicators (redox features in low chroma matrix near surface), and wetland hydrology indicators (secondary indicators of drainage patterns, geomorphic position, and shallow aquitard) and met wetland criteria of the 1987 Manual and WMVC Supplement.

E.1.4 Wetland C

Wetland C is a seep-fed wetland that extends from Peterson Springs and is a headwater source for McFarlane Creek. Wetland C is approximately 523 square feet in size within the defined study area (Figure 6d). This wetland extends off site to the west within a natural channel depression that quickly transitions into McFarlane Creek, a Water of the U.S. (see Section E.2). Wetland C also is adjacent to, and separated by a constructed berm from, Wet Roadbed Area 1, which is part of the current water development (see Section E.3 for a description of Wet Roadbed Area 1). Wetland C sample plots include SP17 and SP18; paired upland sample plots include SP19, SP20, and SP21 (Figure 6d). The Cowardin class for this wetland is palustrine scrub-shrub. HGM class for this wetland is slope.

Vegetation

The dominant plant species recorded at Wetland C included salmonberry (FAC), stink current (*Ribes bracteosum*, FAC), devils club (*Oplopanax horridus*, FAC), Pacific golden saxifrage (OBL), stinging nettle (FAC), and youth on age (FAC). The strong presence of hydrophytic vegetation, indicated by 100 percent of the dominant species being OBL, FACW, or FAC, satisfies Indicator 1: Dominance Test, thereby meeting the hydrophytic vegetation criteria of the WMVC Supplement.

Soils

The steep sloping substrate at Peterson Springs has problematic hydric soils, similar to those observed and described for Wetland A at Knapp Springs. Soils at sample plot SP17 did not exhibit any of the hydric soil indicators presented in Chapter 3 of the WMVC Supplement. However, since indicators of hydrophytic vegetation and wetland hydrology were present, and the area is problematic because of disturbance, methods for identifying wetland indicators for problematic hydric soils as described in Chapter 5 of the WMVC Supplement were followed. Additional requirements including dark parent material, area where groundwater discharges, strong presence of hydrophytic vegetation, and a perennial hydrology are present, thereby meeting the hydric soil criteria of the WMVC Supplement.

Sample plot SP18 had matrix soils were black (10YR 2/1) in the upper 8 inches, very dark grayish brown (10YR 3/2) matrix from 8 to 17 inches with prominent reddish brown redox features. These conditions satisfy Indicator F6: Redox Dark Surface, thereby meeting the hydric soil criteria of the WMVC Supplement.

Hydrology

Wetland hydrology is directly attributable to flows in Peterson Spring that bypass the current water development catchment and diversion, particularly at SP18. At SP17, additional groundwater is contributed by leakage from the buried water pipeline. Because of the perennial spring, this area is likely saturated for long periods during the growing season. Saturation to the surface was observed in the upper 5 inches and satisfied wetland hydrology Indicator A3: Saturation, thereby meeting the wetland hydrology criteria of the WMVC Supplement.

Boundary Determination and Adjacent Uplands

The Wetland C boundary was distinguished from adjacent upland habitat on the ground by patterns of wetland vegetation associated with the distinctive wedge-shaped seep outflow pattern on steep slopes and with wet habitats in the natural drainage topography that is the origin of the main McFarlane Creek channel.

Upland habitats abutting Wetland C supported mesic forest that included red alder (FAC), western hemlock (*Tsuga heterophylla*, FACU), red elderberry (FACU), salmonberry (FAC), thimbleberry (FAC), youth on age (FAC), Fendler's waterleaf (*Hydrophyllum fendleri*, FAC), sword fern (FACU), and Devil's club (FAC). One of the three upland sample plots had a prevalence of hydrophytic plant species. However, none of them had positive indicators of wetland hydrology or hydric soils.

E.1.5 Wetland D

Wetland D is a linear wetland associated with outflow from a small, ephemeral drainage that originates from the south and outside of the study area. Wetland D is approximately 40 square feet in size in the defined study area (Figure 6d). This wetland extends off site to the south. The Cowardin class for this wetland is palustrine forested. HGM class for this wetland is riverine.

Outside of the study area, the drainage is narrow and incised (14 inches wide by 4 to 6 inches deep), has a bare mud bottom, and runs through relatively flat (1 to 3 percent), low lying topography that supports a second-growth Douglas-fir / red alder forest. The slope markedly increases (5 to 7 percent) as it nears the study area. The drainage channel loses a defined bed or bank 20 feet upslope from the study area and becomes a wetland as the topography flats out. Wetland D appears to retain and collect surface runoff from adjacent uplands. Overflow from Wetland D perches onto the adjacent Wet Roadbed Area 1 (see Section E.3 for more explanation of Wet Roadbed Area 1). There are no remaining natural topographic or hydrologic patterns in the Wet Roadbed Area 1 that suggest a possible extension of Wetland D. Therefore, the north end of Wetland D ends abruptly along the existing access road. Wetland D follows a loose pattern of outflow that is generally less compacted and less uniformly disturbed than the Wet Roadbed Area 1 (see Section E.3 for more explanation of Wet Roadbed Area 1).

Vegetation

The Wetland D sample plot is SP26; the paired upland sample plot is SP27. Wetland D is approximately 40 square feet in size (Figure 6d). Vegetation is comprised of red alder (FAC) and water parsley (*Oenanthe sarmentosa*, OBL). Other herbaceous species present include Fendler's waterleaf (FAC), stinging nettle (FAC), and reed canarygrass FACW). The presence of hydrophytic vegetation, indicated by greater than 50 percent of dominant species being OBL, FACW, or FAC, satisfies Indicator 1: Dominance Test, thereby meeting the hydrophytic vegetation criteria of the WMVC Supplement.

Soils

Matrix soils were dark grayish brown (10YR 4/2) in the upper 7 inches, very dark grayish brown (10YR 3/2) from 7 to 16 inches, and gray from 16 to 20 inches. In the upper 7 inches, there were fine prominent dark red redox features (5 percent). From 7 to 16 inches, prominent medium yellowish brown redox features (10 percent) were present along with chunky blocks of yellow siltstone. A 5-inch thick layer in the upper 12 inches had a matrix value of 3 and chroma of 2, with 10 percent prominent redox concentrations present; this satisfies Indicator F6: Redox Dark Surface, thereby meeting the hydric soil criteria of the WMVC Supplement.

Hydrology

Wetland hydrology is supported by saturated ground and runoff early in the growing season. Positive secondary indicators include drainage patterns in the wetland, geomorphic position, and the FAC-Neutral Test. Data collected for this area satisfy wetland hydrology Indicator B10: Drainage

Patterns, Indicator D2: Geomorphic Position, and Indicator D5: FAC-Neutral Test; thereby meeting the wetland hydrology criteria of the WMVC Supplement.

Boundary Determination and Adjacent Uplands

The majority of the Wetland D boundary follows the presence of hydrophytic vegetation and topography.

Uplands abutting Wetland D supported mesic forest that included Douglas-fir (FACU), sword fern (FACU), and redwood sorrel (NL). This young second-growth Douglas-fir forest had no positive indicators of wetland hydrology or hydric soils.

E.2 Other Non-Wetland Waters

In addition to the five identified wetlands, there are two perennial streams in the study area: McFarlane Creek and Creek 1 (Figures 6a-6e). McFarlane Creek is associated with Wetland A and Wetland C. Creek 1 is associated with Wetland B. The OHWL for both streams was flagged in the field and surveyed (see Section G). The federal definition of ordinary high water, which is also defined in Oregon by ORS 274.005, was used in determining the location of the OHWL.

E.2.1 McFarlane Creek

McFarlane Creek is a tributary to Driscoll Slough, which drains to the Columbia River. This creek crosses approximately 51 linear feet of the study area. The approximate size of the creek in the study area is 979 square feet, and it extends beyond the study area (Figure 6b). The OHWL was determined by observations of bank scouring, debris lines, vegetation lines, and water marks. The creek has a broad channel bottom, and its width varies from 5 to 15 feet. The riparian buffer of McFarlane Creek in the study area is intact, with vegetation dominated by red alder forest.

E.2.2 Creek 1

Creek 1 is an unnamed tributary, side channel of McFarlane Creek that flows into an impounded freshwater pond before linking back into McFarlane Creek. Creek 1 crosses approximately 67 linear feet of the study area (Figure 6c). Approximate size of the creek in the study area is 147 square feet, and it extends beyond the study area. The OHWL was determined by observations of vegetation lines and water marks. This small creek is approximately 1 foot wide. The majority of the riparian buffer in the study area is intact, and vegetation is dominated by the red alder forest described for Wetland B. Creek 1 crosses under the access road/water pipeline corridor to the Peterson Springs via a culvert (Figure 6c); the culvert is likely undersized at 24 inches. During higher flows, Creek 1 likely impounds at the road and quickly overflows and inundates the road. Built-up sediment from these overflows have accumulated on top of the original gravel road surface.

E.3 Non-Wetland Wet Areas

In addition to the wetlands and other waters described above, the delineation identified a wet area described as Wet Roadbed Area 1. As described below, this area includes characteristics of wetland hydrology, soils, and vegetation that distinguish it from surrounding uplands; however, it is an artificially created wet area and considered a non-wetland.

E.3.1 Wet Roadbed Area 1

This area occurs on the existing water pipeline right-of-way, which also serves as an access road to Peterson Springs and over a buried water pipeline. This area is adjacent to Wetlands C and D and occupies approximately 3,954 square feet (0.09 acre) (Figure 6d) and is surrounded by upland mixed conifer / hardwood forest. Wet Roadbed Area 1 is represented by sample plots SP22 and SP25 with paired upland sample plots SP23 and SP24, respectively. The hydrology in this area is supported by leakage from the water pipeline, overflow from the collector and junction box, and precipitation perched on the severely compacted roadbed surface. Development of the water pipeline has created wetland hydrology, which has facilitated the formation of wetland characteristics where none occurred prior to development of the water system at Peterson Springs.

Vegetation

The following description includes a brief explanation of alteration to vegetation, effects on vegetation from the alterations, type of vegetation that occurred prior to alterations, and a determination of whether the plant communities that previously occurred constitute hydrophytic vegetation.

General site alterations for this area include logging, development of the water system on Peterson Springs, and the installation of the Peterson Springs pipeline (see Section B for a description of site alterations). The installation of the water system in this area occurred in the 1970s. The area was cleared of all vegetation, graded and compacted, Peterson Springs was developed, and its water diverted into a water pipeline. Grading has changed the slope from 5-10 percent to less than 1 percent. Effects on vegetation as a result of the alteration include the removal and clearing of tree, shrub, and herbaceous plant species; limited shrub and tree growth is a result of soil grading and compaction.

Sample plot SP23 documented an upland mixed conifer / hardwood forest adjacent to SP22 and likely represents the type of habitat that occupied this area prior to development of the water system at Peterson Springs. At SP22, the dominant vegetation consists of Pacific golden saxifrage (OBL), water parsley (OBL), and creeping buttercup (FACW). Sample plot SP25 represents the more typical conditions whereby the installation of the water system has created wetland characteristics in Wet Roadbed Area 1 where none occurred prior to development of the water system at Peterson Springs. At SP25, the most abundant species were creeping bentgrass (*Agrostis stolonifera*, FAC), curly knotweed (*Polygonum lapathifolium*, FACW), reed canarygrass (FACW), stinging nettle (FAC), toothed dock (*Rumex dentatus*, NL), and creeping buttercup (FACW).

The presence of hydrophytic vegetation, indicated by greater than 50 percent of dominant species being OBL, FACW, or FAC, satisfies Indicator 1: Dominance Test, thereby meeting the hydrophytic vegetation criteria of the WMVC Supplement. However, it was determined that hydrophytic vegetation was not formerly present; if the created wetland hydrology were removed, it is likely that dominant vegetation would no longer exist and the area would revert to upland plant species that were likely present pre-development.

Soils

The following description includes a brief explanation of alteration to soils, effects on soils from the alterations, type of soils that occurred prior to the alterations, and a determination of whether the hydric soils were formerly present.

In addition to the alterations described for vegetation above, soils were altered from removal of the surface soil layer, grading of the area to accommodate the water system facilities, excavation from installation of the facilities, and resurfacing and compaction after construction. Effects on soils from these alterations include removal, displacement, and mixing.

Soils that previously occurred are represented by upland sample plot SP23, which included very dark brown (10YR 2/2), and the description for Alstony gravelly loam that is mapped for the area (NRCS 1988). These soils were disturbed in the early 1970s when the alterations occurred. At sample plot SP22, soils did not exhibit any of the hydric soil indicators presented in Chapter 3 of the WMVC Supplement. However, since indicators of hydrophytic vegetation and wetland hydrology were present, and the area is problematic because of disturbance, the methods for identifying wetland indicators for problematic hydric soils (as described in Chapter 5 of the WMVC Supplement) were followed. Additional requirements including hydrophytic vegetation and perennial hydrology are present, thereby meeting the hydric soil criteria of the WMVC Supplement.

Data collected at SP25 included a very dark brown (10YR 2/2) matrix with prominent dark reddish brown (5YR 3/4) redox features (7 percent) in the upper 4 inches, and a very dark grayish brown (10YR 3/2) matrix from 4 to 20 inches with prominent yellowish red (5YR 5/8) redox features (5 percent). These conditions satisfy Indicator F6: Redox Dark Surface, thereby meeting the hydric soil criteria of the WMVC Supplement.

Early growing season saturation in the compacted roadbed was determined primarily because of the dense oxidized root channels observed in the soil profile. The conditions described here for SP25 are representative of numerous areas we observed on the current water pipeline right-of-way that are compacted, flat, and perch water. In contrast, SP24 did not have positive indicators of hydric soils or wetland hydrology. Sample plot SP24 represents the majority of the roadbed habitats that fall nearer the drier end of the substrate moisture gradient.

Based on alterations of the area, it was determined that hydric soil was not formerly present, likely imported from adjacent wetlands, and if the created wetland hydrology were removed, it is likely that current hydric soils indictors would no longer exist and no longer support hydrophytic vegetation.

Hydrology

The following description includes a brief explanation of alterations to hydrology, effects on hydrology from the alterations, type of hydrology that occurred prior to the alterations, and a determination of whether the wetland hydrology was formerly present.

In addition to the alterations described for vegetation and soils above, hydrology changed in the area because of the development of the water system facilities to collect water from Peterson Springs.

Water from Peterson Spring was diverted from flowing into McFarlane Creek to the junction box in Wet Roadbed Area 1. A perforated section of pipe was installed between the springs and the junction box located next to SP22. The area around the junction box was graded to form a sunken area to collect water directly from the springs through the perforated pipe. An unintentional effect of forming this sunken area was the detention of additional water from runoff that includes sediment from adjacent uplands. Because of these factors, the area is more frequently inundated than conditions prior to alterations. The duration of inundation and soil saturation are likely perennial.

Hydrology that previously occurred is represented by upland sample plot SP23 where no wetland hydrology indicators are present. SP22 was inundated with surface water. SP25 had secondary indicators of wetland hydrology that included geomorphic position and the FAC-Neutral Test. Water leaking from the perforated pipe and overflow from the junction box provide a perennial water source that has come to support wetland vegetation on the graded pipeline right-of-way that did not occur here prior to development of the water system at Peterson Springs.

With the exception of Wetland B-1, there were no road or water pipeline right-of-way sections that were determined to have been wetland habitat prior to development of the water system associated with Peterson Springs. This conclusion is primarily based on the presence of upland topography supporting upland vegetation along the road, and the absence of wetland hydrology other than that facilitated by the compacted roadbed or, in the case of SP22, leakage from the water pipeline.

Data collected for this area satisfy wetland hydrology Indicator A1: Surface Water, Indicator A2: High Water Table, Indicator A3: Saturation, Indicator D2: Geomorphic Position, and Indicator D5: FAC-Neutral Test, thereby meeting the wetland hydrology criteria of the WMVC Supplement.

However, based on the alterations of the area, it was determined that wetland hydrology was not formerly present; if the created wetland hydrology were removed, the area would likely revert back to uplands that were present prior to the development of the water system at Peterson Springs.

Boundary Determination and Adjacent Uplands

The majority of the Wet Roadbed Area 1 boundary follows the graded and cleared road surface. Upland habitats abutting Wet Roadbed Area 1 supported mesic forest that included Douglas-fir (FACU), sword fern (FACU), and redwood sorrel (NL). This young second-growth Douglas-fir forest had no positive indicators of wetland hydrology or hydric soils.

Summary and Discussion

Wet Roadbed Area 1 has developed some characteristics of naturally occurring wetlands. Because of the development of the water system, however, the hydrologic regime has changed. The area occurs in a location that supported upland mixed conifer / hardwood forest prior to development of the water system in the 1970s; this conclusion is supported by the presence of sloping, upland topography adjacent to the wet areas and the absence of hydrologic sources that might have supported wetlands prior to the 1970s.

As stated in the 1987 Manual (Part IV, Section F, Subsection 4, "Man-Induced Wetlands"):

> *If hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity (e.g., irrigation) were to be terminated, the area should not be considered a wetland.*

Because of the alterations in the area, it was determined that wetland hydrology was not formerly present; if the created wetland hydrology were removed, the area would likely revert back to uplands that were present prior to the development of the water system at Peterson Springs. Based on the guidance presented in the 1987 Manual, Wet Roadbed Area 1 is not considered a wetland, subject to agency review.

As stated in OAR 141-085-0515(6) Removal-Fill Jurisdiction by Type of Water, Artificially Created Wetlands and Ponds:

> *These waters are jurisdictional when they are:*
> *(a) Equal to or greater than one acre in size;*
> *(b) Created, in part or in whole, in waters of this state; or*
> *(c) Identified in an authorization as a mitigation site.*

Because the Wet Roadbed Area 1 is not equal to or greater than 1 acre in size (0.09 acre), is not created in part or whole in waters of the state (created from uplands), and is not identified in an authorization as a mitigation site, this area is likely non-jurisdictional (OAR 141-085-0515(6)).

F. DEVIATION FROM LWI OR NWI

OAR 141-090-0035(16)(e)

The NWI map for the study area does not depict wetlands within the study area (USFWS 2009). No LWI has been conducted for the study area (DSL 2009). Deviation from the NWI includes the presence of Wetlands A, B, B-1, C, and D.

G. MAPPING METHODS

OAR 141-090-0035(7)(f), (11), (12), (13), (18), & (22)

Professional surveys were conducted by Boatwright Engineering, Inc to an accuracy of 0.01 foot. Wetland plot locations and boundaries, and the OWHL for McFarlane Creek and Creek 1, were flagged in the field. Horizontal accuracy for upland wetland boundaries in the field were typically 1 foot or better. Wetland plot locations and wetland boundaries and non-wetland ordinary high water lines were then surveyed and mapped. Wetland maps were generated using survey results with AutoCAD and ArcGIS mapping software. Based on the surveys conducted by Boatwright Engineering, Inc., flagged locations of wetland plots and boundaries, and integration with mapping software, horizontal position post-processing accuracy for wetland boundaries is typically 3 feet or better.

H. ADDITIONAL INFORMATION

OAR 141-085-0015(1-7), 141-090-0030(2), & 141-090-0035(6)(c), (16)(c), & (21)

No sensitive salmonid species utilize McFarlane Creek or Creek 1. Creek 1 has a culvert that is a velocity barrier to fish downstream of the study area. McFarlane Creek crosses under Oklahoma Hill Road, Taylorville Road, and Highway 30 via culverts before reaching Driscoll Slough. According to StreamNet (2009), no sensitive salmonid species are present in McFarlane Creek or Driscoll Slough despite a direct surface connection to the Columbia River.

ODFW conducted a fisheries resource evaluation in the study area on July 16, 2009. ODFW district fish biologists confirmed that only cutthroat trout and sculpin use McFarlane Creek, within the reach from Knapp Springs downstream north of Taylorville Road (pers. comm., T. Murtagh). The study area is in the ODFW North Willamette Watershed District - Clackamas Office Columbia River tributaries (Big Creek to St. Helens) where the preferred in-water work period is July 1 to September 15 (ODFW 2008).

The State of Oregon issued a certificate of water right to the Wauna Water District that confirms the right to use the waters of the Peterson Springs area for Quasi-Municipal Uses. The right was perfected under Permit 43564. The date of priority is January 14, 1972. In 1972, the amount of water to which the right is entitled was limited to an amount actually used beneficially, and shall not exceed 0.18 cubic foot per second (cfs) or its equivalent in case of rotation, measured at the point of diversion.

Construction of the development began in July 1973 and was completed before September 30, 1974. Construction consisted of a 6-inch cast iron and 6-inch polyvinyl chloride (PVC) pipe gravity system serving 70 homes. In 1978, the amount of water was increased to 0.5 cubic foot per second. Remarks in the application indicate that Peterson Springs is the primary source of water.

Knapp Springs was proposed to be developed by Joan and Howard Knapp for group domestic use and approved by the State of Oregon in 1965 under Permit 30725. The permit to appropriate the public waters of the State of Oregon states that spring water will be collected in a concrete box, a 4-inch pipe line, and approximately 5,000 feet of pipe length. The amount of water that was intended for beneficial use shall not exceed 0.423 cfs. The permit included development of two springs in the Knapp Springs area. The pump, collection boxes, and intake facilities were constructed in the late 1960s.

As stated in the introduction, FEMA is proposing to support the Westport Water Association by providing partial funding for a project to expand an existing domestic water supply system in Clatsop County, Oregon. Part of the planning process is to ensure National Environmental Policy Act compliance.

Executive Order 11990 on Protection of Wetlands direct federal agencies to avoid, to the extent possible, both short-term and long-term adverse effects associated with the occupancy and modifications of wetlands. FEMA uses the Eight-Step Planning Process to meet the requirements for complying with Executive Order 11990 as required by regulation 44 CFR Part 9. Step 1 of the planning process is to determine whether the proposed action is located in a wetland. The public

notice for this disaster and completion of the draft Environmental Assessment is consistent with FEMA's 8 Step planning process for Executive Order 11990 for wetlands.

I. RESULTS AND CONCLUSIONS

OAR 141-090-0035(7)(j)

Five wetlands and two non-wetland waters were delineated in the study area using methods recommended in the 1987 Manual and the WMVC Supplement. The total area of jurisdictional wetlands within the study area boundaries is 6,407 square feet (0.15 acre) (Table 4). The total length of non-wetland waters that cross the study area boundaries is 118 linear feet, with an area of 1,126 square feet (0.03 acre) (Table 5). The total area of non-wetland wet areas within the study area boundaries is 3,950 square feet (0.09 acre) (Table 6).

Wetlands A, B, B-1, C, and D all exhibited hydrophytic vegetation dominance, hydric soils indicators (most with redox features in a low chroma matrix near the surface), and wetland hydrology indicators (most would likely have saturated soil conditions at or near the surface during the early part of the growing season), whereas the identified uplands lack one or more of these indicators. Wetlands A, B, B-1, C, and D; Creek 1; and McFarlane Creek will likely be subject to regulations by DSL under the Removal-Fill law (ORS 196.800-196.990) and by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act.

Wet Roadbed Area 1 is artificially created from upland and identified by AECOM as likely non-wetland, subject to agency review. The determination of each wetland's jurisdictional status is contingent upon regulatory review by the Corps and DSL.

Table 4: Summary of wetlands in the study area.

Feature ID	Cowardin Class	HGM Class	Area (square feet)
Wetland A	PSS	Slope	851
Wetland B	PSS/PFO	Riverine	4,092
Wetland B-1	PEM	Riverine	901
Wetland C	PSS	Slope	523
Wetland D	PFO	Riverine	40
Total	--	--	6,407

PEM = palustrine emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub.

Table 5: Summary of non-wetland waters in the study area.

Feature ID	Cowardin Class	HGM Class	Linear Feet	Area (square feet)
McFarlane Creek	Riverine	Riverine	51	979
Creek 1	Riverine	Riverine	67	147
Total	--	--	118	1,126

Table 6: Summary of non-wetland wet areas in the study area.

Feature ID	Cowardin Class	HGM Class	Area (square feet)
Wet Roadbed 1	NA	NA	3,950
Total			3,950

J. REQUIRED DISCLAIMER

OAR 141-090-0035(7)(k)

This report documents the investigation, best professional judgment, and conclusions of the AECOM investigators. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-0055.

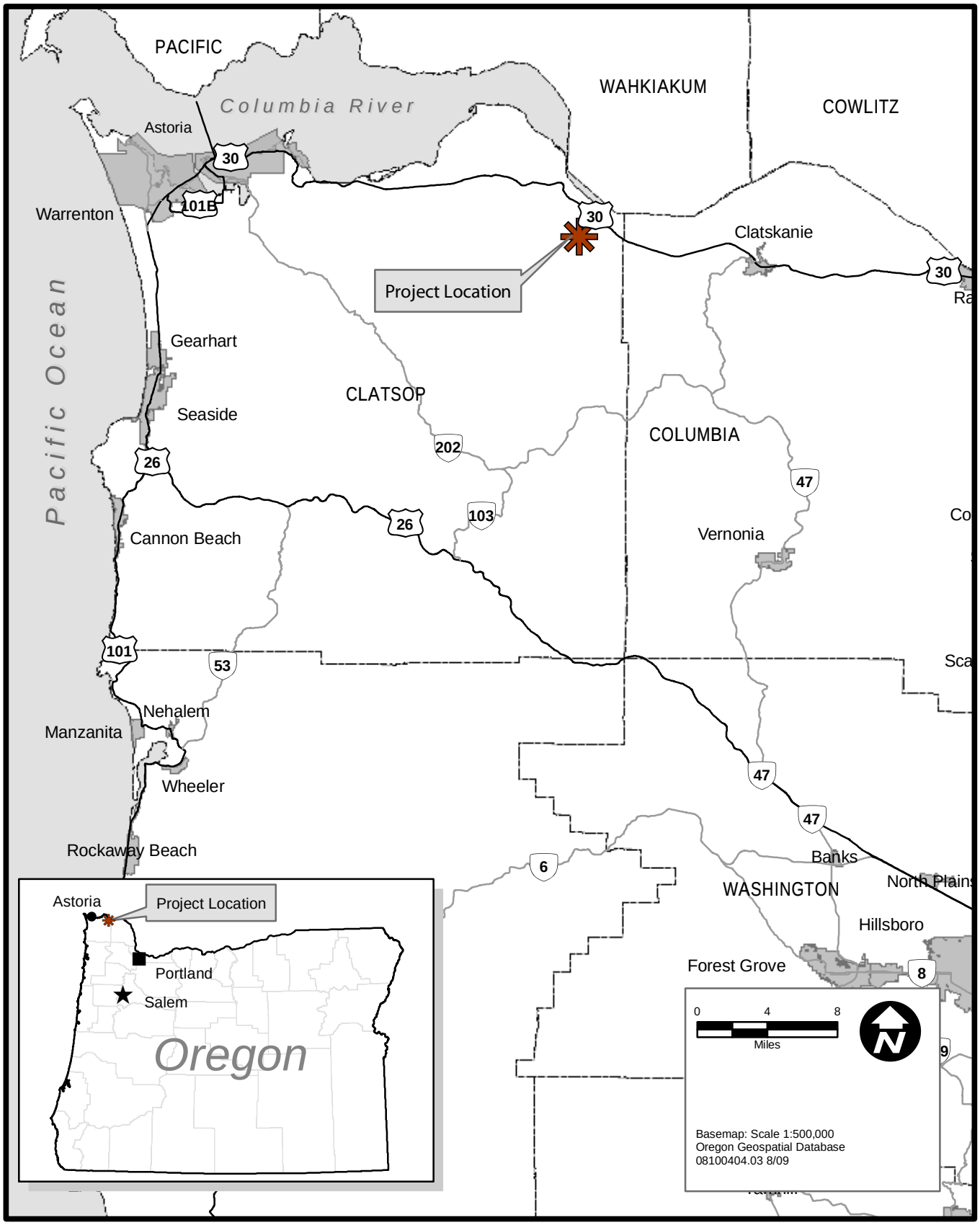
AECOM Disclaimer

AECOM has prepared this report for use by the Federal Emergency Management Agency (FEMA) and the Westport Water Association. The results and conclusions of this report represent the professional opinion of AECOM. They are based in part upon: (1) site reconnaissance and testing, and (2) examination of public domain information concerning the proposed site.

Work performed conforms to accepted standards in the field of jurisdictional delineation using the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (WMVC Supplement) (Environmental Laboratory 2008). However, final determination of jurisdictional boundaries of wetlands and waters of the state or U.S. pertinent to Clean Water Act Section 404 is the responsibility of the Portland District of the U.S. Army Corps of Engineers, the Oregon Department of State Lands (DSL), and/or the local jurisdiction of Clatsop County. Various agencies of the state of Oregon may require review of final site development plans that could potentially affect zoning, water quality, and/or habitat functions of lands in question. Thus, the findings and conclusions contained in this report should be reviewed by appropriate regulatory agencies prior to any detailed site planning and/or construction activities.

APPENDICES

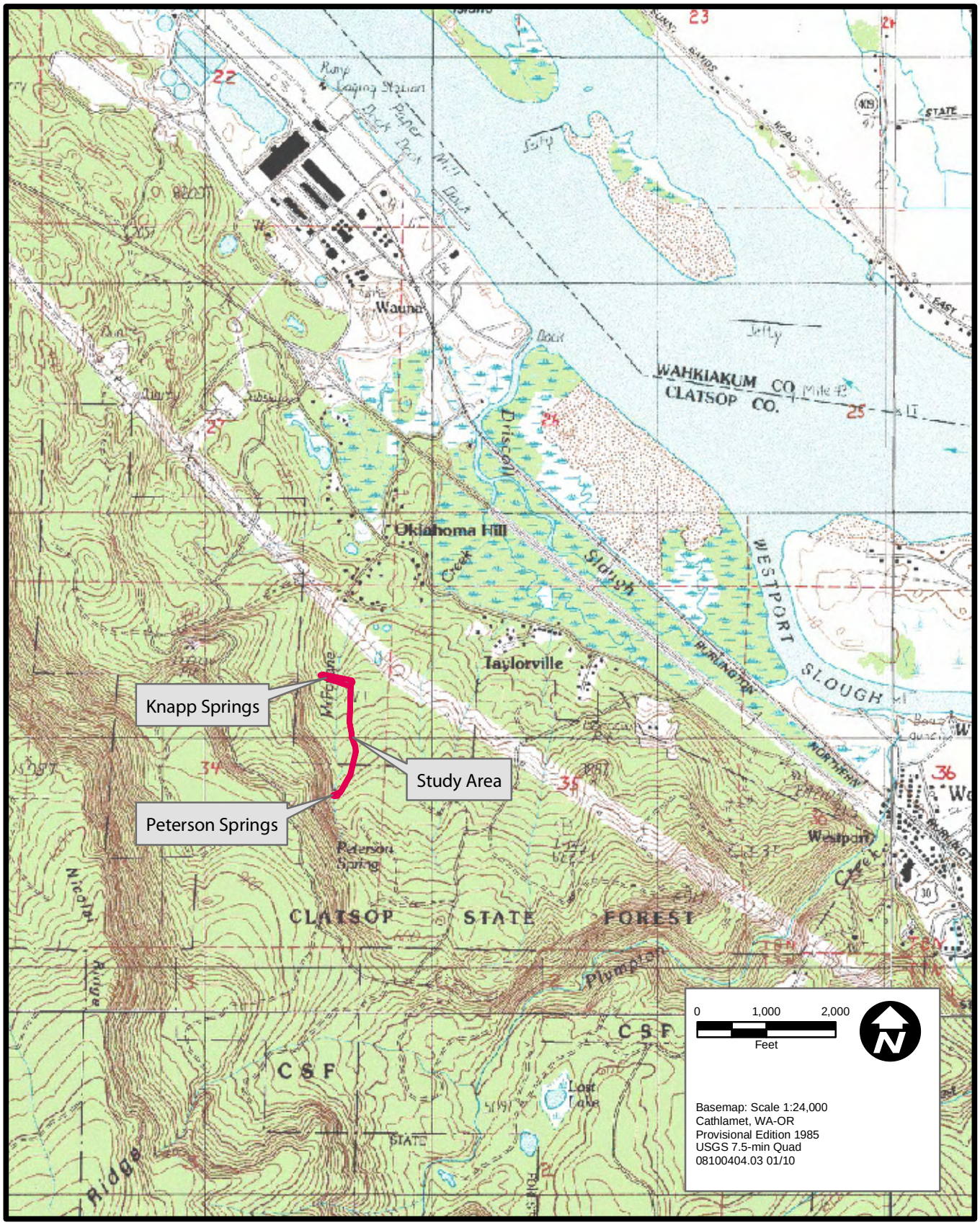
Appendix A: Figures



Location Map

Figure 1a

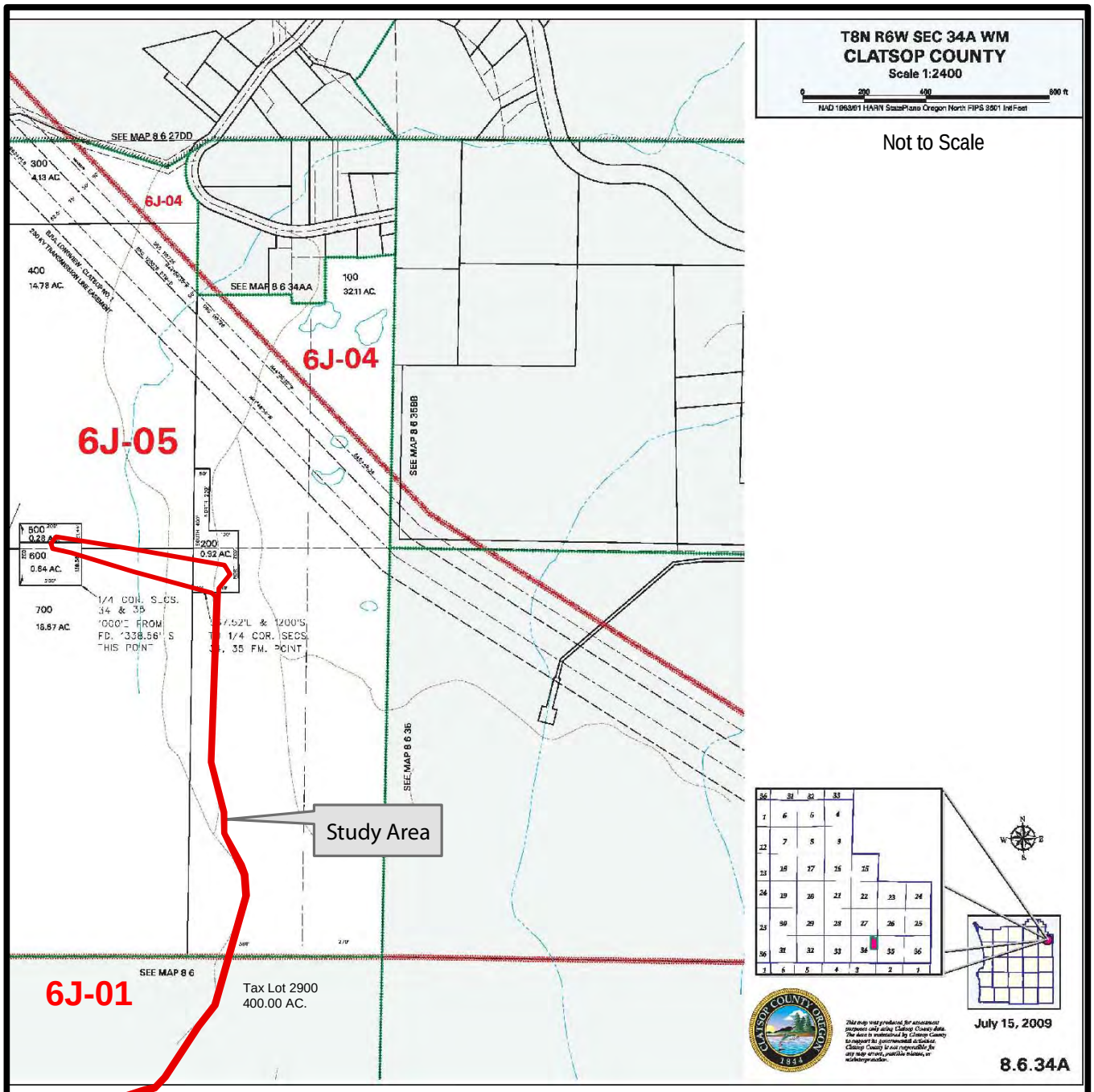
Westport Water Association
Wauna Water District
Westport Water Supply Project



Project Vicinity Map

Figure 1b

Westport Water Association
Wauna Water District
Westport Water Supply Project



Study Area Tax Lots
806000002900
80634A000100
80634A000200
80634A000400
80634A000500
80634A000600
80634A000700

Clatsop County, Oregon
July 15, 2009

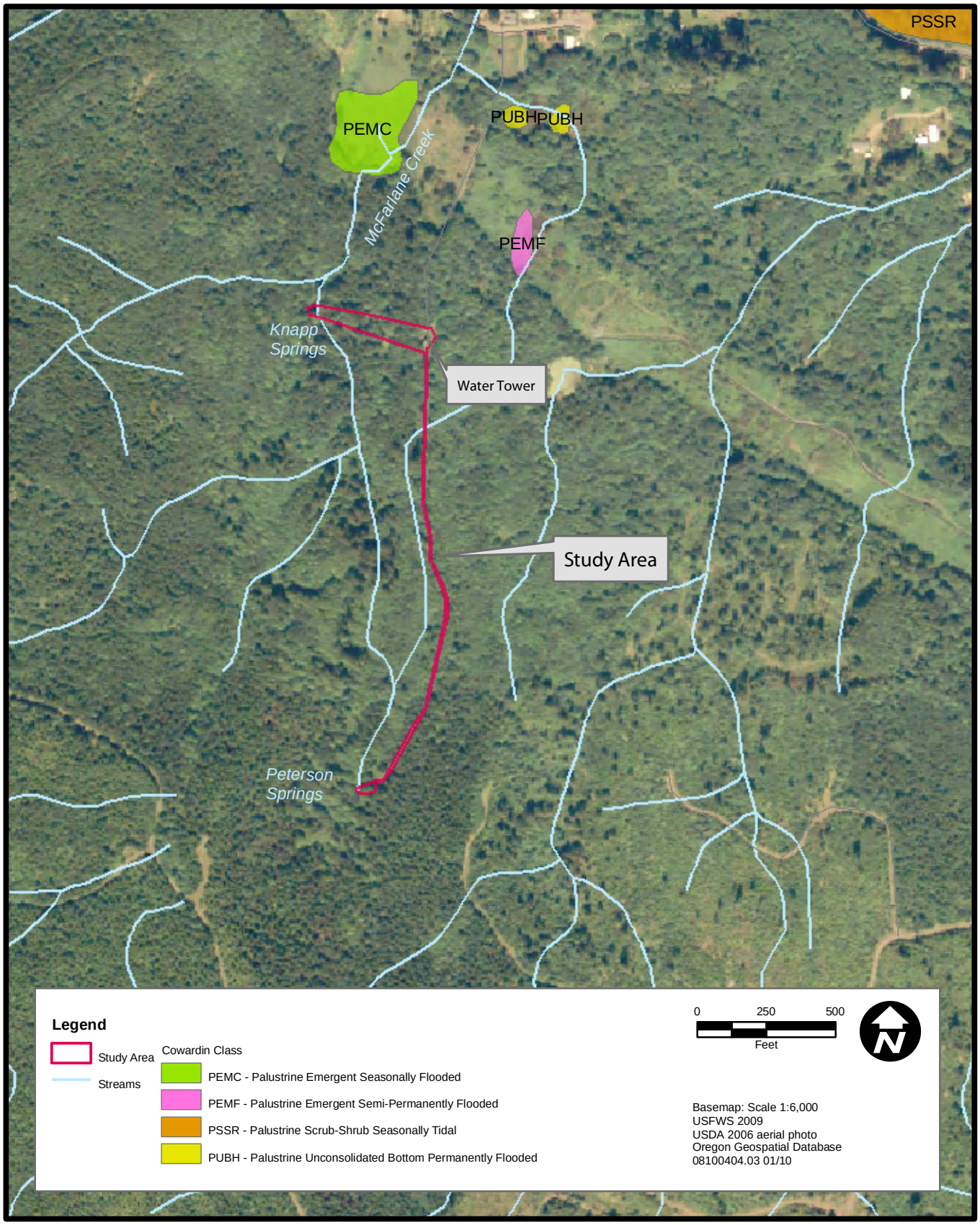
This map was produced for assessment purposes only using Clatsop County data.

08100404.03 01/10

Tax Lot Map 8 6 34A

Figure 2

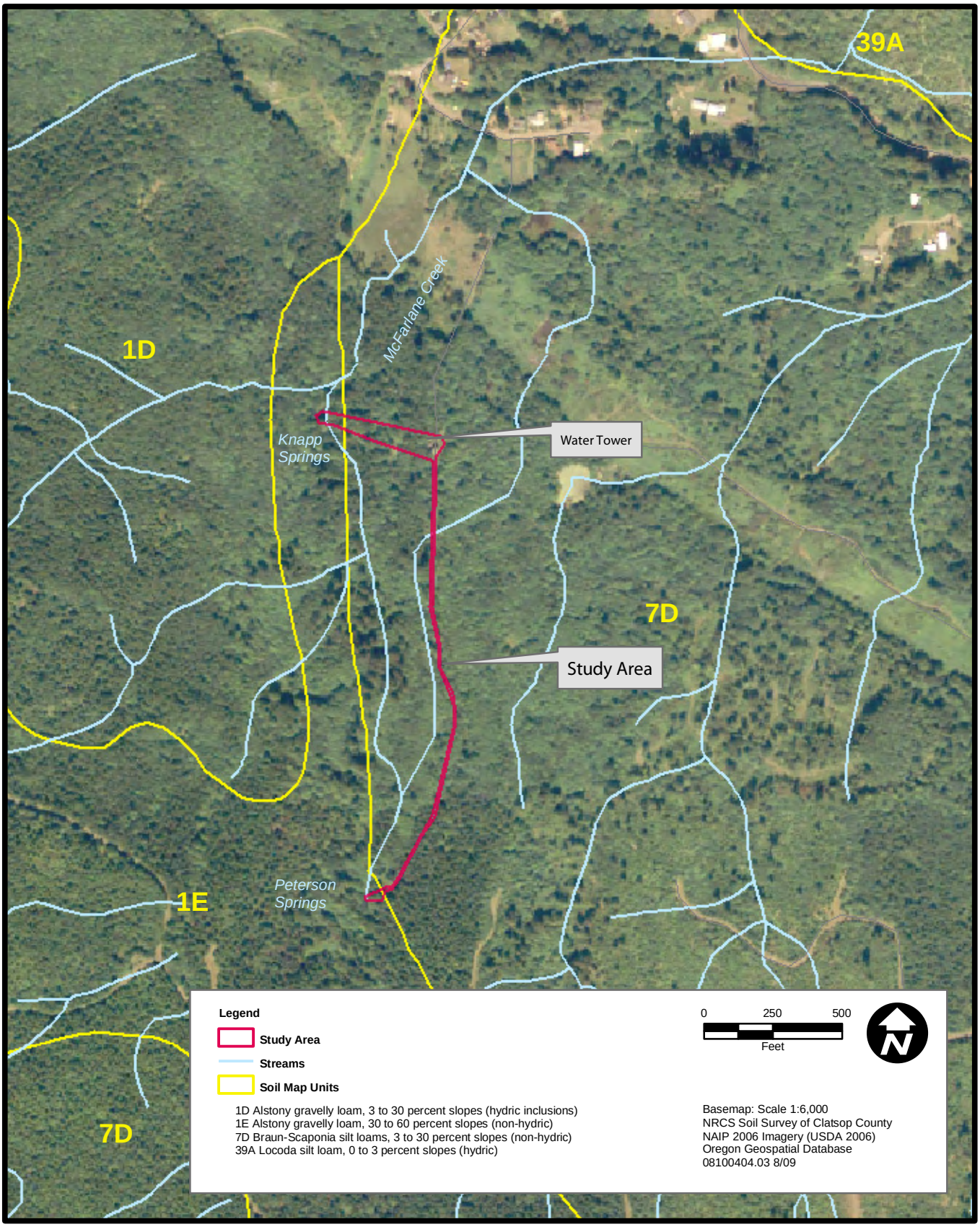
Westport Water Association
Wauna Water District
Westport Water Supply Project



National Wetlands Inventory Map

Figure 3

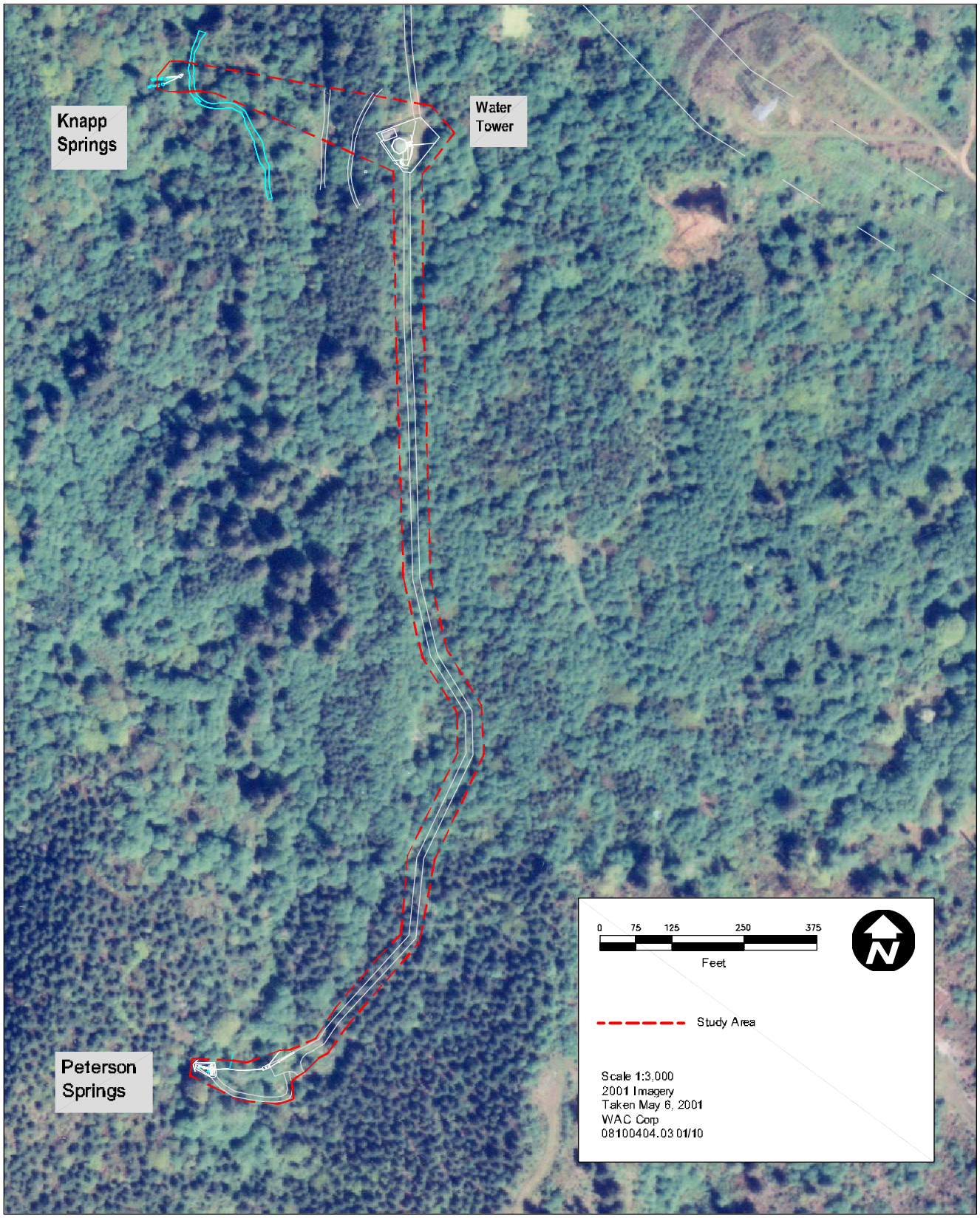
Westport Water Association
Wauna Water District
Westport Water Supply Project



Clatsop County Soil Survey Map

Figure 4

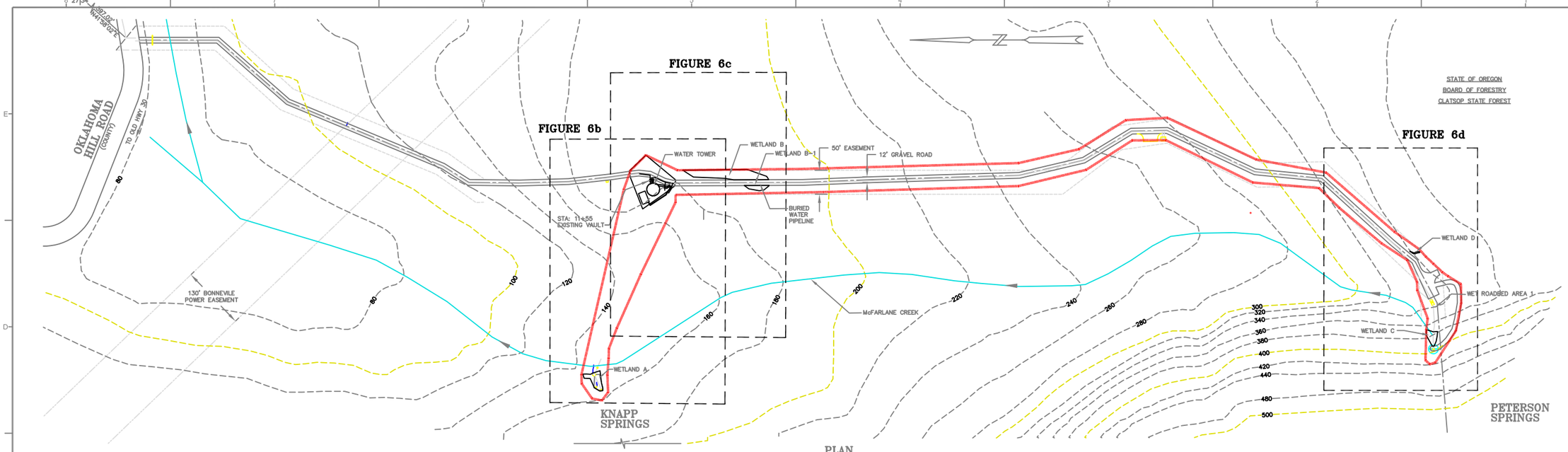
Westport Water Association
Wauna Water District
Westport Water Supply Project



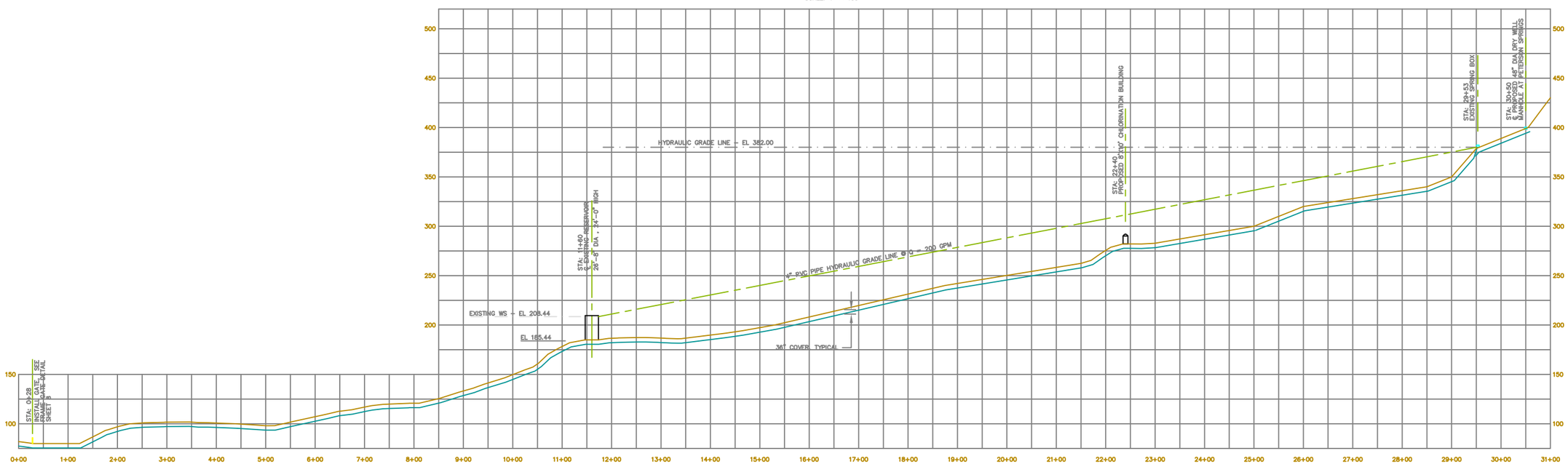
2001 Aerial Photograph

Figure 5

Westport Water Association
Wauna Water District
Water System Improvement Project



PLAN
SCALE: 1" = 100'



PROFILE
SCALE HORIZ: 1" = 100'
VERT: 1" = 50'

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PLOT DATE: Feb 08, 2010 - 1:39pm PLOTTED BY: mejlog

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SEAL:

		DATE
APPROVED BY:		
SCALE:		
CLASS:		
FILENAME:		
DWG No.		
DWR. No.		

WESTPORT WATER SUPPLY PROJECT

Figure 6a. Wetland Delineation Map Index

DRAWING No.	FIGURE	REV No.

SEC. 34, T. 8 N., R. 6 W., W.M.

Knapp Springs

Wetland A
PSS (851 SF)

Existing Spring Intake Boxes and Pipes

Existing Pump House and Spring Junction Box

SP1
SP2
SP3
SP4
SP5

McFarlane Creek

Mixed Hardwood Conifer Forest

Weedy Uplands

Existing Gravel Road

Gravel Staging Area

Shed

Existing Water Tank Reservoir

Existing Access Road and Buried Water Pipeline from Peterson Springs

SP6
SP7
SP8
SP9
SP10
SP11

Wetland B
PSS/PFO
(4,092 SF)

wetlands extend east beyond study area

LEGEND

- 305 — EXISTING CONTOUR, INDEX
- EXISTING CONTOUR
- OHWL
- STREAM CENTERLINE
- STUDY AREA
- PEM WETLAND
- PSS WETLAND
- PSS/PFO WETLAND
- PHOTO POINT DIRECTION
- SP8 — SAMPLE PLOT
- Shed — EXISTING STRUCTURES

20 0 20 40
SCALE IN FEET
1 inch = 40 feet on 11x17 paper (1:480)

NOTE:
Surveyed by Boatwright Engineering
Wetland Delineation conducted by AECOM
Overall wetland mapping accuracy 3 feet or better

No.	DWG. No.	REFERENCE DRAWING	REV	DATE	DESCRIPTION	DRAWN	DESIGN	CHKD	APPR.

SEAL:

APPROVED BY: DATE
SCALE:
CLASS:
FILENAME:
DWG No.
DWR. No.

WESTPORT WATER SUPPLY PROJECT

Figure 6b. Knapp Springs

DRAWING No. | SHEET | REV No.

DRAWING NAME: P:\2006\06100404_03FEMA\Westport\Water\association\CAD\Sheets\Figures-6b-6d.dwg
PLOT DATE: Feb 08, 2010 - 1:38pm PLOTTED BY: mejlog

SEC. 34, T. 8 N., R. 6 W., W.M.

Mixed Hardwood Conifer Forest

Weedy Uplands

Gravel Staging Area

Shed

Existing Water Tank Reservoir

McFarlane Creek

Existing Access Road and Buried Water Pipeline from Peterson Springs

Mixed Hardwood Conifer Forest

Wetland B
PSS/PFO
(4,092 SF)

wetlands extend east beyond study area

SP9
SP10
SP11
SP8
SP7
SP6
SP12
SP13
SP15
SP16
SP14

Wetland B

Creek 1

Wetland B-1
PEM
(901 SF)

Culvert

Creek 1

Red Alder Forest

LEGEND

- 305 — EXISTING CONTOUR, INDEX
- EXISTING CONTOUR
- OHWL
- STREAM CENTERLINE
- STUDY AREA
- PEM WETLAND
- PSS/PFO WETLAND
- A — PHOTO POINT DIRECTION
- SP8 — SAMPLE PLOT
- Shed — EXISTING STRUCTURES

20 0 20 40
SCALE IN FEET
1 inch = 40 feet on 11x17 paper
(1:480)

NOTE:
Surveyed by Boatwright Engineering
Wetland Delineation conducted by AECOM
Overall wetland mapping accuracy 3 feet or better

DRAWING NAME: P:\2008\08100404_03FEMA\Westport\Water\Association\CAD\Sheets\Figures-6b-6d.dwg
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SEAL:

		DATE
APPROVED BY:		
SCALE:		
CLASS:		
FILENAME:		
DWG No.		
DWR. No.		

WESTPORT WATER SUPPLY PROJECT

Figure 6c. Access Road

DRAWING No.	SHEET	REV No.

SEC. 34, T. 8 N., R. 6 W., W.M.

Wetland C
PSS (523 SF)

McFarlane Creek

wetlands extend north beyond study area

Wet Roadbed Area 1
(3,954 SF)

Existing Access Road and Buried Water Pipeline

Wetland D
PFO (40 SF)

wetlands extend south beyond study area

Peterson Springs

Existing Spring Intake

Mixed Hardwood Conifer Forest

Douglas-fir Forest

Existing Junction Box and Pipes

Existng Road

SP20 SP18 SP21 SP17 SP19 SP22 SP23 SP24 SP25 SP27 SP26

NOTE:
Surveyed by Boatwright Engineering
Wetland Delineation conducted by AECOM
Overall wetland mapping accuracy 3 feet or better

LEGEND

- 305 EXISTING CONTOUR, INDEX
- EXISTING CONTOUR
- OHWL
- STREAM CENTERLINE
- STUDY AREA
- PSS WETLAND
- PFO WETLAND
- NON-WETLAND WET AREA
- A PHOTO POINT DIRECTION
- TP SP8 SAMPLE PLOT
- Shed EXISTING STRUCTURES

20 0 20 40
SCALE IN FEET
1 inch = 40 feet on 11x17 paper (1:480)

No.	DWG. No.	REFERENCE DRAWING	REV	DATE	DESCRIPTION	DRAWN	DESIGN	CHKD	APPR.

SEAL:

APPROVED BY:	DATE
SCALE:	
CLASS:	
FILENAME:	
DWG No.	
DWR. No.	

WESTPORT WATER SUPPLY PROJECT

Figure 6d. Peterson Springs

DRAWING No.	SHEET	REV No.

DRAWING NAME: P:\2006\06100404_03FEMA\Westport\Water\association\CAD\Sheets\Figures-6b-6d.dwg
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Appendix B: Data Forms

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP1
Investigator(s): Glen Mejia and Richard Dwerlkotte (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 35
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: Upland sample plot (Wetland A). Paired with SP2. Plot located west and upslope from McFarlane Creek.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	70	Y	FAC
2.			
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	75	Y	FAC
6.			
7.			
8.			
9.			
	75	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Tolmiea menziesii**	25	Y	FAC
11. **Marah oreganus**	10	Y	NL
12. **Hydrophyllum fendleri**	3	N	FAC
13. **Corydalis scouleri**	2	N	FAC
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	40	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **30**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**75**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Alder Forest

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	7.5YR 2.5/2	80					Silt Loam	20% mix of cobble and gravel
17-20	7.5YR 2.5/2	80					Silty Clay Loam	20% mix of cobble

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils present. Well drained soils. Dry and Friable. Mixed with dark color cobble.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed. Surface layer of leaf litter moist from recent rainfall.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP2
Investigator(s): Glen Mejia and Richard Dwerlkotte (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 35
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? Yes (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Wetland sample plot (Wetland A). Paired with SP1. Plot located upslope of McFarlane Creek and 15 feet downslope of spring outlet. SP2 samples Wetland A which hydrology is supported by perennial Knapp Spring flows that bypass the diversion/catchment vaults. Hillslope seep supports a wedge- shaped scrub-shrub wetland narrowed upslope at the seep outlet and wider below where it abuts McFarlane Creek. See soils remarks for explanation of problem hydric soils.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5ft radius)			
5. **Rubus spectabilis**	55	Y	FAC
6. **Rubus parviflorus**	15	Y	FAC
7.			
8.			
9.			
	70	= Total Cover	
Herb Stratum (Plot Size: 5ft radius)			
10. **Chrysosplenium glechomifolium**	10	Y	OBL
11. **Corydalis scouleri**	5	N	FAC
12. **Athyrium filix-femina**	5	N	FAC
13. **Tolmiea menziesii**	10	Y	FAC
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	30	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **70**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Area likely cleared of vegetation in early 1970s when water system facilities were constructed.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 2.5/2	40					Silty Clay Loam	60% mix of boulders and cobble
8-18	7.5YR 2.5/3	15	5YR 3/2	5	C	M	Silty Clay Loam	80% mix of boulders and cobble, very fine redox
18+								Impenetrable

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ see comment **No** ☐

Remarks: Redox features are in interstitial space between coarse fragments which consist of gravel and small cobble. The chroma 3 matrix is too high to qualify this soil for Redox Dark Surfaces (F6). The strong presence of hydrophytic vegetation and a perennial water source in the geomorphic "wedge" strongly suggest soils are hydric based on Procedures for Problematic Hydric Soils (4e). Boulders represent dark colored parent material.

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 Stresses 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):	10
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland hydrology supported by perennial spring flows that bypass the water pipeline intake/diversion structures.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP3
Investigator(s): Glen Mejia and Richard Dwerlkotte (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 35
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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 ☐			
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes** ☐	**No** ☒
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks: Upland sample plot (Wetland A). Paired with SP4. Plot located west of McFarlane Creek upslope. Upland plot outside and north of Wetland A.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	45	Y	FAC
6. **Rubus parviflorus**	35	Y	FAC
7.			
8.			
9.			
	80	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Tolmiea menziesii**	20	Y	FAC
11. **Urtica dioca**	5	N	FAC
12. **Corydalis scouleri**	8	Y	FAC
13. **Hydrophyllum fendleri**	2	N	FAC
14. **Athyrium filix-femina**	2	N	FAC
15. **Galium aparine**	2	N	FACU
16. **Polystichum munitum**	1	N	FACU
17. **Marah oreganus**	5	N	NL
18.			
19.			
20.			
	45	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **60**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP3

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]		
0-24	10YR 2/1	40					Silty Clay Loam	60% mix of cobble and gravel

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils present. Well drained soils. No redox features observed. Soil moist on convex surface from recent rainfall.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP4
Investigator(s): Glen Mejia and Richard Dwerlkotte (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 35
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☒, Or Hydrology ☐, naturally problematic? Yes (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Weltand sample plot (Wetland A). Paired with SP3. Plot located upslope of McFarlane Creek, 25 feet north of spring outlet. SP4 samples Wetland A which is supported by perennial Knapp Spring flows that bypass the diversion/catchment vaults. Hillslope seep supports a wedge- shaped scrub-shrub wetland narrowed upslope at the seep outlet and wider below where it abuts McFarlane Creek. See soils remarks for explanation of problem hydric soils.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	60	Y	FAC
6. **Rubus parviflorus**	20	Y	FAC
7.			
8.			
9.			
	80	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Chrysosplenium glechomifolium**	7	Y	OBL
11. **Oxalis oregana**	1	N	NL
12. **Athyrium filix-femina**	2	N	FAC
13. **Tolmiea menziesii**	5	Y	FAC
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	15	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **85**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Oxalis and Tolmiea rooted on LWD are not included in cover estimates.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP4

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	25					Silt Loam	75% mix of boulders and cobble.

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ See comment **No** ☐

Remarks: Dark soils with very fine grains of red 2.5YR 3/6 apparent during soil texture test. But due to soil wetness difficult to assess abundance in the dark matrix. The strong presence of hydrophytic vegetation and a perennial water source in the geomorphic "wedge" strongly suggest soils are hydric based on Procedures for Problematic Hydric Soils (4e). Boulders represent dark colored parent material.

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 Stresses 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? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland hydrology supported by perennial spring flows that bypass the water pipeline intake/diversion structures.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP5
Investigator(s): Glen Mejia and Richard Dwerlkotte (EDAW) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☒				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: Plot located east of McFarlane Creek on terrace 15 feet from creek. Mixed conifer-hardwood forest.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	90	Y	FAC
2. **Thuja plicata**	15	N	FAC
3.			
4.			
	105	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	25	Y	FAC
6.			
7.			
8.			
9.			
	25	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Polystichum munitum**	25	Y	FACU
11. **Athyrium filix-femina**	5	N	FAC
12. **Oxalis oregana**	12	Y	NL
13. **Cardamine angulata**	2	N	FACW
14. **Hydrophyllum fendleri**	T	N	FAC
15.			
16.			
17.			
18.			
19.			
20.			
	44	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **50**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**50**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: No hydrophytic vegetation present. Moderately open understory.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/3	80					Silt Loam	4" root zone, mix of cobble and gravel
10-20	10YR 3/4	80					Silt Loam	mix of cobble and gravel

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils present. Well drained soils.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP6
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 1 to 3
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Wetland sample plot (Wetland B). Low-lying area along unnamed tributary (Creek 1) within Wetland B. SP6 is grouped with SP7 within Wetland B . SP11 is the paired upland plots for SP6 and SP7.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15 ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	60	Y	FAC
2.			
3.			
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5 ft radius**)			
5. **Sambucus racemosa**	7	Y	FACU
6. **Rubus spectabilis**	5	Y	FAC
7. **Rubus armeniacus**	5	Y	FACU
8.			
9.			
	17	= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Urtica dioica**	10	Y	FAC
11. **Chrysosplenium glechomifolium**	15	Y	OBL
12. **Tolmiea menziesii**	8	N	FAC
13. **Corydalis scouleri**	6	N	FAC
14. **Claytonia sibirica**	3	N	FACW
15. **Stachys rigida**	5	N	FACW
16. **Impatiens noli-tangere**	3	N	FACW
17.			
18.			
19.			
20.			
	50	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **20**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**6**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**67**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Plot sizes truncated because of proximity to SP7 and study area boundary

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP6

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	10					sandy loam	90% coarse sand and 1 to 2 inch gravel
6-10	2.5Y 2.5/1	70	5YR 4/6	10	C	M	sandy clay loam	20% coarse sand fine gravel
10-20	2.5Y 2.5/1	65	5YR 4/6	15	C	M	clay loam	20% coarse sand fine gravel

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Yellowish red redox features.

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 Stresses 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? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	2 inches

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Hydrogen sulfide smell at 6 to 10 inch depth, water leaking into pit at 13 inches but not collecting in bottom

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP7
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Wetland sample plot (Wetland B). Plot located south of water tower, west of unnamed tributary (Creek 1) and east of existing road. SP7 is grouped with SP6 within Wetland B . SP11 is the paired upland plot for SP6 and SP7.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	5	Y	FAC
6. **Rubus parviflorus**	5	Y	FAC
7. **Rubus armeniacus**	5	Y	FACU
8.			
9.			
	15	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Urtica dioca**	40	Y	FAC
11. **Phalaris arundinacea**	35	Y	FACW
12. **Lysichiton americanum**	10	N	OBL
13. **Hydrophyllum fendleri**	10	N	FAC
14. **Impatiens noli-tangere**	10	N	FACW
15.			
16.			
17.			
18.			
19.			
20.			
	105	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 0			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Red alder is rooted in Wetland B but not on this sampled surface

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP7

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100					Silty Clay Loam	
8-20	10YR 3/2	90	10YR 5/8	10	C	M	Sandy Clay Loam	Fine redox

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils 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 Stresses 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):	>20”
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	>20”

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland hydrology likely during the growing season. Rain during site visit.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/12/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP8
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): roadbed Local relief (concave, convex, none): flat Slope (%): 3
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? Yes Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: This sample plot represents Wetland B-1. Sample point in compacted roadbed with perched water table. Also evidence of shallow groundwater based on topography and abundance of redox concentrations deeper in soil pit.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Ranunculus repens**	30	Y	FACW
11. **Phalaris arundinacea**	40	Y	FACW
12. **Polygonum lapathifolium**	10	N	FACW
13. **Rumex dentatus**	15	N	NI
14. **Prunella vulgaris**	10	N	FACU
15.			
16.			
17.			
18.			
19.			
20.			
	105	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **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	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Maintained road. Herbaceous vegetation rooted in accumulated sediment on road surface

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP8

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	90	5YR 4/6	10	C	PL	sand loam	
4-11	5Y 4/1	55	5YR 3/4	15	C	M/F*	clay loam	30% soft silt stones chunks and other stones.
11-20	5Y 3/1	70	5YR 3/4	20	C	M	clay loam	
			5YR 4/6	10	C	M		

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: M/F* = Matrix/Face concentrations in siltstone matrix and on face on soil surface touching rocks; 4-11 inch has 30% 1 to 3 inch rock and chunks of soft siltstone chunks included in compacted road bed, some of the roadbed surface material appears to have been "borrowed" from nearby 20 x 10 x 5 feet deep pit. Imported hydric soils from adjacent Wetland B is likely. Sediment accumulated on access road bed deposited from Creek 1 overflow.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Compacted roadbed and buried leaky water pipeline below road surface likely contributes to hydrology. Also evidence of high water table.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP9
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 10
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐	
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?** **Yes** ☐ **No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒	

Remarks: Plot located south of water tower and east of road in a remnant of undisturbed upland topography pinched between the current waterpipeline/road and the basin supporting Wetland B. This upland sample plot is paired with wetland SP10.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	60	Y	FAC
2.			
3.			
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Acer circinatum**	40	Y	FAC
6. **Sambucus racemosa**	20	Y	FACU
7. **Vaccinium parvifolium**	10	N	NL
8.			
9.			
	70	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Tolmiea menziesii**	30	Y	FAC
11. **Urtica dioica**	20	Y	FAC
12. **Polystichum munitum**	5	N	FACU
13. **Stachys rigida**	10	N	FACW
14. **Ranunculus repens**	10	N	FACW
15. **Pteridium aquilinum**	5	N	FACU
16.			
17.			
18.			
19.			
20.			
	80	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **25**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: **Hydrophytic vegetation present**

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP9

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]		
0-20	10YR 2/2	90					Silty Clay Loam	10% mix of cobble and gravel

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils present. Well drained soils.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed or likely during the growing season. Rain during site visit.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP10
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): overflow area Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Plot located south of water tower and east of road in basin supporting Wetland B. Wetland SP10 has a paired upland sample plot SP9. SP9 and SP10 are located at the north end of Wetland B.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	60	Y	FAC
2.			
3.			
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Acer circinatum**	20	Y	FAC
6. **Rubus spectabilis**	10	Y	FAC
7.			
8.			
9.			
	30	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Tolmiea menziesii**	20	Y	FAC
11. **Polygonum hydropiperoides**	5	N	OBL
12. **Veronica americana**	5	N	OBL
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	30	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 70

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP10

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					Sandy Clay Loam	
6-8	10YR 3/2	90	10YR 5/6	10	C	M	Sandy Clay Loam	Fine redox
8+								Inundated

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Very wet soils. Redox features likely extend from 6 to12 inches. Unable to sample because of water in soil pit.

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 Stresses 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):	6
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland hydrology present. Rain during site visit.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009

Applicant/Owner: Westport Water Association State: OR Sampling Point: SP11

Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3 to 5

Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:

Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:

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? No Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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 ☐		
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampling Area within a Wetland?**	**Yes** ☐ **No** ☒
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: Sample plot on lower slope of upland forest just above Wetland B transition zone which is obscured by road. Upper soil layer (0-11 inch) possible partial fill spoils from nearby borrow pit. No redox features s or other hydric soil indicators in undisturbed 11-22 inch layer which suggests an absence of wetland conditions prior to water pipeline installation including spoils piling. SP11 is upland pair to groups of wetland SP6, SP7.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Pseudotsuga menziesii**	15	Y	FACU
2.			
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus armeniacus**	15	Y	FACU
6. **Rubus spectabilis**	10	Y	FAC
7.			
8.			
9.			
	25	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Urtica dioica**	40	Y	FAC
11. **Equisetum telmateia**	25	Y	FACW
12. **Phalaris arundinacea**	20	Y	FACW
13. **Stachys rigida**	5	N	FACW
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	90	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **0**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**6**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**67**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP11

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	2.5Y 3/3	95					sandy loam	5% siltstone
11-20	10YR 3/2	100					clay loam	
20-22	10YR 4/6	100					fine gravel sandy loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: 20-22 inch layer has matrix of decomposed siltstone (10%) with large chunks (6-10 inch) of less decomposed or "soft" silt stones scattered in matrix; colors are the same for both components but consistency is not. No indication that the 20-22 inch layer acts as an aquitard or sustains wetland hydrology.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed or likely during the growing season.

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

Project Site:	Westport Water Supply Project	City/County:	Clatsop	Sampling Date:	8/13/2009
Applicant/Owner:	Westport Water Association	State:	OR	Sampling Point:	SP12
Investigator(s):	Richard Dwerlkotte and Glen Mejia (AECOM)	Section, Township, Range:	Section 34, T8N, R6W		

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): flat Slope (%): <1

Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:

Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:

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? No Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: Sample plot is on a relatively high topographic flat spot within Wetland B depressional area approximately 16 inches higher in elevation than SP 6, SP7 to north.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	90	Y	FAC
2.			
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Urtica dioica**	60	Y	FAC
11. **Stachys rigida**	15	N	FACW
12. **Phalaris arundinacea**	10	N	FACW
13. **Ranunculus repens**	5	N	FACW
14. **Tolmiea menziesii**	7	N	FAC
15.			
16.			
17.			
18.			
19.			
20.			
	97	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **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	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP12

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	100					sandy loam	
6-13	2.5Y 3/2	90	7.5YR 3/4	10	C	M	sandy clay loam	
13-20	5Y 3/2	60	5YR 3/4	40	C	M	clay loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Local siltstone is prominent component of profile although it is appears better- drained and does not seem to form an aquitard. High water table in the depressional area is suspected source of hydrology.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Based on the secondary indicators and given the late summer season and the presence of strong wetland vegetation and hydric soil we assume that early season saturation criteria are met at this sample plot.

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

Project Site:	Westport Water Supply Project	City/County:	Clatsop	Sampling Date:	8/13/2009
Applicant/Owner:	Westport Water Association	State:	OR	Sampling Point:	SP13
Investigator(s):	Richard Dwerlkotte and Glen Mejia (AECOM)	Section, Township, Range:	Section 34, T8N, R6W		

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): flat Slope (%): 3-5

Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:

Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:

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? No Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: SP13 is a wetland plot in Wetland B paired with upland SP15 at southwest edge of Wetland B located north of Creek 1 and west of road/water pipeline. SP13 is within the upper edge of Wetland B depressional area and appears to be an old pullout or staging area. This sampled surface is estimated to lie within the Wetland B depressional area present prior to road/water pipeline construction which has resulted in surface compaction, churning of native siltstone soils and likely also some addition and mixing of spoils from a nearby borrow pit.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5ft radius)			
5. **Rubus spectabilis**	20	Y	FAC
6. **Sambucus racemosa**	20	Y	FACU
7. **Rubus armeniacus**	10	Y	FACU
8.			
9.			
	50	= Total Cover	
Herb Stratum (Plot Size: 5ft radius)			
10. **Ranunculus repens**	20	Y	FACW
11. **Stachys rigida**	20	Y	FACW
12. **Phalaris arundinacea**	20	Y	FACW
13. **Urtica dioica**	20	Y	FAC
14. **Tolmiea menziesii**	10	N	FAC
15. **Rumex dentatus**	5	N	NI
16.			
17.			
18.			
19.			
20.			
	95	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**5**	(A)
Total Number of Dominant Species Across All Strata:	**7**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**71**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Disturbed roadside wetland. Adjacent to creek berm likely pre-existing wetland prior to installation of culvert to Creek 1 and road/water pipeline.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	50					Sandy Clay Loam	50% mix of cobble and gravel
6-18	10YR 4/1	45	2.5YR 3/6	5	C	M	Sandy Clay Loam	50% mix of cobble and gravel, blocks of reddish yellow siltstone. fine redox

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: The broken, churned native siltstone soils suggest that soils are likely somewhat permeable at 6-18 inches and that shallow groundwater in Wetland B depressional area earlier in the growing season accounts for the redox features. Soil compaction also contributes to maintaining prolonged saturated conditions on the SP13 surface based on shallow exploratory excavations within 10 feet of SP13 which revealed oxidized concentrations in the top few inches of soil.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: No saturation was observed, however, likely is present during the early growing season given the abundant redox features, geomorphic position and relatively strong hydrophytic vegetation.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP14
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): depressional area Local relief (concave, convex, none): flat Slope (%): 1 to 2
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: SP14 has a shallow aquitard and also likely shallow groundwater given its depressional area position below a sharp topographic break (See upland pair SP16) at south end of Wetland B. SP14 is on the right bank of Creek 1 opposite of and ca. 12 inches higher than SP12 located on the left bank .

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5 ft radius**)			
5. **Rubus armeniacus**	5	Y	FACU
6. **Rubus spectabilis**	10	Y	FAC
7.			
8.			
9.			
	15	= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Urtica dioica**	20	Y	FAC
11. **Stachys rigida**	10	Y	FACW
12. **Polystichum munitum**	5	N	FACU
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	35	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **50**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**75**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP14

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					sandy loam	
4-19	5Y 3/2	45	5YR 4/6	25	C	M	clay loam	30% light colored poorly decomposed soft silt stones

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: The 30% component of the 4-19 inch layer described in the remarks has similar matrix and redox feature colors and redox feature abundance but is less decomposed or "soft" silt stones and appears to contribute to this layer having restricted permeability. Likely that this layer is a shallow aquitard and there is a shallow groundwater, or both.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Given the late summer season and the presence of strong wetland vegetation and hydric soil we assume that early season saturation criteria are met at this sample plot particularly given that the 4-19 inch layer has restricted permeability and is filled with redox features. Geomorphic position is positive yet this SP is close to the depressional area edge. The aquitard is present here and in some of the shallow exploratory pits dug in alder stands just offsite to east; the aquitard at SP14 disappears beyond the south end of Wetland B (See SP16).

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP15
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 10
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☒				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: SP15 is an upland plot located on a remnant forested strip at the south end of Wetland B. SP15 is located between Creek 1 and the disturbed wetland surface sampled by SP13.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **5ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Pseudotsuga menziesii**	60	Y	FACU
2. **Alnus rubra**	30	Y	FAC
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Sambucus racemosa**	40	Y	FACU
6. **Rubus armeniacus**	20	Y	FACU
7. **Rubus spectabilis**	20	Y	FAC
8.			
9.			
	80	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Polystichum munitum**	40	Y	FACU
11. **Oxalis oregana**	20	Y	NL
12. **Urtica dioica**	20	Y	FAC
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	80	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 10

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**8**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**38**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Truncated tree stratum plot size because of narrow mixed conifer-hardwood forest strip

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP15

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/3	70					Silt loam	30% mix of cobble and gravel
10-13	10YR 3/3	40					Silt loam	60% mix of cobble and gravel,
13-18	10YR 4/1	35	10YR 5/6	5	C	M	Sandy clay loam	60% mix of cobble and gravel, fine redox, blocks of reddish yellow siltstone

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils present. Well drained rocky soils.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP16
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slightly convex Slope (%): 25
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: SP16 along with SP15 represent uplands bordering the south end of Wetland B. SP16 is on the lower hillslope above the south end of Wetland B.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5 ft radius**)			
5. **Rubus armeniacus**	20	Y	FACU
6. **Rubus spectabilis**	30	Y	FAC
7.			
8.			
9.			
	50	= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Stachys rigida**	15	Y	FACW
11. **Urtica dioica**	12	Y	FAC
12. **Ranunculus repens**	10	N	FACW
13. **Agrostis stolonifera**	8	N	FAC
14. **Muhlenbergia mexicana**	5	N	FAC
15. **Leucanthemum vulgare**	2	N	NL
16.			
17.			
18.			
19.			
20.			
	52	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 20			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**75**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP16

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	7.5YR 3/2	100					silt loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Uniform dark brown profile with no redox features s or other hydric soil indicators; SP16 is indicative of deeper more friable soils upslope to south of Wetland B.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology indicators were observed and it is not assumed that wetland hydrology indicators such as saturation earlier in the growing occur here due to the hillslope surface, 25% slope, the generally convex surface, and strongly non-hydric soils.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP17
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): headwater wetland Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: SP17 is located in Wetland C within drainage basin formed by outflow from Peterson Spring prior to construction of the current water project. Wetland C is the headwater wetland for McFarlane Creek; there is no defined channel, bed or bank. SP19 is the upland paired plot for SP17.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	40	Y	FAC
6.			
7.			
8.			
9.			
	40	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Tolmiea menziesii**	25	Y	FAC
11. **Chrysosplenium glechomifolium**	20	Y	OBL
12. **Hydrophyllum fendleri**	5	N	FAC
13. **Oenanthe sarmentosa**	5	N	OBL
14. **Pteridium aquilinum**	5	N	FACU
15. **Equisetum arvense**	5	N	FAC
16.			
17.			
18.			
19.			
20.			
	65	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 20

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	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP17

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	G1 3/10Y	50	10YR 5/6	20	C	M	Sandy Clay Loam	20% mix of cobble and gravel, Fine redox
			10YR 2/2	10	C	M	Sandy Clay Loam	Medium redox
6+								Inundated

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Very wet soils, dark greenish gray soils in the upper 6 inches. Indicators of hydrophytic vegetation and wetland hydrology are present; and the area is naturally problematic, methods for identifying wetland indicators for problematic hydric soils as described in Chapter 5 of the WMVC supplement were followed. Additional requirements including area where ground water discharges, strong presence of hydrophytic vegetation, and a perennial hydrology are present.

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 Stresses 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):	1
Water Table Present?	Yes	☒	No	☐	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland hydrology present. Existing water pipe above ground from spring intake collector to junction box. Wetland hydrology is from spring flows that bypass diversion vaults located upslope from SP17.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP18
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slightly concave Slope (%): 35
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: SP18 samples Wetland C. Sample plot was on steep slope below road and water pipeline diversion/catchment vault, and 15 feet above the natural remnant channel formed under full spring outflow from Peterson Spring. This slope still receives overflow or bypass flow and was likely highly disturbed when the pipeline (located 24 inches from SP20) was installed in the early 1970s.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size: 5 ft radius)			
5. **Rubus spectabilis**	25	Y	FAC
6. **Ribes bracteosum**	15	Y	FAC
7. **Oplopanax horridus**	10	Y	FAC
8.			
9.			
	50	= Total Cover	
Herb Stratum (Plot Size: 5 ft radius)			
10. **Tolmiea menziesii**	15	Y	FAC
11. **Urtica dioica**	10	Y	FAC
12. **Athyrium filix-femina**	3	N	FAC
13. **Polystichum munitum**	3	N	FACU
14. **Oenanthe sarmentosa**	2	N	OBL
15. **Corydalis scouleri**	5	N	FAC
16.			
17.			
18.			
19.			
20.			
	38	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **50**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**5**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP18

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1-	20					sandy loam	80% mostly 1 to 5" gravel and small cobble
8-17	10YR 3/2	13	2.5Y 4/3	5	C	M	sandy clay loam	85% mostly cobble; concentrations are more finely textured than matrix

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: This slope was heavily disturbed during water pipeline installation 30 years ago. The strong presence of coarse sand, gravel and cobble may have been in place prior to construction or partially introduced. Large cobble in pit prevented digging a deeper soil pit. The natural condition of this seep at SP18 is estimated to be like a stable cobble streambed on a steep slope - hydric soil characteristics may or may not form depending on flow regime– reduced runoff and greater fluctuation in flows in this seep due to water development may facilitate formation of redox features in what little mineral soil there is. The abundance of concentrations was difficult to assess due to the mineral soil matrix falling apart as larger fragments were pulled from the pit during excavation – ca. 5% abundance was assumed given that positive criteria for wetland vegetation and hydrology were met at this sample plot. .

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 Stresses 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? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches): 5

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Soils wet to surface but saturated at 5 inches. Water was leaking into pit at 7 inches on uphill side of pit but was not collecting in bottom due to the high porosity of the cobble.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP19
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 30
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☒				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: SP19 samples upland forest. Paired with sample plot SP17 (Wetland C). Hydrology supported by groundwater discharge at Peterson Spring.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **5ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Tsuga heterophylla**	50	Y	FACU
2. **Alnus rubra**	30	Y	FAC
3.			
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5ft radius**)			
5. **Rubus spectabilis**	30	Y	FAC
6. **Vaccinium parvifolium**	30	Y	NL
7.			
8.			
9.			
	60	= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Polystichum munitum**	60	Y	FACU
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	60	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**40**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Tree stratum plot size truncated to fit upland area between Wetland C and upper terraced road bed.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP19

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	80					Silt Loam	20% mix of cobble and gravel
12-14	10YR 2/2	77	10YR 5/6	3	C	M	Silt Loam	20% mix of cobble and gravel, coarse redox
14-20	10YR 2/2	77	10YR 5/6	3	C	M	Sandy Clay Loam	20% mix of cobble and gravel, coarse redox

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils observed. Well drained soils.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology observed nor is it likely to be present earlier in the growing season.

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

Project Site:	Westport Water Supply Project	City/County:	Clatsop	Sampling Date:	8/13/2009
Applicant/Owner:	Westport Water Association	State:	OR	Sampling Point:	SP20
Investigator(s):	Richard Dwerlkotte and Glen Mejia (AECOM)	Section, Township, Range:	Section 34, T8N, R6W		

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): flat Slope (%): 35

Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:

Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:

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? No Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐	
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?** **Yes** ☐ **No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒	

Remarks: SP20 is upland plot and paired with SP18.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15 ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	70	Y	FAC
2.			
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5 ft radius**)			
5. **Rubus spectabilis**	25	Y	FAC
6. **Sambucus racemosa**	8	Y	FACU
7. **Vaccinium parvifolium**	2	N	NL
8.			
9.			
	35	= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Tolmiea menziesii**	25	Y	FAC
11. **Hydrophyllum fendleri**	15	Y	FAC
12. **Marah oreganus**	10	N	NL
13. **Stachys rigida**	3	N	FACW
14. **Corydalis scouleri**	3	N	FAC
15. **Polystichum munitum**	5	N	FACU
16.			
17.			
18.			
19.			
20.			
	61	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **20**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP20

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/1-	100					silt loam	
7-22	10YR 3/2	100					clay loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Loose friable soil, homogenous profile very much similar to upland SP16 which was borderline 10YR to 7.5YR.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology indicators were observed and none are expected, even earlier in the growing season.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP21
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 40
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic?No (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	☐				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: Upland SP21 is east and adjacent upper portion of well defined "wedge" seep outlet flow channel for Peterson Spring. Deep, dark yet well-drained soil with large cobble and boulders.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15 ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	10	Y	FAC
2. **Tsuga heterophylla**	5	Y	FACU
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5 ft radius**)			
5. **Oplopanax horridus**	45	Y	FAC
6. **Sambucus racemosa**	15	N	FACU
7. **Rubus spectabilis**	20	Y	FAC
8.			
9.			
	80	= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Polystichum munitum**	25	Y	FACU
11. **Tolmiea menziesii**	10	Y	FAC
12. **Stachys rigida**	5	N	FACW
13. **Hydrophyllum fendleri**	8	N	FAC
14. **Athyrium filix-femina**	5	N	FAC
15.			
16.			
17.			
18.			
19.			
20.			
	53	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 20

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**6**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**67**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is $\leq 3.0^1$

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP21

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	10					fine sand clay loam	90% rock up to 20 inches diameter
8-18	10YR 2/1-	15					silt clay loam	85% rock, mostly cobble

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Large boulder in bottom of pit prevented deeper excavation. Soils are dry, powdery and well-drained.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology indicators were observed and none are expected even earlier in the growing season.

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

Project Site:	Westport Water Supply Project	City/County:	Clatsop	Sampling Date:	8/13/2009
Applicant/Owner:	Westport Water Association	State:	OR	Sampling Point:	SP22
Investigator(s):	Richard Dwerlkotte and Glen Mejia (AECOM)	Section, Township, Range:	Section 34, T8N, R6W		

Landform (hillslope, terrace, etc.): graded flat Local relief (concave, convex, none): flat Slope (%): <1

Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:

Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:

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? Y 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	☐	**Is the Sampling Area within a Wetland? Yes ☐ No ☒**
Hydric Soil Present?	Yes	☒	No	☐	
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: This sample plot represents Wet Roadbed Area 1. Wet Roadbed Area 1 has developed some characteristics of naturally occurring wetlands. Because of development of a water system the hydrologic regime has changed. The area occurs in a location that supported upland mixed conifer / hardwood forest prior to development of the water system in the 1970s; this conclusion is supported by the presence of sloping, upland topography adjacent to the wet areas and the absence of hydrologic sources that might have supported wetlands prior to the 1970s. Using the methods for man-induced wetlands in the 1987 Manual, Wet Roadbed Area 1 is not a wetland but subject to agency review.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Chrysosplenium glechomifolium**	45	Y	OBL
11. **Oenanthe sarmentosa**	25	Y	OBL
12. **Ranunculus repens**	25	Y	FACW
13. **Phalaris arundinacea**	12	N	FACW
14. **Athyrium filix-femina**	5	N	FAC
15. **Lysichiton americanum**	2	N	OBL
16.			
17.			
18.			
19.			
20.			
	114	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **0**

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	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is ≤ 3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Sample plot SP23 documented an upland mixed conifer / hardwood forest adjacent to SP22 and likely represents the type of habitat that occupied this area prior to development of the water system at Peterson Springs. The sample plot meets the hydrophytic vegetation criteria of the WMVC Supplement. However, it was determined that hydrophytic vegetation was not formerly present and if the created wetland hydrology was removed, it is likely that dominant vegetation would no longer exist and the area would revert to upland plants species that were likely present pre-development.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP22

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	Gley 1 2.5/5GY	80					sandy clay loam	
			5YR 3/4	20	C	M	sandy loam	
4+								Innudated

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area cleared and graded in the early 1970s to develop water system at Peterson Springs. Soils compacted and disturbed with an accumulation of sediment on top of graded surface. Soils samples did not exhibit any of the hydric soil indicators presented in Chapter 3 of the WMVC supplement. However, since indicators of hydrophytic vegetation and wetland hydrology were present; and the area is naturally problematic, hydric soils are present.

Based on alterations of the area, it was determined that hydric soil was not formerly present, hydric soil was likely imported from adjacent wetlands, and if the created wetland hydrology were removed, it is likely that current hydric soils indictors would no longer exist and would become relict and no longer support wetlandshydrophytic vegetation.

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 Stresses 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):	0-2
Water Table Present?	Yes	☒	No	☐	Depth (inches):	0-2
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: The graded flat surface is heavily grazed and trampled by elk and deer; the pock-marked surface creates many micro-topographic variations affecting surface water and water table depths – buried perforated pipe from catchment box at spring outlet to "forebay" collection box located on the graded flat provides excess water that saturates soils and leaks off of flat into adjacent forest outside the wetland delineation study area. The result of grading a flat surface above and adjacent the natural drainage and burying a perforated water pipeline under this surface. The perforated pipe provides for wetland hydrology to areas where wetlands did not occur prior to construction of the water pipeline project 30 years ago. Based on alterations of the area, it was determined that wetland hydrology was not formerly present and if the created wetland hydrology were removed, the area would likely revert back to uplands that were present prior to the development of the water system at Peterson Springs.

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

Project Site:	Westport Water Supply Project	City/County:	Clatsop	Sampling Date:	8/13/2009
Applicant/Owner:	Westport Water Association	State:	OR	Sampling Point:	SP23
Investigator(s):	Richard Dwerlkotte and Glen Mejia (AECOM)	Section, Township, Range:	Section 34, T8N, R6W		

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:

Soil Map Unit Name: 1E - Alstony gravelly loam, 30 to 60 percent slopes NWI classification:

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? No Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☒				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: Douglas fir-maple-alder upland habitat demonstrates the type of habitat that likely was present before Wet Roadbed Area 1 (as sampled at SP22) was created by development of the water pipeline (Wauna Water Supply) 30 years ago.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15 ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Pseudotsuga menziesii**	20	Y	FACU
2. **Alnus rubra**	55	Y	FAC
3. **Acer macrophyllum**	10	N	FACU
4.			
	85	= Total Cover	
Sapling/Shrub Stratum (Plot Size: **5 ft radius**)			
5. **Rubus spectabilis**	8	Y	FAC
6. **Sambucus racemosa**	4	Y	FACU
7.			
8.			
9.			
	12	= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Polystichum munitum**	40	Y	FACU
11. **Oxalis oregana**	20	Y	NL
12. **Hydrophyllum fendleri**	12	N	FAC
13. **Tolmiea menziesii**	12	N	FAC
14. **Athyrium filix-femina**	5	N	FAC
15.			
16.			
17.			
18.			
19.			
20.			
	89	**= Total Cover**	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **0**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**6**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**33**	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is $\leq$3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks:

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP23

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					sandy clay loam	
12-17	10YR 3/2	100					silt loam	
17-22	2.5Y 5/6	97					silt loam	
	2.5Y 5/2	3						

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: 17-22 inch layer is buried siltstone layer

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology indicators were observed and none are expected even earlier in the growing season.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/13/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP24
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 5
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? Y Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: SP24 sampled Wet Roadbed Area 1 in a location representing the dry end of the range of hydrologic conditions on the road/ water pipeline route (See SP22 for sample of wet end of range).

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Phalaris arundinacea**	60	Y	FACW
11. **Urtica dioica**	30	Y	FAC
12. **Ranunculus repens**	20	N	FACW
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	110	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 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	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Roadbed vegetation. Hydrophytic vegetation likely due to perched water on compacted roadbed although soils are non-hydric at this SP.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP24

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	20					Sandy Clay Loam	80% mix of cobble and gravel
4-14	10YR 2/2	40					Sandy Clay Loam	60% mix of cobble and gravel, coarse redox
14-20	10YR 4/6	40	10YR 5/1	5	C	M	Sandy Clay Loam	60% mix of cobble and gravel, fine redox
			2.5YR 4/6	5	C	M		

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils observed. Some roadbed compaction but apparently drained well enough.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology present. Existing buried 4 inch PVC pipe under road that connects Peterson Springs junction box to water tank reservoir.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/14/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP25
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): road bed Local relief (concave, convex, none): flat Slope (%): 2
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? Y Are "Normal Circumstances" present? Yes ☐ No ☒
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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 ☐			
Hydric Soil Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes** ☐	**No** ☒
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: This sample plot represents Wet Roadbed Area 1. Wet Roadbed Area 1 has developed some characteristics of naturally occurring wetlands. Because of development of a water system the hydrologic regime has changed. There was likely no wetland here prior to road and water pipeline construction 30 years ago based on local topography and data collected. False positive indicators due to accumulation of sediment due to road clearing, import of hydric soil during road building, and artificially created wetland hydrology from buried leaky water pipeline. Using the methods for man-induced wetlands in the 1987 Manual, Wet Roadbed Area 1 is not a wetland, but subject to agency review.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Agrostis stolonifera**	40	Y	FAC
11. **Ranunculus repens**	30	Y	FACW
12. **Polygonum lapathifolium**	20	N	FACW
13. **Rumex dentatus**	10	N	NI
14. **Stachys rigida**	5	N	FACW
15. **Phalaris arundinacea**	10	N	FACW
16.			
17.			
18.			
19.			
20.			
	115	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **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	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is ≤ 3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Wetland Non-Vascular Plants[1]

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Sample plot SP23 documented an upland mixed conifer / hardwood forest adjacent to SP22 and likely represents the type of habitat that occupied this area prior to development of the water system at Peterson Springs. The sample plot meets the hydrophytic vegetation criteria of the WMVC Supplement. However, it was determined that hydrophytic vegetation was not formerly present and if the created wetland hydrology was removed, it is likely that dominant vegetation would no longer exist and the area would revert to upland plants species that were likely present pre-development.

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP25

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	93	5YR 3/4	7	C	PL	silt loam	
4-20	10YR 3/2	90	5YR 5/8	5	C	M	silt loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: The 4 to 20 inch layer, particularly in the upper 6 inches, is a highly compacted version of the native soil also documented in soil sampled at SP24. Based on alterations of the area, it was determined that hydric soil was not formerly present, hydric soil was likely imported from adjacent wetlands, and if the created wetland hydrology were removed, it is likely that current hydric soils indictors would no longer exist and would become relict and no longer support wetlands hydrophytic vegetation.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Secondary indicators of wetland hydrology are present. However, based on alterations of the area, it was determined that wetland hydrology was not formerly present and if the created wetland hydrology were removed, the area would likely revert back to uplands that were present prior to the development of the water system at Peterson Springs.

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

Project Site:	Westport Water Supply Project	City/County:	Clatsop	Sampling Date:	8/14/2009
Applicant/Owner:	Westport Water Association	State:	OR	Sampling Point:	SP26
Investigator(s):	Richard Dwerlkotte and Glen Mejia (AECOM)	Section, Township, Range:	Section 34, T8N, R6W		
Landform (hillslope, terrace, etc.):	hillslope	Local relief (concave, convex, none):	none	Slope (%):	10
Subregion (LRR):	LRR A Northwest Forests and Coasts	Lat:	46.138	Long:	-123.407
Datum:					
Soil Map Unit Name:	7D - Braun-Scaponia silt loam 3 to 30 percent slopes	NWI classification:			

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? No Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?** **Yes** ☒ **No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: SP26 documents Wetland D and is paired with upland SP27. Wetland D is adjacent to Wet Roadbed Area 1. The wetland boundary is based on topographical evidence and the presence of multiple hydrologic inputs including natural runoff from Wetland D; precipitation sheetflow runoff from upslope compacted roadbed; and subsurface flow from diverted overflow from Peterson Spring junction box and bypass.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15 ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Alnus rubra**	80	Y	FAC
2.			
3.			
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5 ft radius**)			
10. **Oenanthe sarmentosa**	30	Y	OBL
11. **Hydrophyllum fendleri**	20	Y	FAC
12. **Urtica dioica**	20	Y	FAC
13. **Phalaris arundinacea**	5	N	FACW
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	75	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	
% Bare Ground in Herb Stratum 15			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: SP26 sampled relatively undisturbed Wetland D vegetation outside the compacted "roadbed wetland" surface.

SOIL

Sampling Point: SP26

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (Moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/2	75	2.5YR 3/6	5	C	M	Silt loam	20% mix of cobble and gravel. Fine redox.
7-16	10YR 3/2	65	10YR 5/8	10	C	M	Silt loam	20% mix of cobble and gravel. Medium redox.
16-20	10YR 5/1	80					Silt loam	20% mix of cobble and gravel

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Hydric soils present.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: No saturation observed but likely saturated during the growing season. Secondary indicators present. The shallow basin enters the project site from the S-SE. The scour or OWHL is 12 inches wide by 3 inches high outside the project site and continues in progressively smaller dimensions onto the site for ca. 25 feet where it (and the basin) completely merges and dissipates into a portion of the developed/disturbed compacted roadbed referred to as Wet Roadbed Area 1 which is more extensive, extending north, east and south. The topographical and hydrologic influence of this basin onsite becomes indistinguishable from the influence of water perched on graded, compacted surfaces but likely still contributes to both hydrology onsite and flow that exits Wet Roadbed Area 1 portions of the roadbed during high runoff periods; excess water runs down the steep project road to the north based on the presence of scoured gullies down the road. There are no natural topographic features onsite or offsite (except upstream) that suggest the extent of the influence of the natural hydrology of this small basin now or prior to development. See SP22 for additional information on hydrology in Wet Roadbed Area 1.

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

Project Site: Westport Water Supply Project City/County: Clatsop Sampling Date: 8/14/2009
Applicant/Owner: Westport Water Association State: OR Sampling Point: SP27
Investigator(s): Richard Dwerlkotte and Glen Mejia (AECOM) Section, Township, Range: Section 34, T8N, R6W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 10
Subregion (LRR): LRR A Northwest Forests and Coasts Lat: 46.138 Long: -123.407 Datum:
Soil Map Unit Name: 7D - Braun-Scaponia silt loam 3 to 30 percent slopes NWI classification:
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? No Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? No (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	☒				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: SP27 is the paired upland plot to wetland plot SP26. The sampled stand is a 30 year old Douglas fir stand on surface one to two feet higher than the SP26 surface.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: **15ft radius**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Pseudotsuga menziesii**	90	Y	FACU
2.			
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot Size:)			
5.			
6.			
7.			
8.			
9.			
		= Total Cover	
Herb Stratum (Plot Size: **5ft radius**)			
10. **Oxalis oregana**	25	Y	NL
11. **Polystichum munitum**	20	Y	FACU
12. **Hydrophyllum fendleri**	5	N	FAC
13. **Tolmiea menziesii**	5	N	FAC
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	55	= Total Cover	
Woody Vine Stratum (Plot Size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum **30**

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: Douglas-fir forest

Project Site: Westport Water Supply Project

SOIL

Sampling Point: SP27

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	40					Slit loam	60% mix of cobble and gravel
6-8	10YR 2/2	20					Slit loam	80% mix of cobble and gravel, layer of siltstone. Reddish yellow and white siltstone.
8-14	10YR 2/2	20					Slit loam	80% mix of cobble and gravel
14+								Impenetrable, rock layer

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]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[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: No hydric soils observed. Well drained very rocky soils.

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 Stresses 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? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: No wetland hydrology present.

Appendix C: Ground Level Color Photographs with Captions

Photo Point A - Wetland A
View North

Photo Point B - Knapp Springs Intake Box
View Southwest

Photo Point C - Knapp Springs Junction Box
View South

Photo Point D - McFarlane Creek
View North

Photo Point E - Wauna Water Tank Reservoir
View Southwest

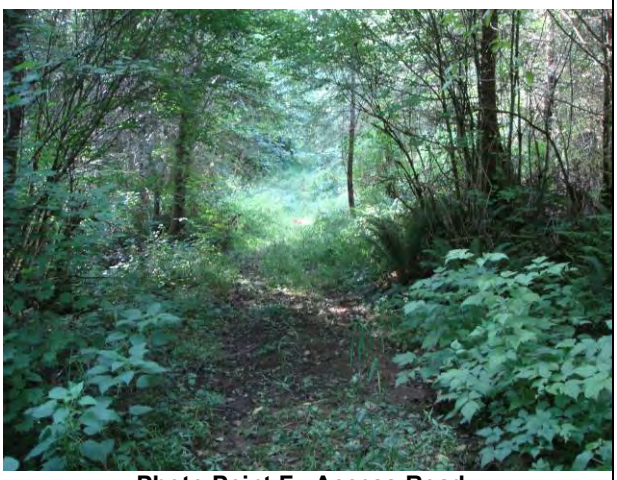

Photo Point F - Access Road
View South

Photo Point G - Wetland B, B-1
View North

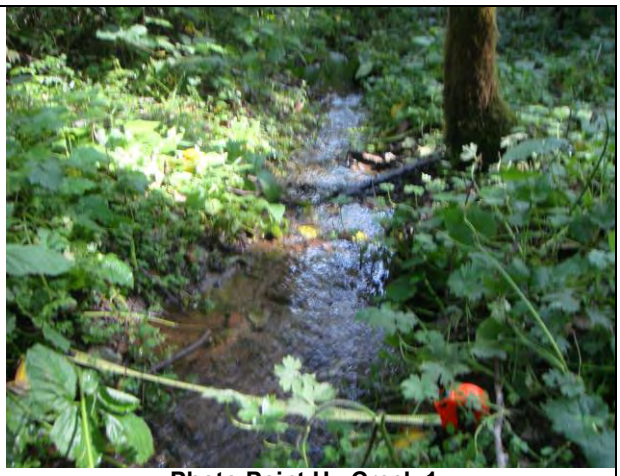

Photo Point H - Creek 1
View Northeast

Photo Point I - Peterson Springs Intake Box
View North

Photo Point J - Wetland C
View West

Photo Point K - Peterson Springs Junction Box
View East

Photo Point L - Wetland D
View South

Appendix D: Additional Tables and Information

WETS Station : ASTORIA WSO AIRPORT, OR0328 Creation Date: 09/09/2002
Latitude: 4609 Longitude: 12353 Elevation: 00010
State FIPS/County(FIPS): 41007 County Name: Clatsop
Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	48.5	36.7	42.6	9.62	6.41	11.52	16	1.2
February	51.2	37.6	44.4	7.87	5.57	9.32	14	0.4
March	53.6	38.6	46.1	7.36	5.63	8.56	15	0.1
April	56.6	40.8	48.7	4.93	3.64	5.79	12	0.1
May	60.5	45.4	53.0	3.28	2.22	3.91	8	0.0
June	64.1	49.8	57.0	2.57	1.70	3.08	6	0.0
July	67.7	52.9	60.3	1.16	0.51	1.42	2	0.0
August	68.8	53.2	61.0	1.21	0.62	1.48	2	0.0
September	67.9	49.5	58.7	2.61	1.00	3.16	5	0.0
October	61.3	44.1	52.7	5.61	3.27	6.82	10	0.0
November	53.5	40.3	46.9	10.50	7.60	12.39	16	0.2
December	48.7	37.0	42.9	10.40	7.62	12.23	16	0.6
Annual	-----	-----	-----	------	59.41	73.51	--	----
Average	58.5	43.8	51.2	------	------	------	--	----
Total	-----	-----	-----	67.12	------	------	122	2.6

GROWING SEASON DATES

Probability	Temperature 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	1/16 to ----- 356 days	2/15 to 12/11 300 days	4/ 7 to 11/ 9 216 days
70 percent *	> 365 days > 365 days	2/ 3 to 12/23 324 days	3/31 to 11/17 231 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

000 CXUS55 KPQR 011230 CF6AST PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ASTORIA OR

MONTH: JULY YEAR: 2009

LATITUDE: 46 9 N LONGITUDE: 123 53 W

TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND

1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
12Z	AVG	MX	2MIN	DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL
S-S	WX		SPD	DR														
1	74	44	59	0	6	0	0.00	0.0	0	10.1	24	310	M	M	0	1	31	310
2	80	46	63	4	2	0	0.00	0.0	0	7.4	21	310	M	M	0	1	24	320
3	65	54	60	1	5	0	0.00	0.0	0	6.4	15	260	M	M	6	18	17	250
4	67	54	61	2	4	0	0.00	0.0	0	5.2	12	270	M	M	5	18	15	250
5	62	55	59	0	6	0	T	0.0	0	11.1	25	220	M	M	9	18	37	210
6	61	56	59	0	6	0	0.02	0.0	0	9.2	18	190	M	M	10	18	28	190
7	64	56	60	1	5	0	T	0.0	0	8.0	17	240	M	M	7	18	22	260
8	63	53	58	-1	7	0	0.08	0.0	0	9.0	23	140	M	M	7	18	59	330
9	66	53	60	0	5	0	0.00	0.0	0	5.5	13	320	M	M	6		16	330
10	75	49	62	2	3	0	0.01	M	0	7.2	24	310	M	M	2	1	28	300
11	60	55	58	-2	7	0	0.01	0.0	0	5.4	12	250	M	M	10	18	15	330
12	60	56	58	-2	7	0	0.35	0.0	0	5.8	12	220	M	M	10	13	28	90
13	61	57	59	-1	6	0	0.01	0.0	0	5.9	13	240	M	M	10	1	16	240
14	67	56	62	2	3	0	T	0.0	0	8.6	18	310	M	M	6	1	24	310
15	72	55	64	4	1	0	0.00	0.0	0	5.9	17	310	M	M	5	1	22	310
16	75	54	65	5	0	0	0.00	0.0	0	5.7	17	310	M	M	4	12	23	310
17	73	53	63	3	2	0	0.00	0.0	0	5.6	15	300	M	M	3	1	21	300
18	69	56	63	3	2	0	0.00	0.0	0	10.7	21	320	M	M	6	1	24	330
19	68	55	62	2	3	0	0.00	0.0	0	13.6	25	330	M	M	4		30	330
20	74	54	64	4	1	0	0.00	0.0	0	6.6	16	300	M	M	3		20	300
21	64	57	61	0	4	0	0.00	0.0	0	5.8	13	260	M	M	10	1	15	360
22	62	57	60	-1	5	0	0.02	0.0	0	6.1	24	180	M	M	10	1	49	90
23	65	56	61	0	4	0	0.06	0.0	0	7.3	15	320	M	M	10	1	21	350
24	67	55	61	0	4	0	0.01	0.0	0	5.1	12	250	M	M	7	12	17	280
25	66	54	60	-1	5	0	0.00	0.0	0	5.3	13	250	M	M	8	12	17	260
26	68	57	63	2	2	0	0.00	0.0	0	4.0	13	260	M	M	8	12	18	270
27	79	57	68	7	0	3	0.00	0.0	0	4.4	10	220	M	M	4	12	13	220
28	92	58	75	14	0	10	0.00	0.0	0	3.9	14	280	M	M	0	8	18	280
29	72	57	65	4	0	0	0.00	0.0	0	5.3	14	260	M	M	4	18	17	270
30	67	58	63	2	2	0	0.01	0.0	0	6.5	14	250	M	M	10	1	17	250
31	69	59	64	3	1	0	0.03	0.0	0	4.9	13	250	M	M	8	1	15	260
SM	2127	1696		108	13		0.61		0.0	211.5			M		192			

000 CXUS55 KPQR 271230 CF6AST PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ASTORIA OR

MONTH: AUGUST YEAR: 2009

LATITUDE: 46 9 N LONGITUDE: 123 53 W

TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND

1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
12Z	AVG	MX	2MIN	DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL
S-S	WX		SPD	DR														
1	70	58	64	3	1	0	0.00	0.0	0	5.8	M	M	M	M	7	1	M	M
2	65	57	61	0	4	0	0.00	0.0	0	5.0	14	240	M	M	10	18	16	250
3	67	59	63	2	2	0	0.00	0.0	0	6.9	15	270	M	M	8		20	250
4	66	58	62	1	3	0	0.00	0.0	0	5.4	14	250	M	M	10		18	270
5	68	57	63	2	2	0	0.00	0.0	0	4.4	31	90	M	M	8	18	32	90
6	65	56	61	0	4	0	T	0.0	0	4.2	14	220	M	M	10	8	30	330
7	66	52	59	-2	6	0	0.02	0.0	0	4.9	14	290	M	M	9	18	M	M
8	66	54	60	-1	5	0	0.01	0.0	0	4.2	13	250	M	M	9	18	17	230
9	69	53	61	0	4	0	0.02	0.0	0	5.4	10	360	M	M	8	1	M	99
10	71	53	62	1	3	0	0.15	0.0	0	5.8	20	230	M	M	8	12	33	240
11	71	60	66	5	0	1	0.26	0.0	0	3.9	10	330	M	M	8	12	13	10
12	66	59	63	2	2	0	0.27	0.0	0	6.2	14	330	M	M	9	1	18	340
13	66	53	60	-1	5	0	0.02	0.0	0	6.2	14	270	M	M	6	1	18	260
14	66	53	60	-1	5	0	T	0.0	0	7.1	16	290	M	M	9		21	290
15	67	58	63	2	2	0	T	0.0	0	6.2	15	290	M	M	9		18	290
16	69	55	62	1	3	0	0.00	0.0	0	5.7	18	310	M	M	4		22	320
17	75	53	64	3	1	0	0.00	0.0	0	5.8	21	310	M	M	2	12	25	310
18	82	52	67	6	0	2	0.00	0.0	0	5.8	21	310	M	M	3	12	24	310
19	73	57	65	4	0	0	0.00	0.0	0	5.3	18	240	M	M	6	12	23	250
20	67	59	63	2	2	0	0.00	0.0	0	8.5	16	230	M	M	10	1	22	230
21	70	58	64	3	1	0	T	0.0	0	6.9	16	310	M	M	10	1	21	310
22	69	51	60	-1	5	0	0.00	0.0	0	9.5	21	320	M	M	2		25	310
23	68	54	61	0	4	0	0.00	0.0	0	9.3	18	310	M	M	2		22	320
24	67	57	62	1	3	0	0.00	0.0	0	4.9	12	270	M	M	5	12	15	240
25	69	55	62	1	3	0	0.01	0.0	0	7.5	15	310	M	M	5	1	22	200
26	81	49	65	5	0	0	0.00	0.0	0	4.4	14	330	M	M	0		22	350
SM	1799	1440		70	3		0.76	0.0		155.2			M		177			

Appendix E: Literature Citations

Literature Citations

Adamus, P.R. 2001. Guidebook for Hydrogeomorphic (HGM)–based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles. Oregon Division of State Lands, Salem, OR.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service PUBL. FWS/OBS-79/31. 103 pp.

DSL (Department of State Lands). 2009. Local Wetland Inventories. Available at URL http://www.oregonstatelands.us/DSL/WETLAND/lwi.shtml.

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. U.S. Army Waterways Experiment Station. Vicksburg, Mississippi. 100 pp. + appendices.

Environmental Laboratory. 2008. U.S. Army Corps of Engineers Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. 154pp.

Kollmorgen Instruments. 1992. Munsell Soil Color Chart. Macbeth Division of Kollmorgen Instruments Corp. Newburgh, New York.

NRCS (Natural Resources Conservation Services, formerly Soil Conservation Service). 1988. Soil Survey of Clatsop County, Oregon. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Oregon Agricultural Experiment Station.

NRCS (Natural Resources Conservation Service). 2002. WETS climate summary tables for Clatsop County. Accessed August 27, 2009. Available at URL ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/or/41007.txt.

NRCS (Natural Resources Conservation Services). 2007. Hydric Soils List - All Components (OR), Clatsop County. U.S. Department of Agriculture.

NRCS (Natural Resources Conservation Service). 2009a. Web Soil Survey. Available at URL http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

NRCS (Natural Resources Conservation Service) 2009b. Current Water Year Data. Available Precipitation Reports for Oregon. Accessed August 27, 2009. Available at URL http://www.wcc.nrcs.usda.gov/cgibin/precip.pl?state=oregon.

NWS (National Weather Service). 2009. Portland Weather Forecast Office. National Climatic Data Center Website. Astoria Climatologically Data Site. Accessed August 27, 2009. Available at URL http://www.weather.gov/climate/index.php?wfo=pqr.

ODFW (Oregon Department of Fish and Wildlife). 2008. Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources. June.

ORNHIC (Oregon Natural Heritage Information Center). 2009. Data system search for rare, threatened and endangered plant and animal records within a two-mile radius of the project site T 08N R 06W Sec 34 WM. Oregon State University. Institute for Natural Resources. Portland, OR. August 18.

OWRD (Oregon Water Resources Department). 2009 (Website). Oregon Water Resources Web Mapping Program. Available at URL http://gis.wrd.state.or.us/apps/map/owrd_map/Default.aspx.

Reed, P.B., Jr. 1988. National List of Plant Species That Occur in Wetlands: Oregon. National Wetlands Inventory, U.S. Fish and Wildlife Service Biological Report NERC – 88/18.37, 109 pp.

Reed, P.B., Jr. 1994. 1993 Supplement to the List of Plant Species that Occur in Wetlands: Northwest (Region 9). U.S. Fish and Wildlife Service, National Wetlands Inventory.

StreamNet. 2009 (Website). StreamNet Interactive Mapper. Available at URL = http://map.streamnet.org/website/bluesnetmapper/adddata.htm. Accessed September 9, 2009.

USDA (U.S. Department of Agriculture). 2006. USDA/FSA - Aerial Photography Field Office. USDA-FSA-APFO National Agricultural Inventory Project (NAIP) Mr SID Mosaic. Salt Lake City, Utah.

USDA (U.S. Department of Agriculture). 2009 (Website). Geospatial Data Gateway. Available at URL http://datagateway.nrcs.usda.gov/GatewayHome.html.

USFWS (U.S. Fish and Wildlife Service). 2009. National Wetlands Inventory Wetlands Mapper. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

USGS (U.S. Geological Survey). 1985 Cathlamet-WA-OR Quadrangle.

USGS (U.S. Geological Survey). 2009. National Hydrography Dataset Website. 2009. Available at URL http://nhd.usgs.gov/index.html.

Personal Communication

Murtagh, Tom. District Fish Biologist, Oregon Department of Fish and Wildlife, North Willamette Watershed District, Clackamas, Oregon. July 17, 2009. Email to Barbara Gimlin, Environmental Specialist, FEMA.