Exhibit J

Wetlands and Other Jurisdictional Waters

North Mist Expansion Project

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Prepared for

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Acronyms and Abbreviations

BMP	Best Management Practice
CFR	Code of Federal Regulations
EFSC	Energy Facility Siting Council
ESCP	Erosion and Sediment Control Plan
GIS	Geographic Information System
GPS	Global Positioning System
HGM	Hydrogeomorphic
JPA	Joint Permit Application
NHD	National Hydrography Dataset
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWN	Northwest Natural Gas
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODSL	Oregon Department of State Lands
ORS	Oregon Revised Statutes
ORWAP	Oregon Rapid Wetland Assessment Protocol
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
Project	North Mist Expansion Project
PUB	palustrine unconsolidated bottom
PUS	palustrine unconsolidated shore
USACE	US Army Corps of Engineers
USC	United States Code
USGS	US Geological Survey
WOS	Waters of the State
WOUS	Waters of the United States

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1.0 Introduction

Exhibit J provides information pertaining to potential adverse impacts of construction and operation of the proposed Project on regulated waters of the State (WOS), as required by Oregon Administrative Rule (OAR) 345-021-0010(1)(j) paragraphs (A) through (F).

2.0 Analysis Area

The Analysis Area for wetlands and other jurisdictional waters is the area within the Site Boundary (**Figure J-1**). The Site Boundary is defined in the Project Description section of this application, which includes the information required by OAR 345-021-0010(1)(a) and (b).

3.0 Wetlands and Other Jurisdictional Waters – OAR 345-021-0010(1)(j)(A)

OAR 345-021-0010(1)(j)(A) requests Northwest Natural Gas (NWN) to provide "A description of all areas within the site boundary that might be waters of this state and a map showing the location of these features." The following sections describe wetlands and other waters identified by NWN. Descriptions of the wetlands and other waters of the state are presented in **Attachment J-1**. Maps showing locations of these features are presented as **Figure J-2**.

3.1 Definitions

3.1.1 Federal

Waters of the United States (WOUS) are defined in 33 Code of Federal Regulations (CFR) § 36 328.3(a)(1-7) as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    a) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

c) Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as WOUS under the definition;
5. Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;
6. The territorial seas; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section.

Wetlands are defined federally at 33 CFR § 328.3(b) as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

3.1.2 State

Oregon Revised Statutes (ORS) 196.800(14) defines WOS more broadly than federal WOUS. Specifically, WOS include "all natural waterways, tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands, that portion of the Pacific Ocean that is in the boundaries of this state, all other navigable and non-navigable bodies of water in this state and those portions of the ocean shore, as defined in ORS 390.605, where removal or fill activities are regulated under a state-assumed permit program as provided in 33 United States Code 1344(g) of the Federal Water Pollution Control Act, as amended."

The Oregon Department of State Land's (ODSL) definition of wetlands mirrors the federal definition; see OAR 141-085-0510 (101).

3.2 Jurisdictional Versus Non-jurisdictional Waters

Not all wetlands and streams are within the jurisdiction of state or federal regulation, and not all waters falling within the state's jurisdiction fall under federal jurisdiction. For the Project, several jurisdictional distinctions are important, to estimate impacts only to jurisdictional wetlands and other waters. These include determinations related to the following:

- Ephemeral streams, which generally are not under state jurisdiction and are evaluated on a case-by-case basis for federal jurisdiction, as distinct from perennial and intermittent (USACE).
- Artificially created roadside and farm ditches, which are considered WOS if they contain food or game fish and are connected to WOS (OAR 141-085-0515(8)) and WOUS if they connect to other WOUS and are not ephemeral (EPA and USACE 2011).

Ephemeral streams are defined in the Oregon Streamflow Duration Assessment Method (Nadeau 2011) as streams that flow:

> *…only in direct response to precipitation. Water typically flows only during and shortly after large precipitation events. An ephemeral stream may or may not have a well-defined channel, the stream bed is always above the water table, and stormwater runoff is the primary source of water. An ephemeral stream typically lacks biological, hydrological, and physical characteristics commonly associated with the continuous or intermittent conveyance of water*).

In contrast, intermittent streams are defined by Oregon as "any stream which flows during a portion of every year and which provides spawning, rearing or food-producing areas for food and game fish" (OAR 141-085-0510(46)). Food-producing streams are typically one stream order above a fish-bearing stream.

Based on the definitions of jurisdictional waters given above, intermittent streams are likely to be jurisdictional under federal regulations if they have physical characteristics such as discernible banks, evidence of sustained surface flow for at least three consecutive months of the year, and a surface water connection to other WOUS.

This Exhibit presents NWNs best professional judgment as to which water features are jurisdictional under ODSL regulation. While Exhibit J uses the term "jurisdictional waters," NWN recognizes that any final determination of agency jurisdiction will be made by ODSL and USACE separately, based on the information presented by NWN.

3.3 Desktop Study

NWN conducted a desktop study of potentially jurisdictional wetlands and other waters in early 2013 to assist in planning for field delineations beginning in spring 2013.

Site-specific literature and Geographic Information System (GIS) map layers reviewed as part of the desktop study included:

- The Natural Resources Conservation Service (NRCS) Soil Surveys of Columbia County in Oregon (NRCS 1986). The soil surveys were useful in estimating the likelihood and extent of wetlands indicated by mapped hydric soil units.
- National Wetland Inventory (NWI) maps (USFWS 2012). The NWI data were useful not only for identifying potential wetlands, but also for identifying the likely location of off-site wetlands with the potential for influencing the duration of flow in on-site streams.
- US Geological Survey (USGS) 7.5-minute quadrangle maps for the proposed transmission pipeline corridor.
- USGS National Hydrography Dataset (NHD) (USGS 2010). The NHD provided the location of potential streams.

3.4 Delineation of Wetlands and Other Water Features

3.4.1 Delineation Methods

Field investigations for the delineation of wetlands and other waters included pedestrian surveys within the Analysis Area. Field delineations were conducted during the following time periods:

- May 13-31, 2013;
- July 15-18, 2013;
- April 7-11, 2014;
- May 27-29, 2014;
- February 12, 2015.

Delineations were conducted where property access has been obtained, which is 98.9 percent (394.9 acres) of the Analysis Area. The remaining 1.1 percent (4.6 acres) will be delineated once access is granted.

Delineations were conducted utilizing techniques published in the 1987 USACE *Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (USACE 2010), Oregon Administrative Rules (OARs) for Wetland Delineations 141-090-0005 through 141-090-0055 (Oregon Department of State Lands [ODSL], 2001), and *Delineations for Large Linear Projects* (ODSL 2013).

During the delineation effort, each wetland or other water encountered was examined for indications that the feature had characteristics consistent with WOUS or WOS, and this evidence was documented using standard field data sheets. The location and extent of each wetland or other water (regardless of its characteristics) was mapped with Global Positioning System technology.

Streams were characterized as intermittent or ephemeral using the Oregon Streamflow Duration Assessment Method, Interim Version (Nadeau 2011), the Approved Jurisdictional Determination Form Instructional Guidebook (USACE 2007), and the guidance memo Clean Water Act Jurisdiction Following the US Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* (USACE 2008).

Detailed descriptions of delineation methods for wetlands and other waters are provided in the Wetland Delineation Report (Attachment J-2). The report will be submitted to ODSL in April 2015, therefore; NWN has not yet received written concurrence from ODSL.

3.4.2 Delineation Results

Based on the results of site investigations conducted, 39 wetlands and 67 other water features were delineated within the Site Boundary. **Table J-1** summarizes all wetland and other waters of the state delineated within the Site Boundary by water type classification. **Attachment J-2** provides

additional detail about each of the wetlands and other waters, including ephemeral streams. Not all features that were delineated would be impacted by the Project.

Table J-1: Summary of Delineated Wetlands and Other Water Features

Type of Water	Number of Features	Acres
Palustrine Emergent (PEM) Wetland	32	31.09
PEM-Palustrine Forested (PFO[1]) Wetland	5	5.59
PFO[1]-PEM	2	0.40
Ephemeral stream	14	0.13
Intermittent stream	10	0.07
Perennial stream	36	7.08
Pond	4	0.44
Seep/spring	3	7.73

1. PFO wetlands are located in popular planation areas and are considered agriculture, not native forest habitat.

4.0 Effects on Wetlands and Other Jurisdictional Waters of the State – OAR 345-021-0010(1)(j)(B)

This section describes NWN's avoidance and minimization activities. The Project has the potential to adversely affect waters of the state, as defined under OAR 141-085-0510. NWN has worked to avoid and minimize potential impacts, and will continue to do so through Project construction.

4.1 Avoidance and Minimization

Since the start of project planning and design, NWN has made efforts to avoid and minimize impacts to wetlands and other waters. While developing the initial Project layout, NWN utilized NWI and NHD data to site the pipeline and other Project facilities away from wetlands and other waters to the maximum extent feasible. After the wetland delineation in 2013 and 2014, the resulting wetland data were used to inform the micrositing of the pipeline and other facilities.

Impacts to wetlands and other waters have been and will continue to be avoided to the extent practicable as the Project design moves forward. Horizontal directional drilling (HDD) will be used in many locations north of Highway 30 to avoid direct impacts to wetlands and streams. For example, HDD will be used to cross waters such as Beaver Slough, Clatskanie River and Larson Slough. In locations south of Highway 30, NWN will narrow the construction footprint to avoid wetlands and will construct the pipeline to traverse over or under culverts to avoid direct impacts to other waters to the maximum extent feasible.

4.2 Continued Assessment of Impacts

NWN will continue to adjust the location of components of the Project to avoid and minimize impacts to waters of the state to the extent practicable. Final impact calculations based on these adjustments will be presented in the final JPA.

4.3 Significance of Impacts – OAR 345-021-0010(1)(j)(C)

OAR 345-021-0010(1)(j)(C) mandates that the Applicant describe "the significance of potential adverse impacts to each feature identified in (A), including the nature and amount of material the applicant would remove from or place in the waters analyzed in (B)."

NWN estimates the construction of the Project would result in temporary impacts to wetlands and other waters of the state which are summarized in **Table J-2**. Due to avoidance and minimization efforts, the Project will not permanently impact wetlands or other waters.

Table J-2: Summary of Impacts to Wetland and other Waters of the State

Type of Water	Number of Permanent Impact Sites	Permanent (acres)	Number of Temporary Impact Sites	Temporary (acres)	Number of Features Impacted
PEM Wetland	0	0	25	4.626	16
PEM PFO[1] Wetland	0	0	6	1.697	4
PFO[1]-PEM	0	0	1	0.051	1
Intermittent stream	0	0	4	0.008	3
Perennial stream	0	0	1	0.012	1
Total				6.394	

1. PFO wetlands are located in popular planation areas and are considered agriculture, not native forest habitat.

As described above, NWN will use HDD methods to install the pipeline under a majority of wetlands and other waters on the floodplain. For locations where the pipeline will not be installed using HDD methods, NWN will utilize the trenching method. Trenching will occur at 11 of the 25 wetlands and other waters proposed to be impacted. Trenching will consist of excavation of soils, stockpiling soils (separating topsoil and subsoil), placement of the pipe, and subsequent backfill to preconstruction contours. Trenching is expected to be a temporary impact.

Other temporary impacts to wetlands and other waters will occur within laydown areas and bore pads associated with HDD pipeline installation methods and temporary extra workspace. The bore pad is the entry point where the pilot hole and pipe will be drilled underground through an excavated pit. The laydown areas extend in the opposite direction of the bore pad. Laydown areas are utilized to assemble the pipe segments prior to installing. Temporary extra work space is needed for construction along the pipeline route in locations where the construction corridor is not wide enough to work in safely (for locations, see **Exhibit C, Figure C-2**). Construction vehicles will operate on laydown areas and designated temporary extra workspace areas when soils are dry. If

soil is moist, construction mats would be used to lessen impacts to soil. No wetland impacts will occur with use of the off-site storage yards.

Following construction, temporary impact sites will be reestablished to the original ground elevation, the ground will be revegetated, and precautions will be taken to ensure that the site's hydrology is retained by placing erosion control devices in appropriate areas. In locations where wetlands and other waters will be directly affected by trenching, no net loss of wetland area and no loss of wetland functions will result since construction will be temporary.

Indirect impacts to wetlands and other waters will be avoided and minimized by employing Best Management Practices (BMP) for erosion and sediment control listed in the National Pollutant Discharge Elimination System (NPDES) permit required for the Project and the accompanying Erosion and Sediment Control Plan (ESCP) (see **Attachment J-3: JPA**).

The location and size of proposed impact to each wetland and other water of the state in the Site Boundary is listed in Attachment J-1 and shown on Figure J-2. Impacts from the Project will be temporary; these impacts will be restored in a timely manner, as described in the Restoration and Rehabilitation of Temporary Impacts Plan (Attachment H of the JPA). Table J-3 summarizes the volume of removal and fill for each wetland or other water including the type of material proposed for removal or fill (i.e., native soil, silt, sand, gravel, etc.). Since there are only temporary impacts proposed for the Project, the removal and fill volumes are the same.

In summary, NWN estimates temporary impact to 21 wetlands and 4 other waters of the state (principally perennial and intermittent streams) of the 39 wetlands and 46 other waters of the state that have been identified within the Site Boundary. The Project has an estimated 6.394 acres of temporary impact, with 6.374 acres of wetland impact and 0.02 acres of other waters impact. Temporary impacts will be restored in a timely manner as described in the Restoration and Rehabilitation of Temporary Impacts Plan (**Attachment H of the JPA**).

Table J-3. Volume of Removal and Fill to Wetlands and Other Waters										
Stream/ Wetland ID	**Activity**	**Channel Length (ft.)**	**Channel Width (ft.)**	**Removal Depth (ft.)**	**Surface Area Impact (sq. ft.)**	**Removal Volume (cy)**	**Removal Material**	**Fill Depth (ft.)**	**Fill Volume (cy)**	**Fill Material**
Permanent Impacts										
N/A	N/A									
TOTALS		0	0	0	0	0		0	0	
Temporary Impacts										
STRM 55	Trench Corridor	80.8	5	8	514.60	119.70	Silt/Clay	8	119.70	Native
STRM 67	Trench Corridor	18.8	1	8	18.82	5.57	Gravel	8	5.57	Native
STRM 70	Trench Corridor	19.7	1	8	19.57	5.84	Silt/Clay, Sand, Gravel	8	5.84	Native
STRM 71	Trench Corridor	293.8	1	8	294.69	87.05	Silt/Clay, Sand, Gravel	8	87.05	Native
WET AA	Laydown			0	2,220.19	0.00	Native	0	0.00	Native
WET CC	Laydown			0	1,534.26	0.00	Native	0	0.00	Native
WET EE	Laydown			0	13,310.50	0.00	Native	0	0.00	Native
WET FF	Trench Corridor			8	14,586.76	4322.00	Native	8	4322.00	Native
WET HH	Bore Pad Mud Pit and Trench			8	39,470.13	11694.85	Native	8	11694.85	Native
WET K	Laydown			0	1,363.64	0.00	Native	0	0.00	Native
WET KK	Trench Corridor			8	2,401.66	711.60	Native	8	711.60	Native
WET L	Laydown			0	4,372.99	0.00	Native	0	0.00	Native
WET LL	Laydown			0	28.13	0.00	Native	0	0.00	Native
WET LL	Trench Corridor			8	11.14	3.30	Native	8	3.30	Native
WET M	Laydown			0	14,988.49	0.00	Native	0	0.00	Native
WET MM	Laydown				3,575.65					
WET MM	Trench Corridor			8	641.11	189.96	Native	8	189.96	Native

Table J-3. Volume of Removal and Fill to Wetlands and Other Waters

Stream/ Wetland ID	Activity	Channel Length (ft.)	Channel Width (ft.)	Removal Depth (ft.)	Surface Area Impact (sq. ft.)	Removal Volume (cy)	Removal Material	Fill Depth (ft.)	Fill Volume (cy)	Fill Material
WET N	Laydown			0	38,407.47	0.00	Native	0	0.00	Native
WET NN	Laydown			0	3,699.19	0.00	Native	0	0.00	Native
WET P	Laydown			0	7,918.98	0.00	Native	0	0.00	Native
WET PP	Bore Pad Mud Pit and Trench			8	15,288.80	4530.02	Native	8	4530.02	Native
WET QQ	Laydown			0	13,901.67	0.00	Native	0	0.00	Native
WET RR	Laydown			0	47,262.75	0.00	Native	0	0.00	Native
WET SS	Laydown			0	38,165.64	0.00	Native	0	0.00	Native
WET TT	Laydown			0	93.51	0.00	Native	0	0.00	Native
WET UU	Laydown			0	7,873.04	0.00	Native	0	0.00	Native
WET VV	Trench Corridor			8	6,547.13	1939.89	Native	8	1939.89	Native
TOTALS		**413.1**			**278,510.49**	**23609.78**			**23609.78**	

Note: For wetlands and other water features that do not have a removal fill, mat or bridges will be placed. They are in the table to show will be temporary impacted; however, there will not be removal or fill.

5.0 Information Supporting Issuance of Removal-Fill Permit – OAR 345-021-0010(1)(j)(E)

The Project will require a Removal-Fill Permit for construction of Project components that impact jurisdictional wetlands or other waters. Since both WOS and WOUS will potentially be impacted, a complete JPA will be filed concurrently with both ODSL and USACE for their respective review and permit issuance. NWN will submit a JPA to USACE and ODSL in spring 2015 to obtain the necessary permits before construction. A copy of the JPA is attached as **Attachment J-3**.

Proposed temporary impacts are anticipated just south of Highway 30 and north of Highway 30 where trenching and bore pits will be located. Most streams and wetlands north of Highway 30 within the Site Boundary are tributaries to a traditional navigable water or have a connectivity to a traditional navigable water, particularly the Columbia River. The Project will avoid permanent impacts to wetlands and other waters.

The JPA demonstrates compliance with the criteria of the DSL Removal-Fill Law and Section 404 of the CWA, as administered by the USACE. Impacts will be minimized, and restoration of the temporary impacts in wetlands and other waters will be accomplished by restoring preconstruction contours and revegetating with native plants. For these reasons, NWN has provided sufficient information to support a determination by the Council that ODSL should issue the requested Removal-Fill Permit for the Project. The National Pollutant Discharge Elimination System (NPDES) permit application (**Attachment E-2**) and JPA contain specific details about efforts to avoid or minimize impacts to state water resources (**Attachment J-3**).

NWN will take the following steps to ensure the Project will meet all requirements for a state Removal-Fill Permit. The order in which these steps are presented below is generally chronological, but many will occur simultaneously.

1. Further adjust the location of Project components to avoid and minimize impacts to wetlands and waters.
2. Complete wetland delineations on lands for which access was not previously obtained and any new parts of the Project layout that were not included in the analysis area.
3. Finalize and submit the Project Wetland Delineation Report.
4. Finalize all impact sites that will be subject to Removal-Fill permitting.
5. Prepare complete documentation of wetland impacts on a site-by-site basis. This documentation will include, but will not be limited to the following:
    a. Impact acreage;
    b. Removal and fill quantities;
    c. Drawings as required in the Project Drawings section of the JPA;

d. Location of each site;

e. All required signatures of impact site owners; and,

6. Finalize the Restoration and Rehabilitation of Temporary Impacts Plan.

6.0 Mitigation and Monitoring Program for Potential Impacts to Wetlands and Other Waters – OAR 345-021-0010(1)(j)(F)

OAR 141 Division 85 requires that NWN demonstrate the ways in which impacts will be avoided where practicable and otherwise minimized. For impacts that cannot be avoided, the JPA (**Attachment J-3**) includes a restoration plan for temporary impacts to wetlands and other waters (**Attachment L to the JPA**).

The primary impacts to wetland and other waters will be from trenching and pits dug at bore pad locations to place the pipe, with lesser impact occurring from the establishment of laydown areas. The Project will cause only temporary disruption of natural resource functions; therefore, no long term or permanent loss of natural resources is expected.

The mitigation goal of the Project is to replace or improve the natural resource functions at each temporary impact site. The goal will be attained through proposed actions including:

- Restoring site hydrology at each wetland and stream crossed;
- Preserving and restoring the native seed bank at each impact site;
- Replacing nonnative vegetation removed during construction with native seeds;
- Restoring site topography and grade to preconstruction elevations; and
- Constructing water breaks in the pipeline trench to avoid disruption of site hydrology.

The Project will result in a no net loss of wetland area or function.

6.1 Monitoring Schedule and Methodology

NWN will monitor temporary impact sites for 3 years. Each year, monitoring efforts will include visual surveys to estimate the coverage area of native versus non-native species. Monitoring efforts will occur each year during the growing season. NWN will document the monitoring results in an annual report and submit the report to USACE, ODSL and ODOE.

7.0 Submittal Requirements and Approval Standards

7.1 Submittal Requirements

Table J-4: Submittal Requirements Matrix	
Requirement	**Location**
OAR 345-021-0010(1)(j) Information based on literature and field study, as appropriate, about waters of this state, as defined under ORS 196.800 including:	
(A) A description of all areas within the site boundary that might be waters of this state and a map showing the location of these features.	Section 3, Attachment J-1, Attachment J-2, and Figure J-2
(B) An analysis of whether construction or operation of the proposed facility would adversely affect any waters of this state.	Section 4
(C) A description of the significance of potential adverse impacts to each feature identified in (A), including the nature and amount of material the applicant would remove from or place in the waters analyzed in (B).	Section 4
(D) If the proposed facility would not need a removal-fill authorization, an explanation of why no such authorization is required for the construction and operation of the proposed facility.	N/A
(E) If the proposed facility would need a removal-fill authorization, information to support a determination by the Council that the Oregon Department of State Lands should issue a removal-fill permit, including information in the form required by the Department of State Lands under OAR chapter 141 division 85.	Section 5
(F) A description of proposed actions to mitigate adverse impacts to the features identified in (A) and the applicant's proposed monitoring program, if any, for such impacts.	Section 6

7.2 Approval Standard

OAR 345 Division 22 does not provide an approval standard specific to Exhibit J.

8.0 References

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FIGURES

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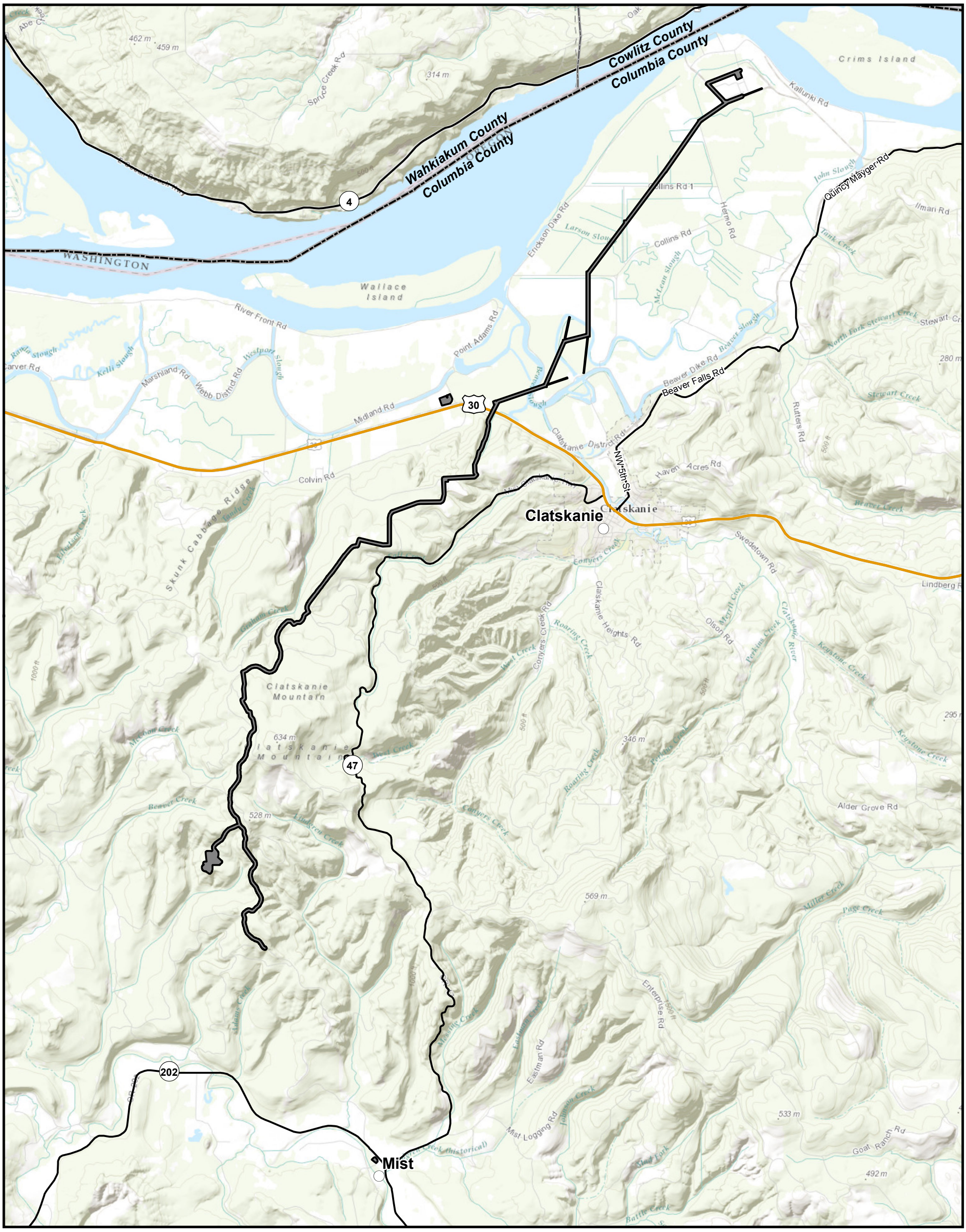


NW Natural

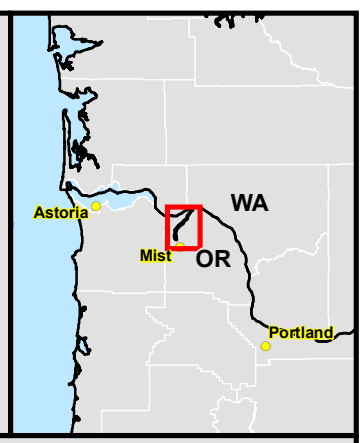
North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-1
Overview Map

Site Boundary
City/Town
Highway
Road
County Boundary
State Boundary



1:67,000 **WGS84 UTM Zone 10**

0 0.5 1 2 3 4 5 Miles

Data Sources Site Boundary-NW Natural

TETRA TECH

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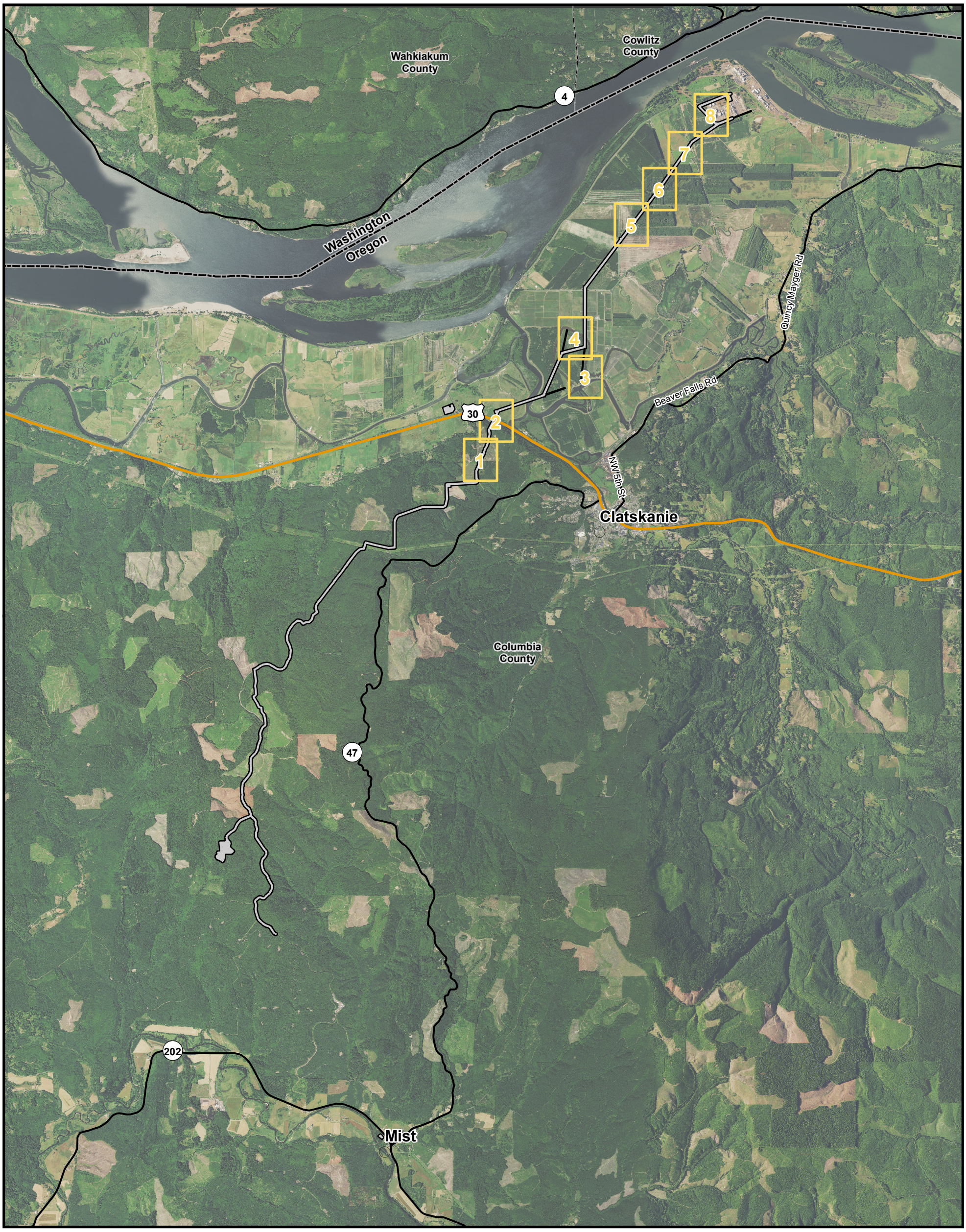


NW Natural

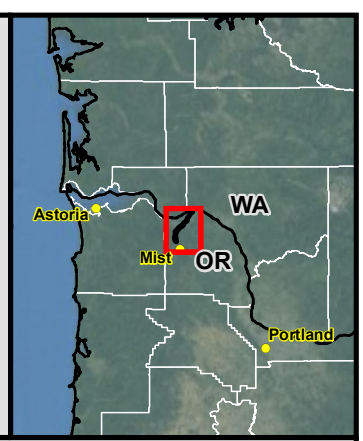
North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-2
Delineated Waters of the State Index Map

Site Boundary
Map Grid
City/Town
Secondary Highway
Secondary Road
County Boundary
State Boundary



1:70,000 WGS84 UTM Zone 10

0 0.5 1 2 3 4 5 Miles

Data Sources NW Natural: project facilities / Tetra Tech: survey area, habitat type and category / ESRI: roads, political boundaries, background imagery

TETRA TECH

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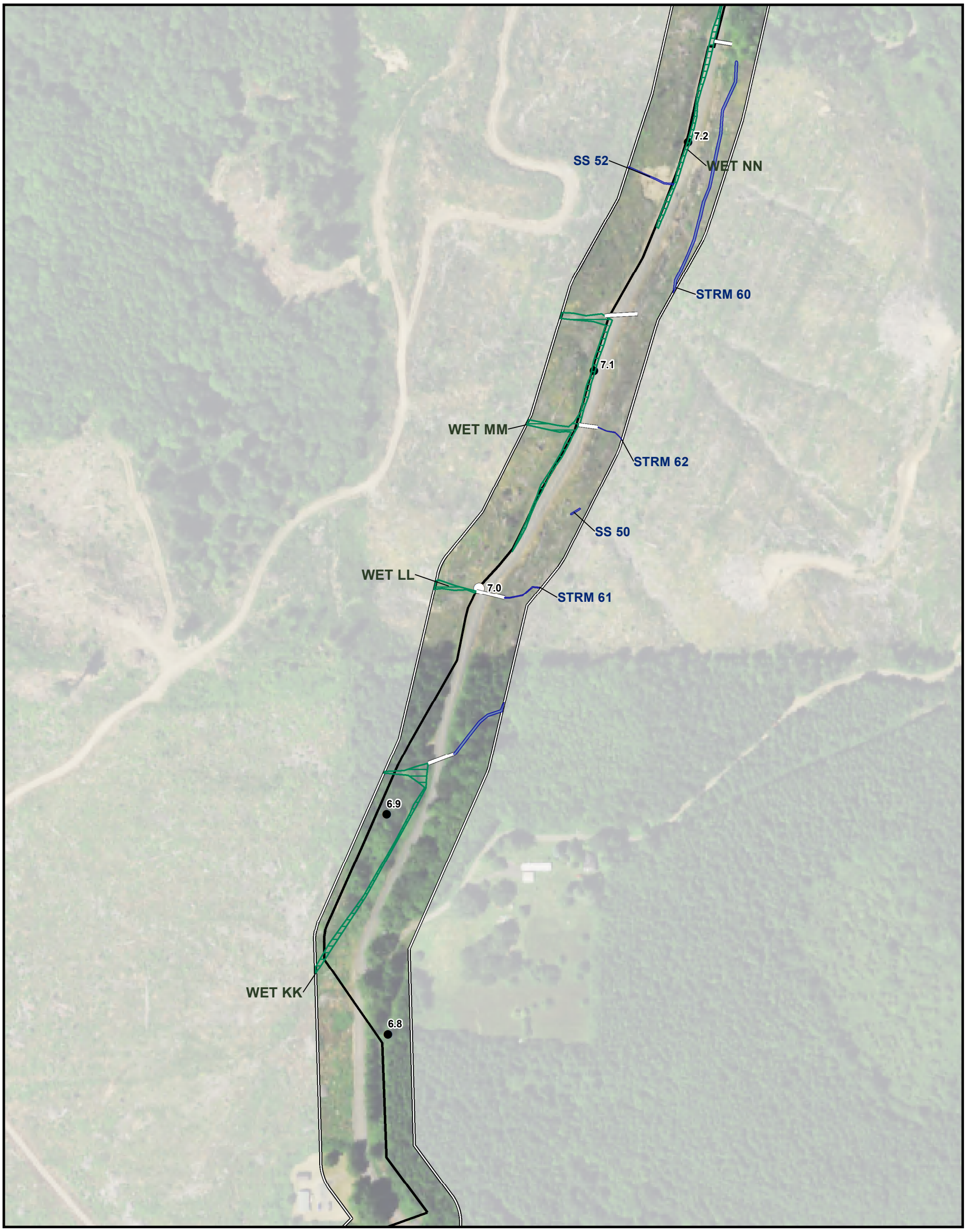

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-2.1
Delineated Waters of the State

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Mile Post
- 1/10 Mile Post
- Pipeline Centerline

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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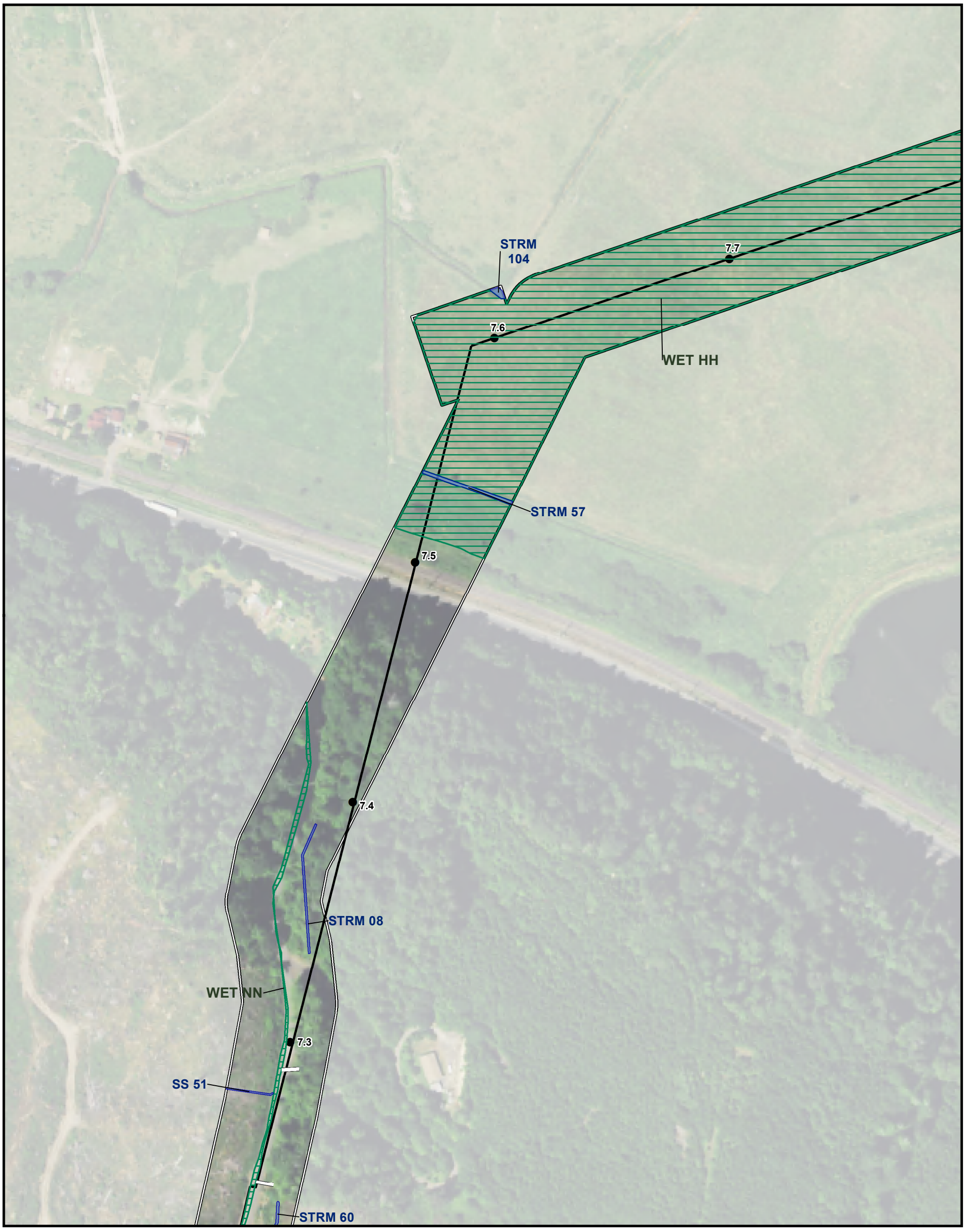

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-2.2
Delineated Waters of the State

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- 1/10 Mile Post
- Pipeline Centerline

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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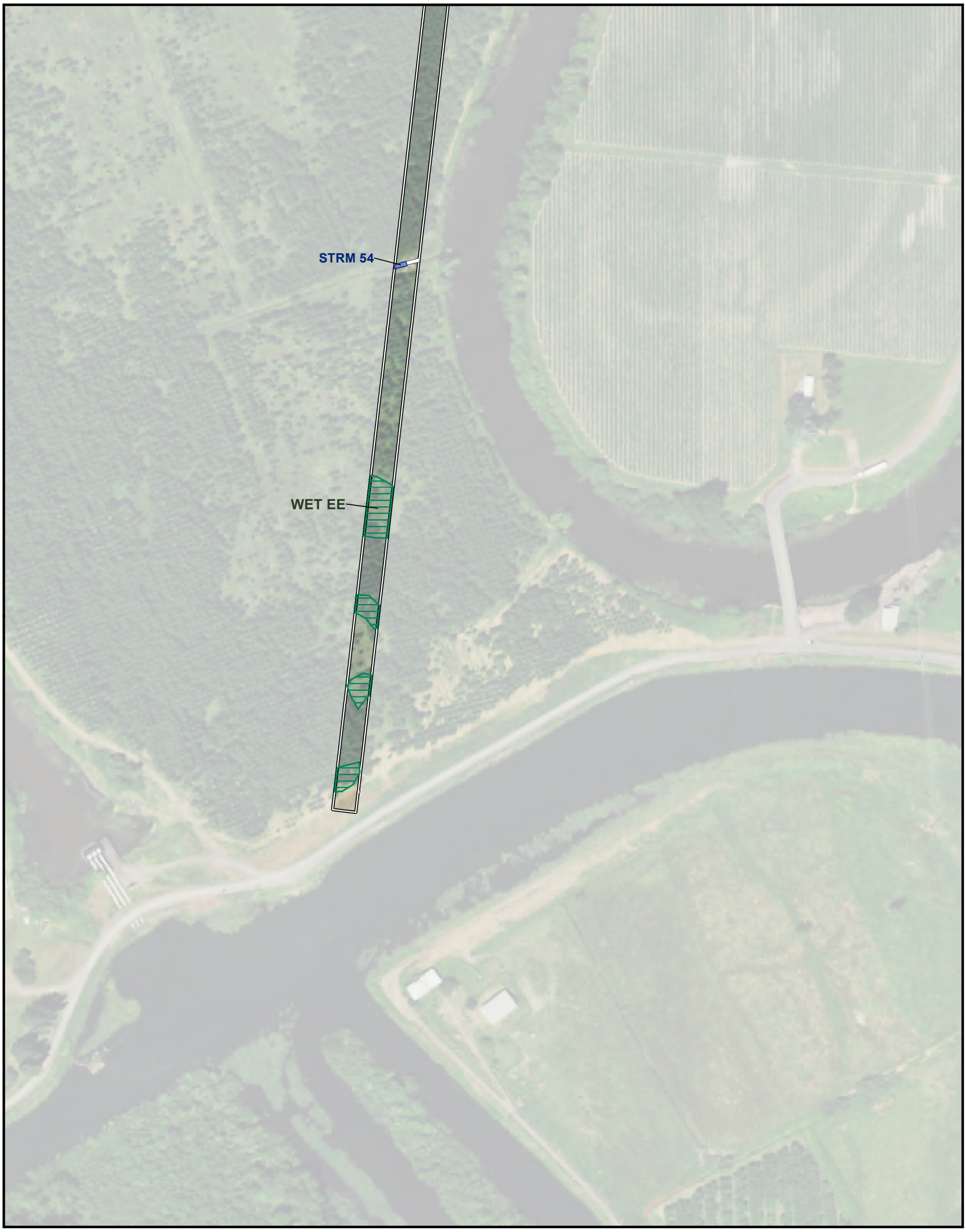

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-2.3
Delineated Waters of the State

Site Boundary

Surveyed Water (Maximum OHWL Width)

Wetlands

Culvert

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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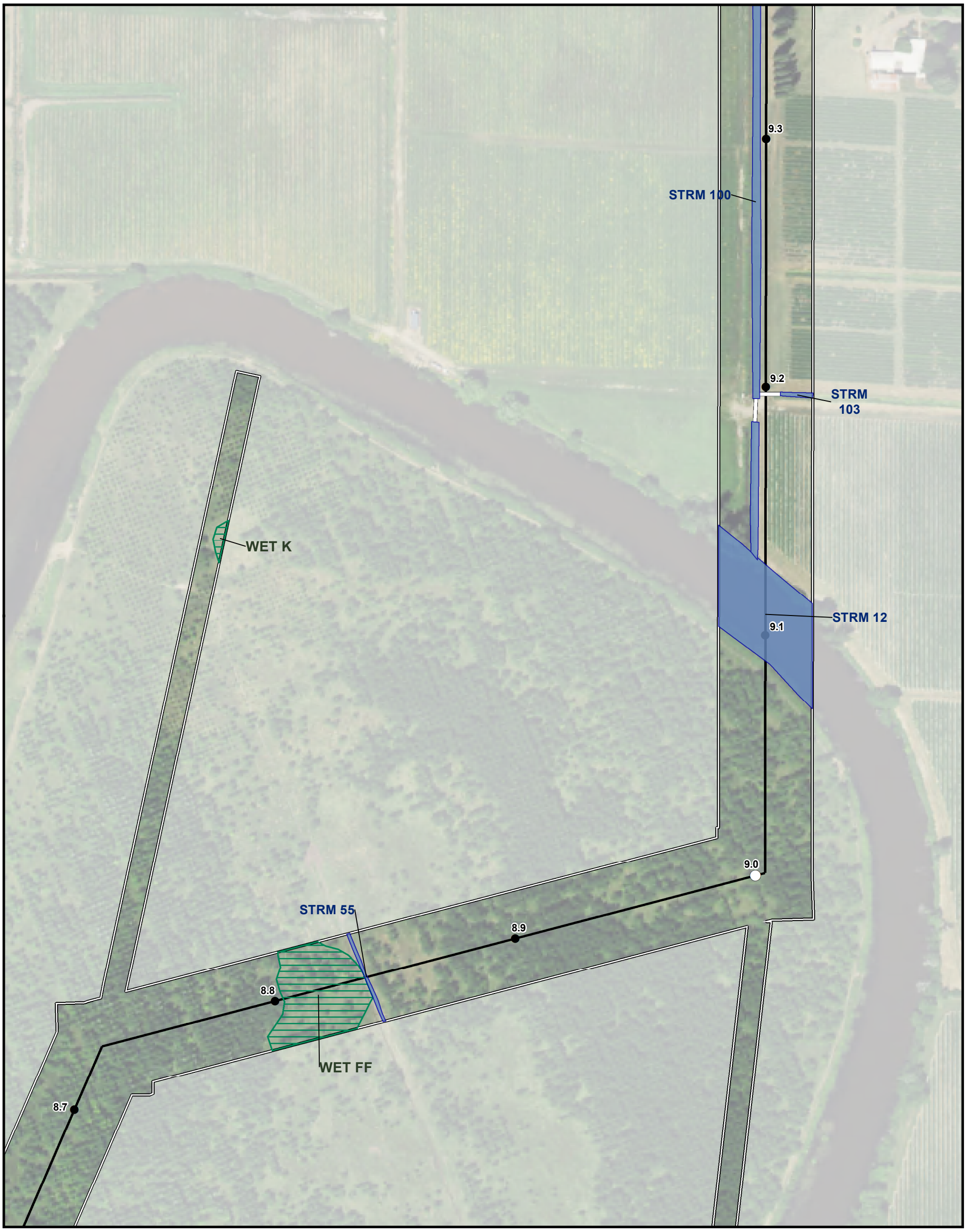

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
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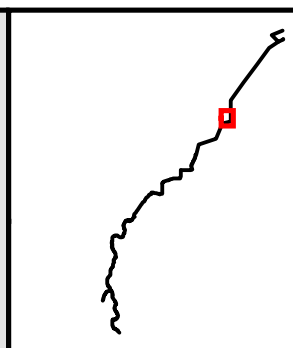
Figure J-2.4
Delineated Waters of the State

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Mile Post
- 1/10 Mile Post
- Pipeline Centerline



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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STRM 20
STRM 19
10.9
WET AA
WET L
10.8
10.7
STRM 18
WET M
10.6
WET BB
10.5
WET CC
STRM 51
STRM 17
10.4
STRM 16

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
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Figure J-2.5
Delineated Waters of the State

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- 1/10 Mile Post
- Pipeline Centerline

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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WET SS
11.4
STRM 22
11.3
STRM 21
WET UU
WET P
WET TT
11.2
11.1
WET N
11.0
STRM 20
STRM 19
10.9
WET AA

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
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Figure J-2.6
Delineated Waters of the State

Site Boundary
Surveyed Water (Maximum OHWL Width)
Wetlands
Mile Post
1/10 Mile Post
Pipeline Centerline

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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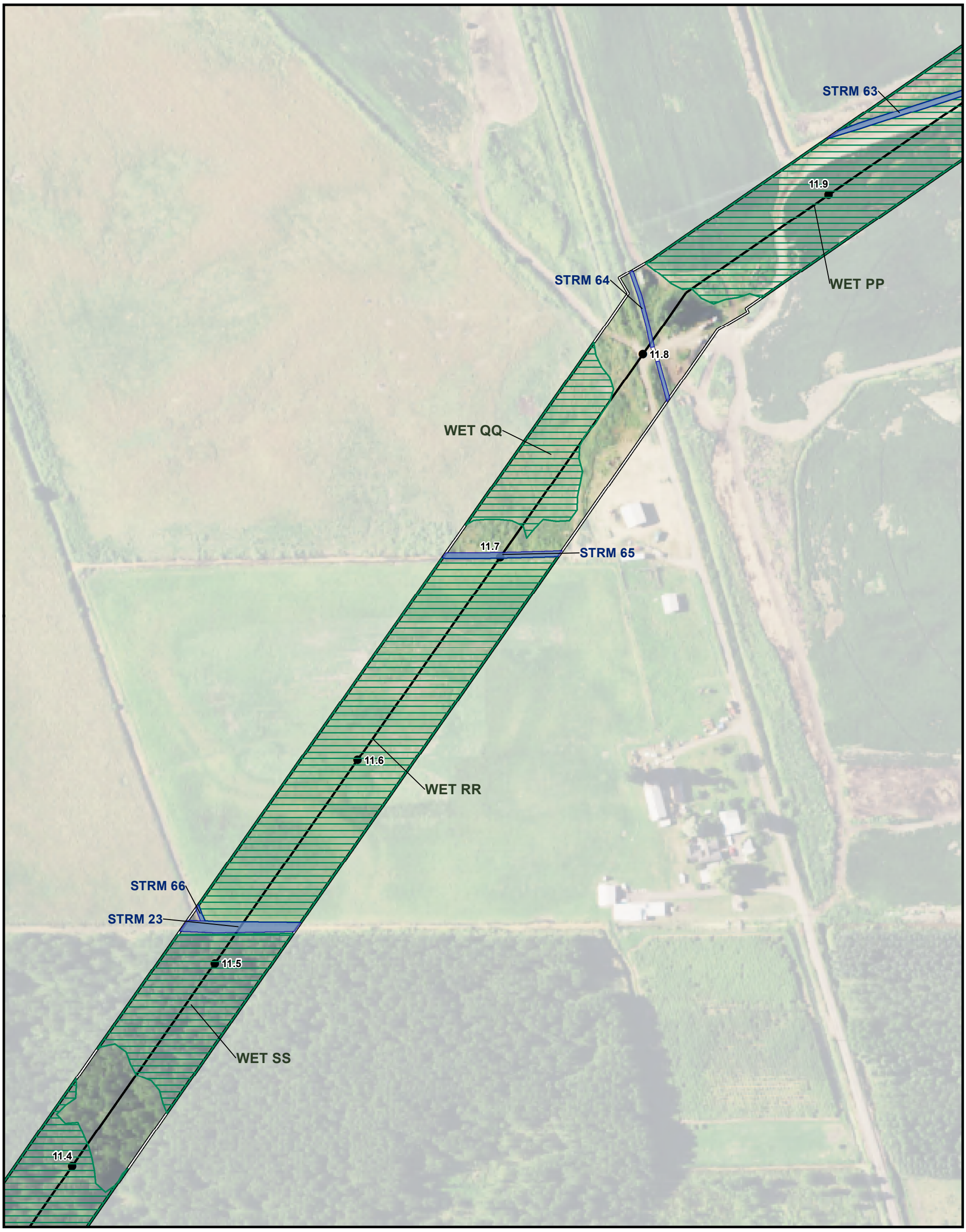

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-2.7
Delineated Waters of the State

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- 1/10 Mile Post
- Pipeline Centerline

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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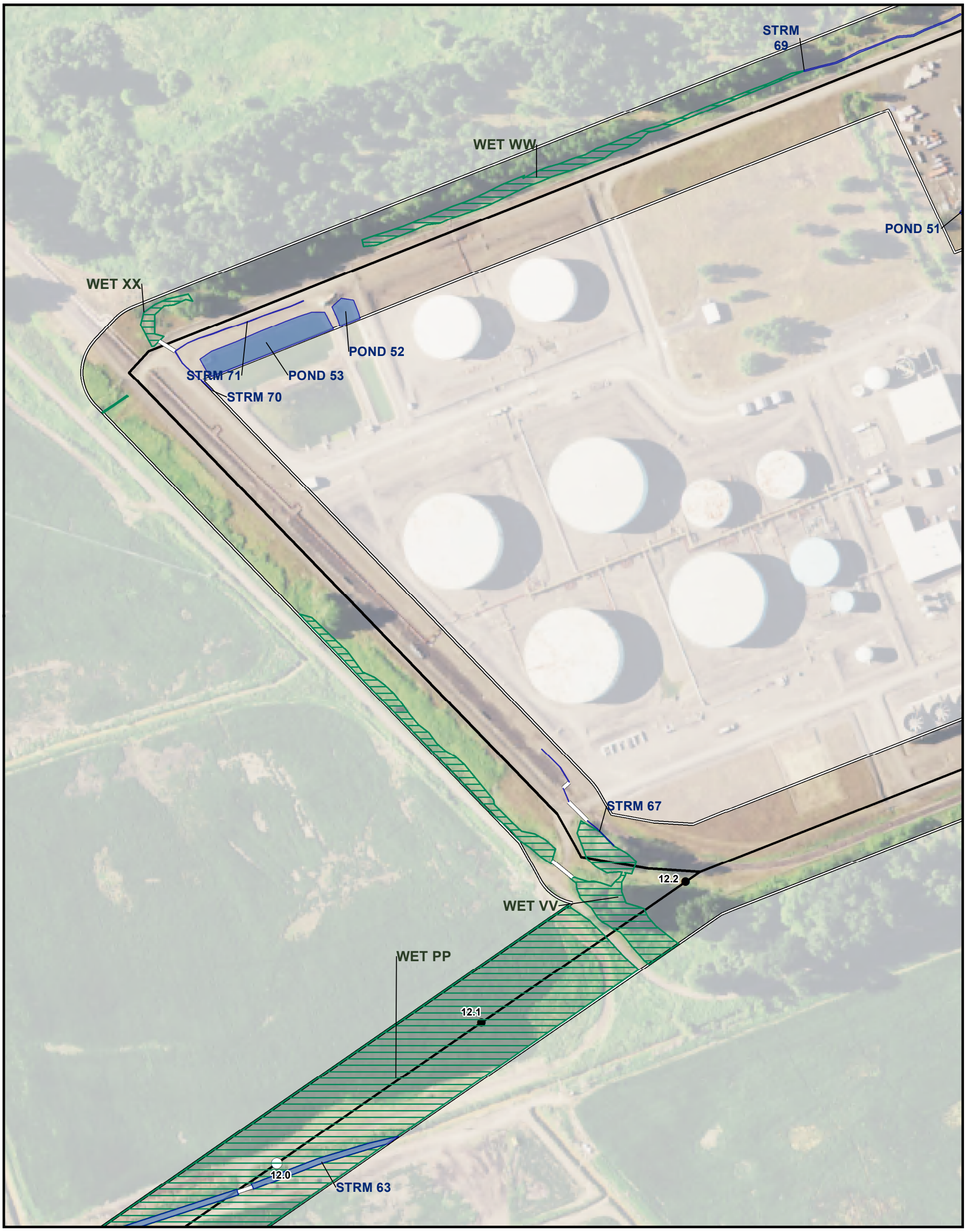

NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
November 2015

Figure J-2.8
Delineated Waters of the State

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Mile Post
- 1/10 Mile Post
- Pipeline Centerline

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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ATTACHMENT J-1:

WETLAND AND OTHER WATERS CHARACTERISTIC TABLES

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Table 1: Summary of Delineated Wetlands									
Wetland Code	**Figure No.**	**Mile Post**	**Sample Plots**	**Cowardin**	**HGM**	**Acres**	**Longitude**	**Latitude**	**Wetland Boundary Characteristics**
WET OO	J-2.1	South Route 2.2	SP OO-01, 02	PEMI	Depression	0.02	-123.259801	45.99879871	Boundary determination method: gradual break in topography, hydrology. Wetland occurs entirely within study area.
WET Y	J-2.2	South Route 1.8	SP Y-01, 02	PEMA	Depression	0.00	-123.2910918	46.03817637	Boundary determination method: abrupt break in topography and vegetation. Roadside ditch less than 10 ft. wide. Wetland occurs entirely within study area.
WET A	J-2.4	North Route 0.6	SP A-01, 02	PEMC	Slope headwater	0.02	-123.2920404	46.05335906	Boundary determination method: abrupt break in topography, soil, hydrology, vegetation. Visible change in vegetation community. Wetland occurs entirely within study area.
WET B	J-2.4	North Route 0.6	SP B-01, 02	PEMC	Riverine Flow Through	0.01	-123.2924579	46.05405202	Boundary determination method: abrupt break in topography, hydrology, vegetation. Visible change in vegetation community. Wetland occurs entirely within study area.
WET V	J-2.6	North Route 2.4	SP V-01, 02	PEMC	Riverine Flow Through	0.09	-123.2906229	46.07812874	Boundary determination method: abrupt break in hydrology, vegetation. Gradual break in topography. Wetland continues off site to the northeast.
WET R	J-2.6	North Route 2.6	SP R-01, 02	PEMA	Riverine Flow Through	0.01	-123.2869114	46.07813667	Boundary determination method: abrupt break in topography, soil, hydrology. Gradual break in vegetation. Wetland occurs entirely within study area.
WET S	J-2.6	North Route 2.6	SP S-01, 02	PEMA	Flat	0.04	-123.2879022	46.0785751	Boundary determination method: abrupt break in topography, soil, hydrology, vegetation. Wetland edge is in at toe of slope. Roadside ditch less than 10 ft. wide. Flows into stream or wetland. Wetland occurs entirely within study area.

Table 1: Summary of Delineated Wetlands									
Wetland Code	**Figure No.**	**Mile Post**	**Sample Plots**	**Cowardin**	**HGM**	**Acres**	**Longitude**	**Latitude**	**Wetland Boundary Characteristics**
WET X	J-2.6	North Route 2.6	SP X-01, 02	PEMC	Riverine Flow Through	0.04	-123.2878355	46.07882225	Boundary determination method: abrupt break in topography, hydrology, vegetation. Wetland continues off site to the north.
WET W	J-2.6	North Route 2.6	SP W-01, 02	PEMC	Riverine Flow Through	0.02	-123.2881397	46.07888879	Boundary determination method: abrupt break in topography, hydrology, vegetation. Subtle break in soil. Wetland continues off site to the northeast, northwest.
WET D	J-2.7	North Route 3.5	SP D-01, 02	PEMC	Riverine Flow Through	0.01	-123.2795966	46.08551623	Boundary determination method: abrupt break in topography, soil, hydrology. Gradual break in vegetation. Wetland occurs entirely within study area.
WET KK	J-2.10	North Route 6.9	SP KK-01, 02	PEMH	Riverine Flow Through	0.10	-123.2371853	46.11173392	Boundary determination method: abrupt break in topography, hydrology, vegetation. Wetland continues off site to the west, southwest.
WET LL	J-2.10	North Route 7.0	SP LL-01, 02	PEME	Riverine Flow Through	0.02	-123.2363098	46.11372392	Boundary determination method: abrupt break in topography, hydrology, vegetation. Wetland continues off site to the west.
WET MM	J-2.10	North Route 7.1	SP MM-01, 02	PEMA	Riverine Flow Through	0.14	-123.2351565	46.11485884	Boundary determination method: abrupt break in topography, hydrology, vegetation. Roadside ditch less than 10 ft. wide. Wetland continues off site to the west.
WET NN	J-2.10; J-2.11	North Route 7.2	SP NN-01,02	PEMAd	Riverine Flow Through	0.19	-123.2342065	46.11665965	Boundary determination method: abrupt break in topography, hydrology. Gradual break in vegetation. Roadside ditch less than 10 ft. wide. Wetland continues off site to the north.

Table 1: Summary of Delineated Wetlands									
Wetland Code	**Figure No.**	**Mile Post**	**Sample Plots**	**Cowardin**	**HGM**	**Acres**	**Longitude**	**Latitude**	**Wetland Boundary Characteristics**
WET HH	J-2.11; J-2.12	North Route 7.9	SP HH-01, 02, 03, 04, 05, 06, 07, 08	PEMAd	Depression	9.97	-123.2298168	46.12226005	Boundary determination method: gradual break in topography, hydrology. Subtle break in vegetation. Difficult site with subtle changes in indicators. NWI Cowardin rating is incorrect. Wetland continues off site to the north, east, west.
WET GG	J-2.13	North Route 8.3	SP GG-01, 02	PEMC	Riverine Flow Through	0.11	-123.2179079	46.12522658	Boundary determination method: abrupt break in topography, hydrology, vegetation. Excavated. Wetland continues off site to the northwest and south east.
WET II	J-2.13	North Route 8.3	SP II-01	PEM_PFOAh	Depression	0.36	-123.2197874	46.12645412	Boundary determination method: gradual break in topography, hydrology, vegetation. Excavated. Wetland continues off site to the east, west.
WET EE	J-2.14	North Route 8.9	SP EE-01, 02, 03	PEM_PFOA	Flat	0.31	-123.2113585	46.12782348	Boundary determination method: gradual break in hydrology, vegetation. Subtle break in in topography, soil. Difficult site with subtle changes in indicators. Wetland continues off site to the east, west.
WET FF	J-2.15	North Route 8.8	SP FF-01, 02	PEM_PFOB	Flat	0.80	-123.2143021	46.13210683	Boundary determination method: gradual break in vegetation. Subtle break in in topography. Difficult site with subtle changes in indicators. Wetland continues off site to the north, west, southwest.
WET K	J-2.15	North Route 8.8	SP K-01, 02	PEMAf	Flat	0.03	-123.2151393	46.13476505	Boundary determination method: gradual break in topography, soil, hydrology, vegetation. Visible change in vegetation community. Wetland occurs entirely within study area.

Table 1: Summary of Delineated Wetlands									
Wetland Code	**Figure No.**	**Mile Post**	**Sample Plots**	**Cowardin**	**HGM**	**Acres**	**Longitude**	**Latitude**	**Wetland Boundary Characteristics**
WET BBB	J-2.16	North Route 9.4	SP BBB-01, 02	PEMBx	Slope/Flat	0.01	-123.2108327	46.13815458	Boundary determination method: abrupt break in topography, hydrology. Wetland continues off site to the west.
WET AAA	J-2.16	North Route 9.4	SP AAA-01, 02	PEMBx	Slope/Flat	0.02	-123.2108033	46.13887218	Boundary determination method: abrupt break in topography, hydrology. Wetland continues off site to the west.
WET DD	J-2.17	North Route 10.0	SP DD-01, 02	PEMC	Riverine Flow Through	0.27	-123.2075664	46.14609244	Boundary determination method: abrupt break in topography, hydrology. Gradual break in vegetation. Excavated. Wetland continues off site to the west.
WET DD	J-2.17	North Route 10.0	SP DD-03, 04	PEMA	Flat	0.28	-123.2064479	46.14655197	Boundary determination method: gradual break in topography, hydrology. Difficult site with subtle changes in indicators. Wetland continues off site to the east, and west
WET CC	J-2.18	North Route 10.5	SP CC-01, 02	PEMA	Depression	0.13	-123.2012324	46.15160227	Boundary determination method: gradual break in topography, hydrology. Wetland continues off site to the east.
WET BB	J-2.18	North Route 10.5	SP BB-01, 02	PFO_PEMA	Flat	0.22	-123.2007969	46.15232939	Boundary determination method: gradual break in topography, hydrology. Wetland continues off site to the northwest.
WET M	J-2.18	North Route 10.6	SP M-01, 02, 03, 04	PEMA	Flat	1.30	-123.1997581	46.15299534	Boundary determination method: gradual break in topography, vegetation. Subtle break in soil. Difficult site with subtle changes in indicators. Wetland continues off site to the west, northwest.

Table 1: Summary of Delineated Wetlands									
Wetland Code	**Figure No.**	**Mile Post**	**Sample Plots**	**Cowardin**	**HGM**	**Acres**	**Longitude**	**Latitude**	**Wetland Boundary Characteristics**
WET L	J-2.18	North Route 10.8	SP L-01, 02	PEMA	Flat	0.38	-123.1971987	46.15555779	Boundary determination method: gradual break in hydrology, vegetation. Subtle break in topography. Soil. Difficult site with subtle changes in indicators. Wetland continues off site to the northwest.
WET AA	J-2.18; J-2.19	North Route 10.9	SP AA-01, 02	PFO_PEMA	Flat	0.18	-123.1960318	46.15619444	Boundary determination method: abrupt break in hydrology. Gradual break in hydrology. Subtle break in in vegetation. Difficult site with subtle changes in indicators. Wetland continues off site to the southeast.
WET N	J-2.19	North Route 11.0	SP N-01, 02, 03, 04	PEMA	Flat	2.77	-123.1936129	46.15865249	Boundary determination method: gradual break in vegetation. Subtle break in topography, soil. Visible change in vegetation community. Wetland continues off site to the northwest, southeast.
WET P	J-2.19	North Route 11.2	SP P-01, 02	PEMA	Flat	0.54	-123.191821	46.16044263	Boundary determination method: gradual break in vegetation. Subtle break in topography, soil. Visible change in vegetation community. Difficult site with subtle changes in indicators. Wetland continues off site to the southeast
WET TT	J-2.19	North Route 11.2	SP TT-01, 02	PEMB	Depression	0.08	-123.1912484	46.16060946	Boundary determination method: gradual break in topography, vegetation. Wetland continues off site to the south.
WET UU	J-2.19	North Route 11.3	SP UU-01, 02	PEM_PFOB	Depression	0.68	-123.1905869	46.16144344	Boundary determination method: subtle break in in topography, vegetation. Difficult site with subtle changes in indicators. Wetland continues off site to the east, northeast, southeast.

Table 1: Summary of Delineated Wetlands									
Wetland Code	**Figure No.**	**Mile Post**	**Sample Plots**	**Cowardin**	**HGM**	**Acres**	**Longitude**	**Latitude**	**Wetland Boundary Characteristics**
WET SS	J-2.19; J-2.20	North Route 11.5	SP SS-01, 02, 03, 04	PEM_PFOB	Flat	3.43	-123.189874	46.16236986	Boundary determination method: subtle break in topography, vegetation. Difficult site with subtle changes in indicators. Wetland continues off site to the east, west, northeast, northwest, southeast, southwest.
WET RR	J-2.20	North Route 11.6	SP RR-01, 02	PEMB	Flat	4.32	-123.186998	46.16517217	Boundary determination method: abrupt break in hydrology. Wetland continues off site to the east, west, northeast, northwest, southeast, southwest.
WET QQ	J-2.20	North Route 11.7	SP QQ-01, 02	PEMB	Depression	1.13	-123.1855035	46.16683489	Boundary determination method: gradual break in topography, vegetation. Wetland continues off site to the west.
WET PP	J-2.20; J-2.21	North Route 11.9	SP PP-01, 02, 03, 04, 05, 06	PEMB	Depression	7.69	-123.1815215	46.16915904	Boundary determination method: gradual break in topography. Visible change in vegetation community. Difficult site with subtle changes in indicators. NWI Cowardin rating is incorrect. Wetland continues off site to the north, south.
WET VV	J-2.21	North Route 12.2	SP VV-03, 04	PEMC	Depression	0.89	-123.1785548	46.17061648	Boundary determination method: abrupt break in topography, vegetation. Gradual break in hydrology. Excavated. Wetland continues off site to the northwest, southeast.
WET XX	J-2.21	North Route 12.1	SP XX-01, 02	PEMB	Depression	0.07	-123.1824089	46.17420255	Boundary determination method: abrupt break in topography. Wetland occurs entirely within study area.
WET WW	J-2.21; J-2.22	North Route 12.2	SP WW-01, 02	PEMC	Depression	0.37	-123.1793025	46.17493568	Boundary determination method: abrupt break in topography, vegetation. Wetland occurs entirely within study area.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 01	J-2.4	North Route 0.6	R4SB3	Intermittent	4	0.5	0.01	-123.2923311	46.05329699	Channel is single thread. Flow direction is west. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank, top of the zone of washed roots, and slope angle break in bank.
STRM 02	J-2.4	North Route 0.6	R4SB3	Intermittent	1	0.5	0.00	-123.2926675	46.05391589	Channel is single thread. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank, lowest extent of woody vegetation, and slope angle break in bank.
STRM 24	J-2.6	North Route 2.8	R3UB1	Perennial	12	.5	0.03	-123.2843382	46.07804728	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and textural change of depositional sediment or soil.
STRM 27	J-2.6	North Route 2.4	R3UB1	Perennial	5	1	0.02	-123.2902959	46.07825508	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and textural change of depositional sediment or soil.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 25	J-2.6	North Route 2.6	R2UB1	Perennial	4	.5	0.01	-123.2865696	46.07835322	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, presence of litter, debris, silt stained leaves, silt lines on tree trunks, lowest extent of woody v
STRM 04	J-2.7	North Route 3.5	R3UB1	Perennial	4	1	0.01	-123.2792877	46.08584122	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank, change in vegetation, and textural change of depositional sediment or soil.
STRM 05	J-2.7	North Route 3.6	R4SB3	Intermittent	3	0.5	0.01	-123.2780004	46.08599427	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and textural change of depositional sediment or soil.
POND 01	J-2.7	North Route 3.6	PUB	Pond	15	0	0.01	-123.2772617	46.08610625	Small pond in forest. Egg masses in pond.
POND 02	J-2.8	North Route 5.5	PUBHUB3	Pond	300 x 300	10	0.08	-123.2555209	46.10442077	Pond located on edge of study area.
POND 03	J-2.9	North Route 6.1	PUBHxUB3	Pond	80 x 50	5	0.08	-123.2444131	46.1068672	Pond.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 60	J-2.10; J-2.11	North Route 6.9	R3RB1UB1	Perennial	3	1	0.08	-123.2360553	46.11292746	Channel is single thread. Flow direction is north. Feature originates within study area and flows out of study area. OHWL field indicators: change in vegetation, and textural change of depositional sediment or soil.
STRM 61	J-2.10	North Route 7.0	R4SB3	Intermittent	2	0.5	0.00	-123.235699	46.1136714	Channel is single thread. Flow direction is east. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, change in vegetation.
SS 50	J-2.10	North Route 7.0	SeepSpring	SeepSpring	3	0.4	0.00	-123.2352513	46.11416239	Seep/spring on hillside.
STRM 62	J-2.10	North Route 7.1	R4SB3	Intermittent	1	.5	0.00	-123.2349647	46.11463009	Channel is single thread. Flow direction is east. Feature originates within study area and flows out of study area. OHWL field indicators: textural change of depositional sediment or soil. Located in clear cut.
SS 52	J-2.10	North Route 7.2	SeepSpring	SeepSpring	1	.25	0.01	-123.2346291	46.11611762	Seep/spring on hillside draining to WET NN.
SS 51	J-2.11	North Route 7.3	SeepSpring	SeepSpring	1	.25	0.01	-123.2341503	46.11743428	Seep/spring on hillside.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 08	J-2.11	North Route 7.4	R3RB1	Perennial	4	1.5	0.03	-123.233692	46.1185847	Channel is single thread. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and textural change of depositional sediment or soil.
STRM 57	J-2.11	North Route 7.5	R2UB3	Perennial	8	4	0.03	-123.2323333	46.12096633	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 104	J-2.11	North Route 7.6	R2UB3	Perennial	15	2	0.01	-123.2320851	46.1221048	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows in/out of study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank.
STRM 09	J-2.12	North Route 7.9	R2UB3	Perennial	6	5	0.04	-123.2259064	46.12331899	Channel is single thread, excavated drainage ditch. Flow direction is southeast. OHWL field indicators: clear, natural line impressed on the bank, presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 10	J-2.12	North Route 8.0	R3UB3	Perennial	150	10	2.46	-123.2236451	46.12386286	Clatskanie River. Channel is single thread. Flow direction is north. Feature flows into and out of study area. OHWL field indicators: slope angle break in bank and change in vegetation.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 54	J-2.14	North Route 8.9	R2UB3	Perennial	7	3	0.01	-123.2110896	46.12981281	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: slope angle break in bank.
STRM 55	J-2.15	North Route 8.8	R2UB3	Perennial	5	1.5	0.03	-123.2139022	46.13221094	Channel is single thread, excavated drainage ditch. Flow direction is southwest. Feature flows into/out of study area. OHWL field indicators: change in vegetation.
STRM 12	J-2.13; J-2.15	North Route 9.1	R2UB3	Perennial	150	10	1.83	-123.2105583	46.13433392	Beaver Slough. Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: change in vegetation.
STRM 103	J-2.15	North Route 9.2	R2UB3	Perennial	0	5	0.01	-123.2102971	46.13561469	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank, and change in vegetation.
STRM 102	J-2.16	North Route 9.4	R2UB3	Perennial	0	2	0.01	-123.2104894	46.13821593	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 100	J-2.15; J-2.16	North Route 9.5	R2UB3	Perennial	10	6	1.01	-123.2106461	46.13845183	Channel is single thread, excavated drainage ditch. Flow direction is south. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank, change in vegetation.
STRM 101	J-2.16	North Route 9.5	R2UB3	Perennial	0	3	0.00	-123.2108927	46.14019989	Channel is single thread, excavated drainage ditch. Flow direction is east. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank.
STRM 53	J-2.16	North Route 9.7	R2UB3	Perennial	8	4	0.04	-123.2105711	46.14239222	Channel is single thread, excavated drainage ditch. Flow direction is west. OHWL field indicators: presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 52	J-2.16	North Route 9.7	R2UB3	Perennial	8	4	0.05	-123.2106016	46.14252543	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: change in vegetation.
STRM 14	J-2.17	North Route 10.1	R2UB3	Perennial	10	3	0.10	-123.205927	46.14703694	Channel is single thread, excavated drainage ditch. Flow direction is east. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 15	J-2.17	North Route 10.3	R2UB3	Perennial	6	3	0.05	-123.2033533	46.14929102	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 16	J-2.17; J-2.18	North Route 10.3	R2UB3	Perennial	7	3	0.11	-123.2024804	46.15042936	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 17	J-2.17; J-2.18	North Route 10.4	R2UB3	Perennial	4	2	0.06	-123.2022699	46.15063857	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 51	J-2.18	North Route 10.4	R2SB5UB3	Perennial	5	1	0.00	-123.201585	46.15168636	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature originates within study area and flows out of study area. OHWL field indicators: change in vegetation.
STRM 18	J-2.18	North Route 10.6	R2UB3	Perennial	0	0	0.12	-123.1991738	46.15344945	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 19	J-2.19; J-2.18	North Route 10.9	R2UB3	Perennial	10	5	0.08	-123.1954134	46.15700013	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 20	J-2.19; J-2.18	North Route 10.9	R2UB3	Perennial	5	1	0.06	-123.1952375	46.15715992	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear and natural line impressed on the bank.
STRM 21	J-2.19	North Route 11.2	R2UB3	Perennial	10	4	0.14	-123.1913321	46.16089439	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank and slope angle break in bank.
STRM 22	J-2.19	North Route 11.3	R2UB3	Perennial	15	6	0.07	-123.1904145	46.16179274	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and slope angle break in bank.
STRM 23	J-2.20	North Route 11.5	R2UB3	Perennial	12	5	0.12	-123.1881199	46.16407442	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and slope angle break in bank.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 66	J-2.20	North Route 11.5	R2UB3	Perennial	8	3	0.01	-123.1884423	46.16415061	Channel is single thread, excavated drainage ditch with evidence of being mowed and grazed. Flow direction is northwest. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 65	J-2.20	North Route 11.7	R2UB3	Perennial	12	3	0.07	-123.1859136	46.16624904	Channel is single thread, excavated drainage ditch with evidence of being mowed and grazed. Flow direction is west. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 64	J-2.20	North Route 11.8	R2UB3	Perennial	8	3	0.05	-123.1846815	46.16754594	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: presence of litter, debris, silt stained leaves, silt lines on tree trunks, and change in vegetation.
STRM 63	J-2.20; J-2.21	North Route 12.0	R2UB3	Perennial	12	3	0.18	-123.1818146	46.16901572	Channel is single thread, excavated drainage ditch in a plowed field. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 67	J-2.21	North Route 12.2	R4SB3	Intermittent	1	.25	0.00	-123.1791373	46.17152168	Channel is single thread, excavated drainage ditch. Flow direction is southeast. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 70	J-2.21	North Route 12.2	R4SB3	Intermittent	1	0.25	0.00	-123.1821821	46.17378671	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.
POND 53	J-2.21	North Route 12.2	PUBHR	Pond	280 x 50	5	0.33	-123.1815708	46.17397028	Artificial pond.
STRM 71	J-2.21	North Route 12.2	R4SB3	Intermittent	1	.25	0.01	-123.1818028	46.17407299	Channel is single thread, excavated drainage ditch. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank.
POND 52	J-2.21	North Route 12.2	PUBHR	Pond	45 x 50	5	0.05	-123.1809033	46.17415223	Artificial pond.
POND 51	J-2.22	North Route 12.2	PUBC	Pond	70 x 35	0.5	0.06	-123.1756003	46.17469643	Seasonally flooded pond.
STRM 69	J-2.22	North Route 12.2	R4SB4	Intermittent	3	.5	0.02	-123.1764045	46.17572681	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank.

Table 2: Summary of Delineated Other Waters										
Waters Code	**Figure No.**	**Mile Post**	**Cowardin**	**Flow Duration**	**OHWL width (ft.)**	**OHWL depth (ft.)**	**Acres**	**Longitude**	**Latitude**	**Channel Characteristics and OSDAM**
STRM 68	J-2.22	North Route 12.2	R4SB3	Intermittent	1	1	0.00	-123.175061	46.17586466	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.

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ATTACHMENT J-2:

WETLAND DELINEATION REPORT

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North Mist Pipeline Expansion Project

Wetlands and Other Waters Delineation Report

Prepared for

NW Natural

Prepared by

Tetra Tech, Inc.

November 2015

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Acronyms and Abbreviations

EPA	Environmental Protection Agency
HUC	Hydrologic Unit Code
LWI	Local Wetlands Inventory
NHD	National Hydrography Dataset
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
NWN	Northwest Natural
OAR	Oregon Administrative Rule
ODSL	Oregon Department of State Lands
OSDAM	Oregon Streamflow Duration Assessment Method
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
Project	North Mist Pipeline Expansion Project
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USGS	US Geological Survey
WETS	Wetlands Determination
WY	water year

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1.0 Landscape Setting and Land Use

1.1 Project Location

NW Natural (NWN) proposes to construct the North Mist Pipeline Expansion Project (Project) approximately three miles north of NWN's existing Miller Station compressor facility near town of Mist in Columbia County, Oregon (**Figure A-1**). The new facility will be an expansion of the NWN Mist underground gas storage infrastructure. The Project will provide approximately 2.5 billion cubic feet of storage capacity and natural gas withdrawal deliveries up to 120 million of cubic feet per day by May 2016. In addition to the gas storage facility, the Project consists of a 24-inch diameter, 13-mile transmission pipeline, remote well site facilities, injection and withdrawal transmission pipelines from the reservoir to the compressor station site, a 2.5-mile conduit line, and temporary workspaces (**Figure A-1**).

The Project study area encompasses all Project components, and includes the following townships, ranges, and sections (**Table 1-1**). **Figure A-2** shows the tax lots in relation to the study area.

Table 1-1: Township, Range, and Section within Project Study Area

Township	Range	Section	Taxlots with No Access
006 N	005 W	03	
006 N	005 W	14	
007 N	004 W	05	7N4W 500 800
007 N	004 W	06	7N4W 600 200; 7N4W 500 800; 7N4W 600 1101; 7N4W 600 1100
007 N	004 W	07	7N4W 700 1001
007 N	005 W	01	
007 N	005 W	11	
007 N	005 W	12	
007 N	005 W	14	
007 N	005 W	15	
007 N	005 W	22	
007 N	005 W	27	
007 N	005 W	34	
008 N	004 W	15	
008 N	004 W	16	
008 N	004 W	21	8N4W2100 200

Table 1-1: Township, Range, and Section within Project Study Area			
Township	**Range**	**Section**	**Taxlots with No Access**
008 N	004 W	22	
008 N	004 W	28	
008 N	004 W	29	
008 N	004 W	31	
008 N	004 W	32	7N4W 500 800

1.2 Study Area

The study area for wetlands and other potentially jurisdictional waters consists predominantly of a 200-foot wide corridor that encompasses Project components including a 13-mile pipeline, 2.5-mile conduit line, temporary workspaces and laydown areas. The study area also includes areas outside the 200-foot wide corridors for the compressor station site, gas wells and temporary workspaces. The study area traverses the floodplain of the Columbia River, the Clatskanie River, and Beaver Slough. The study area also includes privately-owned tree plantations and other timber land, Highway 30, Burlington Northern Railroad, and county roads (**Figure A-1**). NWN will utilize existing roads to access the Project Area; the Project does not include any new access roads.

The study area includes tax lots for which right of entry was not obtained, consisting of approximately 1.0 percent (4.6 acres) of the total study area (approximately 400 acres). Wetlands and waters on these tax lots will be delineated when access is granted, most likely prior to construction. Results of those wetland delineations will be provided as an update to this report.

1.3 Geology and Vegetation

The Project is located within the Environmental Protection Agency (EPA) Level III Coast Range ecoregion (Thorson et al. 2007). The Coast Range ecoregion stretches along the Pacific Coast from the Olympic Peninsula, Washington south to San Francisco Bay in California. The Project study area is located in the Oregon Coast range and is characterized by thick coniferous forests and high rainfall ranging from 60-120 inches of precipitation annually (ODFW 2006).

The Coast Range ecoregion has been subdivided into seven EPA Level IV ecoregions, the Project study area falls in only one Level IV ecoregion: Volcanics. The Volcanics ecoregion occurs in disjointed areas along the Pacific Ocean from Cannon Beach to Florence as well as inland about 60 miles (OWEB 2001). This ecoregion is characterized by steeply sloping mountains with basaltic substrate. There are medium to large streams that drain predominantly to the Pacific Ocean or into larger rivers that eventually drain into the ocean, such as in the Project study area. The region has wet winters and relatively dry summers, with mean annual precipitation varying from 7 to 120 inches (OWEB 2001).

The Project is located within the western hemlock (*Tsuga heterophylla*) vegetation zone of the Coast Range Province (Franklin and Dyrness 1988). Western hemlock is the climax forest species in undisturbed vegetation communities in this zone, although large areas are dominated by Douglas-fir (*Pseudotusuga menziessii*) as a result of fires and timber management practices. Other climax species include Western red cedar (*Thuja plicata*).

Dry site understories are characterized by ocean spray (*Holodiscus discolor*), salal (*Gaultheria shallon*) or both. Moister sites are typified by sword fern (*Polystichum munitum*) and wood sorrel (*Oxalis oregana*), with the wettest forested sites indicated by skunk cabbage (*Lysichiton americanum*), and water sedge (*Carex aquatilis*). Intermediate sites in higher elevations are typified by Oregon grape (*Mahonia nervosa*) and sword fern.

In recently logged sites, slash is typically abandoned on site leaving disturbed soils and an open canopy. Typical shrub species in such sites include vine maple (*Acer circinatum*), trailing blackberry (*Rubus ursinus*), Oregon grape, salal, and several different willow (*Salix*) species. Dominant herbaceous species include various grasses, fireweed (*Epilobium angustifolium*), and bracken fern (*Pteridium aquifolium*) as well as dense communities of non-native invasive species including Himalayan blackberry (*Rubus armeniacus*), Scot's broom (*Cytisus scoparius*), bull thistle (*Cirsium vulgare*), and meadow knapweed (*Centaurium pratensis*) (Franklin and Dyrness, 1988).

1.4 Local Soil Types

Table 1-2 lists the soils in the Project study area mapped by the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). These soil units are described in the *Soil Survey of Columbia County, Oregon* (NRCS 1986). The **Figure A-3** map set, in **Appendix A**, shows the mapped soil units within the study area. There are four hydric soil units in the Project study area, these are all located north of Highway 30.

Table 1-2: Soils in the Project Study Area

Map Unit Code	Map Unit Name	Acres	Percent of Study Area	Hydric Rating (Percent)
15	Crims silt loam, protected	33.57	8	99
66	Wauna silt loam, protected	49.20	12	98
29	Locoda silt loam, protected	31.01	8	97
68	Wauna-Locoda silt loams, protected	12.52	3	94
58	Treharne silt loam	2.24	1	4
12E	Caterl gravelly silt loam, 30 to 60 percent south slopes	12.71	3	0
36D	Murnen silt loam, 3 to 30 percent slopes	45.14	11	0
3E	Alstony gravelly loam, 30 to 60 percent north slopes	6.19	2	0

Table 1-2: Soils in the Project Study Area				
Map Unit Code	**Map Unit Name**	**Acres**	**Percent of Study Area**	**Hydric Rating (Percent)**
49E	Scaponia-Braun silt loams, 30 to 60 percent north slopes	1.06	0	0
4E	Alstony gravelly loam, 30 to 60 percent south slopes	0.10	0	0
50E	Scaponia-Braun silt loams, 30 to 60 percent south slopes	1.79	0	0
56D	Tolke silt loam, 5 to 30 percent slopes	47.58	12	0
5D	Anunde silt loam, 3 to 30 percent slopes	86.46	21	0
64E	Wauld very gravelly loam, 30 to 70 percent slopes	3.45	1	0
7D	Braun-Scaponia silt loams, 5 to 30 percent slopes	45.33	11	0
9F	Braun-Scaponia silt loams, 60 to 90 percent south slopes	0.41	0	0
W	Water	4.69	1	0
61	Udipsamments, nearly level, protected	26.02	6	97

1.5 Historic and Current Land Uses

Current land use in the study area is primarily private timber lands, agriculture lands and poplar plantations. There are no towns within the study area; nearby towns include Mist and Clatskanie in Columbia County (**Figure A-1**).

Lands within the Project study area located south of Highway 30 are intensively managed for timber production, with large tracts of land owned and administered by Weyerhaeuser. Much of the land north of Highway 30 has been converted for agricultural and poplar plantations through the diking and draining of wetlands (OSU 2008). Land use north of Highway 30 is predominantly agriculture, grazing, poplar plantations, and oil and gas production.

Public recreational use is limited.

1.6 Waterbody Crossings and Water Resources

The proposed Project crosses two 4th level Hydrologic Unit Code (HUC) drainage basins: Lower Columbia-Clatskanie and Nehalem. Major named rivers and perennial streams in the level 4 HUC drainage basins within the Project Area include from north to south: Larson Slough, Clatskanie River, Beaver Slough, Graham Creek and Beaver Creek. Smaller perennial and intermittent streams within the Project are discussed in Section 5.2 of this report.

Surface water in the Project study area flows predominantly north and west toward the Columbia and south toward the Nehalem River. Drainages in Lower Columbia- Clatskanie basin

predominantly flow north via Graham Creek and Fall Creek, where they end up flowing into the Clatskanie River and Beaver Slough, which eventually flows into the Columbia River. Ditches and streams in the northern part of the basin flow into Larson Slough, which flows into the Columbia River. The Columbia River is approximately 1 mile northwest of the northern edge of the Project. Drainages in Nehalem basin predominantly flow south into Beaver Creek and Lindgren Creek which eventually flow into the Nehalem River. The Nehalem River is approximately 1.5 miles south of the southern edge of the Project.

Elevations across the Project study area range from approximately sea level at the north end to approximately 1,700 feet at the south end. Much of the Project study area north of Highway 30 is within the mapped 100-year floodplain of the Columbia River and is occasionally flooded.

2.0 Site Alterations

Site alterations are those activities that directly or indirectly impact wetlands and other waters such that the function or area of the wetland or other water changes significantly. A significant alteration is one that renders the wetland or other water non-functioning or one that changes the boundaries of the wetland or other water. Land use in the Project study area is generally dominated by historic and current timber practices and agriculture. Ditching, road building, and other drainage alterations associated with these practices may have affected the geographic size and/or the hydroperiod of wetlands and other waters. Land north of Highway 30 has been converted for agricultural and poplar plantations through the dredging, diking and draining of wetlands (OSU 2008). Lands south of Highway 30 predominantly support the timber industry. Other alterations include transmission lines and railroads.

Where livestock is present on agricultural lands, wetlands and streams have been altered by compacting soils, trampling and grazing of existing vegetation, especially riparian areas, introducing and spreading non-native invasive plant species in the disturbed wetland soils, and reducing water quality by depositing manure and increasing sedimentation through trampling of stream-side soil and vegetation. Alterations associated with livestock affect the vegetation, soils, and hydrologic conditions within the respective wetlands but they do not generally affect the geographic area of the wetlands.

3.0 Precipitation Data and Analysis

Precipitation data for the duration of the wetland delineations was obtained from NRCS Field Office Technical Guide at the Clatskanie weather station (NRCS 2014). These data characterize the climate-sourced hydrology for the water resources examined from May 13 through July 18, 2013, April 7 through May 29, 2014 and February 12, 2015. **Table 3-1** shows the accumulated precipitation for the water year (WY) per month and actual monthly precipitation amounts, and compares the actual monthly totals with historic averages found in Wetlands Determination (WETS) table for Station 351643 in Clatskanie Oregon (NRCS 2014). Daily precipitation amounts

for the 2 weeks prior to the first day of the field investigation, plus those for the remainder of the delineation, are provided in **Appendix D, Table D-1**.

Table 3-1: Current and Historic Precipitation Data at Clatskanie (Inches)

Month	Total (inch)	WETS Average	Precipitation Relative to Average Monthly Total	WETS Normal Range	Water Year (inch)	Wets Accumulated Monthly Average	Precipitation Relative to Average Water Year	Outcome Monthly Precipitation to WETS Range
Oct-12	7.72	4.08	189.22%	2.07 – 4.98	7.72	4.08	189.22%	Above
Nov-12	9.48	8.84	107.24%	5.76 – 10.63	17.2	12.92	133.13%	Within Range
Dec-12	13.26	8.98	147.66%	6.12 – 10.72	30.46	21.9	139.09%	Above
Jan-13	4.83	8.28	58.33%	4.97-10.04	35.29	30.18	116.93%	Below
Feb-13	3.69	6.7	55.07%	4.45- 8.10	38.98	36.88	105.69%	Below
Mar-13	4.47	5.94	75.25%	4.27 - 7.01	43.45	42.82	101.47%	Within Range
Apr-13	3.91	4.08	95.83%	2.78 - 4.87	47.36	46.9	100.98%	Within Range
May-13*	5.14	2.69	191.08%	1.77 – 3.23	52.5	49.59	105.87%	Above
Jun-13	2.1	1.83	114.75%	1.26 – 2.18	54.6	51.42	106.18%	Within Range
Jul-13*	0	0.84	0.00%	0.36 – 1.03	54.6	52.26	104.48%	Below
Aug-13	0.84	0.96	87.50%	0.37 – 1.16	55.44	53.22	104.17%	Within Range
Sep-13	9.43	2.22	424.77%	0.66 – 2.63	64.87	55.44	117.01%	Above
WY to-date Sept 30	64.87	55.44	NA	34.84 - 66.58	64.87	55.4	NA	Within Range
Oct-13	2.1	4.08	51.47%	2.07 – 4.98	2.1	4.08	51.47%	Below
Nov-13	4.29	8.84	48.53%	5.76 – 10.63	6.39	12.92	49.46%	Below
Dec-13	3.57	8.98	39.76%	6.12 – 10.72	9.96	21.9	45.48%	Below
Jan-14	7.94	8.28	95.89%	4.97-10.04	17.9	30.18	59.31%	Within Range
Feb-14	7.53	6.7	112.39%	4.45- 8.10	25.43	36.88	68.95%	Within Range
Mar-14	11.2	5.94	188.55%	4.27 - 7.01	36.63	42.82	85.54%	Above
Apr-14*	5.89	4.08	144.36%	2.78 - 4.87	42.52	46.9	90.66%	Above
May-14*	2.45	2.69	91.08%	1.77 – 3.23	44.97	49.59	90.68%	Within Range
Jun-14	1.37	1.83	74.86%	1.26 – 2.18	46.34	51.42	90.12%	Within Range
Jul-14	0.7	0.84	83.33%	0.36 – 1.03	47.04	52.26	90.01%	Within Range
Aug-14	0.78	0.96	81.25%	0.37 – 1.16	47.82	53.22	89.85%	Within Range
Sep-14	2.17	2.22	97.75%	0.66 – 2.63	49.99	55.44	90.17%	Within Range
WY to-date Sept 30	49.99	55.44	NA	34.84 - 66.58	49.99	54.44	NA	Within Range
Oct-14	7.22	4.08	176.96%	2.07 – 4.98	7.22	4.08	176.96%	Above
Nov-14	5.35	8.84	60.52%	5.76 – 10.63	12.57	12.92	97.29%	Within Range
Dec-14	8.59	8.98	95.66%	6.12 – 10.72	21.16	21.9	96.62%	Within Range

Table 3-1: Current and Historic Precipitation Data at Clatskanie (Inches)								
Month	**Total (inch)**	**WETS Average**	**Precipitation Relative to Average Monthly Total**	**WETS Normal Range**	**Water Year (inch)**	**Wets Accumulated Monthly Average**	**Precipitation Relative to Average Water Year**	**Outcome Monthly Precipitation to WETS Range**
Jan-15	8.06	8.28	97.34%	4.97-10.04	29.22	30.18	96.82%	Within Range
Feb-15*	5.78	6.7	86.27%	4.45- 8.10	35	36.88	94.90%	Within Range
WY to-date Feb 12	35	36.88	NA	23.37 - 44.47	105.17	105.96	NA	Within Range
*Field months								

3.1 Precipitation for 2013 Surveys

The Clatskanie weather station precipitation data and NRCS WETS table shows that the 64.87 inches of precipitation recorded for the water year (October 1, 2012 through Sept 30, 2013), is within the normal range of precipitation for this period (34.84 – 66.58). For the three months preceding the start of field work in 2013, precipitation amounts relative to the NRCS WETS average monthly total averaged 75 percent, with March and April being below average but within the normal range of precipitation. February was below average and below normal range of precipitation.

Of note is that the monthly percent of average precipitation for May, the month of field work, was above average and outside of the normal range. Recorded totals exceeded the upper range of normal for this month by 2.45 inches. This level contrasted sharply with later-season field work when the precipitation relative to the average monthly total were zero percent for July.

Because precipitation levels swung above normal NRCS WETS precipitation range in May and slightly below normal precipitation range in July, groundwater and surface flow were estimated to be at or just above their normal levels.

3.2 Precipitation Data for 2014 Surveys

The Clatskanie weather station precipitation data and NRCS WETS table shows that the 44.97 inches of precipitation recorded for the water year (October 1, 2013 through May 29, 2014), is within the normal range of precipitation for this period (32.19 – 59.58). For the three months preceding the start of field work in 2014, precipitation amounts relative to the average monthly total averaged 109 percent, with January and February being below average and within the normal range of precipitation. March was well above average and within the normal WETS range of precipitation.

Of note is that the monthly percent of average precipitation for March, the month just before field work began, was above average and outside of the normal range. Recorded totals exceeded the

upper range of normal for this month by 5.26 inches. This level contrasts with field work in May when the recorded totals were below average and within normal range.

Groundwater and surface flow were estimated to be at or just above their normal levels due to the high precipitation levels recorded in March and below average and within normal range for May.

3.3 Precipitation Data for 2015 Surveys

The Clatskanie weather station precipitation data and NRCS WETS table shows that the 35.0 inches of precipitation recorded for the water year (October 1, 2014 through February 12, 2015), is within the normal range of precipitation for this period (23.37-44.47). For the 3 months preceding the start of field work in 2015, precipitation amounts relative to the average monthly total averaged 97 percent, where all 3 months were within the normal range of precipitation.

Groundwater and surface flow were estimated to be at their normal levels since all 3 months were within the normal range.

3.4 Conclusion

Higher than average precipitation levels in the spring of 2013 made delineations difficult because there was water in both the wetland and uplands. However, in 2014 there was a route change and wetlands and other waters were re-delineated. Higher than average spring precipitation in 2014 did not affect the delineation of wetlands, as evidence of hydrology was not observed in locations with non-hydric soils or non-hydrophytic vegetation. Higher than average precipitation levels did not affect the delineation of other waters as determinations of intermittent versus ephemeral streams were made using indicators described in the Oregon Streamflow Duration Assessment Method (OSDAM) (Nadeau 2011), which relies on multiple indicators independent of the presence or absence of hydrology. In 2015, precipitation levels were within range; therefore climatic and hydrologic conditions were typical.

4.0 Methods

4.1 Pre-field Data Review

Prior to the on-site investigation, an analysis of the mapped soil units, recent aerial photographs, recent precipitation, USFWS National Wetland Inventory (NWI) maps, and the NHD maps was completed for the study area (USFWS 2012 and USGS 2001). Maps used in the field contained the NWI, NHD, soils units, and recent aerial photograph overlays. **Figure A-4** exhibits NWI-mapped features in the study area.

4.2 Wetland Delineation Methods

Field investigations for the delineation of wetlands and other waters included pedestrian surveys within the study area. The field delineation was conducted during the following time periods: May 13-31 and July 15-18 in 2013, and April 7-11 and May 27-29 in 2014 and Februarys 12, 2015.

Delineations covered areas where property access was allowed, approximately 99 percent of the study area.

The delineation was conducted utilizing techniques published in the 1987 US Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (USACE 2010), Oregon Administrative Rules (OARs) for Wetland Delineations 141-090-0005 through 141-090-0055 (Oregon Department of State Lands [ODSL], 2001), and *Delineations for Large Linear Projects* (ODSL 2013).

The Project is located within the Northwest Forests and Coasts Land Resource Region (Land Resource Region A) of the Western Mountains, Valleys and Coast Region (USACE 2010). Information was collected on wetlands and other waters as well as the connections to other surface waters of each wetland or waterway and estimated duration of streamflow within observed waterways per the methods described in the *US EPA and USACE 2008 Clean Water Act Jurisdiction Following the US Supreme Court's Decision in Rapanos v. United States & Carabell v. United States* (USACE 2008).

Paired sample points were used to determine wetland boundaries and were selected to best represent conditions in each wetland and adjacent upland location. Each of the sample plots was selected to be in close proximity to the line separating wetland from upland. Single sample plot locations were dug to confirm absence of wetland conditions at locations that appeared as potentially wetland on aerial maps, and to confirm upland conditions at some NWI mapped wetlands. Notes on the specific rationale used to select each sample plot location are included in the comment section for each data sheet. All data sheets are included in **Appendix B-1**.

The location of each wetland and upland sampling point was selected based on vegetation community homogeneity and points are considered representative of the vegetation community. At each sample plot, trees within a 30- foot radius, shrubs within a 15-foot radius, and non-woody herbaceous plants within a 5-foot radius of plot center, were identified and recorded on a wetland field data form. The dominant species for each stratum are defined as those that provide 20 percent or more cover. The indicator status of each of the dominant species was used to determine the presence of wetland vegetation. A sample plot is considered to have wetland vegetation if more than 50 percent of the dominant species have an indicator status of facultative (FAC) or wetter (FACW). Scientific nomenclature of all plant species follows that of the Hitchcock and Cronquist (1973). When plants could not be identified to species due to seasonal constraints or grazing, only the genus or plant community is listed and was given a FAC wetland indicator.

Soil samples were obtained at each representative sampling plot by digging a pit down to a depth of at least 20 inches, unless an impenetrable layer or rock prohibited digging. Soil samples were then examined for hydric indicators. Soil colors were evaluated against a Munsell soil color chart (GretagMacbeth LLC 2000). Wetland soil indicators primarily observed were Depleted Matrix (F3), Redox Dark Surface (F6) and Depleted Below Dark Surface (A11). Delineations on the floodplain were difficult because redoximorphic features were in the uplands as well as the wetlands. Soils on the floodplain were determined to have relic redoximorphic features where plants were not

hydrophytic because the hydric soils are now protected by the levee and drainage systems; therefore, the soils no longer meet hydrology criterion and are too dry to support a predominance of hydrophytes.

Wetland hydrology, if present, was generally determined through the presence of the primary indicators: High Water Table (A2), Saturation (A3), Hydrogen Sulfide Odor (C1) and Stunted or Stressed Plants (D1). When two or more secondary hydrology indicators were found, they were typically Geomorphic Position (D2), and FAC-Neutral Test (D5). Many of the wetlands have seasonal primary hydrology due to the Pacific Northwest climate; therefore, primary hydrology indicators may not be present during the summer.

Climatic and hydrologic conditions were considered not typical during field visits in spring of 2013 (May delineations). Regional precipitation levels were below average rainfall, but within normal range reported by the WETS station for this area. In May of 2013, regional precipitation levels were above average; therefore, the surveys later in the season (July) were considered typical. Hydrologic conditions in late May 2013 were difficult to delineate because the uplands had standing water. Many of the wetlands on the floodplain in 2013 were re-delineated in 2014 due to re-routes. In 2014 and 2015 climatic and hydrologic conditions were considered typical during field visits. **Appendix D, Table D-2** lists all wetlands delineated during 2013, 2014 and 2015 surveys.

4.3 Other Waters Field Methods

Boundaries of waterways such as ditches, streams, and rivers were delineated utilizing ODSL Field Determination of Ordinary High Water Mark (OHWM) guidelines per Oregon Administrative Rule (OAR) 141-085-0010(150). These generally included a combination of the following:

- Distinct high water demarcation along the stream banks;
- Top of bank where a high water line was not discernible;
- Change in dominant vegetation from wet-tolerant to dry-tolerant species;
- Debris line;
- Changes in the character of the soil; and
- Scour.

Streams are classed as perennial, intermittent, or ephemeral according to water permanence. Streams are determined to be perennial if they flow continuously throughout the year and methodology included direct observation during the site visit. Intermittent streams are larger drainages that receive baseflow only during the wet weather season. Methods for classifying intermittent streams, as detailed in OSDAM (Nadeau 2011), include position in the landscape, indicators of flow level and velocity, hydrophytic plant species in or adjacent to stream banks, indicators of prolonged soils saturation within the channel, well developed banks, and a defined developed meandering channel with scour and deposition. Ephemeral drainages are in the upper reaches of the landscape and only flow in direct response to precipitation. Ephemeral determinations were made if features had straight, poorly developed stream channels tending to flatten out at the base of slopes, and upland vegetation dominated the channel. The geomorphology, hydrology, and dominate vegetation data was collected at each feature and listed on **Table D-3 in**

Appendix D. Additional information recorded included vegetation, channel depth, and site alterations, if any. Where an OSDAM was recorded, the data sheets are included in **Appendix B-2**.

Ponds and seeps were also delineated during surveys and are listed on **Table D-3 in Appendix D**.

4.4 Other Features

Stream channels viewed on aerial photos and NHD maps were examined for channel structure and potential hydrology. In some cases, these features that appeared to be wetland swales or channels on aerial photos turned out to be erosional features that lacked channel structure and a defined OHWM. These features may have occasional flow after precipitation. In cases where features were determined to lack channel characteristics, they were mapped as erosional features, labeled "XBB" and photographed. These features are found on **Table D-4 in Appendix D**.

5.0 Descriptions of All Wetlands and Other Waters

All wetlands and other waters evaluated in the study area are depicted in **Appendix A, Figure A-5**. These figures are provided at three scales. **Figure A-5** is a large-scale (1:65,700) index figure depicting the location of an interim-scale (1:12,000) **Figure A-5.1** through **Figure A-5.6**. The interim scale depicts the locations of the detail scale (1:1,000) **Figure A-5.1.1** through **Figure A-5.1.86**.

Wetland and stream codes in the text, on the maps, and in the tables may not be sequential. Wetlands are coded with the "WET" and a letter(s): WET A or WET AA. Streams are coded based on flow duration such as "EPH" or "STRM" followed by numbers: EPH 01 is an ephemeral stream; STRM 01 is an intermittent or perennial stream. Sample plots are coded "SP", the wetland letter(s) and a number: SP A-01 or SP AA-01. When soils are sampled to confirm non-NWI or non-hydric soils, the sample plot code will not have a wetland letter: SP 01.

Detailed wetland and water descriptions are provided in table format in **Appendix D, Table D-2** and **D-3**. Individual wetland and stream data sheets are provided in **Appendix B** and photographs are provided in **Appendix C**.

5.1 Wetlands

Within the study area, wetland features were identified, evaluated, and delineated. Thirty nine wetlands occur within the study area. **Table D-2 in Appendix D** summarizes all wetland features observed and delineated within the Project study area. Notes pertaining to specific characteristics for each feature surveyed have been included. Wetland types crossed by the Project include Palustrine Emergent Wetlands (PEM), and Palustrine Forested Wetlands (PFO). PEM wetlands include roadside ditch wetlands and wetlands associated with clearcuts that may have been rivers prior to forest practices. PFO wetlands were typically found in poplar plantations, which are crop, not native forest.

In the following description of the vegetation on site, the species name is followed by the wetland indicator status for plants as listed in the National Wetland Plant List for Oregon 2013, Version 1 (USACE 2013). Vegetation and wetlands within the Project Area are dominated by plant species with a wetland indicator of FAC. For wetlands on the floodplain dominant species include balsam poplar (*Populus balsamifera)* (FAC), field horsetail (*Equisetum arvense)* (FAC), rough stalk bluegrass (*Poa trivialis)* (FAC), soft rush (*Juncus effusus)* (FACW), common velvet grass (*Holcus lanatus)* (FAC), reed canary grass (*Phalaris arundinacea)* (FACW) and field meadow foxtail (*Alopecurus pratensis)* (FAC). Wetlands south of Highway 30, in the forest comprise of wetlands in clearcut, roadside ditches, and adjacent to streams. Dominant wetland species include western hemlock (FACU), red alder (*Alnus rubra*)(FAC), skunk cabbage (OBL), reed canary grass (FACW), Siberian springbeauty (*Claytonia sibirica)* (FAC), lady fern (*Anthyrium filix-femina)* (FAC), and Pacific golden saxifrage (*Chrysosplenium glechomifolium)* (OBL).

5.2 Other Waters

Waters **Table D-3**, located in **Appendix D**, lists all drainage ditches, ephemeral, intermittent, and perennial channels, ponds and seeps and springs found within the study area.

Perennial single thread drainage ditches are the most common type of stream morphology in the Project study area. These features are located north of Highway 30. A total of 7.74 acres of other waters were delineated within the study area.

5.3 Other Features

Table D-4, included in **Appendix D**, lists other features that were identified within the portion of the study area observed during field investigations that did not meet the wetlands or waters criteria but are worth documenting. Many of these features document upland conditions.

6.0 Deviations from Local Wetlands Inventory and National Wetlands Inventory

Deviations are features that are mapped by the NWI that differ from field observations. **Table D-5**, included in **Appendix D**, provides a list of the wetlands and waters delineated as deviations. In addition, features determined in the field to be wetlands or other waters that were not mapped by the NWI, and streams that had a different flow regime than mapped, are also included in **Table D-5**.

The Project comes in proximity to town of Clatskanie, which has completed a Local Wetlands Inventory (LWI) (ODSL 2014). However, the study area does not cross the mapped LWI areas (ODSL 2014).

7.0 Mapping Method

All field data were collected using a survey grade Trimble GeoXH handheld GPS. Field data was then differentially corrected in post-processing using same time data from known surrounding base stations. Position dilution of precision was limited to a value of 6 or less to maintain data quality. Trimble GeoXH data has submeter accuracy when using real-time differential correction.

Wetland boundaries were recorded as polygon features. Locations of sample plots, photograph locations, and other data collection sites were recorded as GPS point features.

Other waters were recorded as polyline features. Streams wider than 2 meters, regardless of their duration of flow, were documented with 2 line features, one representing OHW stage on each side of the channel. Streams less than 2 meters wide were documented as a single centerline of the channel. These small streams were documented with a centerline because the combination of the estimated accuracy of the GPS equipment and software (1 meter) and the mapping scale would not reliably result in the features being depicted as polygons if the data was collected as such.

Wetlands and other waters are detailed in **Figure A-5.1.1** through **Figure A-5.1.86** at 1:1000 scale. These figures depict the locations where features were recorded during field investigations. Areas outside the figure boundaries were sampled; however, no features were recorded and maps have not been generated for those areas.

On **Figure A-5.1.1** through **Figure A-5.1.86**, direction of flow arrows have been included for all stream features mapped and arrows have been added where wetlands or other waters continue off site on the detailed 1:100 maps.

8.0 Additional Information

Please refer to wetland and other waters summary tables in **Appendix D**.

9.0 Results and Conclusions

Based on the results of site investigations from May 13-31 and July 15-18 in 2013, and April 7-11 and May 27-29 in 2014 and February 12, 2015, 39 wetlands and 67 other water features were identified within the Project study area. **Table 9-1** summarizes wetland features observed within the study area by wetland type classifications.

Table 9-1: Summary of Identified Wetland Features		
Wetland Type	**Number of Features**	**Acres**
PEM	32	31.09
PEM-PFO	5	5.58
PFO-PEM	2	0.40
TOTAL	**39**	**37.07**

Table 9-2 summarizes the other water features delineated within the Project study area by water type.

Table 9-2: Summary of Identified Other Waters		
Feature	**Number of Features**	**Acres**
Ephemeral	14	0.13
Intermittent	10	0.07
Perennial	34	6.92
Pond	6	0.60
Seep/Spring	3	0.02
TOTAL	**67**	**7.74**

10.0 Disclaimer

This report documents the investigation, best professional judgment and conclusions of the investigator. 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 one's own risk unless it has been reviewed and approved in writing by ODSL in accordance with OAR 141-090-0005 through 141-090-0055.

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APPENDIX A: FIGURES

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-1 PROJECT OVERVIEW INDEX MAP

- Wetland and Waters Study Area
- City/Town
- County Boundary
- Highway
- Road

0 0.5 1
Miles

1:90,000

WGS 84
UTM 10

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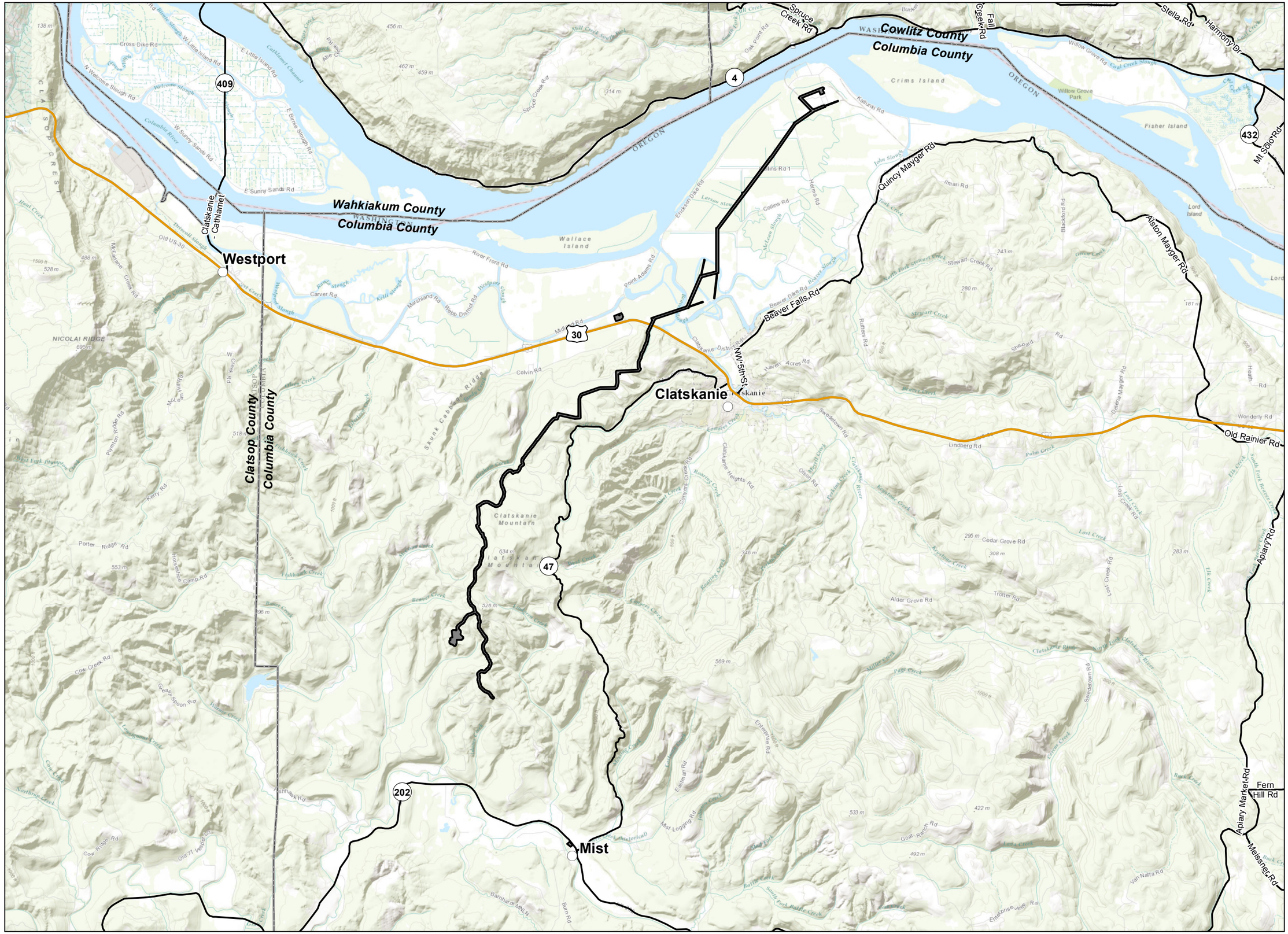

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-2 TAX LOT INDEX MAP

- A2 Map Grid
- Wetland and Waters Study Area
- City/Town
- Highway
- Road

0 0.5 1
Miles
1:90,000

WGS 84
UTM 10

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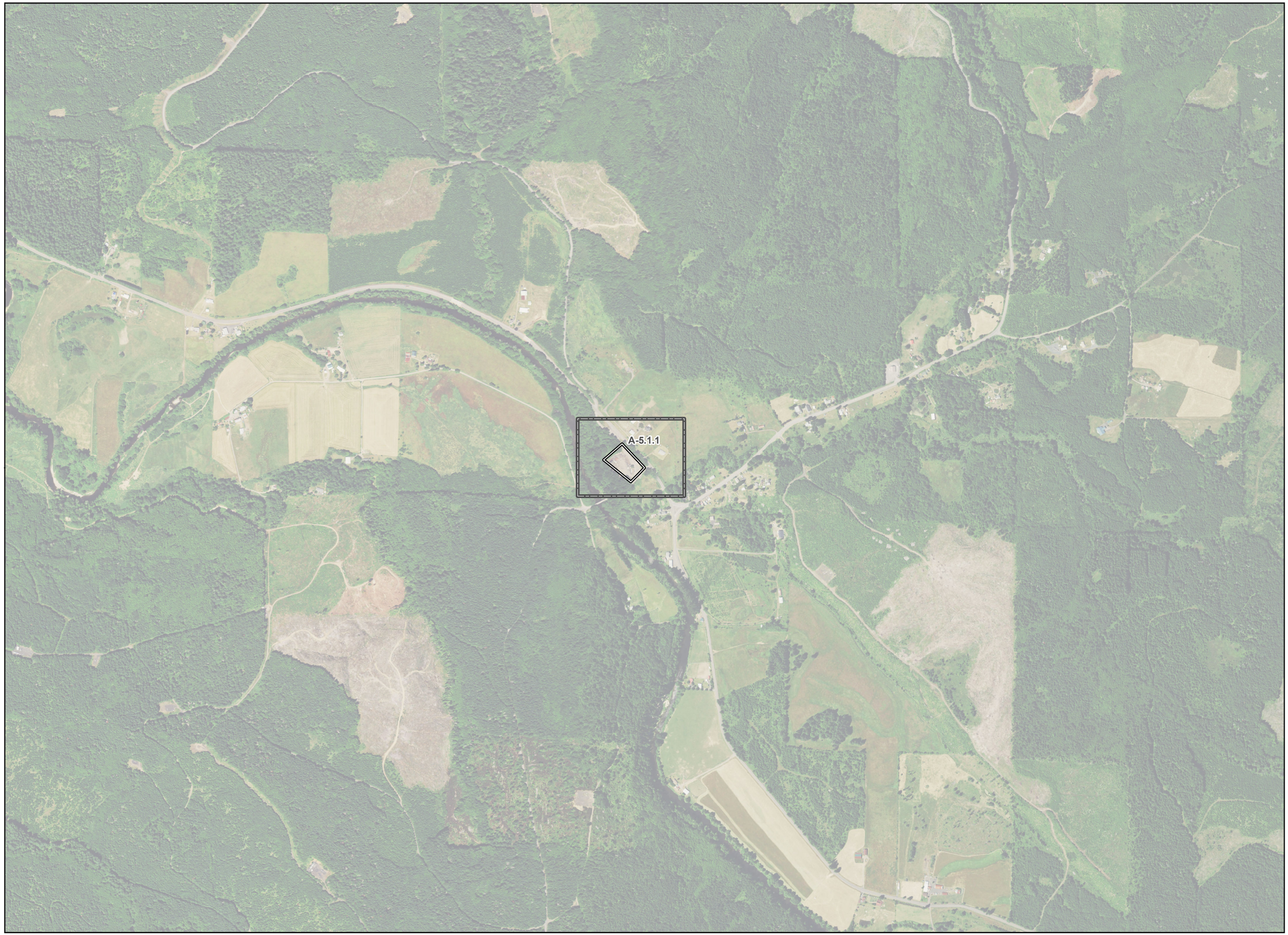
NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-2.1
TAX LOT MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- Taxlot Boundary



0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

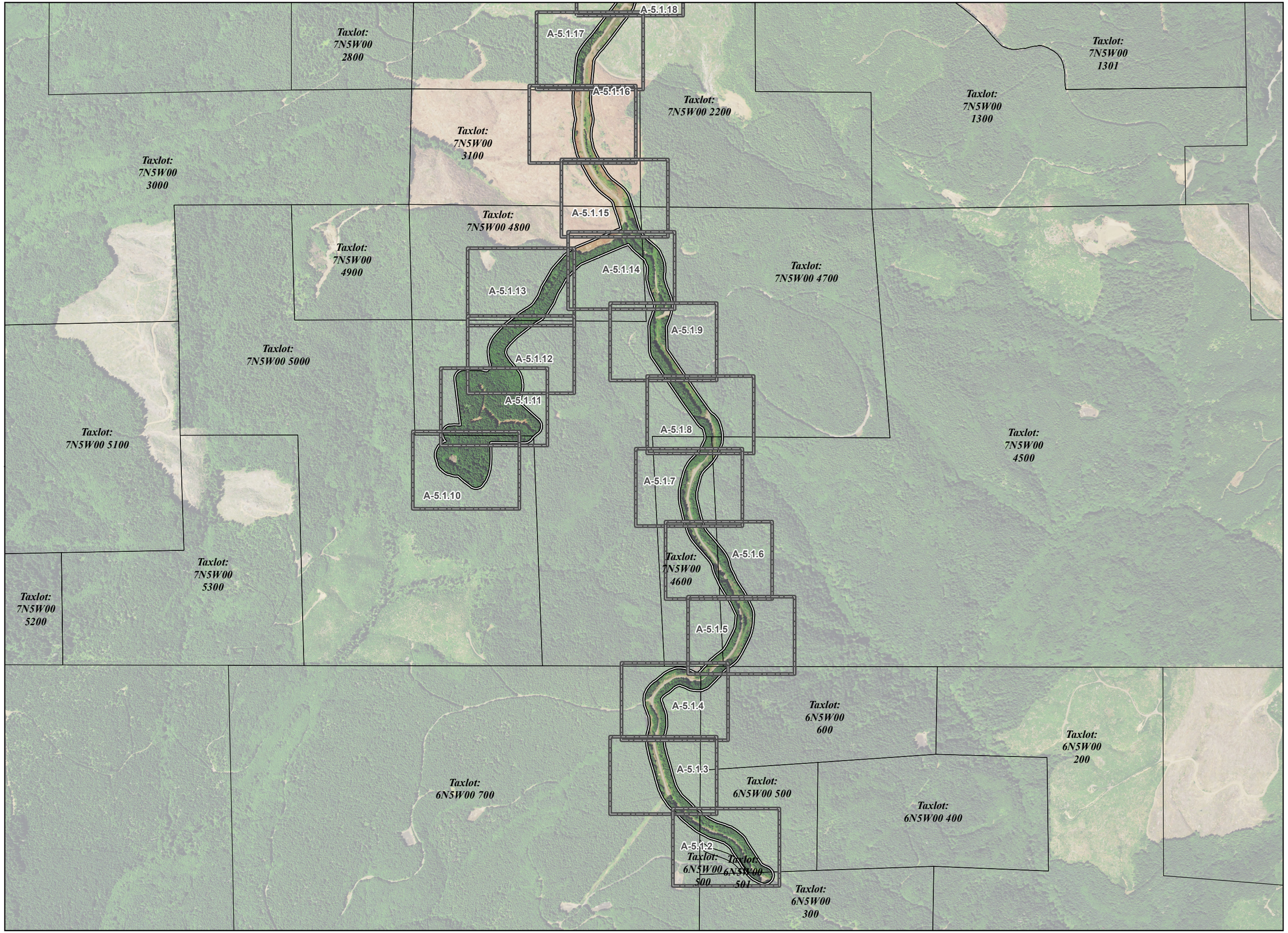
WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-2.2
TAX LOT MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- Taxlot Boundary

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-2.3
TAX LOT MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- Taxlot Boundary

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

P:\GIS_PROJECTS\NW_NaturalNorthMistExpansion\MXDs\ASCIExhibit_JWetland_Delineation_ReportNWN_NorthMistExpansion_WetlandDelineation_A-2_DETAILS_1711i_20150422.mxd

Taxlot: 7N5W00 1100

Taxlot: 7N5W00 2200

Taxlot: 7N5W00 2700

Taxlot: 7N5W00 3000

Taxlot: 7N5W00 2800

Taxlot: 7N5W00 1300

Taxlot: 7N5W00 1301

A-5.1.32
A-5.1.31
A-5.1.30
A-5.1.29
A-5.1.28
A-5.1.27
A-5.1.26
A-5.1.25
A-5.1.24
A-5.1.23
A-5.1.22
A-5.1.21
A-5.1.20
A-5.1.19
A-5.1.18

NORTHWEST NATURAL

NORTH MIST EXPANSION

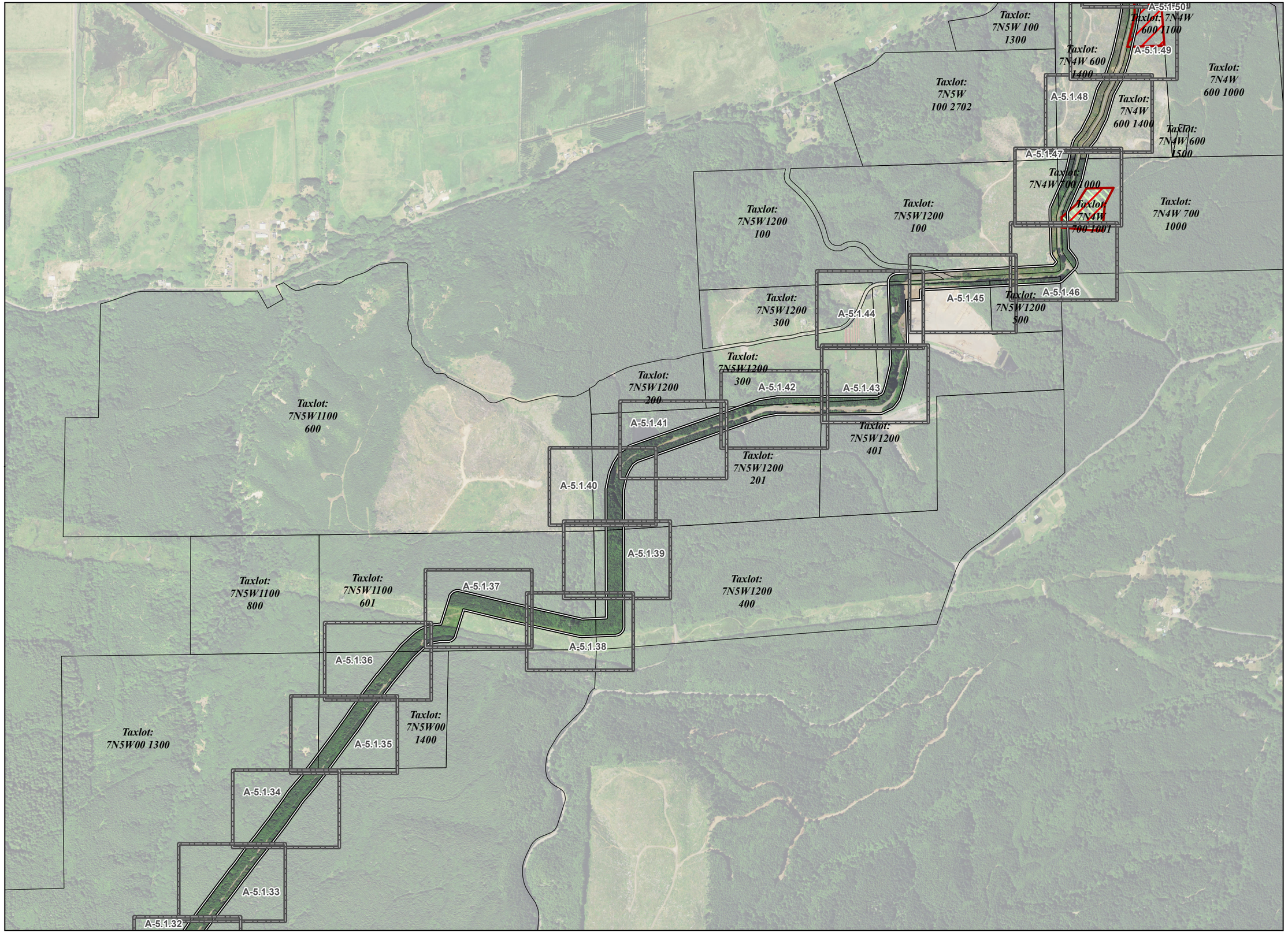
WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-2.4 TAX LOT MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)
- Early Access Granted then Rescinded
- Taxlot Boundary

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

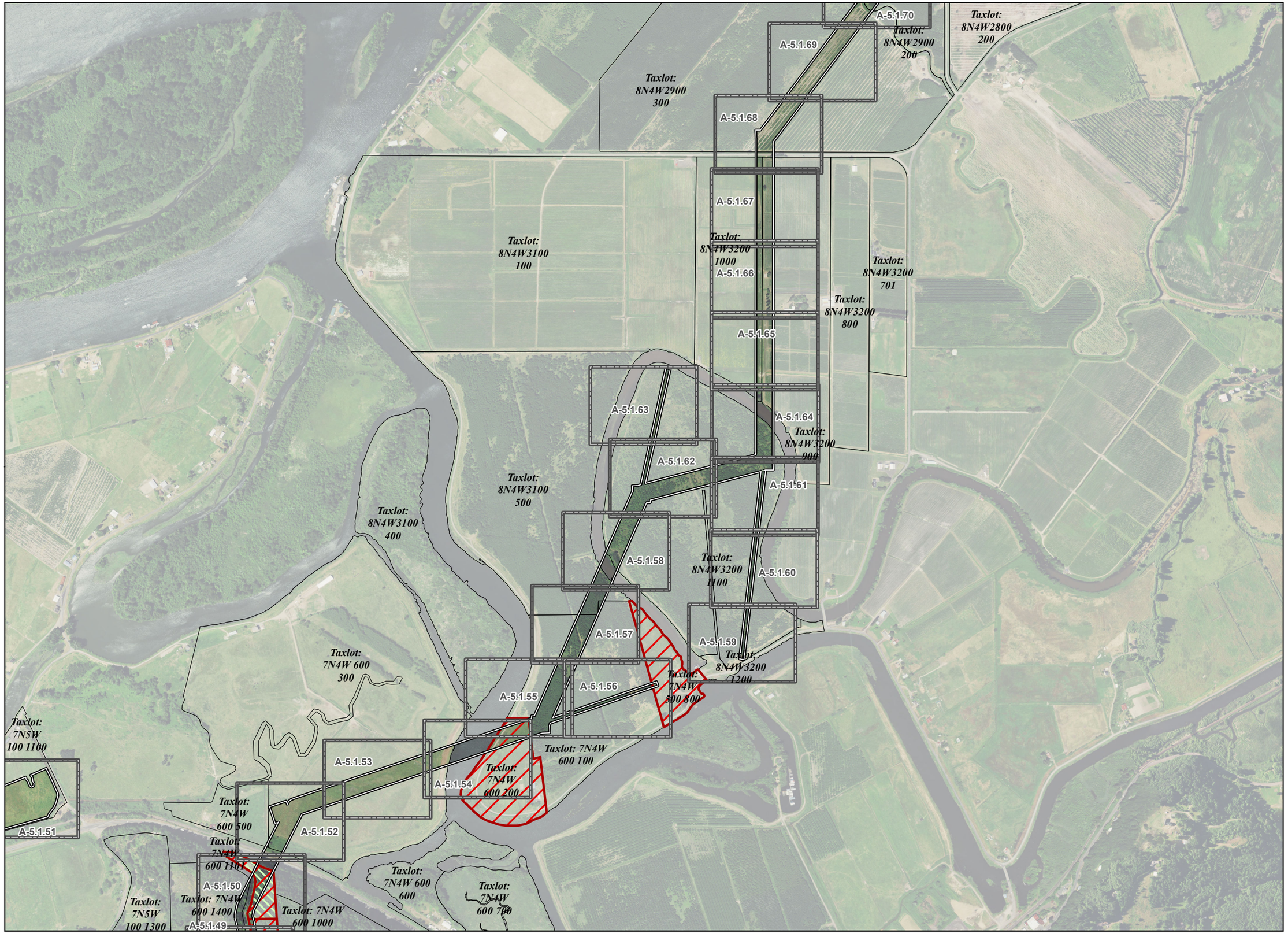
WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-2.5
TAX LOT MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)
- Early Access Granted then Rescinded
- Taxlot Boundary

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-2.6
TAX LOT MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)
- Taxlot Boundary

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCIExhibit_JWetland_Delineation_ReportNWN_NorthMistExpansion_WetlandDelineation_A-2_DETAILS_17i11i_20150422.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-3 SOILS INDEX MAP

- A3 Map Grid
- Wetland and Waters Study Area
- City/Town
- Highway
- Road

Figure A-3.1
Figure A-3.2
Figure A-3.3
Figure A-3.4
Figure A-3.5
Figure A-3.6

0 0.5 1
Miles
1:90,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-3 SOILS MAP LEGEND

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Map Symbol: Map Unit Name

11E: Caterl gravelly silt loam, 30 to 60 percent north slopes

12E: Caterl gravelly silt loam, 30 to 60 percent south slopes

15: Crims silt loam, protected

18E: Dowde silt loam, 30 to 60 percent north slopes

19E: Dowde silt loam, 30 to 60 percent south slopes

20: Eilertsen silt loam

23D: Goble silt loam, warm, 15 to 30 percent slopes

24: Hapludalfs-Udifluvents complex

26C: Kenusky silty clay loam, 0 to 15 percent slopes

28: Locoda silt loam

29: Locoda silt loam, protected

30D: Mayger silt loam, 3 to 30 percent slopes

32: McNulty silt loam

35B: Multnomah variant loam, 0 to 8 percent slopes

36D: Murnen silt loam, 3 to 30 percent slopes

37: Natal silty clay loam

3E: Alstony gravelly loam, 30 to 60 percent north slopes

3F: Alstony gravelly loam, 60 to 90 percent north slopes

44D: Rinearson silt loam, 3 to 30 percent slopes

49E: Scaponia-Braun silt loams, 30 to 60 percent north slopes

4E: Alstony gravelly loam, 30 to 60 percent south slopes

50E: Scaponia-Braun silt loams, 30 to 60 percent south slopes

56D: Tolke silt loam, 5 to 30 percent slopes

57D: Tolke-Alstony complex, 5 to 30 percent slopes

58: Treharne silt loam

59: Udifluvents-Dystrochrepts complex

5D: Anunde silt loam, 3 to 30 percent slopes

60: Udipsamments, nearly level

61: Udipsamments, nearly level, protected

62D: Vernonia silt loam, 3 to 30 percent slopes

64E: Wauld very gravelly loam, 30 to 70 percent slopes

66: Wauna silt loam, protected

67: Wauna-Locoda silt loams

68: Wauna-Locoda silt loams, protected

7D: Braun-Scaponia silt loams, 5 to 30 percent slopes

8F: Braun-Scaponia silt loams, 60 to 90 percent north slopes

9F: Braun-Scaponia silt loams, 60 to 90 percent south slopes

W: Water

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

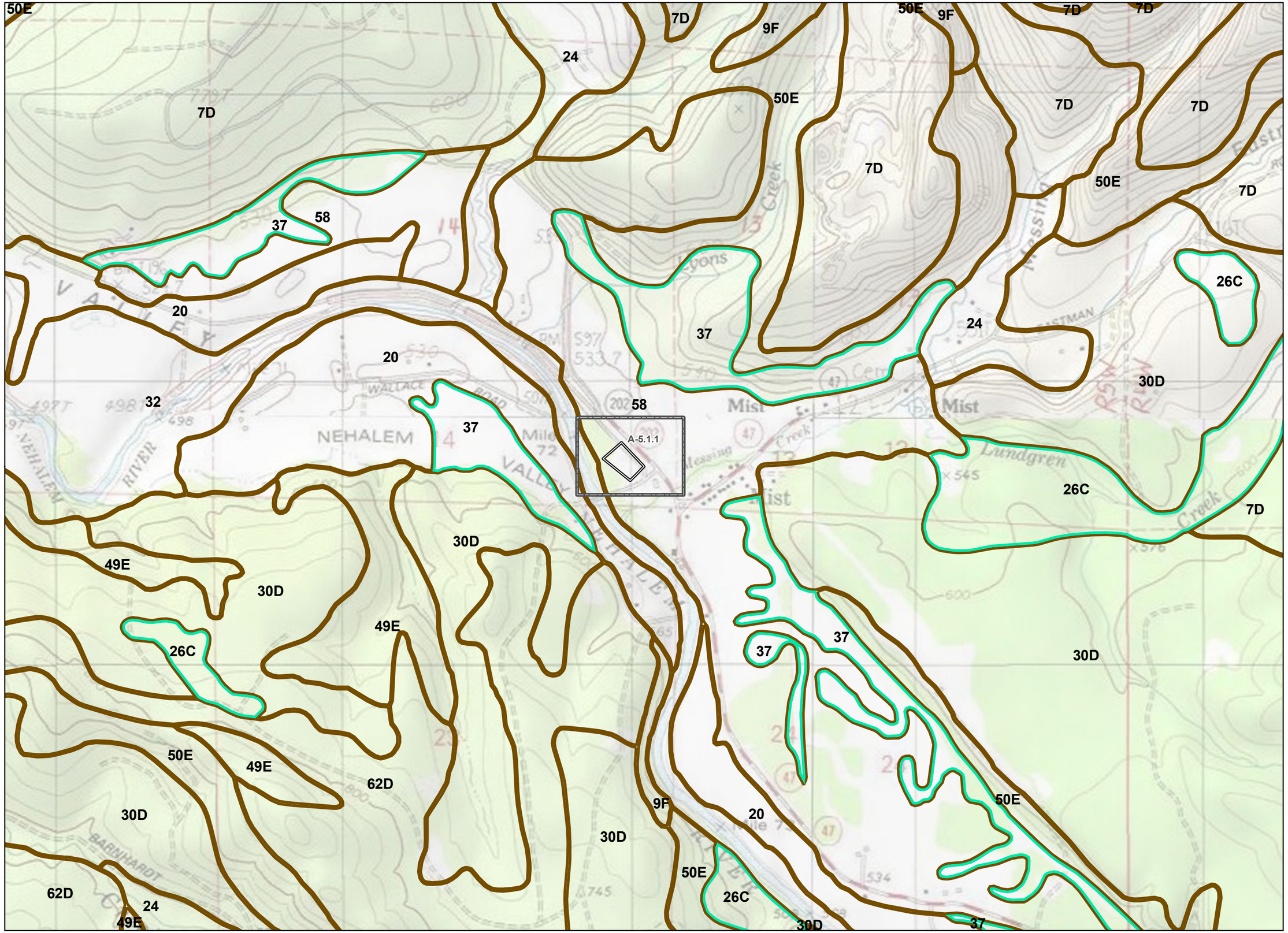
FIGURE A-3.1
SOILS MAP

- A-5 Map Grid
- Wetland and Waters Study Area

Hydric Rating
- Hydric
- Nonhydric

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-3.2 SOILS MAP

A-5 Map Grid

Wetland and Waters Study Area

Hydric Rating

Nonhydric

0 500 1,000

Feet

1:12,000

WGS 84
UTM 10

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A-5.1.18
A-5.1.17
A-5.1.16
A-5.1.15
A-5.1.14
A-5.1.13
A-5.1.12
A-5.1.11
A-5.1.10
A-5.1.9
A-5.1.8
A-5.1.7
A-5.1.6
A-5.1.5
A-5.1.4
A-5.1.3
A-5.1.2

4E 56D 3E 56D 50E 11E 49E 56D 4E 12E 12E 36D 4E 9F 49E 56D 50E 3E 56D 49E 4E 50E 8F 7D 56D 50E 9F 49E 7D 7D 56D 3E 7D 50E 56D 50E 44D 9F 56D

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-3.3
SOILS MAP

A-5 Map Grid

Wetland and Waters Study Area

Hydric Rating

Nonhydric

0 500 1,000
Feet

1:12,000

WGS 84
UTM 10

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50E 5D 49E 50E 9F 56D 50E 56D 50E 56D 9F 19E 19E 56D 19E 4E 3E 57D 4E 50E 3E 3F 57D 56D 4E 4E 56D 4E 50E 3E 56D 12E 36D 12E 11E 50E 49E 4E

A-5.1.32
A-5.1.31
A-5.1.30
A-5.1.29
A-5.1.28
A-5.1.27
A-5.1.26
A-5.1.25
A-5.1.24
A-5.1.23
A-5.1.22
A-5.1.21
A-5.1.20
A-5.1.19
A-5.1.18

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-3.4
SOILS MAP

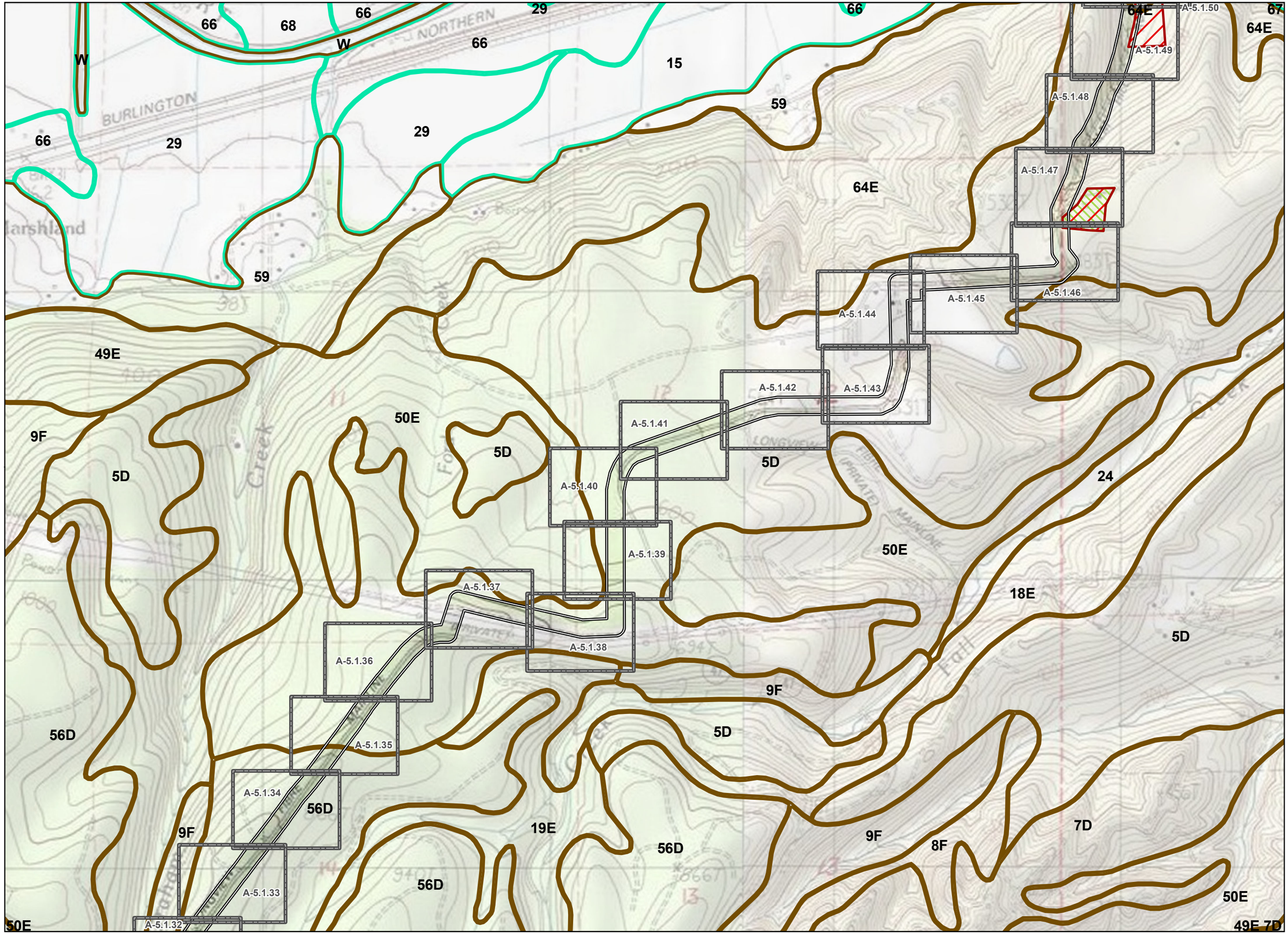
- A-5 Map Grid
- Wetland and Waters Study Area

Hydric Rating

- Hydric
- Nonhydric
- No Access (2/4/2015)
- Early Access Granted then Rescinded

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-3.5
SOILS MAP

- A-5 Map Grid
- Wetland and Waters Study Area

Hydric Rating

- Hydric
- Nonhydric
- No Access (2/4/2015)
- Early Access Granted then Rescinded

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

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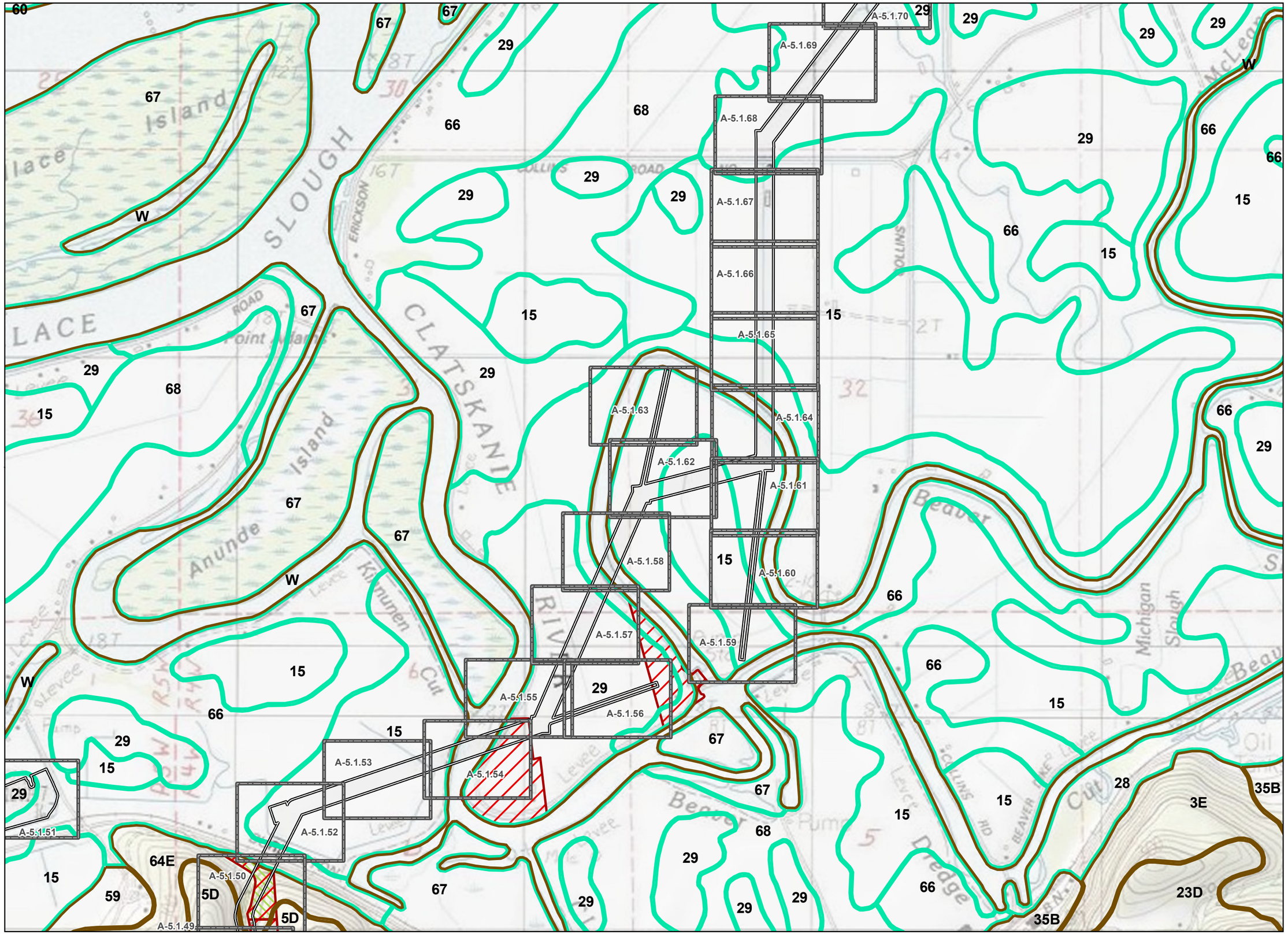

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-3.6
SOILS MAP

- A-5 Map Grid
- Wetland and Waters Study Area

Hydric Rating

- Hydric
- Nonhydric
- No Access (2/4/2015)

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

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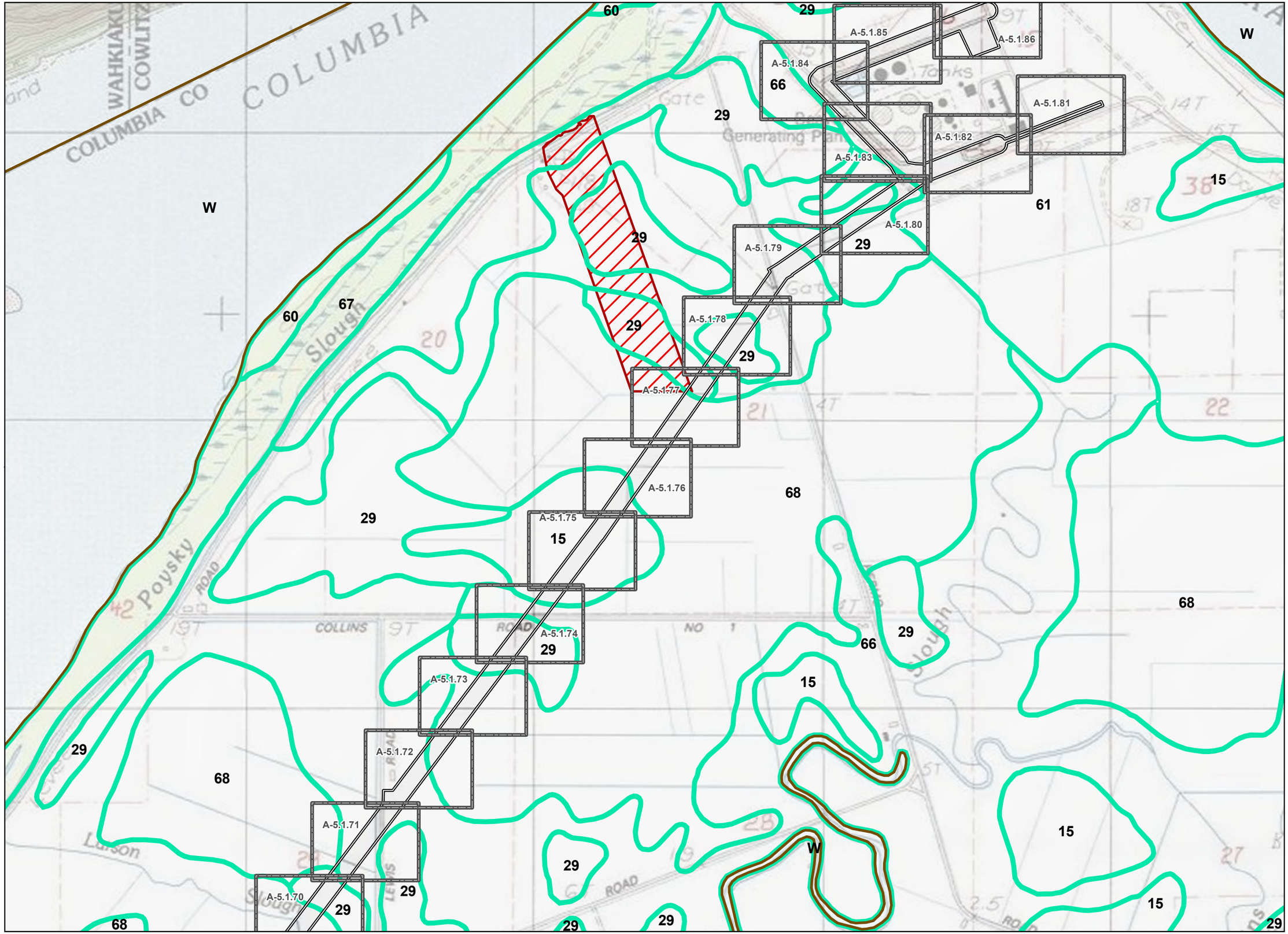

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-4 NATIONAL WETLAND INVENTORY INDEX MAP

- A3 Map Grid
- Wetland and Waters Study Area
- City/Town
- Highway
- Road

0 0.5 1
Miles
1:90,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-4.1
NATIONAL WETLAND INVENTORY MAP

- A-5 Map Grid
- Wetland and Waters Study Area

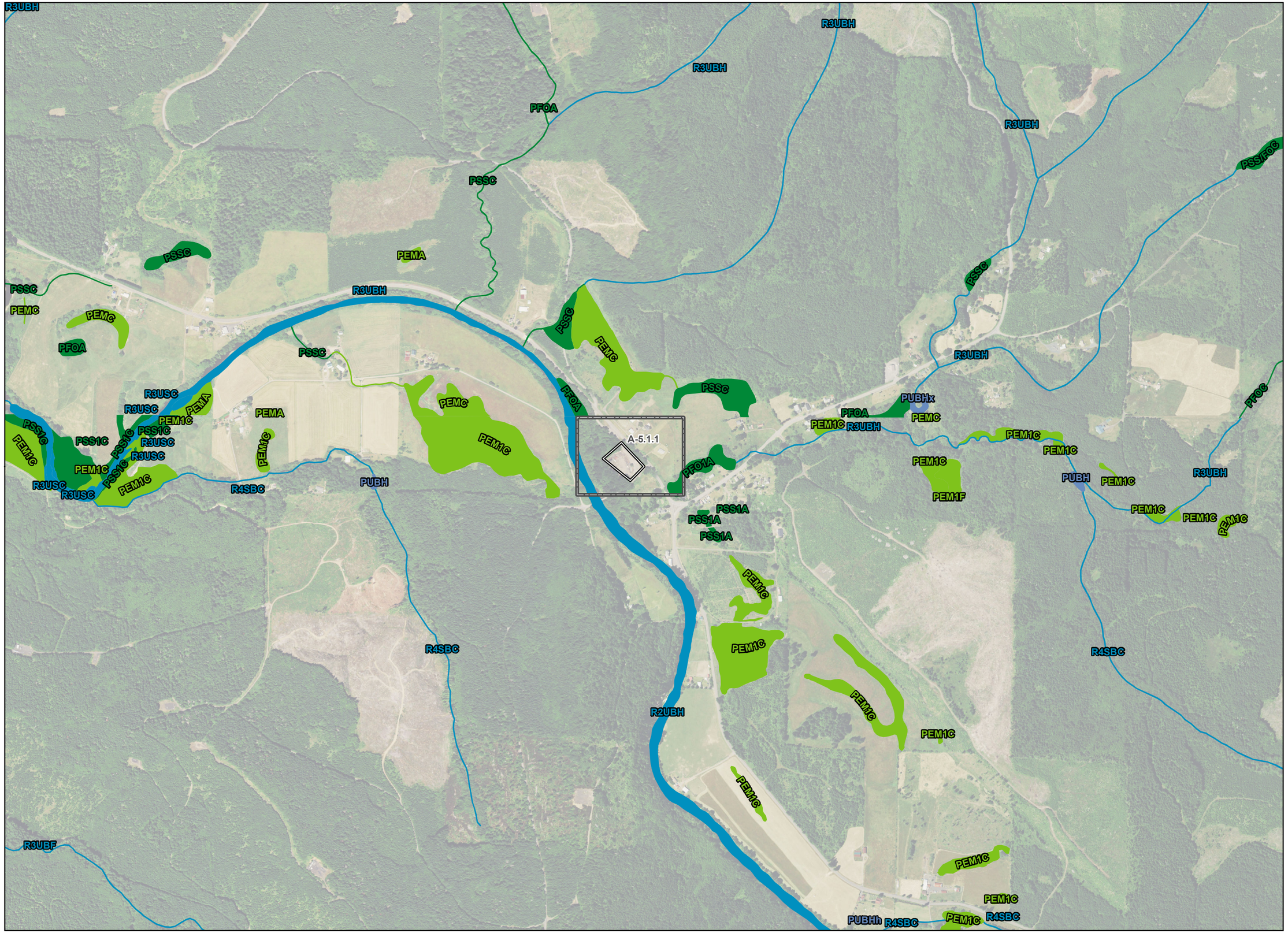
Wetland

- Freshwater Emergent
- Freshwater- Forested and Shrub wetland
- Freshwater pond
- Riverine

0 500 1,000
Feet

1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-4.2
NATIONAL WETLAND INVENTORY MAP

A-5 Map Grid

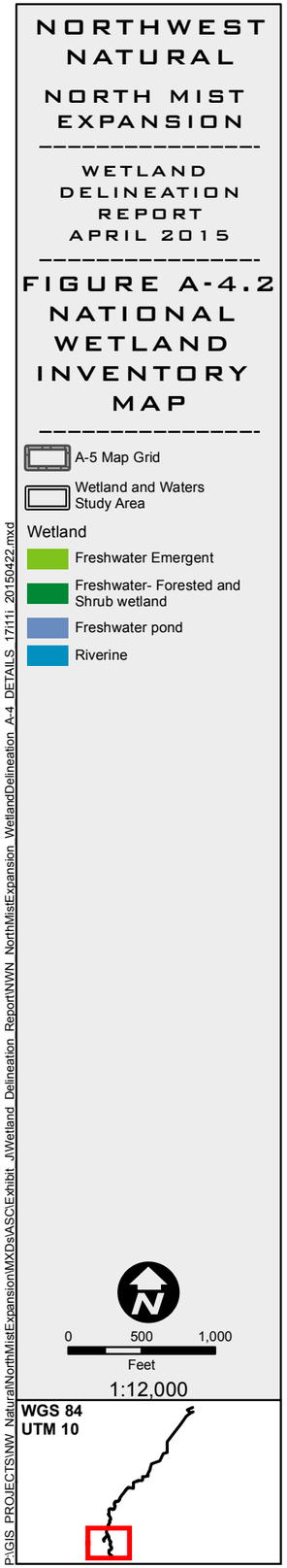
Wetland and Waters Study Area

Wetland

- Freshwater Emergent
- Freshwater- Forested and Shrub wetland
- Freshwater pond
- Riverine

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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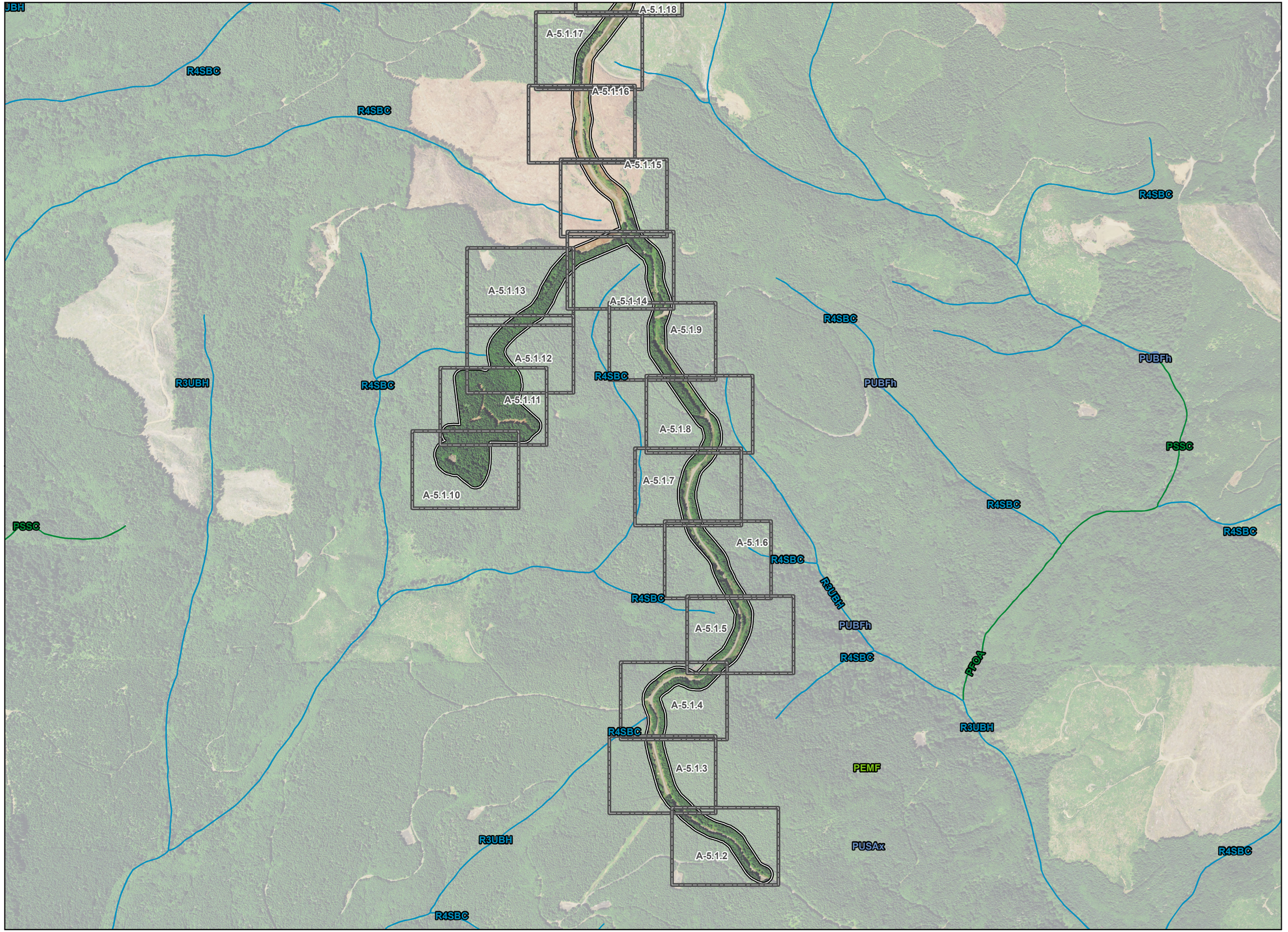

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-4.3
NATIONAL WETLAND INVENTORY MAP

A-5 Map Grid

Wetland and Waters Study Area

Wetland

Freshwater- Forested and Shrub wetland

Riverine

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

P:\GIS_PROJECTS\NW_NaturalNorthMistExpansionMXDs\ASCIExhibit_JWetland_Delineation_ReportNWN_NorthMistExpansion_WetlandDelineation_A-4_DETAILS_17i11i_20150422.mxd

R4SBC
PSSCh
R4SBC
R3UBH
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R3UBH
R4SBC
R4SBC
R4SBC
R3UBH
R4SBC
R4SBC
R4SBC
R4SBC
R4SBC
R3UBH
R4SBC
PSSA
PSSA
R4SBC
R3UB
R4SBC
R4SBC

A-5.1.32
A-5.1.31
A-5.1.30
A-5.1.29
A-5.1.28
A-5.1.27
A-5.1.26
A-5.1.25
A-5.1.24
A-5.1.23
A-5.1.22
A-5.1.21
A-5.1.20
A-5.1.19
A-5.1.18

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-4.4
NATIONAL WETLAND INVENTORY MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access
- Early Access Granted then Rescinded

Wetland Type

- Freshwater Emergent wetland
- Freshwater- Forested and Shrub wetland
- Freshwater pond
- Riverine

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-4.5 NATIONAL WETLAND INVENTORY MAP

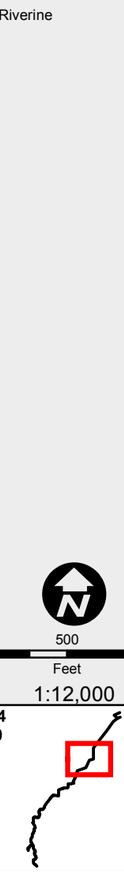
- A-5 Map Grid
- Wetland and Waters Study Area
- No Access
- Early Access Granted then Rescinded

Wetland

- Freshwater Emergent
- Freshwater- Forested and Shrub wetland
- Freshwater pond
- Riverine

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-4.6
NATIONAL WETLAND INVENTORY MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)

Wetland

- Freshwater Emergent
- Freshwater- Forested and Shrub wetland
- Freshwater pond
- Riverine

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10

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R1USR
R1UBV
R1USN
PEMR
PSSR
PFO/SSR
PEMC
PEMA
PUBKHR
PFOA
PSS/EMC
PUBF
PFOS
PEMN
A-5.1.70
A-5.1.71
A-5.1.72
A-5.1.73
A-5.1.74
A-5.1.75
A-5.1.76
A-5.1.77
A-5.1.78
A-5.1.79
A-5.1.80
A-5.1.81
A-5.1.82
A-5.1.83
A-5.1.84
A-5.1.85
A-5.1.86

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5 WETLAND DELINEATION INDEX MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- City/Town
- Highway
- Road

0 0.5 1
Miles
1:90,000

WGS 84
UTM 10

Figure A-5.6
Figure A-5.5
Figure A-5.4
Figure A-5.3
Figure A-5.2
Figure A-5.1

Westport
Clatskanie
Mist

409
4
30
47
202
432

Clatskanie - Cathlamet Ferry
Westport Ferry Rd
Quincy Mayger Rd
Beaver Falls Rd
NW 5th St
Alston Mayger Rd
Harmony Dr
Old Rainier Rd
Apiary Rd
Fern Hill Rd
Apiary Market Rd

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1
WETLAND DELINEATION MAP

A-5 Map Grid

Wetland and Waters Study Area

No Access (2/4/2015)

A-5.1.1

0 500 1,000
Feet

1:12,000

WGS 84
UTM 10

P:\PROJECTS\NW_NaturalNorthMistExpansion\MXDs\ASCIExhibit_JWetland_Delineation_ReportNWN_NorthMistExpansion_WetlandDelineation_A-5_Intermediate_DETAILS_17i11i_20150422.mxd

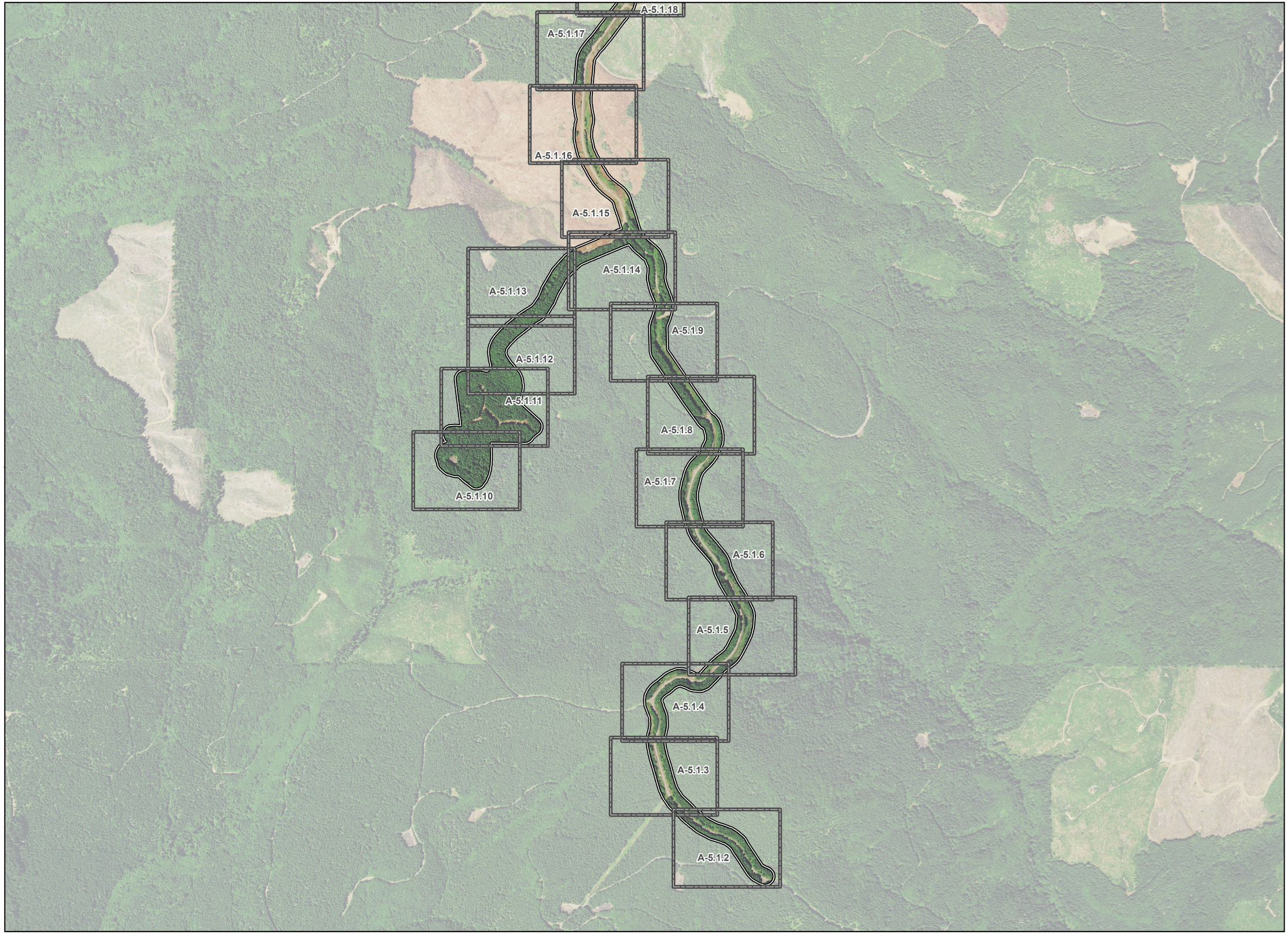
NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

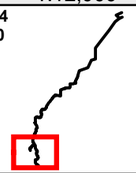
FIGURE A-5.2
WETLAND DELINEATION MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)



0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.3
WETLAND DELINEATION MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)

N

0 500 1,000
Feet

1:12,000

WGS 84
UTM 10

A-5.1.32
A-5.1.31
A-5.1.30
A-5.1.29
A-5.1.28
A-5.1.27
A-5.1.26
A-5.1.25
A-5.1.24
A-5.1.23
A-5.1.22
A-5.1.21
A-5.1.20
A-5.1.19
A-5.1.18

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NORTHWEST NATURAL

NORTH MIST EXPANSION

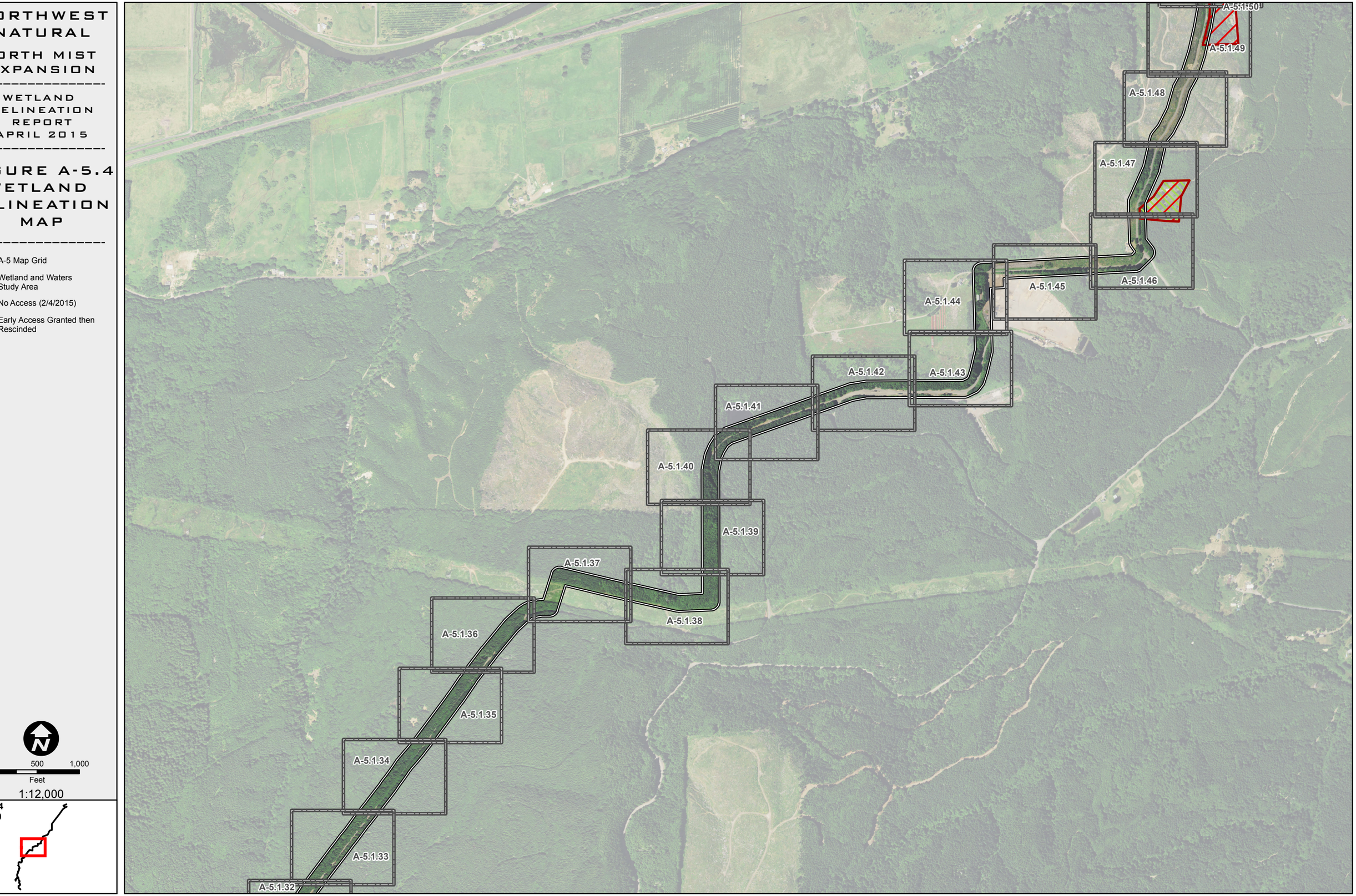
WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.4 WETLAND DELINEATION MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)
- Early Access Granted then Rescinded

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

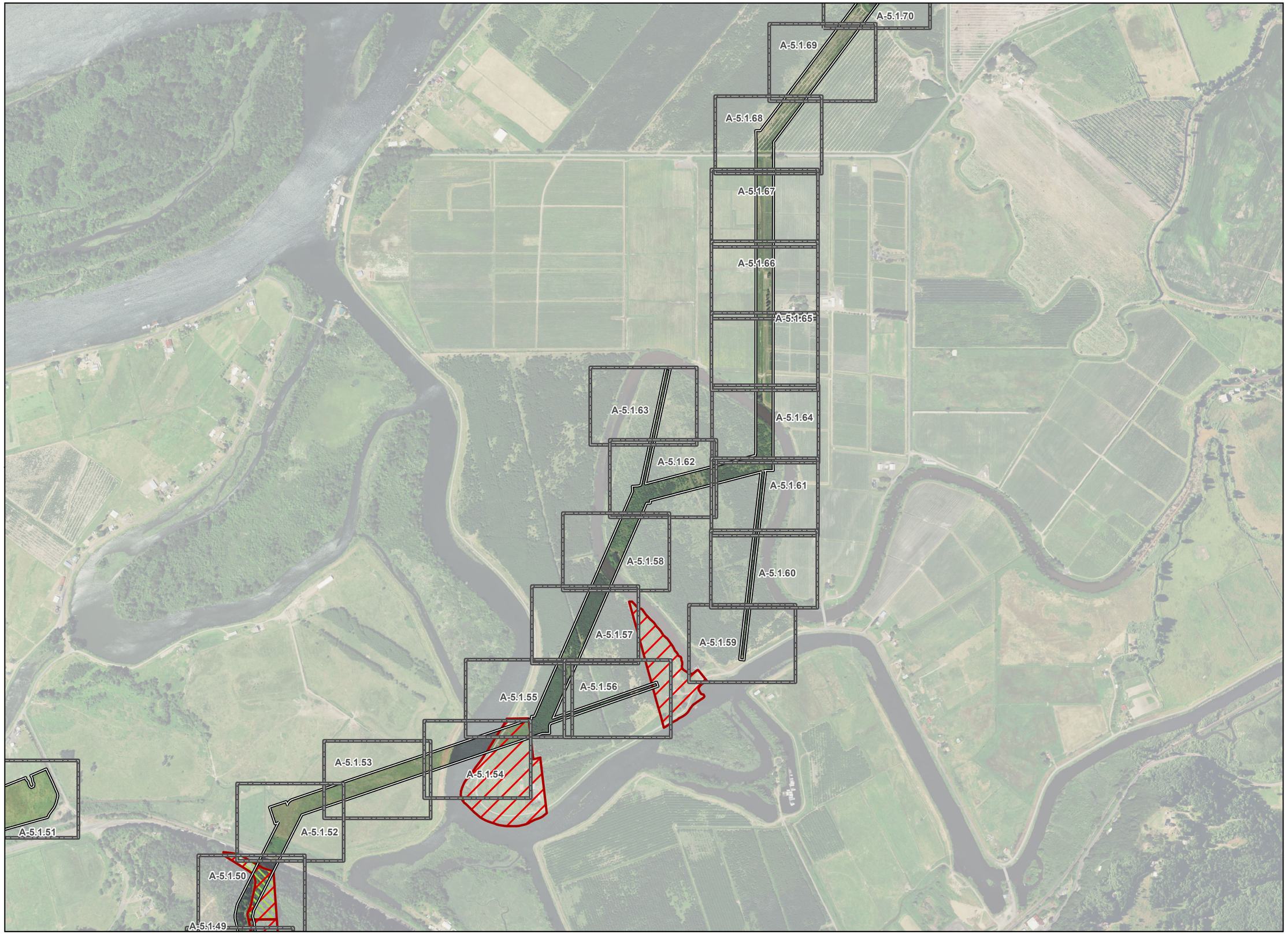
WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.5
WETLAND DELINEATION MAP

- A-5 Map Grid
- Wetland and Waters Study Area
- No Access (2/4/2015)
- Early Access Granted then Rescinded

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.6
WETLAND DELINEATION MAP

A-5 Map Grid

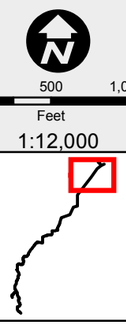
Wetland and Waters Study Area

No Access (2/4/2015)

A-5.1.85
A-5.1.86
A-5.1.84
A-5.1.81
A-5.1.82
A-5.1.83
A-5.1.80
A-5.1.79
A-5.1.78
A-5.1.77
A-5.1.76
A-5.1.75
A-5.1.74
A-5.1.73
A-5.1.72
A-5.1.71
A-5.1.70

0 500 1,000
Feet
1:12,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.1
WETLAND DELINEATION MAP

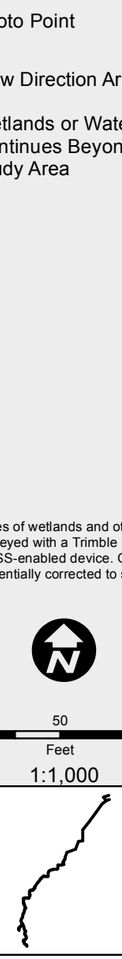
- Wetland and Waters Study Area
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



EPH 52
#3
#2
SP OO-02
SP OO-01
WET OO
#1
SP 53

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASC\Exhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.2
WETLAND DELINEATION MAP

Wetland and Waters Study Area

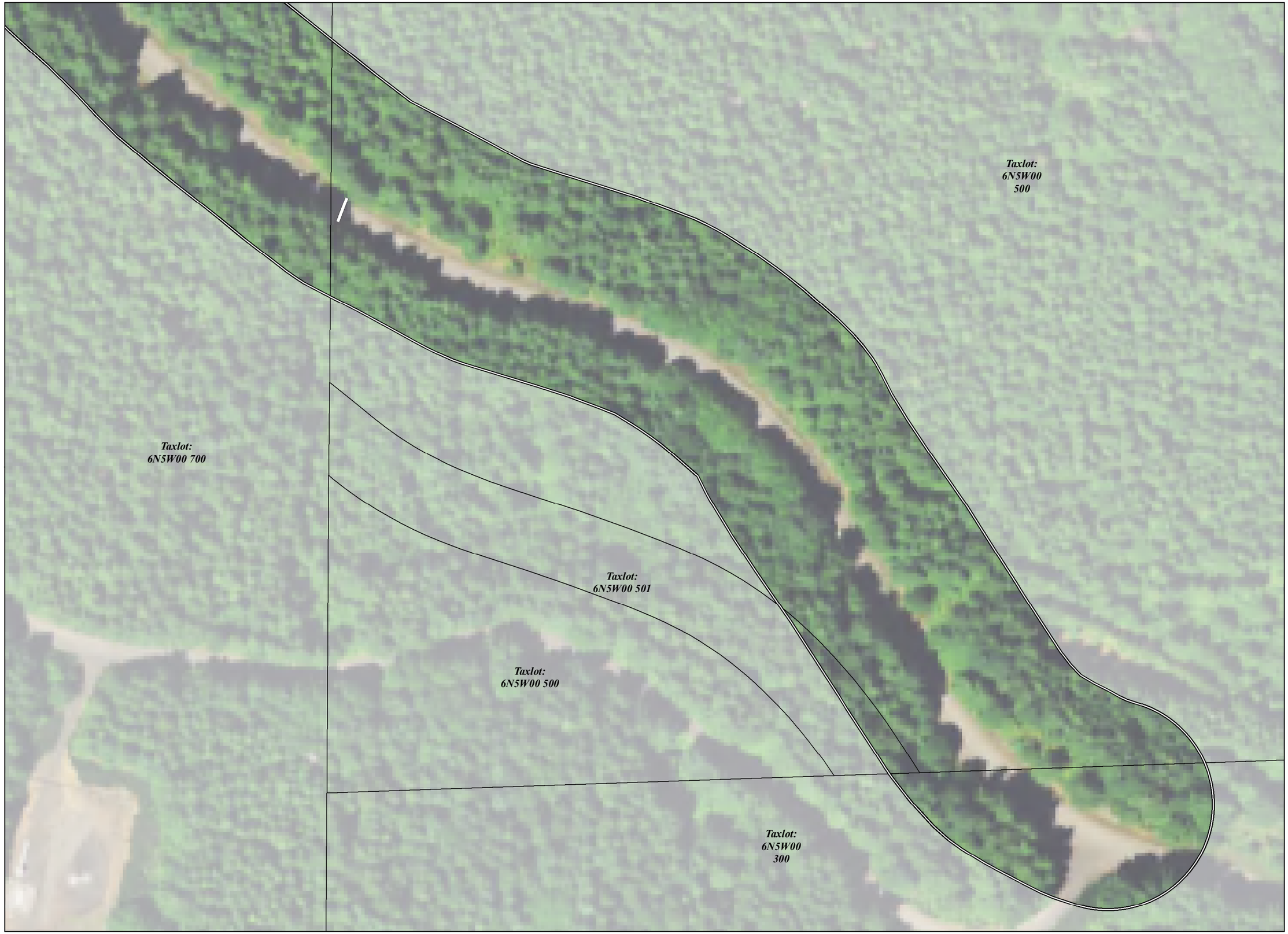
Taxlot Boundary

Culvert

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.3
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
6N5W00 600

Taxlot:
6N5W00 500

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.4
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot: 7N5W00 4700

Taxlot: 7N5W00 4600

Taxlot: 7N5W00 4500

Taxlot: 6N5W00 600

Taxlot: 6N5W00 700

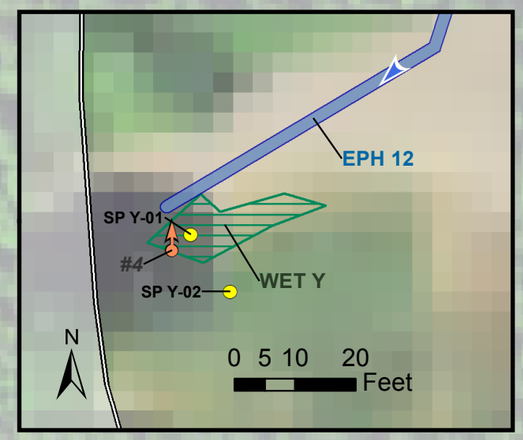
#6

EPH 11

#5

EPH 12

WET Y



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

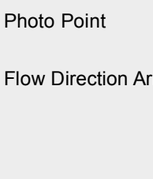
FIGURE A-5.1.5
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Photo Point
- Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 7N5W00 4600

Taxlot: 7N5W00 4500

EPH 11

#6

Taxlot: 6N5W00 700

Taxlot: 6N5W00 600

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.6
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W00
4600

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.7
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Surveyed Water (Maximum OHWL Width)

Photo Point

Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

#7

EPH 13

Taxlot: 7N5W00 4700

Taxlot: 7N5W00 4600

Taxlot: 7N5W00 4500

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

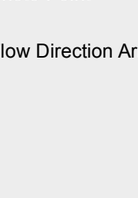
FIGURE A-5.1.8
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Photo Point
- Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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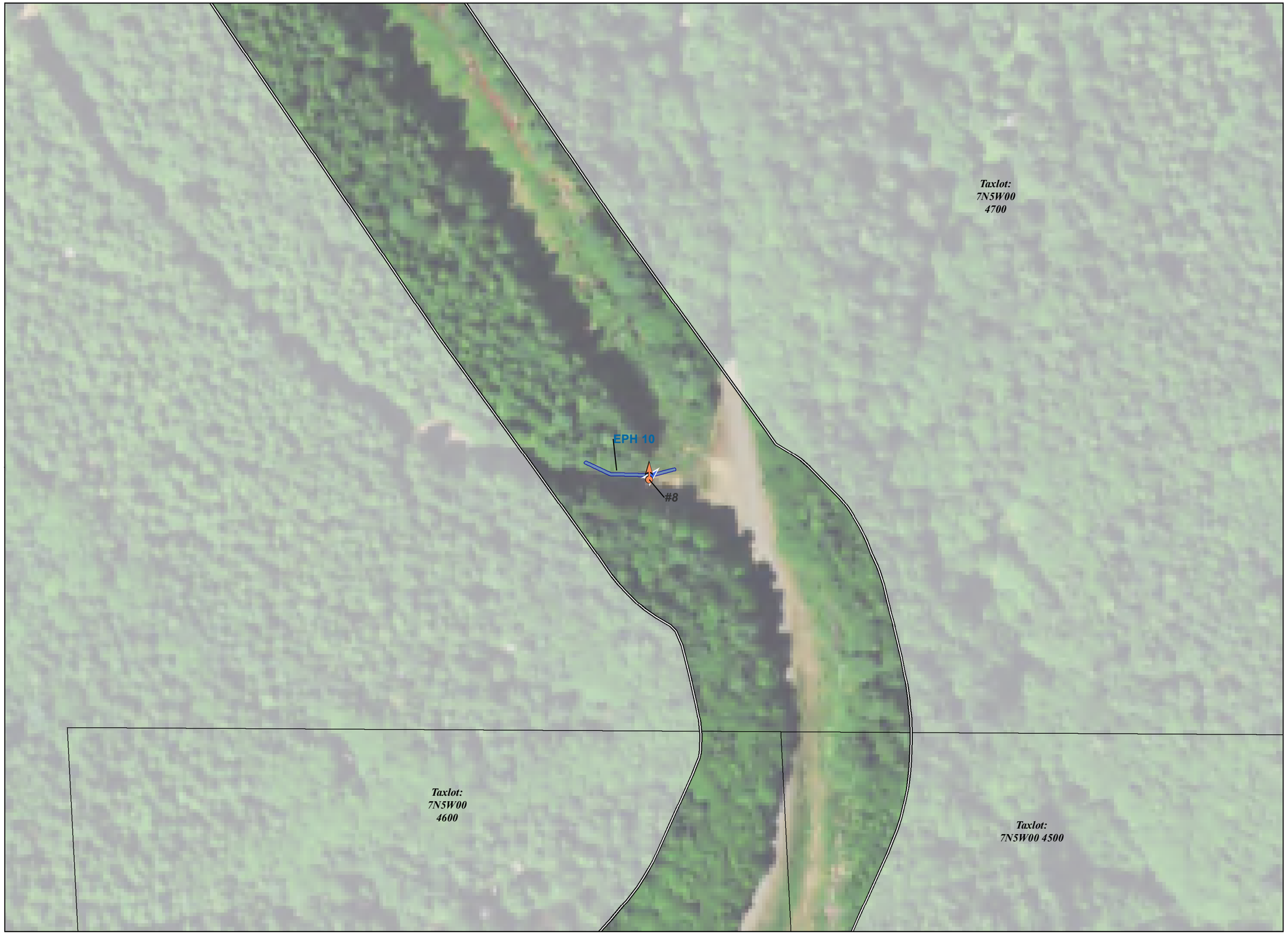

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.9
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

Taxlot:
7N5W00 4800

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.10
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

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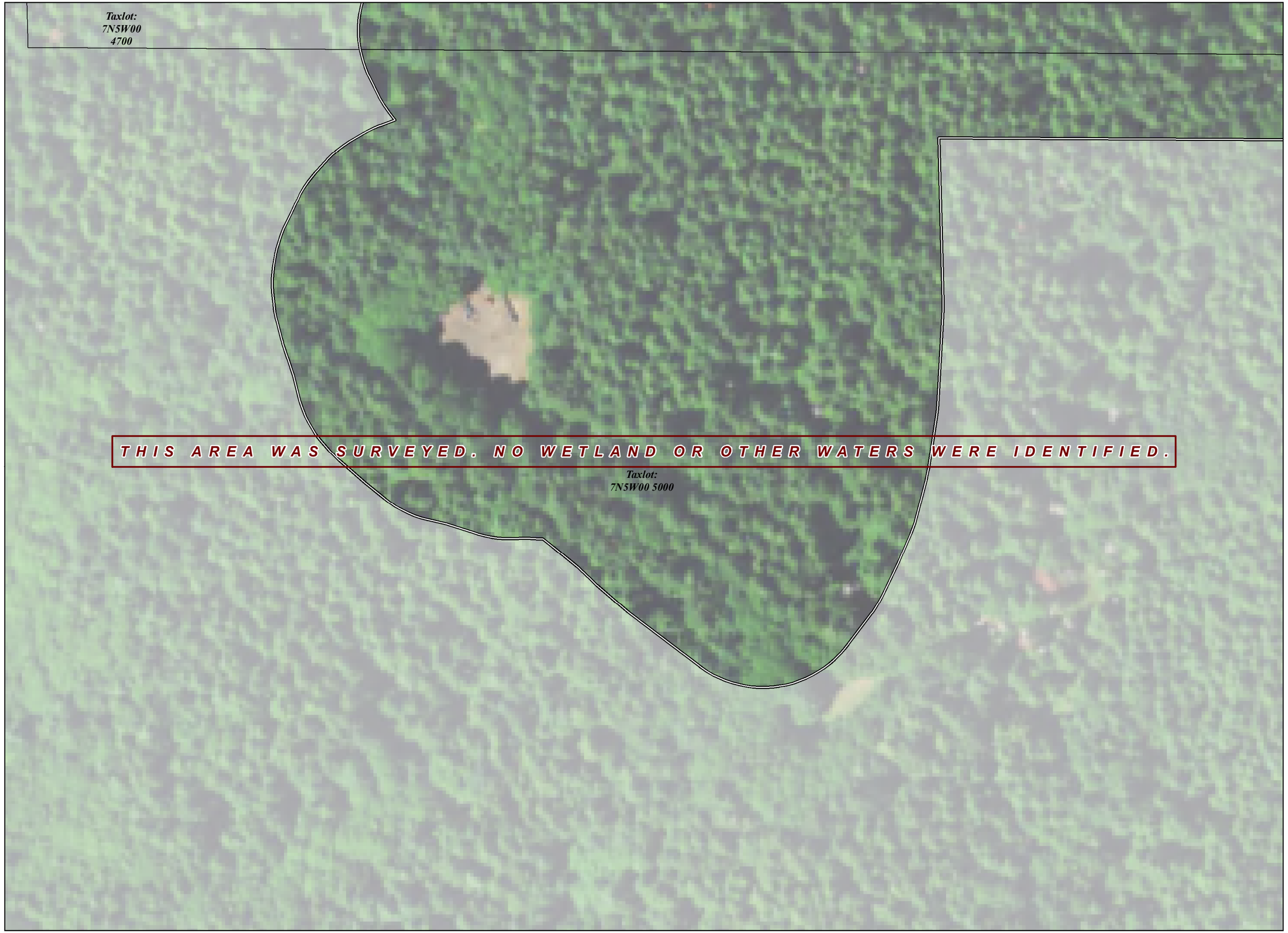

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.11
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot:
7N5W00 4700

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W00 5000

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.12
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot:
7N5W00
4700

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.13
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.14
WETLAND DELINEATION MAP

Wetland and Waters Study Area

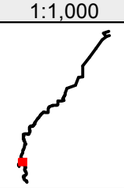
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



Taxlot:
7N5W00
4700

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCExhibit_JW\Wetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

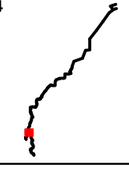
FIGURE A-5.1.15
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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Taxlot: 7N5W00 3100

Taxlot: 7N5W00 2200

Taxlot: 7N5W00 4700

STRM 02
WET B

WET A
SP A-01
SP A-02
#10
STRM 01
#9

SP B-02
#12
SP B-01
STRM 02
#11
WET B
N
0 5 10 20 30 40
Feet

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.16
WETLAND DELINEATION MAP

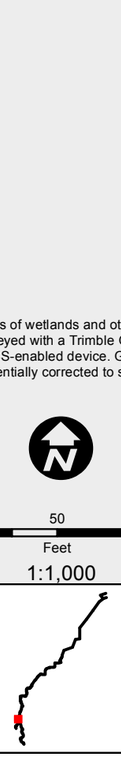
Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W00 3100

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.17
WETLAND DELINEATION MAP

Wetland and Waters Study Area

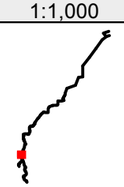
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.18
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W00 1300

Taxlot:
7N5W00
2200

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.19
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W00
2200

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASC\Exhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.20
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Culvert

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JW\Wetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

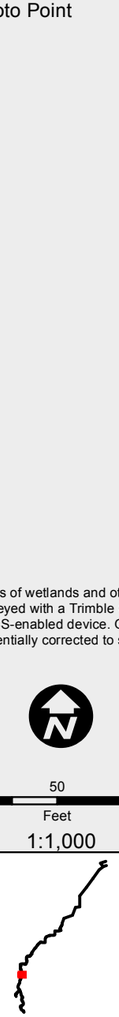
FIGURE A-5.1.21
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Sample Plot
- Photo Point

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



XBB 01

XBB 01 #13

Taxlot:
7N5W00
1300

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JWetland_Delineation_ReportNWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i1i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.22
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Surveyed Water (Maximum OHWL Width)

Culvert

Photo Point

Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JiWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.23
WETLAND DELINEATION MAP

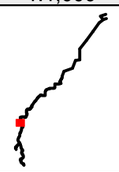
Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W00
2200

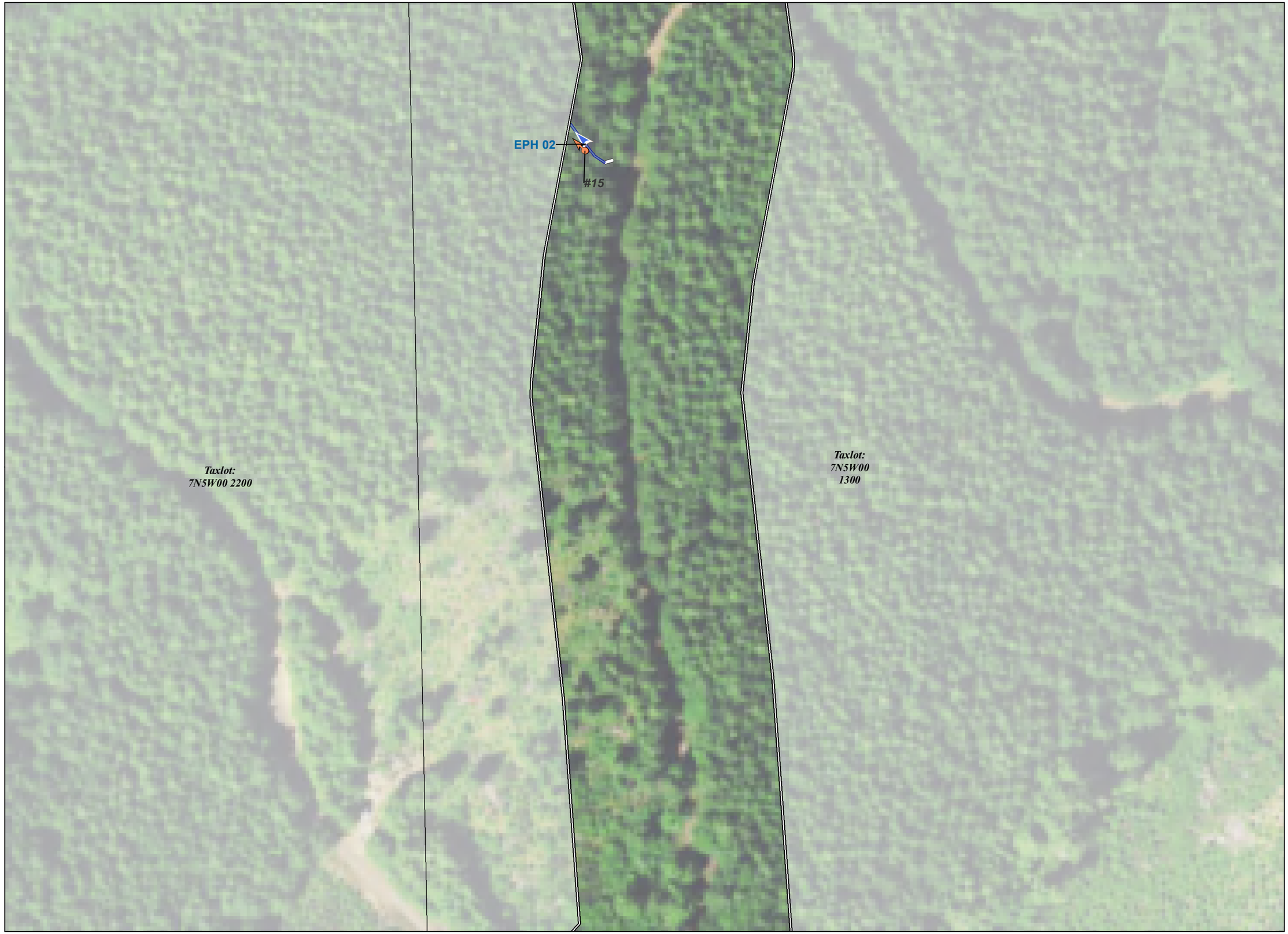
P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCE\Exhibit_J\Wetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.24
WETLAND DELINEATION MAP



- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Photo Point
- Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.25
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCE\Exhibit_J\Wetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.26
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

WET W
SP W-01
SP W-02
#20
WET X
SP X-01
SP X-02
#21
SP S-02
SP S-01
WET S
#22
EPH 26
#19
#24
STRM 25
SP R-01
SP R-02
WET R
#23
#18
#17
WET V
SP V-02
SP V-01
STRM 27
6
Taxlot:
7N5W00
1300

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCE\exhibit_JW\etland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_171111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.27
WETLAND DELINEATION MAP

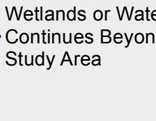
- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot:
7N5W00
1300

#25

STRM 24

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASC\Exhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.28
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet

1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JIWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.29
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet

1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCIExhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.30
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Surveyed Water (Maximum OHWL Width)

Culvert

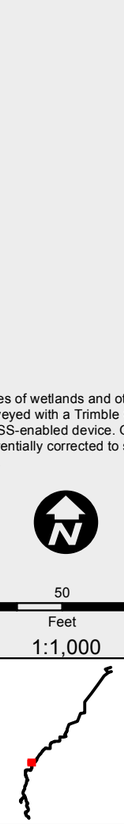
Sample Plot

Photo Point

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot:
7N5W00
1300

XBB 02 #26

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.31
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

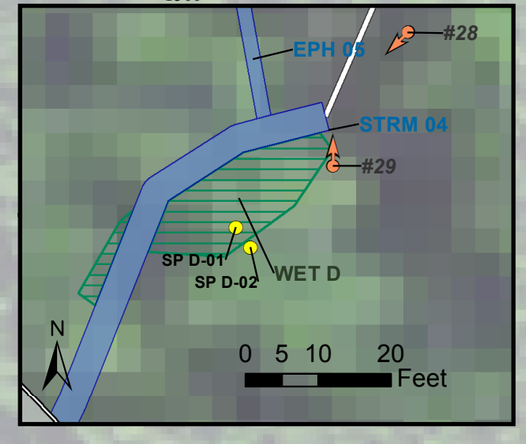
0 50 100
Feet

1:1,000

WGS 84
UTM 10

XBB 02
#27
STRM 04
EPH 05
#28
WET D
STRM 05
#30
POND 01
#31

Taxlot: 7N5W00 1300



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.32
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCExhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.33
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.34
WETLAND DELINEATION MAP

Wetland and Waters Study Area

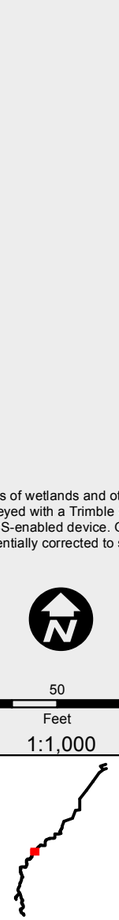
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCIExhibit_JiWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.35
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

Taxlot:
7N5W00
1300

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCExhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.36
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

Taxlot:
7N5W1100
601

Taxlot:
7N5W00
1400

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASC\Exhibit_JW\Wetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.37
WETLAND DELINEATION MAP

Wetland and Waters Study Area

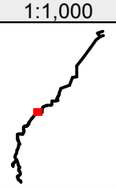
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JI\Wetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.38
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot:
7N5W1100 601

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W1200
400

Taxlot:
7N5W00
1300

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASC\Exhibit_JWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17i11i_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.39
WETLAND DELINEATION MAP

Wetland and Waters Study Area

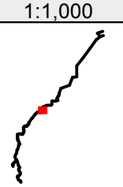
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



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Taxlot:
7N5W1100
600

Taxlot:
7N5W1200
201

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W1100
601

Taxlot:
7N5W1200 400

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.40
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
7N5W1100
600

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

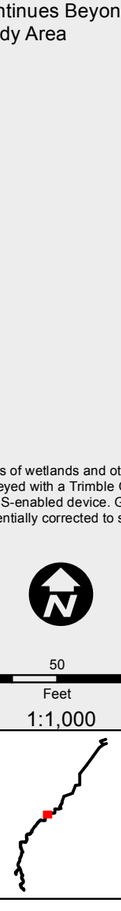
FIGURE A-5.1.41
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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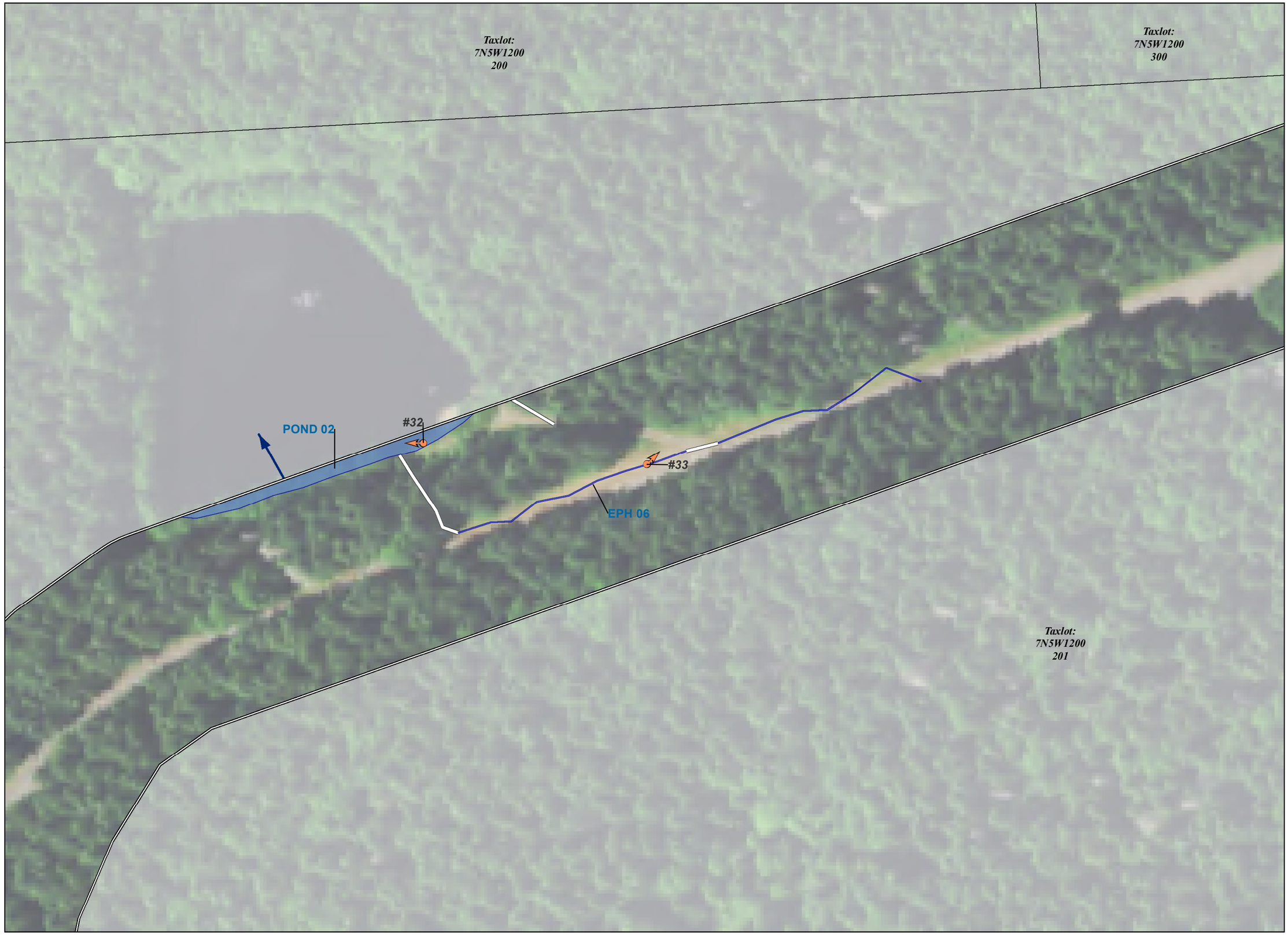

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.42
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.43
WETLAND DELINEATION MAP

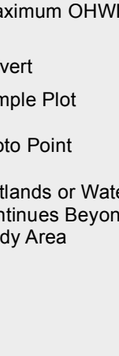
- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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Taxlot: 7N5W1200 300

Taxlot: 7N5W1200 401

#36
SP 03
#35
SP 02
POND 03
#34

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.44
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Sample Plot

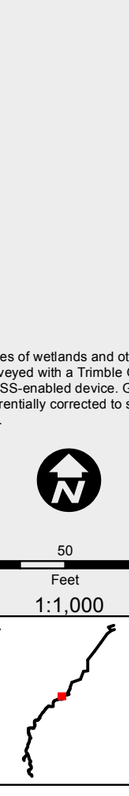
Photo Point

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.45
WETLAND DELINEATION MAP

Wetland and Waters Study Area

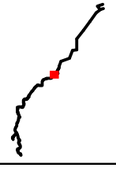
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.46
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Early Access Granted then Rescinded

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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Taxlot: 7N4W 700 1001

Taxlot: 7N5W1200 100

Taxlot: 7N4W 700 1000

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot: 7N4W 700 ROAD

Taxlot: 7N5W1200 ROAD

Taxlot: 7N5W1200 500

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.47
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Early Access Granted then Rescinded
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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Taxlot: 7N5W 100 2702

Taxlot: 7N4W 600 1400

Taxlot: NW ROAD

Taxlot: 7N4W 600 1400

Taxlot: 7N4W 700 1000

STRM 60

#38

#37

SP KK-01

SP KK-02

Taxlot: 7N4W 700 1000

Taxlot: 7N4W 700 ROAD

Taxlot: 7N5W1200 100

WET KK

Taxlot: 7N4W 700 1001

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

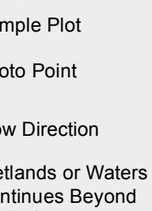
FIGURE A-5.1.48
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 7N4W 600 1400

Taxlot: 7N5W 100 2702

Taxlot: NW ROAD

Taxlot: 7N4W 600 1400

WET NN

#45

STRM 60

#44

STRM 62

#43

WET MM

#42

SP MM-01

SP MM-02

#41

SS 50

WET LL

#40

STRM 61

#39

SP LL-01

SP LL-02

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.49
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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Taxlot: 7N4W 600 1400

#49

SS 51

Taxlot: 7N4W 600 1100

WET NN

Taxlot: NW ROAD

SP NN-02

SP NN-01

#48

Taxlot: 7N4W 600 1000

#47

Taxlot: 7N4W 600 1400

SS 52

STRM 60

#46

WET NN

#45

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.50
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Granted than Denied Access
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,130

WGS 84
UTM 10

EPH 51
EPH 07
#51
WET NN
#50
STRM 08

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.51
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Sample Plot

Photo Point

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

Taxlot:
7N5W 100
1100

SP 52

#57

SP 51

#56

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

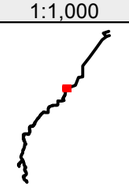
FIGURE A-5.1.52
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Early Access Granted then Rescinded
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 7N4W 600 300

Taxlot: 7N4W 600 500

WET HH

STRM 104

SP HH-06

SP HH-05

#55

Taxlot: 7N4W 600 300

STRM 57

#54

Taxlot: 7N4W 600 RAIL

#53

#52

SP HH-03

EPH 51

SP HH-04

Taxlot: 7N4W 600 ROAD

Taxlot: 7N4W 600 1101

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.53
WETLAND DELINEATION MAP

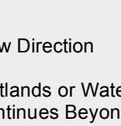
- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



Taxlot:
7N4W
600 300

STRM 09

SP HH-07

#58

WET HH

WET HH

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.54
WETLAND DELINEATION MAP

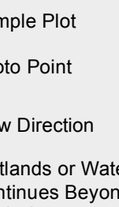
- Wetland and Waters Study Area
- Taxlot Boundary No
- Access (2/4/2015)
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot:
8N4W3100WATER

Taxlot:
7N4W
600WATER

Taxlot:
7N4W
600 100

Taxlot:
7N4W
600 300

STRM 10

#61

#60

SP HH-08

#59

STRM 09

#58

WET HH

Taxlot:
7N4W
600 200

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.55
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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Taxlot: 8N4W3100 400

Taxlot: 8N4W3100WATER

Taxlot: 7N4W 600 100

Taxlot: 7N4W 600WATER

Taxlot: 7N4W 600 300

Taxlot: 7N4W 600 200

WET II

WET II

#64

#62

SP 04

STRM 10

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.56
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Wetlands
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

WET II
#64
Taxlot:
7N4W
600 100
WET II
#63
SP GG-01
SP GG-02
Taxlot:
7N4W
500 800
Taxlot:
7N4W
600WATER

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.57
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Wetlands
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot: 8N4W3200 1100
Taxlot: 8N4W3200WATER
Taxlot: 8N4W3100WATER
Taxlot: 8N4W3100 500
Taxlot: 7N4W 500WATER
Taxlot: 7N4W 500 800
Taxlot: 7N4W 600 100
Taxlot: 7N4W 600WATER
WET GG
WET II
SP II-01
SP II-02
#65

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

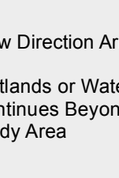
FIGURE A-5.1.58
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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STRM 12

#66

Taxlot: 8N4W3100 500

Taxlot: 8N4W3200 1100

Taxlot: 8N4W3200WATER

Taxlot: 8N4W3100WATER

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.59
WETLAND DELINEATION MAP

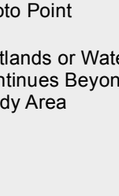
- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Wetlands
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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WET EE
Taxlot: 8N4W3200WATER
SP EE-02
#68
SPEE-03
WET EE
Taxlot: 8N4W3200 1100
Taxlot: 8N4W3200 1100
SP EE-01
WET EE
#67
WET EE
Taxlot: 8N4W3200WATER
Taxlot: 7N4W 500WATER
Taxlot: 8N4W3200 1200
Taxlot: 7N4W 500 800

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

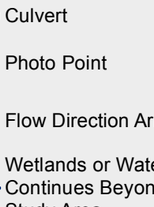
FIGURE A-5.1.60
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.61
WETLAND DELINEATION MAP

Wetland and Waters Study Area

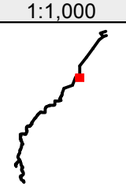
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



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Taxlot:
8N4W3200
900

THIS AREA WAS SURVEYED. NO WETLAND OR OTHER WATERS WERE IDENTIFIED.

Taxlot:
8N4W3200WATER

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

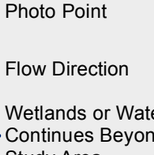
FIGURE A-5.1.62
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.63
WETLAND DELINEATION MAP

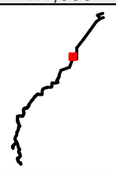
- Wetland and Waters Study Area
- Taxlot Boundary
- Wetlands
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot:
8N4W3100
500

Taxlot:
8N4W3200WATER

Taxlot:
8N4W3100WATER

Taxlot:
8N4W3100WATER

Taxlot:
8N4W3200WATER

WET K

#70

SP K-01

SP K-02

Taxlot:
8N4W3200
1100

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.64
WETLAND DELINEATION MAP

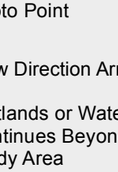
- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 8N4W3200WATER

Taxlot: 8N4W3200 1000

Taxlot: 8N4W3200 1100

STRM 100

STRM 12

#73

Taxlot: 8N4W3200 900

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.65
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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STRM 100

Taxlot:
8N4W3200
1000

Taxlot:
8N4W3200
900

#75

#74

STRM 103

STRM 100

Taxlot:
8N4W3200WATER

Taxlot:
8N4W3200
1100

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

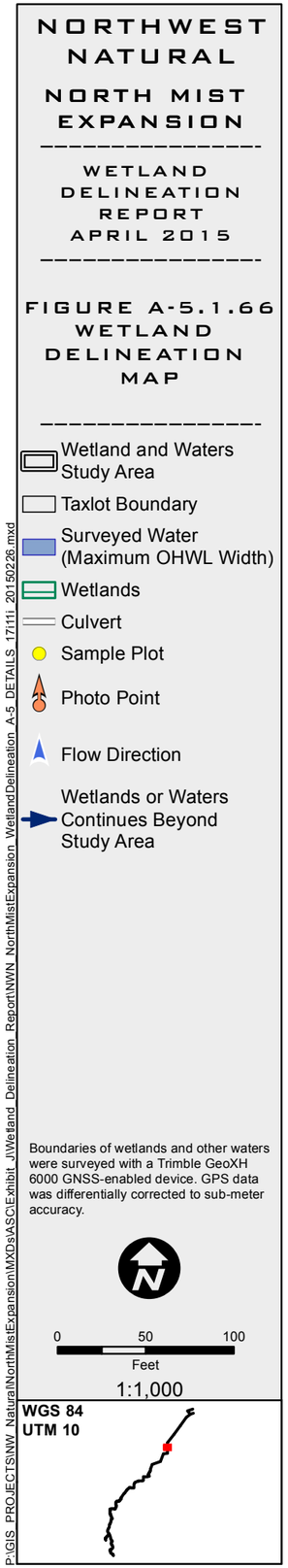
FIGURE A-5.1.66
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.67
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

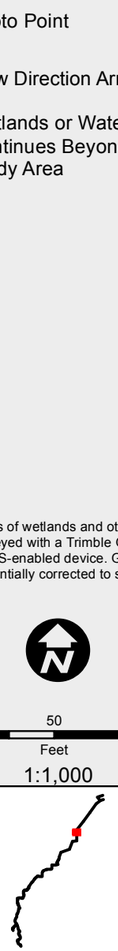
Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet

1:1,000

WGS 84
UTM 10



Taxlot: 8N4W3200 1000

STRM 100

Taxlot: 8N4W3200 900

#79

STRM 101

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.68
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Surveyed Water (Maximum OHWL Width)

Culvert

Photo Point

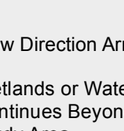
Flow Direction Arrow

Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 8N4W2900 300

Taxlot: 8N4W2900 ROAD

Taxlot: 8N4W3200 ROAD

Taxlot: 8N4W3200 1000

Taxlot: 8N4W3200 900

#81

#80

STRM 52

STRM 53

STRM 100

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

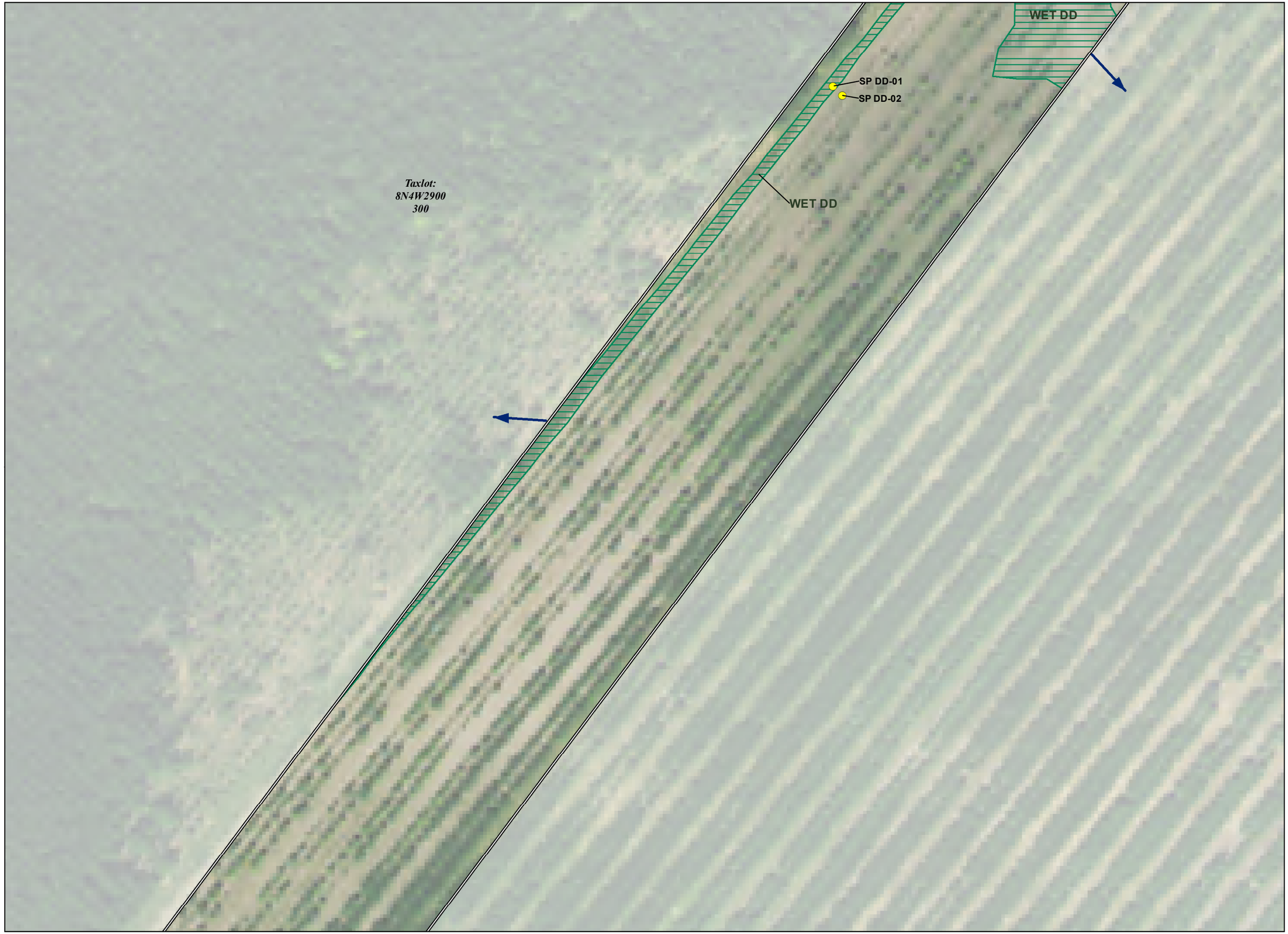
FIGURE A-5.1.69
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Wetlands
- Sample Plot
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.70
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

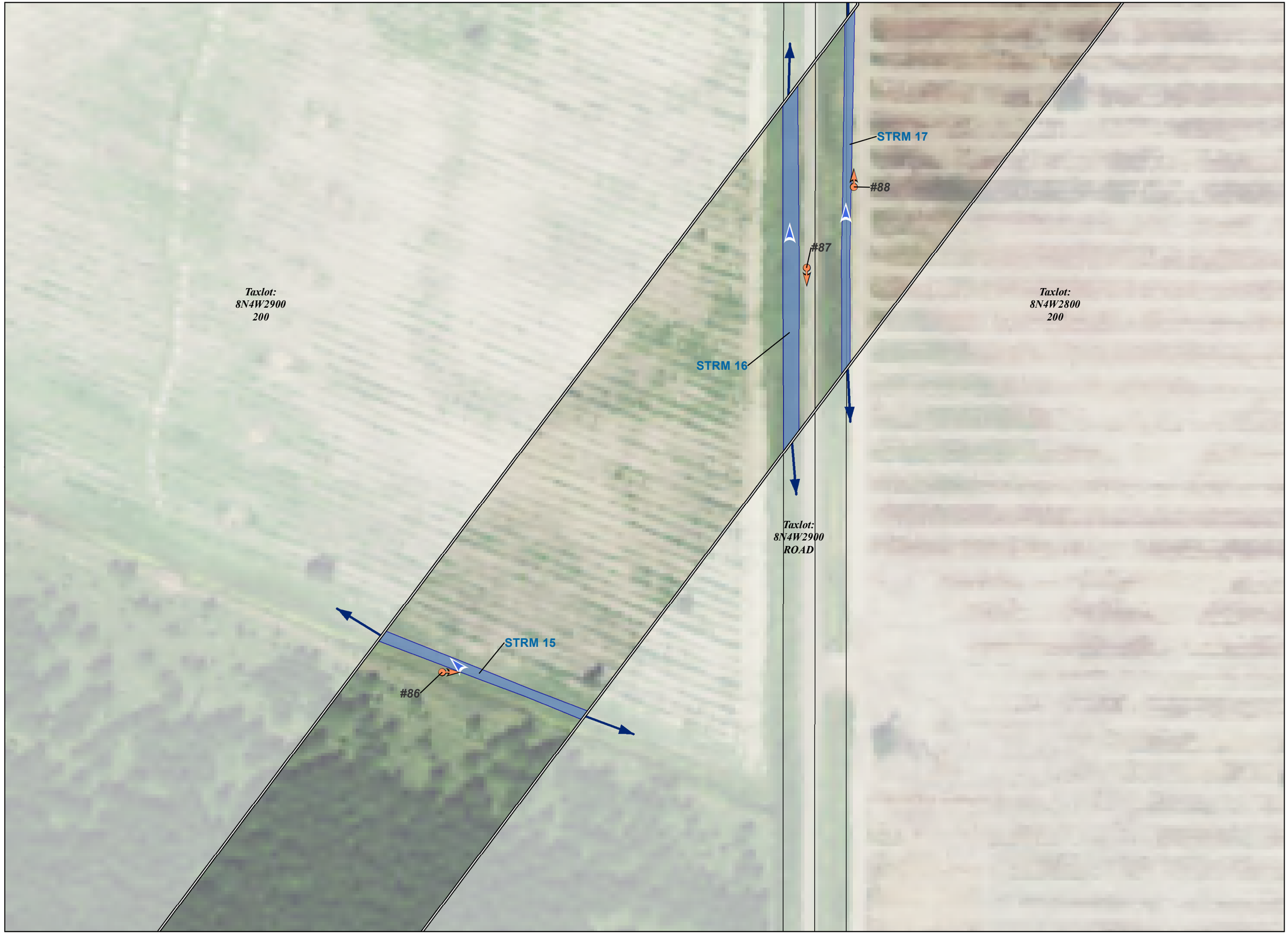
FIGURE A-5.1.71
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

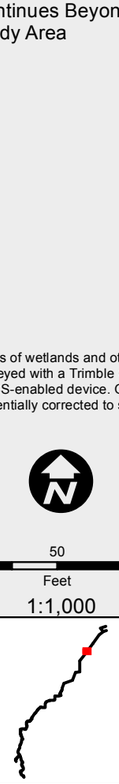
FIGURE A-5.1.72
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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EPH 50
#94
SP M-06
#93
SP M-05
#92
WET M
SP M-03
SP M-01
SP M-02
#91
SP BB-02
SP BB-01
WET BB
Taxlot: 8N4W2900 200
Taxlot: 8N4W2900 ROAD
STRM 51
#89
#90
WET CC
SP CC-01
SP CC-02
Taxlot: 8N4W2800 200

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

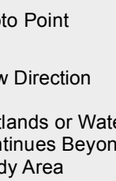
FIGURE A-5.1.73
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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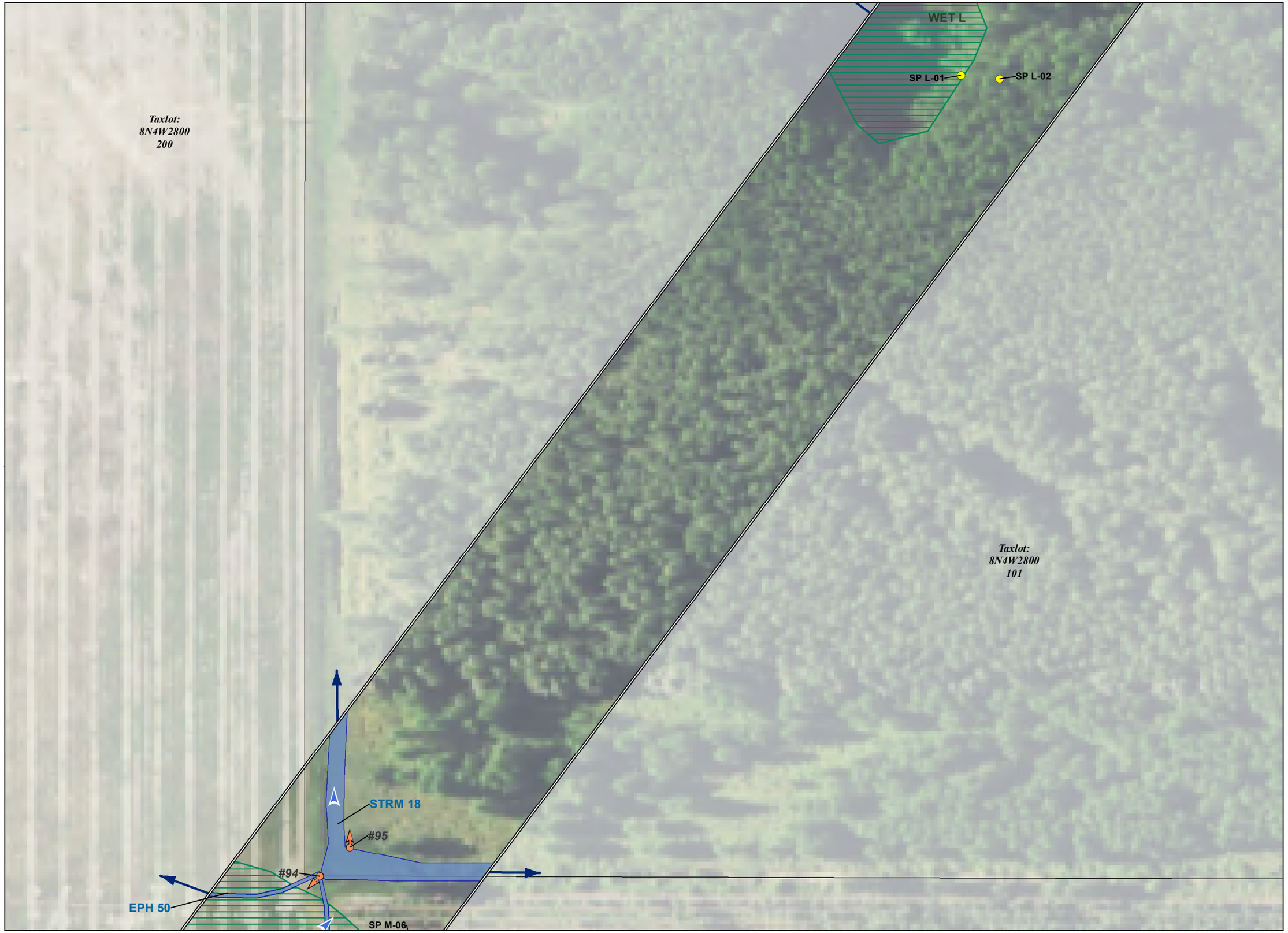


NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

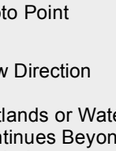
FIGURE A-5.1.74
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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Taxlot: 8N4W2000 300

Taxlot: 8N4W2100 400

Taxlot: 8N4W2800 ROAD

Taxlot: 8N4W2100 ROAD

Taxlot: 8N4W2800 101

WET N

STRM 20

#99

STRM 19

#98

SP AA-02

SPAA-01

#97

WET AA

#96

WET L

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

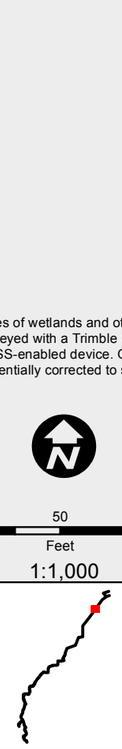
FIGURE A-5.1.75
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Wetlands
- Sample Plot
- Photo Point
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 8N4W2100 400

WET P

#100

SP N-05

SP N-06

SP N-04

SP N-03

Taxlot: 8N4W2100 500

WET N

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

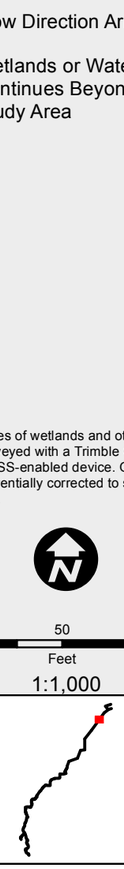
FIGURE A-5.1.76
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



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WET SS
SP SS-03
#106
STRM 22
SP SS-04
#105
WET UU
#104
SP UU-01
SP UU-02
Taxlot:
8N4W2100
400
STRM 21
SP TT-02
#103
SP TT-01
WET TT
SP P-02
#102
SPP-01
WET P
#101
WET P
Taxlot:
8N4W2100
500

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.77
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access (2/4/2015)
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot: 8N4W2100 200

Taxlot: 8N4W2100 100

Taxlot: 8N4W2100 500

WET RR

WET SS

WET SS

STRM 66

STRM 23

#109

#108

#107

SP RR-01

SP SS-01

SP SS-02

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.78
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- No Access
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

N

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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WET QQ

SP QQ-01

SP QQ-02

#112

#110

#111

STRM 65

SP RR-02

WET RR

Taxlot: 8N4W2100 100

Taxlot: 8N4W2100 700

Taxlot: 8N4W2100 200

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.79
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

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Taxlot:
8N4W2100
700

Taxlot:
8N4W2100
100

STRM 63

STRM 64

SP PP-04

#115

WET PP

#114

SP PP-05

SP PP-06

#113

WET QQ

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.80
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

WET VV
Taxlot: 8N4W1600 300
#118
SP PP-02
SP PP-01
WET PP
#117
SP PP-03
#116
STRM 63
WET PP
Taxlot: 8N4W2100 700

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.81
WETLAND DELINEATION MAP

Wetland and Waters Study Area

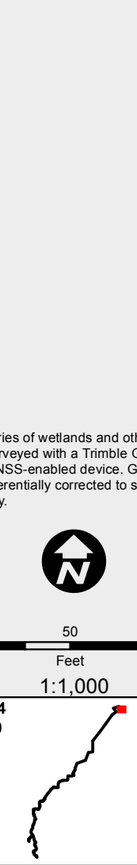
Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10



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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT APRIL 2015

FIGURE A-5.1.82
WETLAND DELINEATION MAP

Wetland and Waters Study Area

Taxlot Boundary

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet

1:1,000

WGS 84
UTM 10

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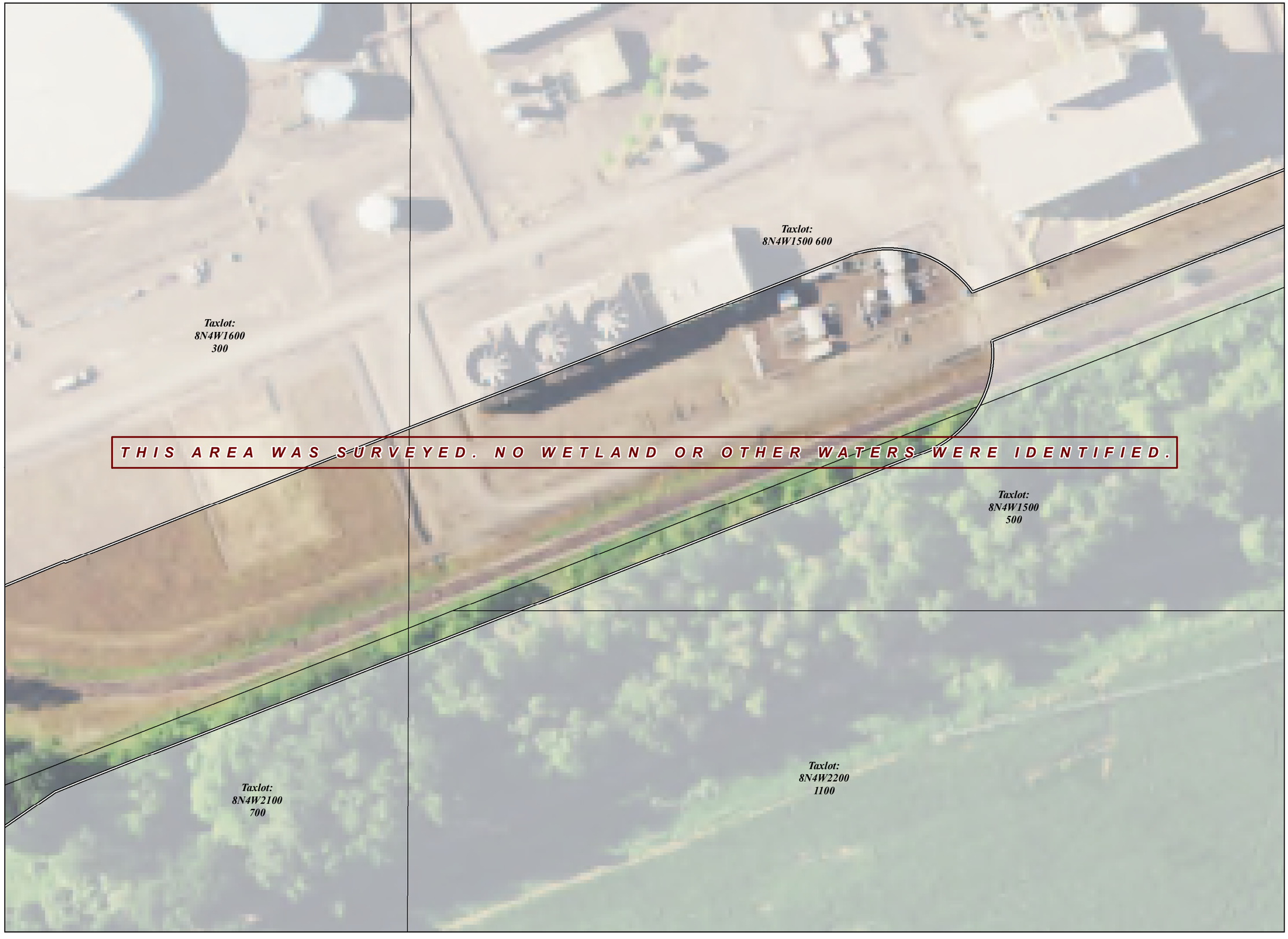

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.83
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,130

WGS 84
UTM 10

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

FIGURE A-5.1.84
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10

Taxlot:
8N4W1600
300

Taxlot:
8N4W1600
400

Taxlot:
8N4W1600
200

SP XX-02
SP XX-01
WET XX
#126
STRM 71
#127
POND 52
#128
POND 53
#125
#124
STRM 70
WET VV

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NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

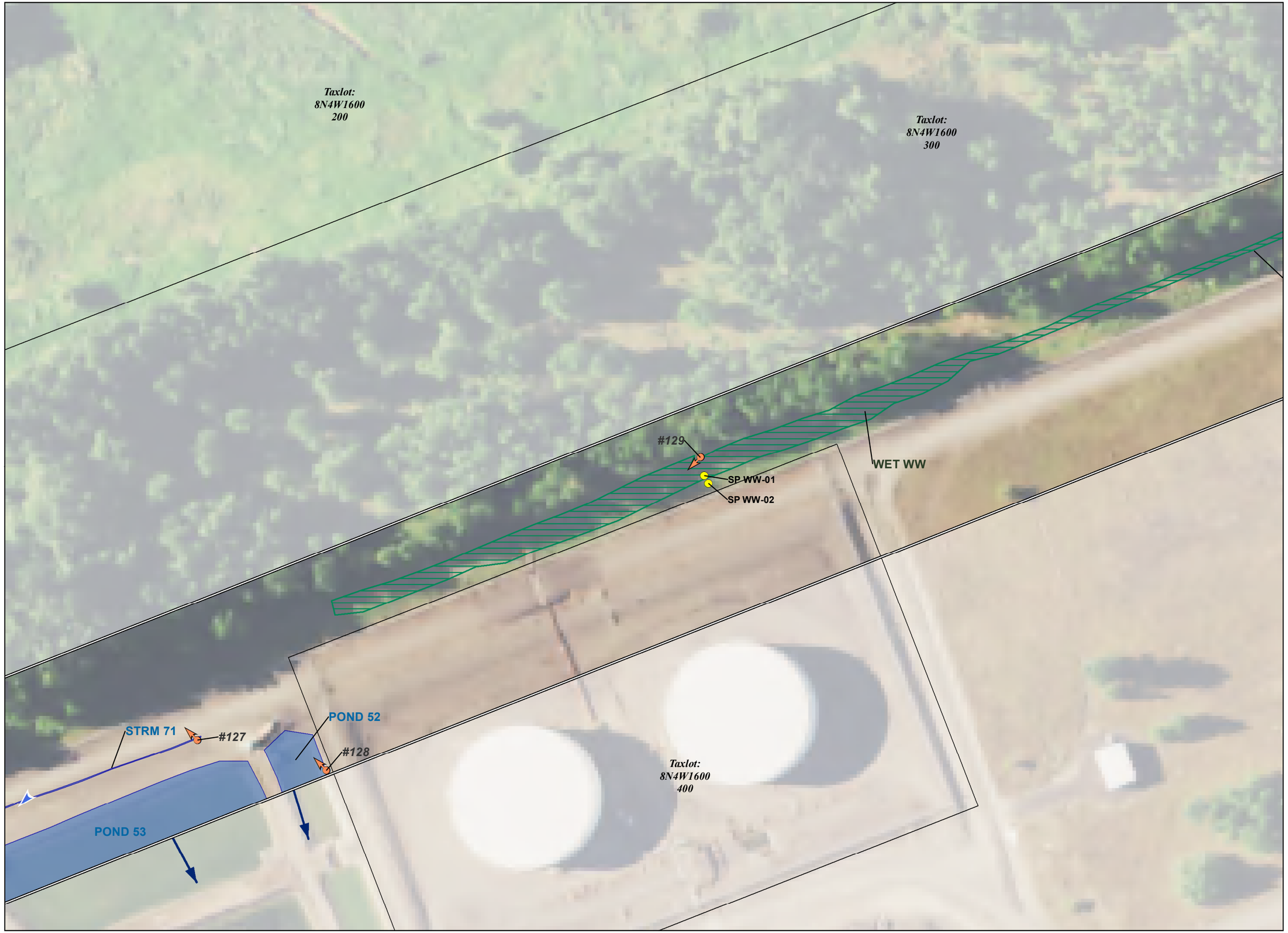
FIGURE A-5.1.85
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Sample Plot
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASC\Exhibit_JW\etland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

NORTHWEST NATURAL

NORTH MIST EXPANSION

WETLAND DELINEATION REPORT
APRIL 2015

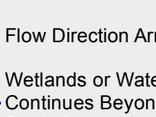
FIGURE A-5.1.86
WETLAND DELINEATION MAP

- Wetland and Waters Study Area
- Taxlot Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Photo Point
- Flow Direction Arrow
- Wetlands or Waters Continues Beyond Study Area

Boundaries of wetlands and other waters were surveyed with a Trimble GeoXH 6000 GNSS-enabled device. GPS data was differentially corrected to sub-meter accuracy.

0 50 100
Feet
1:1,000

WGS 84
UTM 10



Taxlot: 8N4W1600 200
Taxlot: 8N4W1500 500
Taxlot: 8N4W1500 500
Taxlot: 8N4W1600 300
Taxlot: 8N4W1500 600
STRM 68
#131
#132
STRM 69
WET WW
#130
POND 51

P:\GIS_PROJECTS\NW_Natural\NorthMistExpansion\MXDs\ASCI\Exhibit_JIWetland_Delineation_Report\NWN_NorthMistExpansion_WetlandDelineation_A-5_DETAILS_17111_20150226.mxd

APPENDIX B: DATA FORMS

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 27-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP 53

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 14 T 6 N R 5 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 45.9985317191 **Long.:** -123.260515835 **Datum:** NAD 83

Soil Map Unit Name: Treharne silt loam **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. Plot located on flat area outside (west) of the fence of the existing laydown area. To the west of the flat area the land drops off to the west.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	100	☑ 90.9%	FACW
2. Galium aparine	10	☐ 9.1%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	110	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	100	**x 2 =**	200
FAC species	0	**x 3 =**	0
FACU species	10	**x 4 =**	40
UPL species	0	**x 5 =**	0
Column Totals:	110	**(A)**	240 **(B)**

Prevalence Index = B/A = 2.182

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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 is dominated by reed canarygrass.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 53

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 Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 2/2						Silt Loam	w/cobbles to 4"

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology. No saturation.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 27-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP OO-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 14 T 6 N R 5 W

Landform (hillslope, terrace, etc.): **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 45.9988556063 **Long.:** -123.25989374 **Datum:** NAD 83

Soil Map Unit Name: Treharne silt loam **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Precipitation is normal. Plot is located between the edge of the paved road and the fenced staging area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Festuca arundinacea	5	☐ 8.3%	FAC
2. Juncus effusus	10	☑ 16.7%	FACW
3. Epilobium ciliatum	5	☐ 8.3%	FACW
4. Holcus lanatus	10	☑ 16.7%	FAC
5. Gramineae sp.	30	☑ 50.0%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	60	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 40

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	45	x 3 =	135
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		165 (B)

Prevalence Index = B/A = 2.750

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground the result of early season ponding, estimated at 3".

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP OO-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	3/1	90%	10YR	3/6	10%	C	M	Silt Loam	
4-6	10YR	3/1	60%	10YR	3/6	40%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Compacted rock

Depth (inches): 6

Hydric Soil Present? Yes ◉ No ○

Remarks:

Shovel refusal at 6" due to compacted rock.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Water marks on rocks along edge of road and wetland edge. There is a small area which previousl contained shallow standing water, but not at the plot location.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 27-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP OO-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 14 T 6 N R 5 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 45.9988764655 **Long.:** -123.259917853 **Datum:** NAD 83

Soil Map Unit Name: Treharne silt loam **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Precipitation is normal. Plot is located in a completely vegetated area to the west of the wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Vicia sativa	15	☐ 15.0%	UPL
2. Festuca arundinacea	65	☑ 65.0%	FAC
3. Geranium dissectum	10	☐ 10.0%	UPL
4. Holcus lanatus	5	☐ 5.0%	FAC
5. Juncus tenuis	5	☐ 5.0%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	25	x 5 =	125
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.500

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP OO-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	2/2	80%	10YR	4/4	10%	C	M	Silt Loam	gravel throughout
				10YR	4/2	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Rock refusal

Depth (inches): 4

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Area does not meet criteria for primary or secondary indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 18-Jul-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP Y-02

Investigator(s): J D'Avanzo, W. Young **Section, Township, Range:** S 3 T 6 N R 5 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 57.7 % / 30.0 °

Subregion (LRR): LRR A **Lat.:** 46.0381462259 **Long.:** -123.291088147 **Datum:** NAD 83

Soil Map Unit Name: Tolke silt loam, 5 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?** **(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 ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

Upland plot is located on hillslope three feet higher than wetland plot.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	40	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Polystichum munitum	90	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus ursinus	10	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	10	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	140 (A)		520 (B)

Prevalence Index = B/A = 3.714

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP Y-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR	4/4	100%						Loam	roots in top 2 inches

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Soils are not hydric.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators are present for the plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 18-Aug-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP Y-01

Investigator(s): J D'Avanzo, W. Young **Section, Township, Range:** S 3 T 6 N R 5 W

Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** concave **Slope:** 8.7 % / 5.0 °

Subregion (LRR): LRR A **Lat.:** 46.0381720241 **Long.:** -123.291114046 **Datum:** NAD 83

Soil Map Unit Name: Tolke silt loam, 5 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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Wetland is located on the edge of the road and hillside. Water most likely pools in this area from hillside and road.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	40	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size:)			
1. Rumex crispus	10	☐ 13.3%	FAC+
2. Alopecurus geniculatus	60	☑ 80.0%	OBL
3. Poa palustris	5	☐ 6.7%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	75	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 25

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		225 (B)

Prevalence Index = B/A = 1.957

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP Y-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/1	70%	5YR	4/6	30%			Loam clay	Roots in top inch, rocks through out

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Rock

Depth (inches): 6

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soils are comprised of rock and gravel

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Water marks are present on rocks.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 13-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP A-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 34 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** concave **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.0533542455 **Long.:** -123.292008727 **Datum:** NAD 83

Soil Map Unit Name: Alstony gravelly loam, 30 to 60 percent north slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Precipitation has been below average for the last 4 months. Wetland is fed by hillside seeps.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	30	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Petasites frigidus	60	☑ 66.7%	FACW-
2. Equisetum telmateia	20	☑ 22.2%	FACW
3. Agrostis gigantea	10	☐ 11.1%	UPL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	120 (A)		300 (B)

Prevalence Index = B/A = 2.500

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Plant community is hydrophytic.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP A-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	3/3	70%	10YR	4/4	30%	C	PL	Loamy Sand	Roots and gravel present
8-18	10YR	4/1	80%	10YR	4/4	20%	C	PL	Loamy Sand	Rocks and gravel present

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

There is distinct change at 8 inches. Upper layers of soils have a reddish hue. Soils meet F3, depleted matrix.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soils are saturated through out due to surface flow and high water table.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 13-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP A-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 34 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 26.8 % / 15.0 °

Subregion (LRR): LRR A **Lat.:** 46.0533636278 **Long.:** -123.291957106 **Datum:** NAD 83

Soil Map Unit Name: Alstony gravelly loam, 30 to 60 percent north 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation has been below average for the last 4 months. Upland plot is dug upslope of wetland by 3 feet.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	20	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus parviflorus	20	☑ 50.0%	FACU
2. Ribes lacustre	20	☑ 50.0%	FAC+
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	40	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Polystichum munitum	20	☑ 28.6%	FACU
2. Equisetum arvense	20	☑ 28.6%	FAC
3. Claytonia sibirica	15	☑ 21.4%	FAC
4. Agrostis gigantea	15	☑ 21.4%	UPL
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 7 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 57.1% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	40	x 4 =	160
UPL species	15	x 5 =	75
Column Totals:	130 (A)		460 (B)

Prevalence Index = B/A = 3.538

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Plant community is dominated by FAC plants. Plot is located close to wetland boundary

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP A-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR	3/3	100%							Roots and rocks

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Soils are reddish in color. No redox.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soils are completely dry

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 13-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP B-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 27 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** concave **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.0541792025 **Long.:** -123.292315737 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation has been below average for the last 4 months. Wetland is fed by hillside seeps into depression wetland, then into STRM 01 and out to another portion of the wetland before entering into a culvert.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Acer circinatum	40	☑ 100.0%	FAC-
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Cardamine angulata	70	☑ 73.7%	FACW
2. Polystichum munitum	5	☐ 5.3%	FACU
3. Lysichiton americanum	5	☐ 5.3%	OBL
4. Blechnum spicant	10	☐ 10.5%	FAC+
5. Chrysosplenium glechomifolium	5	☐ 5.3%	OBL
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	70	x 2 =	140
FAC species	50	x 3 =	150
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	135 (A)		320 (B)

Prevalence Index = B/A = 2.370

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP B-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/1	100%						Mucky Peat	wood bits and roots
6-18	10YR	3/3	90%	7.5YR	5/8	10%	C	M	Loamy Sand	rocks 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils are mucky mineral on in the upper 6 inches. Due to being in MLRA 1 this is not considered an indicator. Soils in the area are reddish but not a hue 7.5. Soils have a hydrogen sulfide smell. At the time of sampling soils were saturated throughout. For this time of year, and precipitation be being below average, soils also meet the hydric soils definition of being saturated for more than 2 weeks of the growing season.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

There are areas with surface water throughout wetland however not at the location where the plot was dug.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 13-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP B-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 27 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 26.8 % / 15.0 °

Subregion (LRR): **Lat.:** 46.0542085954 **Long.:** -123.292269005 **Datum:** NAD 83

Soil Map Unit Name: Murnen 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

Precipitation has been below average for the last 4 months. Upland plot is dug upslope of wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Acer circinatum	20	☑ 100.0%	FAC-
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Acer circinatum	10	☐ 11.8%	FAC-
2. Gaultheria shallon	20	☑ 23.5%	FACU
3. Polystichum munitum	25	☑ 29.4%	FACU
4. Berberis nervosa	20	☑ 23.5%	UPL
5. Cardamine angulata	10	☐ 11.8%	FACW
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	85	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 15

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	30	x 3 =	90
FACU species	45	x 4 =	180
UPL species	20	x 5 =	100
Column Totals:	105 (A)		390 (B)

Prevalence Index = B/A = 3.714

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Plant community is not hydrophytic.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP B-02

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 Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 2/2	100%					Loam	large and small roots, rocks 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Root refusal

Depth (inches): 8

Hydric Soil Present? Yes ○ No ◉

Remarks:

Soils are not hydric. They are dark due to duff and leaf material breaking down. No redox.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present a pit.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-Jul-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP V-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): hillslope **Local relief (concave, convex, none):** none **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.0780627995 **Long.:** -123.290491908 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☑ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ No ◉

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

Wetland is within a recently (~1-3 years) clearcut area. Slash and thick duff made finding a location to dig a pit challenging. Upland plot is on edge of clearcut.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Tsuga heterophylla	60	☑ 85.7%	FACU
2. Thuja plicata	10	☐ 14.3%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus spectabilis	25	☑ 38.5%	FAC
2. Oplopanax horridus	20	☑ 30.8%	FAC
3. Vaccinium membranaceum	20	☑ 30.8%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	65	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Pteridium aquilinum	15	☑ 33.3%	FACU
2. Polystichum munitum	15	☑ 33.3%	FACU
3. Galium aparine	5	☐ 11.1%	FACU
4. Dicentra formosa	5	☐ 11.1%	FACU
5. stachys mexicana	5	☐ 11.1%	FACW
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	45	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 55

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: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	55	x 3 =	165
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	180 (A)		655 (B)

Prevalence Index = B/A = 3.639

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of moss and woody debris.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP V-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	2/2	100%						Silty Clay Loam	
7-21	7.5YR	4/4	95%	5YR	3/4	5%	C	M	Clay	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: none

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-Jul-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP V-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): hillslope **Local relief (concave, convex, none):** concave **Slope:** 10.0 % / 5.7 °

Subregion (LRR): LRR A **Lat.:** 46.078086803 **Long.:** -123.290559565 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ No ◉

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Wetland is within a recently (~1-3 years) clearcut area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus spectabilis	25	☑ 71.4%	FAC
2. Oplopanax horridus	10	☑ 28.6%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	35	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Lysichiton americanus	20	☑ 25.0%	OBL
2. Claytonia sibirica	20	☑ 25.0%	FAC
3. Chrysosplenium glechomifolium	20	☑ 25.0%	OBL
4. Cardamine angulata	20	☑ 25.0%	FACW
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☑ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus spectabilis	10	☑ 100.0%	FAC
2.	0	☐ 0.0%	
	10	= Total Cover	

% Bare Ground in Herb Stratum: 20

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	20	x 2 =	40
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	125 (A)		275 (B)

Prevalence Index = B/A = 2.200

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Bare ground is slash and exposed soil.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP V-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	2/2	100%						Clay Loam	with roots and woody debris
7-14	10YR	3/1	100%						Sandy Loam	
14-21	5GY	4/1	95%	5YR	4/6	5%	C	PL	Loamy Sand	with cobbles

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: none

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil is hydric by definition because observed saturated for greater than 2 weeks during the growing season. Recent logging has likely caused erosion and sediment deposition in the wetland resulting in alteration of the soil profile.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	3
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Some surface water was running through the wetland but not at the pit location. Water seeped in from pit walls and filled pit to within 3 inches of the top of the pit. Saturated throughout profile.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 31-May-13

Applicant/Owner: NW Natural **State:** **Sampling Point:** **SP R-01**

Investigator(s): Jennifer D'Avanzo, Wendy Young **Section, Township, Range:** **S** 22 **T** 7 N **R** 5 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): **Lat.:** 46.0781724975 **Long.:** -123.286938881 **Datum:** NAD 83

Soil Map Unit Name: Caterl gravelly silt loam, 30 to 60 percent south 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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation has been below average for the last 3 months however the last week has been heavy rains. Wetland is adjacent to STRM 25.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Tsuga heterophylla	30	☑ 50.0%	FACU-
2. Alnus rubra	30	☑ 50.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10)			
1. Sambucus racemosa	5	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Lysichiton americanum	15	☑ 25.0%	OBL
2. Claytonia sibirica	15	☑ 25.0%	FAC
3. Chrysosplenium glechomifolium	20	☑ 33.3%	OBL
4. Galium aparine	5	☐ 8.3%	FACU
5. Maianthemum dilatatum	5	☐ 8.3%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	60	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 40

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: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	35	x 1 =	35
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	125 (A)		345 (B)

Prevalence Index = B/A = 2.760

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of duff and downed wood.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP R-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR	2/1	100%						Loam	broken down plant material
1-4	10YR	4/1	90%	5YR	5/6	10%	C	M	Sandy Loam	Roots present
4-20	10YR	4/1	90%	7.5YR	4/4	10%	C	M	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	11
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	7

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 31-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP R-02

Investigator(s): Jennifer D'Avanzo, Wendy Young **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 17.6 % / 10.0 °

Subregion (LRR): A **Lat.:** 46.0781729629 **Long.:** -123.28695675 **Datum:** NAD 83

Soil Map Unit Name: Caterl gravelly silt loam, 30 to 60 percent south 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?** **(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 ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

Precipitation has been below average for the last 3 months however the last week has been heavy rains.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Tsuga heterophylla	30	☑ 50.0%	FACU-
2. Alnus rubra	30	☑ 50.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10)			
1. Sambucus racemosa	10	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Polystichum munitum	20	☑ 25.0%	FACU
2. Oxalis oregana	30	☑ 37.5%	UPL
3. Maianthemum dilatatum	20	☑ 25.0%	FAC
4. Galium aparine	10	☐ 12.5%	FACU
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 20

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: 33.3% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	70	x 4 =	280
UPL species	30	x 5 =	150
Column Totals:	150 (A)		580 (B)

Prevalence Index = B/A = 3.867

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of duff and downed wood.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP R-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR	2/1	100%						Loam	roots and broken down plant material
5-20	10YR	3/4	100%							rocks

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Soils are rocky and no redox features 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators are present for the plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 14-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP 01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** concave **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.078191 **Long.:** -123.290894 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☑ **, Soil** ☑ **, or Hydrology** ☑ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ No ◉

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

Lower than normal precip for the past 3 months. Site is disturbed by recent logging. Site is on fringe of disturbed wetland that is outside Project survey area. Sample plot was collected to demonstrate that no wetland occurs at this location despite some standing water.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Athyrium filix-femina	10	☑ 50.0%	FAC
2. Polystichum munitum	10	☑ 50.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	20	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus spectabilis	10	☐ 100.0%	FAC+
2.	0	☐ 0.0%	
	10	= Total Cover	

% Bare Ground in Herb Stratum: 70

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	30 (A)		100 (B)

Prevalence Index = B/A = 3.333

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground is primarily moss. Site is a disturbed, recently logged Douglas fir/western hemlock forest.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR	3/4	100%						Loam	
14-20	10YR	3/3	50%						Loam	With rocks; marbled with color listed below.
14-20	10YR	2/2	50%						Loam	With rocks; marbled with color listed above.

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: none

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	14
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	8

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

On either side of sample plot, logging machinery has excavated/compacted soil, removed vegetation, and exposed groundwater. Sample Plot location represents more normal, pre-logging hydrology conditions. Hydrology indicators exposed in excavated/disturbed areas are indicated above on this dataform, although overall, site does not have hydrology indicators at 'normal' (pre-disturbance) surface level.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 31-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP S-01

Investigator(s): Jennifer D'Avanzo, Wendy Young **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Roadside ditch **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): A **Lat.:** 46.0785935326 **Long.:** -123.287921305 **Datum:** NAD 83

Soil Map Unit Name: Murnen 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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Precipitation has been below average for the last 3 months however the last week has been heavy rains. Feature is a roadside ditch

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5)			
1. Petasites frigidus	40	☑ 50.0%	FACW-
2. Equisetum arvense	30	☑ 37.5%	FAC
3. Galium aparine	5	☐ 6.3%	FACU
4. Holcus lanatus	5	☐ 6.3%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 20

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	35	x 3 =	105
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	80	(A)	205 (B)

Prevalence Index = B/A = 2.563

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Bare ground consists moss. Trees on steep slope not included in wetland plot.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP S-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/1	95%	7.5YR	3/4	5%	C	M	Loam	gravel and roots present
6-20	10YR	4/1	80%	5YR	5/8	5%	C	PL	Sandy Clay Loam	roots, rock and large gravel present
				7.5YR	4/6	15%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	7
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 31-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP S-02

Investigator(s): Jennifer D'Avanzo, Wendy Young **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** convex **Slope:** 17.6 % / 10.0 °

Subregion (LRR): A **Lat.:** 46.0786425779 **Long.:** -123.287925432 **Datum:** NAD 83

Soil Map Unit Name: Murnen 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Precipitation has been below average for the last 3 months however the last week has been heavy rains.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Tsuga heterophylla	20	☑ 40.0%	FACU-
2. Alnus rubra	30	☑ 60.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Polystichum munitum	5	☑ 50.0%	FACU
2. Petasites palmatus	5	☑ 50.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	10	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus laciniatus	10	☐ 100.0%	FACU+
2.	0	☐ 0.0%	
	10	= Total Cover	

% Bare Ground in Herb Stratum: 90

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: 40.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	35	x 3 =	105
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	70 (A)		245 (B)

Prevalence Index = B/A = 3.500

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Bare ground consists duff.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP S-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	3/4	100%						Sandy Clay Loam	
10-19	10YR	4/6	80%	10YR	5/2	7	D	M	Clay Loam	
				10YR	5/8	13	C	M		
19-20	2.5YR	6/2	60%	7.5YR	5/8	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Depleted soils at 19 inches and lower.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present for this plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-Jul-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP X-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): hillslope **Local relief (concave, convex, none):** convex **Slope:** 25.0 % / 14.0 °

Subregion (LRR): LRR A **Lat.:** 46.0787789243 **Long.:** -123.28788498 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	60	☑ 80.0%	FAC
2. Tsuga heterophylla	15	☑ 20.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Vaccinium membranaceum	10	☑ 25.0%	FACU
2. Oplopanax horridus	15	☑ 37.5%	FAC
3. Rubus spectabilis	15	☑ 37.5%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	40	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Athyrium filix-femina	5	☐ 6.3%	FAC
2. Cardamine angulata	20	☑ 25.0%	FACW
3. Blechnum spicant	10	☐ 12.5%	FAC
4. Polystichum munitum	15	☑ 18.8%	FACU
5. Galium aparine	20	☑ 25.0%	FACU
6. Claytonia sibirica	10	☐ 12.5%	FAC
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 8 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	115	x 3 =	345
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	195 (A)		625 (B)

Prevalence Index = B/A = 3.205

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of duff.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP X-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-21	10YR	4/4	100%							

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-Jul-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP W-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): hillslope **Local relief (concave, convex, none):** none **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.0787928096 **Long.:** -123.288187579 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	30	☑ 50.0%	FAC
2. Tsuga heterophylla	30	☑ 50.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Sambucus racemosa	10	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Polystichum munitum	20	☑ 66.7%	FACU
2. Maianthemum dilatatum	5	☐ 16.7%	FAC
3. Claytonia sibirica	5	☐ 16.7%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	30	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 70

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	100 (A)		360 (B)

Prevalence Index = B/A = 3.600

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

bare ground consists of duff.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP W-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	2/2	100%						Clay Loam	
4-9	10YR	3/6	100%						Loam	
9-21	2.5Y	5/1	90%	5YR	4/6	10%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-Jul-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP X-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): hillslope **Local relief (concave, convex, none):** none **Slope:** 15.0 % / 8.5 °

Subregion (LRR): LRR A **Lat.:** 46.0787965516 **Long.:** -123.287864469 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Oplopanax horridus	15	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	15	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Chrysosplenium glechomifolium	50	☑ 50.0%	OBL
2. Cardamine angulata	25	☑ 25.0%	FACW
3. Lysichiton americanum	25	☑ 25.0%	OBL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	25	x 2 =	50
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		170 (B)

Prevalence Index = B/A = 1.478

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Half vegetation plots used due to proximity of plot to upland.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP X-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	2/2	100%						Loam	
3-7	10YR	4/2	100%						Loamy Sand	
7-21	10GY	5/1	80%	5YR	5/6	20%	C	M	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	14
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Surface water 2" adjacent to pit.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-Jul-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP W-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 22 T 7 N R 5 W

Landform (hillslope, terrace, etc.): hillslope **Local relief (concave, convex, none):** concave **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 46.0788076975 **Long.:** -123.28817305 **Datum:** NAD 83

Soil Map Unit Name: Murnen silt loam, 3 to 30 percent slopes **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Lysichiton americanum	50	☑ 66.7%	OBL
2. Chrysosplenium glechomifolium	15	☑ 20.0%	OBL
3. Cardamine angulata	5	☐ 6.7%	FACW
4. Equisetum arvense	5	☐ 6.7%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	75	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 25

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	65	x 1 =	65
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		90 (B)

Prevalence Index = B/A = 1.200

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of mud/exposed soil. Half plots were used due to proximity of plot to upland boundary.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP W-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR	3/2	100%						Silty Loam	
9-21	10YR	6/3	60%	10GY	4/1	30%	D	M	Sandy Loam	
+mottle				7.5YR	4/6	10%	C	M	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: none

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydrogen sulfide odor encountered at 9 inches. Soil was also observed saturated for greater than 2 weeks during the growing season.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 15-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP D-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 14 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 173.2 % / 60.0 °

Subregion (LRR): LRR A **Lat.:** 46.0855002095 **Long.:** -123.279583407 **Datum:** NAD 83

Soil Map Unit Name: Tolke silt loam, 5 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

Precipitation has been below average for the last 4 months however it has been raining for 3 days. Upland is located upslope of floodplain wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Tsuga heterophylla	50	☑ 100.0%	FACU-
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Vaccinium ovalifolium	20	☑ 66.7%	UPL
2. Rubus parviflorus	10	☑ 33.3%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Athyrium filix-femina	10	☑ 33.3%	FAC
2. Oxalis oregana	10	☑ 33.3%	UPL
3. Blechnum spicant	10	☑ 33.3%	FAC+
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	30	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	60	x 4 =	240
UPL species	30	x 5 =	150
Column Totals:	110	(A)	450 (B)

Prevalence Index = B/A = 4.091

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bareground comprises of moss.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP D-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	2/2	100%						Loam	Roots and broken down plant material
3-17	10YR	4/4	95%	10YR	5/8	5%	C	M	Clay Loam	Rocks and clay chunks.

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Soils do not meet hydric indicators nor the definition.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	16

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No indicators of hydric soil present.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 15-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP D-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 15 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.0855076861 **Long.:** -123.279591071 **Datum:** NAD 83

Soil Map Unit Name: Tolke silt loam, 5 to 30 percent slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation has been below average for the last 4 months however it has been raining for 3 days. Wetland is located on floodplain of STRM 04.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Menziesia ferruginea	10	☑ 40.0%	FACU+
2. Rubus parviflorus	10	☑ 40.0%	FACU
3. Sambucus racemosa	5	☑ 20.0%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	25	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Chrysosplenium glechomifolium	30	☑ 30.0%	OBL
2. Oxalis oregana	20	☑ 20.0%	UPL
3. Lysichiton americanum	5	☐ 5.0%	OBL
4. Athyrium filix-femina	15	☑ 15.0%	FAC
5. Polystichum munitum	5	☐ 5.0%	FACU
6. Tellima grandiflora	5	☐ 5.0%	FACU
7. Cardamine angulata	5	☐ 5.0%	FACW
8. Claytonia sibirica	15	☑ 15.0%	FAC
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 7 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	5	x 2 =	10
FAC species	30	x 3 =	90
FACU species	35	x 4 =	140
UPL species	20	x 5 =	100
Column Totals:	125 (A)		375 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Did not include trees in because they higher up on the bank not in the wetland. Plant community passes the prevalence test.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP D-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	3/2	100%						Sandy Loam	Fine plant material and roots
8-14	10YR	3/2	100%						Sandy Loam	Alluvial material about 60%
14-20	10YR	3/1	100%						Sandy Loam	no rocks just sandy texture

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils are saturated through and have a high water table, therefore they meet the hydric soil definition because it is well into the growing the season.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	8
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Wetland is on the floodplain adjacent to stream.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 16-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP 02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 12 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Bench **Local relief (concave, convex, none):** concave **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.1069352376 **Long.:** -123.243830604 **Datum:** NAD 83

Soil Map Unit Name: Anunde silt loam, 3 to 30 percent slopes **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is below normal for the past 4 months. Site appears to have been disturbed historically. It is located on an old road at the foot of the slope of the existing road. Downslope from the plot is a culvert that drains a pond on the other side of the existing road. The culvert feeds an

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Alnus rubra	30	☑ 60.0%	FAC
2. Sambucus racemosa	20	☑ 40.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Sambucus racemosa	10	☑ 33.3%	FACU
2. Alnus rubra	20	☑ 66.7%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	60	☑ 60.0%	FACW
2. Ranunculus repens	10	☐ 10.0%	FACW
3. Oenanthe sarmentosa	10	☐ 10.0%	OBL
4. Cardamine angulata	10	☐ 10.0%	FACW
5. Dicentra formosa	10	☐ 10.0%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus discolor	10	☐ 50.0%	FACU
2. Rubus spectabilis	10	☑ 50.0%	FAC+
	20	= 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: 7 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 57.1% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	80	x 2 =	160
FAC species	60	x 3 =	180
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	200 (A)		550 (B)

Prevalence Index = B/A = 2.750

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Although vegetation passes dominance test, plot is not in a wetland. Highly invasive Phalaris arundinacea is a dominant and may be thriving due to compacted soils on old road bed.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	3/3	100%						Sandy Clay Loam	roots
3-20	10YR	3/2	70%	7.5YR	4/6	20%	C	M	Sandy Clay Loam	clay chunks with redox.
3-20	10YR	3/2	70%	10YR	5/1	10%	D	M	Sandy Clay Loam	clay chunks with 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: none

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Clay chunks from 3 inches down with striations of redox. Although soil qualifies as hydric, redox is likely remnant. Soils was very dry at time of sampling and should have been saturated given recent heavy rains if in a wetland.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators despite recent heavy rain.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 17-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP 03

Investigator(s): J. D'Avanzo, A. Bensted **Section, Township, Range:** S 12 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1073668867 **Long.:** -123.244366847 **Datum:** NAD 83

Soil Map Unit Name: Anunde 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is below normal for the past three months. Sample plot located in a Phalaris patch to test for soils and hydrology because it was in a lower area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	100	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	3/2	98	10YR	5/8	20%			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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Does not meet F6.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators are present for the plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP KK-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 7 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1125985298 **Long.:** -123.236480697 **Datum:** NAD 83

Soil Map Unit Name: Anunde 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot is located on the slope of planted zone containing Populus balsamifera, and 15" south of wetland plot SP CC-01.fill slope of the adjacent paved roadway and is about 3 feet above skunk

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30)			
1. Sambucus racemosa	10	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Athyrium filix-femina	20	☑ 40.0%	FAC
2. Phalaris arundinacea	15	☑ 30.0%	FACW
3. Dicentra formosa	15	☑ 30.0%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	50	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	5	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	5	= 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: 5 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	20	x 3 =	60
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	65 (A)		210 (B)

Prevalence Index = B/A = 3.231

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of past season's dead reed canarygrass.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP KK-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	4/4	90%	10YR	3/2	5%	C	M	Silty Clay Loam	
				10YR	5/8	5%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Plot is on roadway fill slope. Soil appears to be disturbed.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	16

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP KK-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 7 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Gulch or Gully **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): **Lat.:** 46.1126203216 **Long.:** -123.236498281 **Datum:** NAD 83

Soil Map Unit Name: Anunde silt loam, 3 to 30 percent slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Wetland consists of a narrow creek channel vegetated with FACW and Obligate hydrophytes and occassional wider zones dominated by skunk cabbage.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5)			
1. Lysichiton americanum	100	☑ 100.0%	OBL
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP KK-01

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Soil plot not dug because the wetland is dominated with obligate wetland plants and is clearly wetland based on hydrology and landscape context.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP LL-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1136813195 **Long.:** -123.236084871 **Datum:** NAD 83

Soil Map Unit Name: Anunde 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Plot is located on the fill slope of the adjacent paved roadway. Plot is about 2 feet higher than the PEM wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Dicentra formosa	30	☑ 37.5%	FACU
2. Tolmiea menziesii	10	☐ 12.5%	FAC
3. Taraxacum officinale	20	☑ 25.0%	FACU
4. Galium aparine	15	☐ 18.8%	FACU
5. Epilobium ciliatum	5	☐ 6.3%	FACW
6.		☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 20

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	10	x 3 =	30
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	80 (A)		300 (B)

Prevalence Index = B/A = 3.750

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of moss.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP LL-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	3/4	80%	10YR	4/6	20%	C	M	Silty Clay Loam	Cobbles to 3" in 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Compacted road fill

Depth (inches): 16

Hydric Soil Present? Yes ○ No ◉

Remarks:

Plot is located on the fill slope of the adjacent paved road. Soil appears to be disturbed.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP LL-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1136948628 **Long.:** -123.236104124 **Datum:** NAD 83

Soil Map Unit Name: Anunde silt loam, 3 to 30 percent slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Small PEM wetland is loacted on the upslope side of the paved roadway. A small stream flows through the wetland and water is conveyed through a culvert to the opposite side of the road.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Glyceria elata	80	☑ 80.0%	FACW
2. Equisetum hyemale	20	☑ 20.0%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP LL-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	5/2	70%	10YR	5/8	30%	C	M	Silty Clay Loam	
16-20	10YR	5/2	70%	10YR	5/8	30%	C	M	Silty Clay Loam	Angular cobbles to 2" and small gravel in 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	16
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Shallow flowing about 2 feet from the sample plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP MM-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1143324747 **Long.:** -123.235491331 **Datum:** NAD 83

Soil Map Unit Name: Anunde 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Upland plot is located on the fill slope of the adjacent paved roadwayand is about 2.5 feet higher than SP MM-01

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	35	☑ 50.0%	FAC
2. Myosotis sylvatica	20	☑ 28.6%	FAC
3. Taraxacum officinale	15	☑ 21.4%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 10

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	70 (A)		225 (B)

Prevalence Index = B/A = 3.214

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

20% of ground cover is moss and bare ground is roadside gravel.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP MM-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	4/4	70%	10YR	6/1	30%	C	M	Sandy Clay Loam	distrubed soil mixed with gravel
16-20	10YR	4/4	70%	10YR	4/6	20%	C	M	Sandy Clay Loam	
				10YR	6/2	10%	C	M	Sandy 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators. Soil moist only.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP MM-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.114348693 **Long.:** -123.235503539 **Datum:** NAD 83

Soil Map Unit Name: Anunde silt loam, 3 to 30 percent slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Wetland is contained within a roadside ditch about 3'-4' wide and two connecting seep areas upslope of the ditch.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5)			
1. Lysichiton americanum	15	☑ 21.4%	OBL
2. Phalaris arundinacea	30	☑ 42.9%	FACW
3. Geum macrophyllum	15	☑ 21.4%	FAC
4. Equisetum hyemale	0	☐ 0.0%	FACW
5. Poa trivialis	10	☐ 14.3%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	30	x 2 =	60
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		150 (B)

Prevalence Index = B/A = 2.143

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of small areas of shallow open water and dead reed canarygrass from 2013.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP MM-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-14	N	6/1	80%	5YR	4/6	20%	C	M	Sandy Clay	
14-20	2.5Y	6/3	70%	5YR	4/6	30%	C		Sandy Clay	

[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 Muck Mineral (S1)
- ☑ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Heavy soil, highly gleyed in upper 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	14
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Saturation at surface due to adjacent small flowing stream in wetland ditch.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 11-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP NN-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** concave **Slope:** 10.0 % / 5.7 °

Subregion (LRR): LRR A **Lat.:** 46.1168110959 **Long.:** -123.234156291 **Datum:** NAD 83

Soil Map Unit Name: Anunde silt loam, 3 to 30 percent slopes **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Wetland is contained withion a roadside ditch and is predominantly PEM. Steep bank on uphill side of wetland and paved raodway borders the opposite side of the wetland ditch.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3X20)			
1. Alnus rubra	15	☑ 60.0%	FAC
2. Salix sessilifolia	10	☑ 40.0%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	25	= Total Cover	
Herb Stratum (Plot size: 3x5)			
1. Oenanthe sarmentosa	30	☑ 37.5%	OBL
2. Phalaris arundinacea	50	☑ 62.5%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	60	x 2 =	120
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		195 (B)

Prevalence Index = B/A = 1.857

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP NN-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/4	100%						Silty Clay Loam	
6-10	10YR	3/1	80%	10YR	3/6	20%	C	M	Silty Clay Loam	some sand and gravel in matrix from roadside

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: compacted gravel

Depth (inches): 10

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	9
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Shallow water (1") in ditch within 1-2 feet of sample plot. A few hillside seep areas are connected to the ditch along its length.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 11-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP NN-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Hillside **Local relief (concave, convex, none):** convex **Slope:** 119.2 % / 50.0 °

Subregion (LRR): LRR A **Lat.:** 46.1168210611 **Long.:** -123.234177698 **Datum:** NAD 83

Soil Map Unit Name: Anunde 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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot is located on steep hillside about 3 feet above the wetland ditch, opposite the road.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Rubus ursinus	30	☑ 31.6%	FACU
2. Phalaris arundinacea	40	☑ 42.1%	FACW
3. Hydrophyllum tenuipes	15	☐ 15.8%	FAC
4. Urtica dioica	10	☐ 10.5%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	25	x 3 =	75
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	95 (A)		275 (B)

Prevalence Index = B/A = 2.895

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP NN-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	3/2	100%						Sandy Loam	gravel and sand mixed into 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Bedrock

Depth (inches): 4

Hydric Soil Present? Yes ○ No ◉

Remarks:

Soil pit not excavated below 4 " due to bedrock beneath shallow soil and root layer on steep hillslope.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Moisture in upper layer likely from seepage between bedrock and shallow soil layer.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP HH-04

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1205965551 **Long.:** -123.23245454 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot is located on a berm that follows the property line fence parallel to Hwy 30.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	95	☑ 100.0%	FACW
2. Cardamine oligosperma	0	☐ 0.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. Rubus armeniacus	10	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	10	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	105 (A)		230 (B)

Prevalence Index = B/A = 2.190

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP HH-04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/3	100%						Silty Clay Loam	
6-12	10YR	3/3	80%	10YR	5/1	10%	D	M	Sandy Loam	
				10YR	4/6	10%	C	M		
12-20	10YR	3/2	90%	10YR	5/1	5%	C	M	Fine Sand	
				10YR	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Soil is likely fill from past roadway ROW activity. Plot is about 3 feet higher than the wetland to the north.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP HH-03

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1206527928 **Long.:** -123.232432718 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
PEM wetland. Plot located near Hwy 30.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	90	☑ 90.0%	FACW
2. Urtica dioica	10	☐ 10.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		210 (B)

Prevalence Index = B/A = 2.100

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP HH-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	90%	10YR	4/4	10%	C	M	Silty Clay Loam	
6-16	10YR	2/2	90%	10YR	4/2	10%	D	M	Silty Clay Loam	
16-20	10YR	4/2	45	10YR	3/4	10%	C	M	Silty Clay Loam	
	10YR	2/2	45							

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP 51

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 1 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1214012262 **Long.:** -123.244590788 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. NWI mapped PEM. Not a wetland - no hydrology due to hydrology manipulation by surrounding drainage canals and pump system. Plot dug in pasture to investigate.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	45	☑ 45.0%	FACW
2. Alopecurus pratensis	45	☑ 45.0%	FAC
3. Trifolium repens	10	☐ 10.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	55	x 3 =	165
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		255 (B)

Prevalence Index = B/A = 2.550

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Pasture dominated by Phalaris arundinacea and Alopecurus pratensis.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 51

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	45%	10YR	4/6	5%	C	M	Silty Clay Loam	
	10YR	3/1	45%							
6-16	10YR	3/1	80%	10YR	4/6	20%	C		Silty Clay Loam	
16-20	10YR	3/3	90%	10YR	5/3	5%	C		Silty Clay Loam	
				10YR	4/6	5%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology present. Soil moist only.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP HH-05

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): **Lat.:** 46.1219757236 **Long.:** -123.232689427 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PEMAd

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot located on wetsern extent of wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	30	☑ 30.0%	FACW
2. Phalaris arundinacea	15	☐ 15.0%	FACW
3. Poa trivialis	50	☑ 50.0%	FAC
4. Trifolium repens	5	☐ 5.0%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	55	x 3 =	165
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		255 (B)

Prevalence Index = B/A = 2.550

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP HH-05

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR	2/2	100%						Silt Loam	
5-16	10YR	2/2	95%	10YR	3/4	5%	C	M	Silt Loam	
16-20	10YR	4/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No saturation but meets hydrology by secondary indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP HH-06

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1219763205 **Long.:** -123.232813538 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Upland boundary at created berm bounds wetland on the eastside of the ditch (STRM 56)

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	40	☑ 57.1%	FACW
2. Poa trivialis	30	☑ 42.9%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	30	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	30	= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	30	x 3 =	90
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	100 (A)		290 (B)

Prevalence Index = B/A = 2.900

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP HH-06

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	100%						Silt Loam	
6-16	N	2.5/1	100%						Silt Loam	
16-20	10YR	2/2	95%	10YR	3/4	5%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology present.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP 52

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 1 T 7 N R 5 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1220382571 **Long.:** -123.242778361 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Dug sample plot to check hydrology.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	50	☑ 50.0%	FACW
2. Alopecurus pratensis	50	☑ 50.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		250 (B)

Prevalence Index = B/A = 2.500

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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 is in a pasture.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 52

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	3/2	90%	10YR	3/4	10%	C	M	Silty Clay Loam	
8-16	10YR	3/1	90%	10YR	3/6	10%	C	M	Silty Clay Loam	
16-20	10YR	3/1	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	16
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	14

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No wetland hydrology present to meet hydrology indicator.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP 50

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.122172314 **Long.:** -123.235108564 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. NWI mapped PEM. Plot is located in pasture with 100% reed canarygrass. Assumed relict soils.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	100	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 50

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	100%						Silt Loam	
6-12	10YR	3/2	90%	10YR	3/4	10%	C	M	Silt Loam	
12-20	10YR	3/1	100%							

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Assumed to be relict redox features. Area is protected by a dike.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No saturation, no water table. The patusre is protected by a dike.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP HH-07

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.123138932 **Long.:** -123.225962513 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	40	☑ 40.0%	FACW
2. Phalaris arundinacea	30	☑ 30.0%	FACW
3. Trifolium repens	30	☑ 30.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		230 (B)

Prevalence Index = B/A = 2.300

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP HH-07

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	3/1	80%	10YR	3/6	20%	C	M	Silty Clay Loam	
7-14	N	2.5/1	90%	10YR	3/6	10%	C	M	Silty Clay Loam	
14-20	10YR	2/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	7
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	4

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 09-Apr-14

Applicant/Owner: NW Natural **State:** **Sampling Point:** SP HH-08

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1233088376 **Long.:** -123.22568609 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	50	☑ 62.5%	FACW
2. Poa trivialis	30	☑ 37.5%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	20	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	20	= Total Cover	

% Bare Ground in Herb Stratum: 20

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	30	x 3 =	90
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	100 (A)		270 (B)

Prevalence Index = B/A = 2.700

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP HH-08

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	3/2	100%						Silty Clay Loam	
7-16	10YR	3/2	50%						Silty Clay Loam	
	10YR	3/3	50%							
16-20	10YR	3/2	80%	10YR	3/6	10%	C	M	Silty Clay Loam	
				10YR	2/1	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology present.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 21-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP 04

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): flats **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1248006073 **Long.:** -123.22044435 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is below normal for the past three months. Mapped by NWI as PEMA, but likely historic. Area is currently diked and planted with poplar. A drainage ditch also drains the area, potentially lowering the water table. Neither hydric soil nor wetland hydrology present; plants pass the dominance

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	95	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	95	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Ranunculus repens	40	☑ 80.0%	FAC
2. Equisetum arvense	5	☐ 10.0%	FAC
3. Rumex crispus	5	☐ 10.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	50	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	145	x 3 =	435
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	145 (A)		435 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground in herb stratum is exposed dirt and leaf litter. Community is entirely FAC, likely because it is forested and generally moist, but site is not a wetland. Populus balsamifera is planted.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP 04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR	2.5/2	100%						Sandy Clay Loam	
5-21	10YR	3/2	98%	7.5YR	3/4	2%	C	M	Silty Clay Loam	
21+	10YR	5/1	93%	7.5YR	4/6	&%	C	M	Silty Clay	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP GG-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1252065147 **Long.:** -123.217951804 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot dug about 6 feet higher than the wetland. Soils are mostly disturbed from excavation and compaction due to vehicle travel.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	50	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Sambucus racemosa	5	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	20	☑ 20.0%	FACW
2. Equisetum arvense	15	☐ 15.0%	FAC
3. Gramineae sp.	50	☑ 50.0%	FAC
4. Stellaria media	5	☐ 5.0%	FACU
5. Cardamine oligosperma	5	☐ 5.0%	FAC
6. Galium aparine	5	☐ 5.0%	FACU
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	120	x 3 =	360
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	155 (A)		460 (B)

Prevalence Index = B/A = 2.968

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP GG-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR	3/4	100%						Silt Loam	
4-10	7.5YR	3/4	50%						Sandy Loam	
4-10	10YR	5/1	50%						Sandy Loam	
10-20	7.5YR	2.5/1	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP GG-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.125214762 **Long.:** -123.217926978 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Wetland is located in drainage ditch.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	10	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Sambucus racemosa var. racemosa	5	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	20	☑ 28.6%	FACW
2. Impatiens capensis	30	☑ 42.9%	FACW
3. Equisetum arvense	10	☐ 14.3%	FAC
4. Gramineae sp.	10	☐ 14.3%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	30	x 3 =	90
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	85	(A)	210 (B)

Prevalence Index = B/A = 2.471

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground includes standing water.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP GG-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	90%	10YR	5/1	10%	D	M	Silty Clay Loam	
6-20	5GY	4/1	100%							

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	4
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Plot dug at toe of bank inside ditch.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP II-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.126749533 **Long.:** -123.2193649 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Upland plot dug in forest where there is no Juncus effusus. Plots are more widely spaced due to flat terrain.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	70	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	40	☑ 44.4%	FACW
2. Medicago lupulina	30	☑ 33.3%	FACU
3. Poa trivialis	15	☐ 16.7%	FAC
4. Senecio sylvaticus	5	☐ 5.6%	FACU
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	85	x 3 =	255
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	160 (A)		475 (B)

Prevalence Index = B/A = 2.969

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP II-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	95%	10YR	3/4	5%	C	PL	Silt Loam	
6-16	10YR	2/2	90%	10YR	3/4	10%	C	PL	Silty Clay Loam	
16-20	10YR	2/2	90%	10YR	3/4	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	17
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	14

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP II-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 6 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1267557686 **Long.:** -123.21944023 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Wetland is located in a managed tree plantation.Most of the wetland is in an opening in the tree plantation where trees are not planted possibly due to extended saturation.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	20	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	25	☑ 31.3%	FACW
2. Alopecurus geniculatus	30	☑ 37.5%	OBL
3. Phalaris arundinacea	25	☑ 31.3%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	50	x 2 =	100
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		190 (B)

Prevalence Index = B/A = 1.900

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP II-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	95%	10YR	3/6	5%	C	M	Silty Clay Loam	
6-20	10YR	2/2	90%	10YR	3/6	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	4
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP EE-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 5 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.127338054 **Long.:** -123.211423384 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PFO/PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	20	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	20	☑ 20.0%	FACW
2. Phalaris arundinacea	10	☐ 10.0%	FACW
3. Gramineae sp.	65	☑ 65.0%	FAC
4. Cirsium arvense	5	☐ 5.0%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	90	x 3 =	270
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		330 (B)

Prevalence Index = B/A = 2.750

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP EE-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	2/2	100%						Silt Loam	
7-11	10YR	2/2	45	10YR	3/4	10%	C	M	Silt Loam	
	N2.5	1	45							
11-20	10YR	2/2	80%	10YR	3/4	20%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	13.5
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	10

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP EE-03

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 5 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 46.1277447288 **Long.:** -123.211405078 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot is within managed cottonwood tree farm.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	20	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Gramineae sp.	90	☑ 90.0%	FAC
2. Juncus effusus	5	☐ 5.0%	FACW
3. Poa trivialis	5	☐ 5.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	115	x 3 =	345
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		355 (B)

Prevalence Index = B/A = 2.958

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP EE-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	2/2	100%						Silt Loam	
7-14	10YR	2/2	95%	10YR	3/4	2.5	C	M	Silt Loam	
	10YR	2/2	95%	10YR	5/2	2.5	D	M	Silt Loam	
14-20	10YR	4/1	90%	10YR	3/4	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	21
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	20

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP EE-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 5 T 7 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** undulating **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 46.1277947299 **Long.:** -123.211411448 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PFO/PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Wetland bands throughout area defined by Juncus effusus. Depressions in the landscape.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	30	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	30	☑ 30.0%	FACW
2. Gramineae sp.	70	☑ 70.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	130 (A)		360 (B)

Prevalence Index = B/A = 2.769

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP EE-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	2/2	100%						Silt Loam	
7-14	10YR	2/2	45	10YR	3/4	5%	C	M	Silt Loam	
	N2.5	1	45	10YR	3/4	5%	C	M		
14-20	10YR	4/2	90%	10YR	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	14
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	12

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP FF-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1321942477 **Long.:** -123.214682442 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	40	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	10	☐ 10.0%	FACW
2. Gramineae sp.	90	☑ 90.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	130	x 3 =	390
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	140 (A)		410 (B)

Prevalence Index = B/A = 2.929

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP FF-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	2/2	100%						Silt Loam	
8-16	10YR	2/2	50%						Silt Loam	
8-16	10YR	3/1	50%						Silt Loam	
16-20	10YR	4/2	90%	10YR	4/6	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	16
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	14

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP FF-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1322139088 **Long.:** -123.214632925 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	30	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	25	☑ 25.0%	FACW
2. Gramineae sp.	70	☑ 70.0%	FAC
3. Phalaris arundinacea	5	☐ 5.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	30	**x 2 =**	60
FAC species	100	**x 3 =**	300
FACU species	0	**x 4 =**	0
UPL species	0	**x 5 =**	0
Column Totals:	130	**(A)**	360 **(B)**

Prevalence Index = B/A = 2.769

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP FF-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	100%						Silt Loam	
6-8	10YR	3/2	95%	10YR	3/4	5%	C	M	Silt Loam	
8-12	10YR	3/1	100%						Silt Loam	
12-20	10YR	5/2	80%	10YR	4/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	8

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 22-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP K-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1346717066 **Long.:** -123.215200099 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation has been below normal for the past three months. Upland plot is located on the flat land in the tree plantation slightly higher than the wetland plot.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	20	☑ 20.0%	FAC
2. Trifolium repens	50	☑ 50.0%	FAC
3. Rumex crispus	5	☐ 5.0%	FAC+
4. Vicia sativa	5	☐ 5.0%	UPL
5. Alopecurus geniculatus	10	☐ 10.0%	OBL
6. Cirsium arvense	10	☐ 10.0%	FAC+
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	105 (A)		305 (B)

Prevalence Index = B/A = 2.905

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Vegetation is dominated by FAC plants.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP K-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	3/2	100%						Silty Clay Loam	Roots
3-10	10YR	3/2	98%	5YR	5/6	20%	C	M	Silty Clay Loam	
10-20	10YR	4/1	70%	10YR	5/8	20%	C	M	Silty Clay	
				5YR	5/6	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

There is redox from 3 inches down, but it does not meet any indicators. Much of the soils in the area have relix redox due to being on the floodplain of the Columbia River.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators are present for the upland plot. It has been raining for over a week, however no observation of water table or saturation.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 22-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP K-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** concave **Slope:** 8.7 % / 5.0 °

Subregion (LRR): LRR A **Lat.:** 46.1346939806 **Long.:** -123.215148173 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation has been below normal for the past 3 months. It has been raining for over a week but no standing water or saturation observed. Wetland is located in a subtle depression in a tree plantation. Wet plot is located where there are dead and stressed trees.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Alopecurus geniculatus	60	☑ 60.0%	OBL
2. Trifolium repens	20	☑ 20.0%	FAC
3. Poa trivialis	10	☐ 10.0%	FAC
4. Cirsium arvense	10	☐ 10.0%	FAC+
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		195 (B)

Prevalence Index = B/A = 1.857

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Plant community/wetland depression domintated by ALOGEN.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP K-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR	3/2	93	7.5YR	4/6	7	C	M	Silt Loam	dense roots
2-12	10YR	4/1	90%	10YR	4/6	10%	C	M	Silty Clay Loam	Prominent redox
12-20	10YR	4/1	70%	7.5YR	4/6	30%	C	M	Silty Clay Loam	Prominent 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils meet both F3 and F8 indicators. The wetland located with in the overall floodplain of the Columbia River and it is a depression. Redox is present in the upper two inches of the profile. From 2" to 20" soils meet F3.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☑ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Hydrololgy indicators present for wetland include stunted or stressed trees, as well as FAC Neutral and geomorphic position. At the time of the visit the water table was not visible and there was no saturation.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 12-Feb-15

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP BBB-02

Investigator(s): JG **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 1.0 % / 0.6 °

Subregion (LRR): LRR A **Lat.:** 46.138120 **Long.:** -123.210891 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size:)			
1. Juncus effusus	40	☑ 40.0%	FACW
2. Agrostis stolonifera	50	☑ 50.0%	FAC
3. Phalaris arundinacea	10	☐ 10.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		250 (B)

Prevalence Index = B/A = 2.500

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP BBB-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR	2/1	95	2.5YR	3/3	5	C	M	Loam	
11-20	10YR	4/1	85	5YR	4/6	15	C	M	Clay	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators are present for the plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 12-Feb-15

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP BBB-01

Investigator(s): JG **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 1.0 % / 0.6 °

Subregion (LRR): LRR A **Lat.:** 46.138152 **Long.:** -123.210885 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size:)			
1. Juncus effusus	50	☑ 50.0%	FACW
2. Phalaris arundinacea	25	☑ 25.0%	FACW
3. Beckmannia syzigachne	25	☑ 25.0%	OBL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	75	x 2 =	150
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		175 (B)

Prevalence Index = B/A = 1.750

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Identification of Beckmannia syzigachne is tentative, based on dead material from previous season.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP BBB-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/1	60	10YR	5/1	25	D	M	Loam	Additional redox: 2.5YR 4/6, 10%, C, M.
10-20	10YR	4/1	95	5YR	5/4	5	C	M	Clay	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	7

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 12-Feb-15

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP AAA-01

Investigator(s): JG **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 1.0 % / 0.6 °

Subregion (LRR): LRR A **Lat.:** 46.138885 **Long.:** -123.210918 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size:)			
1. Juncus effusus	50	☑ 50.0%	FACW
2. Agrostis stolonifera	30	☑ 30.0%	FAC
3. Holcus lanatus	10	☐ 10.0%	FAC
4. Phalaris arundinacea	10	☐ 10.0%	FACW
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	40	x 3 =	120
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		240 (B)

Prevalence Index = B/A = 2.400

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP AAA-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	2/1	100						Loam	
4-10	10YR	4/1	80	10R	3/3	20	C	M	Clay	Some redox were 5YR 4/6.
10-20	10YR	4/1	90	10R	3/3	10	C	PL	Clay	Some redox were 5YR 4/6.

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	9

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Plot is in the bottom of an excavated drainage swale. Swale is shallow "U" shape, 10' across at the top, and about 2' deep.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 12-Feb-15

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP AAA-02

Investigator(s): JG **Section, Township, Range:** S 32 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 1.0 % / 0.6 °

Subregion (LRR): LRR A **Lat.:** 46.138916 **Long.:** -123.210897 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size:)			
1. Agrostis stolonifera	60	☑ 60.0%	FAC
2. Phalaris arundinacea	20	☑ 20.0%	FACW
3. Holcus lanatus	15	☐ 15.0%	FAC
4. Juncus effusus	5	☐ 5.0%	FACW
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100	(A)	275 (B)

Prevalence Index = B/A = 2.750

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP AAA-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	2/1	75	10YR	5/2	15	D	M	Loam	Also 0-20", redox 10R 3/4, 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators are present for the plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP DD-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1463072856 **Long.:** -123.207244072 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Populus balsamifera	10	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	10	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Equisetum arvense	10	☐ 15.4%	FAC
2. Poa trivialis	15	☑ 23.1%	FAC
3. Epilobium ciliatum	15	☑ 23.1%	FACW
4. Gramineae sp.	25	☑ 38.5%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	65	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 35

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		210 (B)

Prevalence Index = B/A = 2.800

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP DD-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	2/2	100%						Silt Loam	
16-20	10YR	4/2	90%	10YR	3/4	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	14
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	10

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP DD-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1463309114 **Long.:** -123.207279048 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Wetland is contained within an ~10' wide excavated drainage ditch.Wetland is mapped by NWI as riverine (R4). Plot sampled near edge of water but not in the water.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	25	☑ 35.7%	FACW
2. Equisetum arvense	5	☐ 7.1%	FAC
3. Phalaris arundinacea	10	☐ 14.3%	FACW
4. Gramineae sp.	30	☑ 42.9%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		175 (B)

Prevalence Index = B/A = 2.500

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground equals open water.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP DD-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	100%						Silt Loam	
10-20	10YR	4/2	90%	10YR	3/4	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils are depleted starting at 10".

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	4

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Standing water in wetlands about 2"-3" deep.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP DD-03

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1467353826 **Long.:** -123.206366356 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. From the drainage ditch portion of WET DD a narrow arm of wetland extends SE into the plantation and becomes a wider area consisting of a shallow depression surrounded by slightly higher areas

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Populus balsamifera	20	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	20	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	60	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	60	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 40

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		240 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Most of the wetland lacks vegetation due to ponded conditions. Few Pop. balsamifera within the ponded area appear stressed.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP DD-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	100%						Silt Loam	
10-20	10YR	5/2	80%	10YR	4/6	20%	C	M	Sandy 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	3
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Surface water present in shallow ponded areas adjacent to SP DD-03.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 08-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP DD-04

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1467729889 **Long.:** -123.206346799 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.Upland plot is located on gently sloping portion of planted area NW of the wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Populus balsamifera	20	☑ 80.0%	FAC
2. Sambucus racemosa var. melanocarpa	5	☑ 20.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	25	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	10	☑ 40.0%	FAC
2. Epilobium ciliatum	5	☑ 20.0%	FACW
3. Phalaris arundinacea	5	☑ 20.0%	FACW
4. Equisetum arvense	5	☑ 20.0%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	25	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 75

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	35	x 3 =	105
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	50 (A)		145 (B)

Prevalence Index = B/A = 2.900

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Planted Pop. Balsamifera dominant veg. Bare ground attributed to managed landscape in upland areas and not from ponding.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP DD-04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	2/2	100%						Silt Loam	
16-20	10YR	5/2	80%	10YR	4/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	9

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** **Sampling Point:** SP CC-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1514932276 **Long.:** -123.201449813 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Plot is located on the slope of planted zone containing Populus balsamifera, and 15" south of wetland plot SP CC-01.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Populus balsamifera	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	70	☑ 77.8%	FAC
2. Equisetum arvense	10	☐ 11.1%	FAC
3. Cardamine oligosperma	5	☐ 5.6%	FAC
4. Cirsium arvense	5	☐ 5.6%	FAC
5. Galium aparine	0	☐ 0.0%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		285 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP CC-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	4/2	95%	10YR	4/6	5%	C	M	Silt Loam	
4-20	10YR	4/2	70%	10YR	4/6	15%	C	M	Sandy Clay Loam	
				5YR	3/4	15%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No positive hydrology indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP CC-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.1515266848 **Long.:** -123.201415976 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Populus balsamifera	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	50	☑ 50.0%	FACW
2. Poa trivialis	30	☑ 30.0%	FAC
3. Equisetum arvense	10	☐ 10.0%	FAC
4. Cardamine oligosperma	10	☐ 10.0%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	55	x 3 =	165
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		265 (B)

Prevalence Index = B/A = 2.524

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP CC-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/2	90%	10YR	3/4	10%	C	M	Silty Clay Loam	
6-20	10YR	4/2	70%	10YR	4/6	15%	C	M	Sandy Clay Loam	
				5YR	3/4	15%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	8

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Standing water throughout, but not at edge of sample plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP BB-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 15.0 % / 8.5 °

Subregion (LRR): LRR A **Lat.:** 46.1524417233 **Long.:** -123.200555749 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	10	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Ranunculus repens	10	☑ 50.0%	FAC
2. Poa trivialis	10	☑ 50.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	20	= Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. Rubus armeniacus	20	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	20	= 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: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	50 (A)		170 (B)

Prevalence Index = B/A = 3.400

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP BB-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	98	10YR	4/4	2	C	M	Silt Loam	
6-20	10YR	4/2	75%	10YR	3/6	25%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soil exhibits depleted matrix.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology present. No evidence of hydrology including saturation to 20" depth.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP BB-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1524491291 **Long.:** -123.20058725 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	50	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	25	☑ 25.0%	FACW
2. Ranunculus repens	25	☑ 25.0%	FAC
3. Poa trivialis	50	☑ 50.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	125	x 3 =	375
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		425 (B)

Prevalence Index = B/A = 2.833

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Wetland is located within a managed Populus balsamifera tree farm.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP BB-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	4/2	95%	10YR	4/4	5%	C	M	Silt Loam	
4-12	10YR	4/2	85%	10YR	4/6	15%	C	M	Silt Loam	
12-20	10YR	4/2	70%	10YR	4/6	30%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	6
Water Table Present?	Yes ◉	No ○	Depth (inches):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	10

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Main area of wetland is ponded up to several inches. Mostly unvegetated in ponded area except for planted Populus Balsamifera and few patches of reed canarygrass and soft rush. Sample plot is located at the edge of the ponded area. Water marks on tree trunks about 4"6" above current water ponding level.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 23-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP M-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1526226392 **Long.:** -123.199853596 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **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?** **(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 ○

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

Precipitation is lower than normal for the past three months.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	25	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Ranunculus repens	25	☑ 25.0%	FAC
2. Poa trivialis	25	☑ 25.0%	FAC
3. Galium aparine	20	☑ 20.0%	FACU
4. Vicia sativa	15	☐ 15.0%	UPL
5. Stellaria media	10	☐ 10.0%	FACU
6. Myosotis laxa	5	☐ 5.0%	OBL
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	10	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	10	= 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: 5 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	40	x 4 =	160
UPL species	15	x 5 =	75
Column Totals:	135 (A)		465 (B)

Prevalence Index = B/A = 3.444

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Half plot done for trees due to proximity to wetland. Community is FAC-dominated as entire floodplain area is generally moist; however, site is not a wetland as no hydrology indicators are present. Vegetation community in upland plot starkly contrasts the vegetation within the wetland plot.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP M-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR	4/2	100%						Sandy Clay Loam	
5-20	10YR	4/2	78	5YR	4/4	15%	C	M	Sandy Clay Loam	
+mottle				10YR	3/2	7	D	M		in a band at 16 inches.

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Redox likely relic. Site is on floodplain of the Columbia and is currently drained by ditches.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 23-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP M-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1526958866 **Long.:** -123.199848967 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is lower than normal for the past three months. Wetland is located within a recently logged poplar plantation. Extensive, exclusive patches of Juncus bufonius located throughout the wetland. Wetland is bound by robust planted poplar on the south end where the understory vegetation

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	25	☑ 26.3%	FAC
2. Alopecurus geniculatus	50	☑ 52.6%	OBL
3. Trifolium repens	5	☐ 5.3%	FAC
4. Juncus bufonius	10	☐ 10.5%	FACW
5. Juncus effusus	5	☐ 5.3%	FACW
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 5

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	50	x 1 =	50
FACW species	15	x 2 =	30
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		170 (B)

Prevalence Index = B/A = 1.789

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground in herb stratum is leaf litter. Half plot used in tree stratum due to proximity to upland.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP M-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR	4/1	83	5YR	3/4	7	C	M	Sandy Clay Loam	
+mottle				5YR	4/6	10%	C	M		
17-19	10YR	5/2	90%	7.5YR	4/6	10%	C	M	Silty Clay Loam	
19-21	10YR	3/2	95%	5YR	3/3	5%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Extensive iron deposits located in patches of the wetland without vegetation, but not within the plot. Saturation visible on several years of aerial imagery (see attached aerials).

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 23-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP M-03

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1528849614 **Long.:** -123.199362037 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Precipitation is lower than normal for the past three months but it has been raining hard for over a week.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	5	☐ 6.3%	FAC
2. Alopecurus geniculatus	30	☑ 37.5%	OBL
3. Holcus lanatus	20	☑ 25.0%	FAC
4. Juncus effusus	5	☐ 6.3%	FACW
5. Poa annua	5	☐ 6.3%	FAC
6. Juncus bufonius	15	☐ 18.8%	FACW
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size: 5)			
1. Rubus discolor	5	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	5	= Total Cover	

% Bare Ground in Herb Stratum: 20

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	30	x 1 =	30
FACW species	20	x 2 =	40
FAC species	30	x 3 =	90
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	85 (A)		180 (B)

Prevalence Index = B/A = 2.118

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:
Bare ground in herb stratum is within large tire treads, presumably from recent logging.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP M-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	3/2	95%	5YR	3/3	5%	C	M	Sandy Clay Loam	shallow roots
10-20	10YR	5/2	82	5YR	5/6	7	C	M	Clay Loam	
+mottle				2.5YR	2.5/4	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Iron deposits in bare areas. Observed water seeping in pit but it has been raining hard for over a week. Seepage at 11 inches, at a root, and at 14 inches. Slight change in topography between this wetland plot and its associated upland plot corresponds to inundation visible from aerial photos from multiple years.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP M-05

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1531549408 **Long.:** -123.199111262 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Wetland is located in a Populus balsamifera plantation. New sample plots established because 2013 study areas boundary shifted. North edge of wetland defined by micro topography.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	5	☑ 33.3%	FAC
2. Equisetum arvense	5	☑ 33.3%	FAC
3. Stellaria media	5	☑ 33.3%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	15	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 85

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: 75.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	20 (A)		65 (B)

Prevalence Index = B/A = 3.250

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Sparsely vegetated due to water and plantation activity.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP M-05

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	95%	5YR	3/4	5%	C	M	Silt Loam	
10-20	10YR	4/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	4
Saturation Present? (includes capillary fringe)	Yes ◉ No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Puddles of standing water where there are depressions.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP M-06

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1532132901 **Long.:** -123.199065381 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	40	☑ 50.0%	FAC
2. Equisetum arvense	20	☑ 25.0%	FAC
3. Cardamine oligosperma	10	☐ 12.5%	FAC
4. Galium aparine	10	☐ 12.5%	FACU
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	85	(A)	265 (B)

Prevalence Index = B/A = 3.118

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP M-06

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	100%						Silt Loam	
10-12	10YR	2/2	95%	10YR	3/4	5%	C	M	Silt Loam	
12-20	10YR	4/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	16

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No hydrology present.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 23-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP L-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 28 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1554859434 **Long.:** -123.196865148 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is lower than normal for the past three months. Redox is likely relic; this conclusion is supported by the lack of hydrology indicators and hydrophytic vegetation.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	80	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Sambucus racemosa	5	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	25	☑ 25.0%	FAC
2. Juncus effusus	5	☐ 5.0%	FACW
3. Galeopsis tetrahit	20	☑ 20.0%	FACU
4. Galium aparine	10	☐ 10.0%	FACU
5. Stellaria media	15	☐ 15.0%	FACU
6. Holcus lanatus	20	☑ 20.0%	FAC
7. Polystichum munitum	5	☐ 5.0%	FACU
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	5	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	5	= 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: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	125	x 3 =	375
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	190 (A)		625 (B)

Prevalence Index = B/A = 3.289

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground in herb stratum is leaf litter. Upland community in plot and throughout area is FAC-dominated.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP L-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR	2/1	100%						Silty Clay Loam	
5-12	10YR	5/1	86	5YR	4/6	7	C	M	Silty Clay	
+mottle				5YR	4/4	7	C	M		
12-20	10YR	5/1	86	5YR	4/6	7	C	M	Sandy Clay	same as layer above except for higher sand content
+mottle				5YR	4/4	7	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Redox likely relic. Site is on floodplain of the Columbia and is currently drained by ditches.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia County **Sampling Date:** 23-May-13

Applicant/Owner: Northwest Natural **State:** OR **Sampling Point:** SP L-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 29 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1554953611 **Long.:** -123.19701039 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is lower than normal for the past three months. Wetland is in a clearing within a poplar plantation. Open area and saturation visisble on aerial imagery from several years (see attached images). Poplars are absent and stressed if present within wetland. Wetland is located in a slight

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Spiraea douglasii	5	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	25	☑ 26.3%	FACW
2. Polygonum lapathifolium	60	☑ 63.2%	FACW
3. Alopecurus pratensis	10	☐ 10.5%	FAC
4. Epilobium ciliatum	0	☐ 0.0%	FACW
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		210 (B)

Prevalence Index = B/A = 2.100

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP L-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	95%	2.5YR	3/4	5%	C	M	Sandy Clay Loam	with roots
10-22	10YR	5/2	86	5YR	4/6	7%	C	M	Silty Clay	
+mottle				5YR	3/4	7	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Planted Populus balsamifera is absent or stressed in wetland plot and robust in adjacent upland plot.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP AA-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 28 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1563209231 **Long.:** -123.19617778 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal. Wetland is located in a Populus balsamifera plantation.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	90	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	70	☑ 77.8%	FAC
2. Juncus effusus	10	☐ 11.1%	FACW
3. Stellaria media	10	☐ 11.1%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	160	x 3 =	480
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	180 (A)		540 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

FAC dominated community due to Populus balsamifera and Poa trivialis.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP AA-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	95%	10YR	3/4	5%	C	PL	Silt Loam	
10-20	10YR	4/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Uppersoil layer in wetland pit does not look disturbed in comparison to upper layer in upland pit which looked mixed.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	2
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Ponded water through wetland.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 07-Apr-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP AA-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 28 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1563620729 **Long.:** -123.196258306 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation is normal. There have been some recent heavy rain but for the water year it is normal.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	90	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	70	☑ 77.8%	FAC
2. Stellaria media	20	☑ 22.2%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	160	x 3 =	480
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	180	(A)	560 (B)

Prevalence Index = B/A = 3.111

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Site is a managed tree farm.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP AA-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR	2/2	100%						Silt Loam	
13-20	10YR	4/2	90%	10YR	3/6	10%			Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	15
Saturation Present? (includes capillary fringe)	Yes ◉ No ○	Depth (inches):	13

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Water table depth taken after 20 minutes.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-13

Applicant/Owner: NW Natural **State:** **Sampling Point:** **SP N-03**

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** **S** 21 **T** 8 N **R** 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1590295226 **Long.:** -123.193507242 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Precipitation has been below average, however the last week there has been heavy rainfall. Wetland is located in a clearing in the Poplar plantation. There is standing water in the uplands and the wetlands due to recent heavy rainfall.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	25	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	25	☑ 25.0%	FACW
2. Alopecurus geniculatus	70	☑ 70.0%	OBL
3. Juncus effusus	5	☐ 5.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	70	x 1 =	70
FACW species	30	x 2 =	60
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	125 (A)		205 (B)

Prevalence Index = B/A = 1.640

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Plant community is dominated by Alopecurus geniculatus an OBL species.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP N-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR	2/1	90%	2.5YR	2.5/3	10%	C	M	Clay Loam	
12-18	10YR	4/1	85%	2.5YR	2.5/3	10%	C	M	Silty Clay Loam	
				2.5YR	3/4	5%	C	PL		

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	2
Water Table Present?	Yes ◉	No ○	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soils are saturated due to recent heavy rainfall. Observations 4 days prior did not yield any water. There are stressed trees throughout. Wetland is slightly lower in elevation from upland.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP N-04

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1591090062 **Long.:** -123.193499713 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation has been below average, however the last week there has been heavy rainfall. There is standing water in wetlands and in uplands. Upland is slightly higher than wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	80	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	35	☑ 35.0%	FAC
2. Stellaria media	30	☑ 30.0%	FACU
3. Phalaris arundinacea	25	☑ 25.0%	FACW
4. Persicaria maculosa	5	☐ 5.0%	FACW
5. Cirsium arvense	5	☐ 5.0%	FAC+
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	120	x 3 =	360
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	180 (A)		540 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP N-04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR	2/1	90%	2.5YR	2.5/3	10%	C	M	Clay Loam	
13-20	10YR	4/1	75%	7.5YR	4/6	15%	C	PL	Silty Clay Loam	
				2.5YR	2.5/3	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Very dark redox throughout.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	2
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	0

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Lower soil layer not saturated. Top layer saturated due to recent heavy rainfall.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP N-06

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): **Local relief (concave, convex, none):** convex **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 46.1591875154 **Long.:** -123.192636145 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Upland plot located upslope of wetland plot SP N-05. Slight topo change in this location which is back within the zone of plant cottonwood trees.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	70	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	50	☑ 62.5%	FACW
2. Poa trivialis	25	☑ 31.3%	FAC
3. Ranunculus repens	5	☐ 6.3%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		400 (B)

Prevalence Index = B/A = 2.667

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP N-06

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	2/2	90%	7.5YR	3/4	10%	C	M	Silt Loam	
16-18	10YR	2/1	100%						Silt Loam	
18-20	10YR	4/2	90%	7.5YR	3/4	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Upland plot is not in the wetland depression. Trees are robust in this part of the plantation. No primary or secondary indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP N-05

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 46.1592241669 **Long.:** -123.192680706 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Wetland N was extended SE into the 2014 site boundary and consists of an opening in the cottonwood tree plantation. It is assumed that the trees do not thrive in the opening due to prolonged soil saturation.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	20	☑ 20.0%	FACW
2. Phalaris arundinacea	20	☑ 20.0%	FACW
3. Alopecurus geniculatus	60	☑ 60.0%	OBL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	60	x 1 =	60
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		140 (B)

Prevalence Index = B/A = 1.400

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP N-05

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR	2/2	90%	7.5YR	3/4	10%	C	M	Silt Loam	
12-20	10YR	3/2	45%	10YR	3/4	10%	C	M	Silt Loam	
	10YR	4/2	45%							

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	18
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	16

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP P-02

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1605455632 **Long.:** -123.192125238 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

Precipitation has been below average, however the last week there has been heavy rainfall. There is standing water in wetlands and in uplands. Upland is slightly higher than wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	50	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	60	☑ 60.0%	FAC
2. Alopecurus geniculatus	20	☑ 20.0%	OBL
3. Holcus lanatus	20	☑ 20.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	130	x 3 =	390
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		410 (B)

Prevalence Index = B/A = 2.733

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Plant community is dominated by FAC species. Alopecurus geniculatus is located on the edge closest to the wetland.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP P-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR	3/1	85%	7.5YR	4/6	1%	C	M	Loam	
				2.5YR	2.5/3	4%	C	PL		
				2.5YR	2.5/3	10%	C	M		
14-18	10YR	4/1	95%	2.5YR	3/6	5%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Very dark redox throughout located on the faces of the peds and the pore linings.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Soils were dry throughout when broken apart and squeezed. Water table is present due to recent rainfall.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-13

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP P-01

Investigator(s): Jennifer D'Avanzo, Amy Bensted **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1605455712 **Long.:** -123.192041179 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Precipitation has been below average, however the last week there has been heavy rainfall. There is standing water in wetlands and in uplands. Wetland is slightly lower than upland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	25	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Alopecurus geniculatus	90	☑ 90.0%	OBL
2. Poa trivialis	10	☐ 10.0%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	10	x 2 =	20
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	125 (A)		185 (B)

Prevalence Index = B/A = 1.480

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP P-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR	3/2	93	2.5YR	2.5/3	7	C	M	Clay Loam	
11-16	10YR	4/2	88	7.5YR	4/6	7	C	PL	Silty Clay Loam	
				2.5YR	2.5/3	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	5
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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Hydrology indicators for the area indicated by hydrogen sulfide odor at 11 inches, stressed trees, geomorphic position and FAC neutral test. Saturated soils are due to recent rain.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP TT-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1606417051 **Long.:** -123.191220084 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **NWI classification:** PEMB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Wetland located where there is an opening in the cottonwood plantation and is adjacent to STRM 21 (drainage ditch).

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus bufonius	20	☑ 21.1%	FACW
2. Persicaria maculata	10	☐ 10.5%	OBL
3. Juncus effusus	10	☐ 10.5%	FACW
4. Poa trivialis	35	☑ 36.8%	FAC
5. Holcus lanatus	20	☑ 21.1%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 5

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	30	x 2 =	60
FAC species	55	x 3 =	165
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		235 (B)

Prevalence Index = B/A = 2.474

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP TT-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR	3/2	95%	10YR	3/4	5%	C	M	Silt Loam	
9-16	10YR	3/2	90%	10YR	3/4	5%	C	M	Silt Loam	
				10YR	5/3	5%	C	M		
16-20	N	2.5/1	80%	10YR	3/6	20%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

It is assumed that the clearing in the tree plantation where the wetland is located is due to prolonged saturation which prevents trees from thriving in this location.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP TT-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 46.1606690011 **Long.:** -123.191197695 **Datum:** NAD 83

Soil Map Unit Name: Crims silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Upland plot is located upslope of wetland in an area where the cottonwood trees are robust.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	30	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Cirsium vulgare	15	☐ 15.0%	FACU
2. Holcus lanatus	45	☑ 45.0%	FAC
3. Poa trivialis	30	☑ 30.0%	FAC
4. Galium aparine	10	☐ 10.0%	FACU
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	105	x 3 =	315
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	130 (A)		415 (B)

Prevalence Index = B/A = 3.192

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP TT-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	3/2	100%						Silt Loam	
10-16	10YR	3/2	80%	10YR	5/3	20%	C	M	Silt Loam	
16-20	10YR	2/1	95%	10YR	3/3	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP UU-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 46.1613300136 **Long.:** -123.190848793 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Slight depression in landscape. Wetland bounded by drainage ditches.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	80	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	60	☑ 75.0%	FAC
2. Juncus effusus	10	☐ 12.5%	FACW
3. Persicaria maculata	10	☐ 12.5%	OBL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 20

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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	10	x 2 =	20
FAC species	140	x 3 =	420
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	160 (A)		450 (B)

Prevalence Index = B/A = 2.813

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP UU-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	100%						Silt Loam	
6-10	10YR	3/2	95%	10YR	3/4	5%	C	PL	Silt Loam	
10-13	10YR	4/1	40%	10YR	3/4	20%	C	M	Silt Loam	
	10YR	3/2	40%							
13-20	10YR	2/2	90%	10YR	3/4	10%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP UU-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 46.1613511088 **Long.:** -123.190935105 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Upland plot located on side of berm. Berm bounds the wetland on west and north edges.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	90	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus armeniacus	5	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Galeopsis tetrahit	15	☑ 30.0%	FACU
2. Poa trivialis	10	☑ 20.0%	FAC
3. Persicaria maculata	15	☑ 30.0%	OBL
4. Galium aparine	10	☑ 20.0%	FACU
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	50	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	15	x 1 =	15
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	145 (A)		435 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP UU-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR	2/2	100%						Silt Loam	
9-13	10YR	3/1	95%	10YR	3/4	5%	C	PL	Silt Loam	
13-16	10YR	4/1	80%	10YR	3/6	20%	C	M	Silt Loam	
16-20	10YR	2/2	70%	10YR	3/4	30%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Plot located upslope of wetland depression.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP SS-04

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1618772578 **Long.:** -123.190340847 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Upland plot located on south edge of Wetland SS where the topo rises slightly.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	30	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Galium aparine	45	☑ 45.0%	FACU
2. Holcus lanatus	45	☑ 45.0%	FAC
3. Phalaris arundinacea	10	☐ 10.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	75	x 3 =	225
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	130 (A)		425 (B)

Prevalence Index = B/A = 3.269

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP SS-04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	3/2	95%	10YR	3/4	5%	C	M	Silt Loam	
10-16	10YR	3/2	45%	10YR	3/4	10%	C	M	Silt Loam	
	10YR	2/1	45%							
10-20	10YR	4/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Plot is located on a berm that is slightly higher than the wetland.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP SS-03

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1619001638 **Long.:** -123.190345263 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **NWI classification:** PEM/PFO B

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Wetland plot dug on southern edge of wetland where there is a berm created adjacent to a drainage ditch (STRM 22).The wetland is located within a cottonwood plantation. One upland exclusion runs across the greater wetland area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	60	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	20	☑ 20.0%	FACW
2. Poa trivialis	30	☑ 30.0%	FAC
3. Holcus lanatus	30	☑ 30.0%	FAC
4. Impatiens capensis	10	☐ 10.0%	FACW
5. Galium aparine	10	☐ 10.0%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	120	x 3 =	360
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	160 (A)		460 (B)

Prevalence Index = B/A = 2.875

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP SS-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	3/2	100%						Silt Loam	
3-6	10YR	3/2	90%	10YR	3/4	10%	C	M	Silt Loam	
6-10	10YR	3/2	80%	10YR	3/4	20%	C	M	Silt Loam	
10-16	10YR	2/1	90%	10YR	3/4	10%	C	M	Silty Clay Loam	
16-20	10YR	4/2	70%	10YR	3/6	30%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Wetland is lower in elevation than upland exclusion and berm adjacent to drainage ditch.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP SS-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1631941158 **Long.:** -123.18900533 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Upland plot dug on north side of upland exclusion.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	50	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Sambucus racemosa	20	☑ 66.7%	FACU
2. Rubus armeniacus	10	☑ 33.3%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Galium aparine	20	☑ 21.1%	FACU
2. Poa trivialis	40	☑ 42.1%	FAC
3. Holcus lanatus	30	☑ 31.6%	FAC
4. Athyrium filix-femina	5	☐ 5.3%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 6 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	125	x 3 =	375
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	175 (A)		575 (B)

Prevalence Index = B/A = 3.286

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP SS-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	100%						Silt Loam	
10-20	10YR	5/2	80%	10YR	4/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Upland exclusion is a slightly higher zone that runs perdendicular across the greater wetland within the study area.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP SS-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1632557212 **Long.:** -123.188974963 **Datum:** NAD 83

Soil Map Unit Name: Wauna-Locoda silt loams, protected **NWI classification:** PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Northern edge of wetland is defined by a drainage ditch (STRM 23). The wetland is located within a cottonwood plantation. One upland exclusion runs across the greater wetland area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	75	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Juncus effusus	15	☑ 18.8%	FACW
2. Persicaria hydropiper	15	☑ 18.8%	OBL
3. Poa trivialis	10	☐ 12.5%	FAC
4. Athyrium filix-femina	10	☐ 12.5%	FAC
5. Impatiens capensis	25	☑ 31.3%	FACW
6. Galium aparine	5	☐ 6.3%	FACU
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	15	x 1 =	15
FACW species	40	x 2 =	80
FAC species	95	x 3 =	285
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	155 (A)		400 (B)

Prevalence Index = B/A = 2.581

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP SS-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	2/2	100%						Silt Loam	
10-12	10YR	2/2	95%	10YR	4/6	5%	C	M	Silty Clay Loam	
12-20	10YR	2/2	80%	10YR	4/6	10%	C	M	Silty Clay Loam	
	10YR	4/1	10%							

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydric soil indicators combined as indicated as permissible in regional guidance. Meets A-11 and F6 except for thickness criteria.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 10-Jun-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP RR-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1641887339 **Long.:** -123.188020515 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Wetland plot is located within an actively grazed pasture, ~30' north of a drainage ditch (STRM 23).

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Agrostis stolonifera	20	☑ 20.0%	FAC
2. Holcus lanatus	60	☑ 60.0%	FAC
3. Persicaria maculata	20	☑ 20.0%	OBL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		260 (B)

Prevalence Index = B/A = 2.600

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP RR-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	2/2	95%	10YR	4/4	5%	C	M	Silt Loam	
6-20	10YR	4/2	85%	10YR	3/6	15%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Area is slightly lower in elevation than surrounding land. Area is most likely saturated for more than 2 weeks of the early growing season due to presense of hummocky soils and clay content.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP RR-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): **Lat.:** 46.1661335604 **Long.:** -123.186027498 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEMB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Grazed pasture. Center of pasture is dominated by JUEF. Edges are dominated by HOLA. Defined by draiange canal on either end (STRM 65 and STRM 23).

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Holcus lanatus	80	☑ 80.0%	FAC
2. Agrostis stolonifera	15	☐ 15.0%	FAC
3. Phalaris arundinacea	5	☐ 5.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	95	x 3 =	285
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		295 (B)

Prevalence Index = B/A = 2.950

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP RR-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	3/2	100%						Silt Loam	
8-20	10YR	5/2	70%	10YR	3/6	15%	C	M	Silty Clay Loam	Redox features concentraed in bands through matrix
				10YR	3/1	15%	C	M	Sandy Clay Loam	Redox features concentraed in bands through 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Area is slightly lower in elevation than surrounding land. Area is most likely saturated for more than 2 weeks of the early growing season due to presense of hummocky soils and clay content.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP QQ-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1664381204 **Long.:** -123.185877642 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Upland plot is located on a zone of higher ground that runs parallel to the drainage ditch. Plot is ~1.5 feet higher than the adjacent wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus armeniacus	80	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	80	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Poa trivialis	20	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	20	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.800

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP OO-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR	3/2	100%						Silt Loam	
11-20	10YR	3/1	80%	10YR	3/4	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators. Upland plot is about 1.5' higher than the wetland located to the north.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP QQ-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1664739921 **Long.:** -123.185859882 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Wetland plot is located in a pasture. Area is well vegetated with OBL-FAC veg. Hoof marks impressed into the soil across the site from cattle indicating seasonally moist soil conditions to the surface. A drainage ditch is located 50-75 feet south of the wetland. Higher upland terrain separates the ditch

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Alopecurus geniculatus	65	☑ 65.0%	OBL
2. Ranunculus repens	10	☐ 10.0%	FAC
3. Holcus lanatus	15	☐ 15.0%	FAC
4. Juncus bufonius	10	☐ 10.0%	FACW
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	65	x 1 =	65
FACW species	10	x 2 =	20
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A = 1.600

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP OO-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR	2/2	90%	10YR	3/6	10%	C	M	Silty Clay Loam	
5-11	10YR	2/2	80%	10YR	3/6	10%	C	PL	Silty Clay Loam	
				10YR	5/2	10%	D	M	Silty Clay Loam	
11-20	10YR	3/1	70%	10YR	3/6	20%	C	M	Silty Clay Loam	
				10YR	5/2	10%	D	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP PP-06

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1676933825 **Long.:** -123.184199545 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Plot is located on a fill-mound to the north of the wetland plot SP PP-05. Fill appears to have been in place a long time.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Equisetum arvense	30	☑ 60.0%	FAC
2. Conium maculatum	10	☑ 20.0%	FAC
3. Phalaris arundinacea	10	☑ 20.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	50	= Total Cover	
Woody Vine Stratum (Plot size: 15)			
1. Rubus armeniacus	10	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	10	= 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: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	60	(A)	180 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP PP-06

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	80%	10YR	3/6	20%	C			

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Crushed rock and cobbles to 5"

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators, Plot is about 2' higher than the wetland located o the north.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP PP-05

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 46.1677445831 **Long.:** -123.18420515 **Datum:** NAD 83

Soil Map Unit Name: Wauna silt loam, protected **NWI classification:** PEMB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

Plot is located adjacent to an upland area where fill was placed in the past.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Conium maculatum	30	☑ 42.9%	FAC
2. Equisetum arvense	10	☐ 14.3%	FAC
3. Epilobium ciliatum	10	☐ 14.3%	FACW
4. Phalaris arundinacea	15	☑ 21.4%	FACW
5. Galium aparine	5	☐ 7.1%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	40	x 3 =	120
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	70 (A)		190 (B)

Prevalence Index = B/A = 2.714

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

Bare ground consists of areas of last season's dead grass material.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP PP-05

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	4/2	80%	10YR	3/6	20%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Plot is in an area at the edge of a cultivated mint field which is 1.5'-2' lower than the adjacent upland mound.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP PP-04

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1684256562 **Long.:** -123.18285572 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEMB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Area mapped by NWI as PEMC and SSURGO hydric soils. Dug plot in mint field where there is evidence of stressed plants and depression in landscape.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Mentha X piperita	65	☑ 92.9%	FACW
2. Juncus effusus	5	☐ 7.1%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 30

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		140 (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP PP-04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR	3/2	90%	10YR	3/6	10%	C	M	Silty Clay Loam	
11-20	10YR	4/1	90%	7.5R	4/6	10%	C	M	Silty Clay	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils do not appear to be disturbed by plowing. Farmer said last time field was plowed was 15 years ago.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☑ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Evidence of ponding water onfield due to sparce veg surface and surface cracks.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP PP-03

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1692393107 **Long.:** -123.181377492 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **NWI classification:** PEMB

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Plot located on an access road in mint plantation where the landscape is a bit lower in elevation.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Alopecurus geniculatus	70	☑ 70.0%	OBL
2. Phalaris arundinacea	20	☑ 20.0%	FACW
3. Trifolium repens	10	☐ 10.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	20	x 2 =	40
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		140 (B)

Prevalence Index = B/A = 1.400

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Location of pit on a farm access road. Dominated by Alopecuris geniculatus.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP PP-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	95%	10YR	4/6	5%	C	M	Silty Clay Loam	
6-20	10YR	3/2	60%	10YR	5/8	20%	C	M	Clay Loam	
				10YR	5/2	20%	D	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils mapped by SSURGO as 100% hydric.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☑ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soils are most likely saturated for more than two weeks of the growing season.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP PP-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.170514638 **Long.:** -123.178844528 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **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?** **(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 ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:

Wetland is located in a farmed mint plantation. Plot dug in edge of farmed area where there is a berm to the north and road for PGE plant. Area is slightly lower than rest of wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	40	☑ 40.0%	FACW
2. Alopecurus pratensis	60	☑ 60.0%	FAC
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	5	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	5	= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	60	x 3 =	180
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	105	(A)	280 (B)

Prevalence Index = B/A = 2.667

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP PP-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR	2/1	95%	10YR	3/6	5%	C	M	Silty Clay Loam	roots present
11-20	10YR	4/1	80%	10YR	3/6	20%	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soils are mapped by SSURGO as 100% hydric.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☑ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

Plot dug near edge. Further to the south are surface soil cracks and standing water. Due to being a few months into the growing season there is likely a few weeks of saturation early in the growing season, and water most likely ponds due to clay content in soils.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP PP-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1705600182 **Long.:** -123.178747866 **Datum:** NAD 83

Soil Map Unit Name: Locoda silt loam, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Upland plot for mint farm located on fill of road.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Leucanthemum vulgare	10	☐ 12.5%	FACU
2. Vicia sativa	10	☐ 12.5%	UPL
3. Festuca arundinacea	20	☑ 25.0%	FAC
4. Phalaris arundinacea	30	☑ 37.5%	FACW
5. Parentucellia viscosa	10	☐ 12.5%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	20	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	20	= 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: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	30	x 3 =	90
FACU species	30	x 4 =	120
UPL species	10	x 5 =	50
Column Totals:	100	(A)	320 (B)

Prevalence Index = B/A = 3.200

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP PP-02

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 Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 3/2						Sand	crushed rock

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Rock and fill

Depth (inches): 6

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP VV-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): **Lat.:** 46.1708035475 **Long.:** -123.178810683 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **NWI classification:** PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Wetland defined by topography and is bounded by a gravel access to the SW. A PGE facility is located immediately to the north.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Scirpus microcarpus	15	☑ 60.0%	OBL
2. Phalaris arundinacea	10	☑ 40.0%	FACW
3. Carex sp.	0	☐ 0.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	25	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	15	x 1 =	15
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	25 (A)		35 (B)

Prevalence Index = B/A = 1.400

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP VV-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10GY	2.5/1	70%	10YR	2/2	20%	C	M	Sandy Clay Loam	
				10YR	3/4	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	8

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Evidence of earlier ponding.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP VV-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 46.1708433048 **Long.:** -123.178775935 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Plot is located upslope of SP VV-01.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	75	☑ 93.8%	FACW
2. Galium aparine	5	☐ 6.3%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Rubus armeniacus	20	☐ 100.0%	FACU
2.	0	☐ 0.0%	
	20	= Total Cover	

% Bare Ground in Herb Stratum:

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	75	x 2 =	150
FAC species	0	x 3 =	0
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	100 (A)		250 (B)

Prevalence Index = B/A = 2.500

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP VV-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y	4/1	50%	10YR	3/6	50%	C	M	Sand	Gravel throughout 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Soft clayey masses throughout.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP VV-05

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 46.1709602131 **Long.:** -123.178502928 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **NWI classification:** PEM/PFO

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Portion of wetland VV located east of the PGE tank farm and west of R/R track.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	40	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Populus balsamifera	30	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Carex obnupta	90	☑ 90.0%	OBL
2. Leucanthemum vulgare	5	☐ 5.0%	FACU
3. Festuca arundinacea	5	☐ 5.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90	
FACW species	0	x 2 =	0	
FAC species	75	x 3 =	225	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column Totals:	170	(A)	335	(B)

Prevalence Index = B/A = 1.971

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP VV-05

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 Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-14	10YR 4/1	80%	10YR 3/6	20%	C	M	Sand	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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: Compacted sand and roots

Depth (inches): 14

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP VV-06

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 46.1709826169 **Long.:** -123.178453953 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Plot is located ~15' west of R/R track and ~10' east of plot SP VV-05.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30)			
1. Populus balsamifera	40	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Leucanthemum vulgare	25	☑ 27.8%	FACU
2. Anthoxanthum odoratum	25	☑ 27.8%	FACU
3. Festuca arundinacea	40	☑ 44.4%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 10

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: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	130 (A)		440 (B)

Prevalence Index = B/A = 3.385

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP VV-06

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	2/2							Sandy Loam	
4-20	10YR	4/1	70%	10YR	4/6	30%	C	M	Sand	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No indicators present.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP VV-03

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1711231187 **Long.:** -123.179444154 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Plot is located in the northern part of the wetland.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Carex amplifolia	60	☑ 80.0%	OBL
2. Juncus effusus	15	☑ 20.0%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	75	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 25

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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	15	x 2 =	30
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		90 (B)

Prevalence Index = B/A = 1.200

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Bare ground from previous growing season's dead carex.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP VV-03

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	5/1	75%	10YR	4/6	25%	C	M	Silty Clay Loam	
7-20	10YR	2.5/1	90%	10YR	3/4	10%	C	M	Silty 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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	3
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Plot located at toe of slope in wetland swale bounded by access roads to the east and west, which are 3'-5' higher than the wetland.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP VV-04

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 21 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.171153473 **Long.:** -123.179449439 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Upland plot is located on fill slope ~10' east and 4' higher than wetland plot SP VV-03.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Equisetum arvense	50	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	50	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	50 (A)		150 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP VV-04

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	2/2	100%						Sand	
4-20	10YR	3/3	100%						Sand	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Plot on fill slope of PGE tank farm.

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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators.

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 28-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP XX-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 16 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 46.1741642663 **Long.:** -123.182534099 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Plot is located in a swale located north of the tank farm and east of an existing surface pipeline.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Carex obnupta	100	☑ 100.0%	OBL
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		100 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP XX-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR	4/2	80%	N	4/	10%	D	M	Sand	
				10YR	3/4	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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP XX-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 16 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 46.1741822127 **Long.:** -123.182571182 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Cytisus scoparius	70	☑ 100.0%	UPL
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	70	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Rumex acetosella	30	☑ 33.3%	FACU
2. Bromus hordeaceus	10	☐ 11.1%	FACU
3. Vicia sativa	5	☐ 5.6%	UPL
4. Poa trivialis	20	☑ 22.2%	FAC
5. Holcus lanatus	10	☐ 11.1%	FAC
6. Leontodon saxatilis ssp. saxatilis	10	☐ 11.1%	FACU
7. Cytisus scoparius	5	☐ 5.6%	UPL
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 10

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	50	x 4 =	200
UPL species	80	x 5 =	400
Column Totals:	160 (A)		690 (B)

Prevalence Index = B/A = 4.313

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP XX-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR	3/2	100%						Sand	
16-20	10YR	4/2	100%						Sand	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 29-May-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP WW-02

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 16 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** convex **Slope:** 8.0 % / 4.6 °

Subregion (LRR): LRR A **Lat.:** 46.1748768707 **Long.:** -123.179353594 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **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?** **(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 Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Plot is located on hillslope/berm top near tank farm.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus armeniacus	15	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	15	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Anthoxanthum odoratum	35	☑ 50.0%	FACU
2. Vicia americana	10	☐ 14.3%	FAC
3. Polystichum munitum	5	☐ 7.1%	FACU
4. Holcus lanatus	20	☑ 28.6%	FAC
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 30

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	85 (A)		310 (B)

Prevalence Index = B/A = 3.647

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Bare ground comprised of gravel between slope and tank farm.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP WW-02

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	3/2	100%						Sand	
7-20	10YR	3/2	80%	N	4/	20%	C	M	Sand	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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, monitor well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: North Mist Expansion Project **City/County:** Columbia **Sampling Date:** 11-Jun-14

Applicant/Owner: NW Natural **State:** OR **Sampling Point:** SP WW-01

Investigator(s): Jennifer D'Avanzo, Ed Strohmaier **Section, Township, Range:** S 16 T 8 N R 4 W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** concave **Slope:** 4.0 % / 2.3 °

Subregion (LRR): LRR A **Lat.:** 46.1748972706 **Long.:** -123.179369427 **Datum:** NAD 83

Soil Map Unit Name: Udipsamments, nearly level, protected **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉	No ○	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Plot is located within a long depressional area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	30	☑ 42.9%	FACW
2. Juncus effusus	30	☑ 42.9%	FACW
3. Carex obnupta	10	☐ 14.3%	OBL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= 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: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	60	x 2 =	120
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		130 (B)

Prevalence Index = B/A = 1.857

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - 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:
Bare ground consists of areas of last season's dead plant material.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: SP WW-01

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-20	10Y	2.5/1	70%	10YR	3/6	30%	C	M	Sand	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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 Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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):	4
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	2

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Surface water was in a narrow, shallow ditch ~2' north of the sample plot.

Project # / Name – NORTH MIST EXPANSION PROJECT			Assessor JenniferD'Avanzo, Amy Bensted	
North West Natural Project			Date 5/13/2013	
Waterway Name - STRM 01			Coordinates at downstream end (ddd.mm.ss)	Lat. 46.053296995 N
Reach Boundaries - Survey Area				Long. -123.292331197 W
Precipitation w/in 48 hours (in) YES -		Channel Width (ft) 4	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	
Observed Hydrology	% of reach w/observed surface flow: 100			
	% of reach w/any flow (surface or hyporheic): 100			
	# of pools observed: 0 (none)			

Observations

Observed Wetland Plants (and indicator status):

NONE

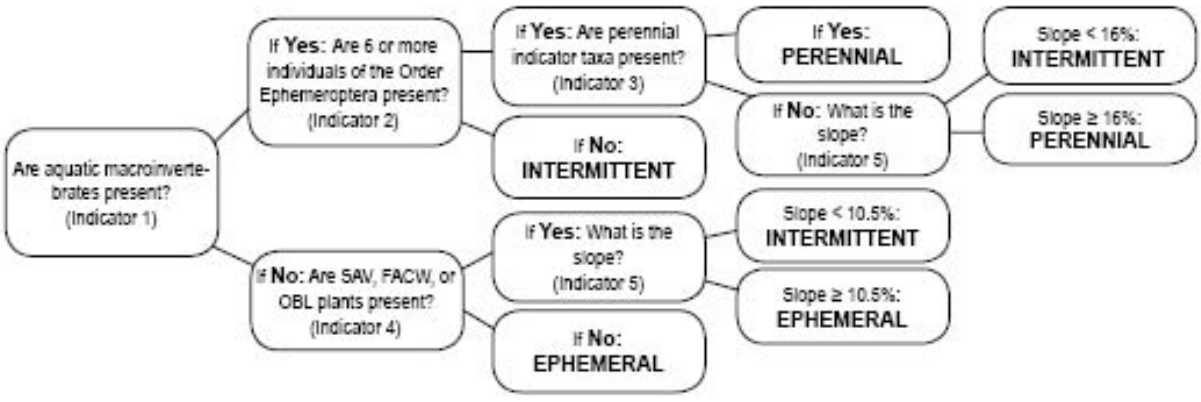
Observed Macroinvertebrates: YES

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
Unknown species			

Indicators

1. Are aquatic macroinvertebrates present?	☒ Yes	☐ No
2. Are 6 or more individuals of the Order Ephemeroptera present?C	☐ Yes	☐ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☐ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	35%	

Conclusions



Single Indicators	Finding
☐ Fish	☐ Ephemeral
☐ Amphibians	☒ Intermittent
	☐ Perennial

Notes: single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:	Describe situation. For disturbed streams, note extent, type, and history of disturbance.
☐ Prolonged Abnormal Rainfall/Snowpack ☐ Below Average ☐ Above Average ☐ Natural or Anthropogenic Disturbance ☐ Other:	

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

Fed by seep spring. Stream was determined to be intermittent because it has macro invertabrates, but no wetland vegetation. Dominant vegetation is Alnus rubra and Tsuga heterphylla.

Ancillary Information:

☒ Riparian Corridor

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

APPENDIX C: GROUND LEVEL COLORED PHOTOS WITH CAPTIONS

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Photo 1. Looking SE. Plot confirming uplands. No hydric soils present. 5/27/2014.

Photo 2. Looking NW. Roadside ditch connected to WET_OO. 5/27/2014.

Photo 3. Looking S. Shovel on wetland boundary. 5/27/2014.

Photo 4. Looking N. Wetland between road and hill slope, shovel in wetland plot. 7/18/2013.

Photo 5. Looking S. Roadside ditch shovel on centerline. 7/18/2013.

Photo 6. Looking S. Roadside ditch shovel on center line. 7/18/2013.

Photo 7. Looking N. Roadside ditch. Shovel on centerline. 7/18/2013.

Photo 8. Looking N. Roadside ditch. Shovel on centerline. 7/18/2013.

Photo 9. Looking E. View upstream; culvert in background. 5/13/2013.

Photo 10. Looking SW. Shovel is located on wetland/upland interface. Wetland is to the left of the shovel. 5/13/2013.

Photo 11. Looking SW. View downstream. Shovel in center of channel. 5/13/2013.

Photo 12. Looking NE. Standing in wetland facing toward upland. Orange field book is at the wetland/upland interface. Wetland to the left of book. 5/13/2013.

Photo 13. Looking S. Shovel in center of swale. 5/14/2013.

Photo 14. Looking NE. Shovel on centerline of ephemeral feature. 5/14/2013.

Photo 15. Looking NW. Shovel on centerline of ephemeral feature. 5/14/2013.

Photo 16. Looking NE. Shovel in center of roadside ditch. 5/14/2013.

Photo 17. Looking NE. Facing NW in a clear cut. Wetland is predominately defined by Skunk cabbage and hydrology. 7/16/2013.

Photo 18. Looking S. View upstream under roots. Hard to view downstream due to clear cut and thick vegetation. 7/16/2013.

Photo 19. Looking E. Ephemeral roadside ditch. 5/31/2013.

Photo 20. Looking N. Shovel on interface. Wetland to the right. 7/16/2013.

Photo 21. Looking N. Wetland in foreground and than channelized to the background. 7/16/2013.

Photo 22. Looking E. Wetland is bounded by road and hill. Shovel in wetland plot. 5/31/2013.

Photo 23. Looking E. View across wetland. 5/31/2013.

Photo 24. Looking S. View upstream. 5/31/2013.

Photo 25. Looking S. View upstream from north side of road at culvert. 5/31/2013.

Photo 26. Looking N. View downslope of drainge without a continious channel. Shovel on flowline. 5/15/2013.

Photo 27. Looking SE. View downslope of ephemeral roadside ditch; shovel in center of channel. 5/15/2013.

Photo 28. Looking SW. Shovel is located on wetland/upland interface. Wetland to the right of shovel. 5/15/2013.

Photo 29. Looking N. Shovel in center of channel. 5/15/2013.

Photo 30. Looking N. View to sinuous curve in channel. 5/15/2013.

Photo 31. Looking NE. View of pond with egg masses. Shovel located on log over pond. 5/15/2013.

Photo 32. Looking W. Pond located on edge of study area. 5/16/2013.

Photo 33. Looking NE. Shovel on center of excavated ephemeral ditch. 5/16/2013.

Photo 34. Looking NE. Shovel on pond boundary. 5/16/2013.

Photo 35. Looking S. Plot confirming uplands. No hydric soils present. 5/16/2013.

Photo 36. Looking S. Plot confirming uplands where the dominant vegetation is Phalaris arundunacea. No hydric soils present. 5/17/2013.

Photo 37. Looking S. Wetland to the left of biologist. 4/10/2014.

Photo 38. Looking NE. View downstream from road. Originates from culvert and WET KK. 4/10/2014.

Photo 39. Looking SW. Intermittent stream flow through clearcut slope. 4/10/2014.

Photo 40. Looking W. PEM wetland in clearcut. Shovel in upland. 4/10/2014.

Photo 41. Looking SW. Hillside seep. 4/10/2014.

Photo 42. Looking N. View down slope of wetland ditch. 4/10/2014.

Photo 43. Looking W. Intermittent stream flows out of corridor. 4/10/2014.

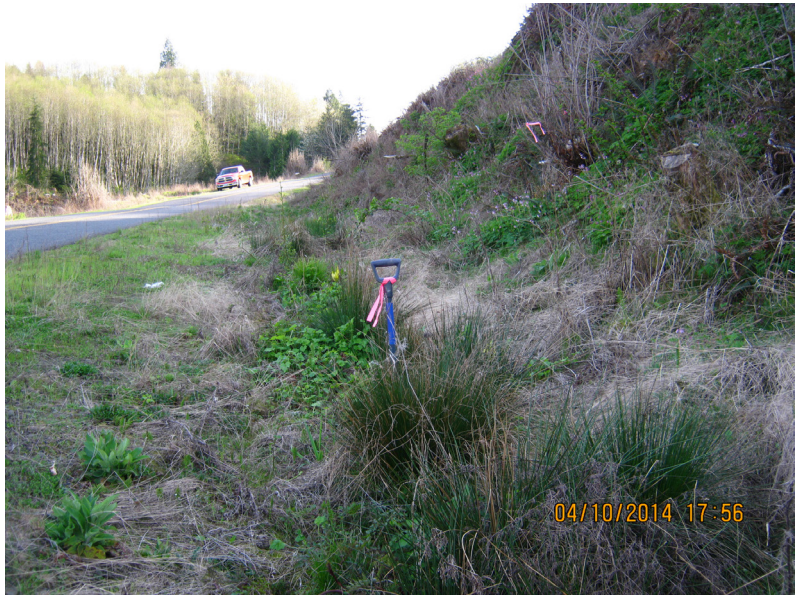

Photo 44. Looking S. View uphill at wetland ditch. 4/10/2014.

Photo 45. Looking S. Facing upstream. 4/11/2014.

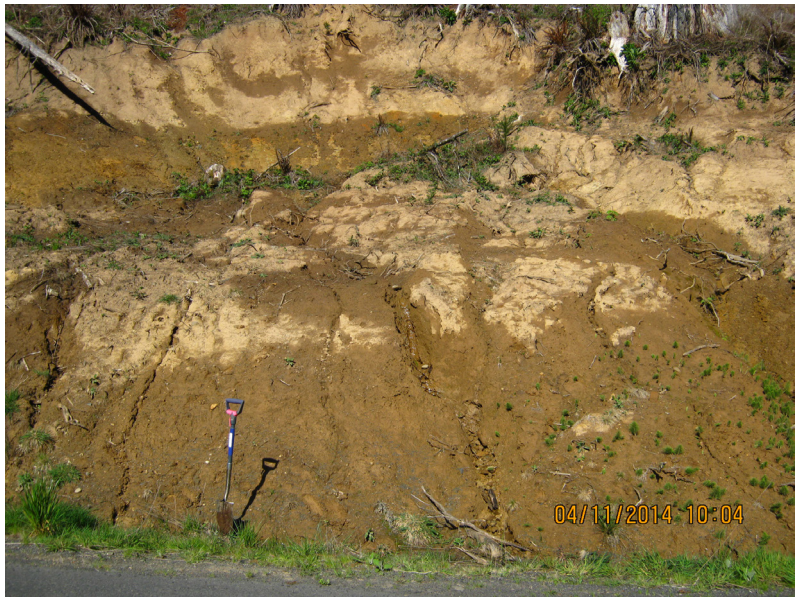

Photo 46. Looking W. Facing hillslope with seeps. 4/11/2014.

Photo 47. Looking S. Facing upstream at an opening in the clearcut. 4/11/2014.

Photo 48. Looking S. Wetland ditch. View upslope. 4/11/2014.

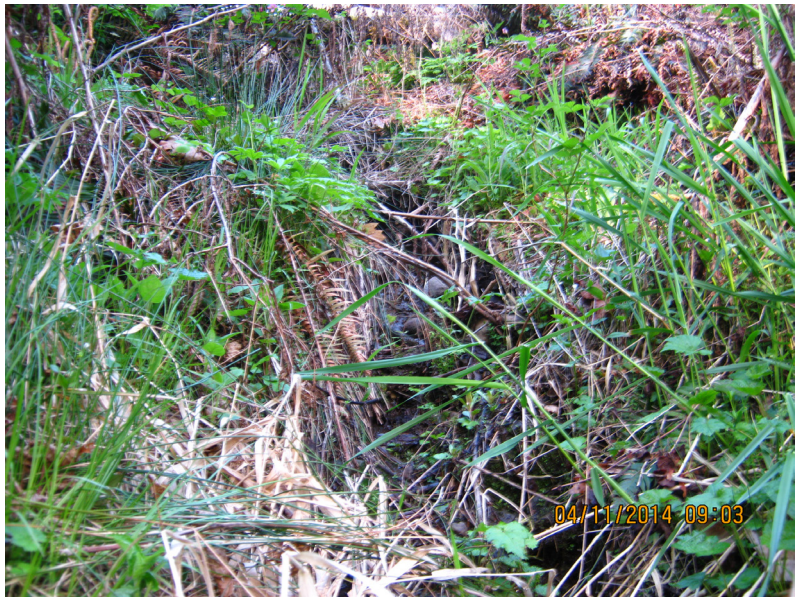

Photo 49. Looking W. Hillside seep draining into WET NN. 4/11/2014.

Photo 50. Looking S. View upstream. 5/17/2013.

Photo 51. Looking W. Shovel on centerline of channel. 5/20/2013.

Photo 52. Looking W. Ephemeral ditch along railroad ROW. 4/9/2014.

Photo 53. Looking E. Shovel in wetland. Biologist in upland. 4/9/2014.

Photo 54. Looking E. Drainage ditch in WET HH. 4/9/2014.

Photo 55. Looking NW. Wetland is to the right of shovel. 4/9/2014.

Photo 56. Looking E. Plot confirming uplands where NWI mapped a PEM wetland. 4/10/2014.

Photo 57. Looking W. Plot confirming uplands. 4/10/2014.

Photo 58. Looking NW. View upstream along a drainage ditch. 4/9/2014.

Photo 59. Looking NW. Shovel in upland ditch/wetland boundary. Wetland is to the left of the ditch. 4/9/2014.

Photo 60. Looking NE. Clatskanie River. 4/9/2014.

Photo 61. Looking SW. Overview of WET HH. 4/9/2014.

Photo 62. Looking N. Plot confirming uplands where NWI mapped a PEM wetland. 5/21/2013.

Photo 63. Looking S. Shovel in wetland plot. Wetland is to the left of shovel. 4/8/2014.

Photo 64. Looking E. Shovel is located on wetland/upland interface. Wetland to the left of stressed trees. 5/21/2013.

Photo 65. Looking S. Wetland to the right of shovel. 4/10/2014.

Photo 66. Looking N. View downstream of Beaver Slough. 5/21/2013.

Photo 67. Looking S. Wetland located at the toe of the slope. 4/8/2014.

Photo 68. Looking W. Wetland to the right of shovel. 4/8/2014.

Photo 69. Looking W. Excavated drainage ditch. 4/8/2014.

Photo 70. Looking N. Shovel is located on wetland/upland interface. Wetlad to the right of shovel. 5/22/2013.

Photo 71. Looking NE. Shovel is located on wetland/upland interface. Wetland to the left of shovel. 4/8/2014.

Photo 72. Looking NE. Drainage ditch. 4/8/2014.

Photo 73. Looking NE. West Bank of Beaver Slough. 4/8/2014.

Photo 74. Looking N. Incised irrigation canal bisects active blueberry farmland. 2/12/2015.

Photo 75. Looking W. Drainage ditch in blueberry field connects to irrigation canal (STRM 100). 2/13/2015.

Photo 76. Looking E. Shovel marks south edge of wetland boundary. PEM wetland lies in narrow swale that connects to irrigation canal (STRM 100). 2/13/2015.

Photo 77. Looking W. Drainage ditch connects to irrigation canal (STRM 100). 2/12/2015.

Photo 78. Looking E. Shovel marks north edge of wetland boundary. PEM wetland lies in narrow swale that connects to irrigation canal (STRM 100). 2/13/2015.

Photo 79. Looking E. Drainage ditch in agricultural field connects to irrigation canal (STRM 100). 2/12/2015.

Photo 80. Looking W. Drainage ditch engulfed with blackberry. 4/8/2014.

Photo 81. Looking E. Drainage ditch at the edge of plantation and road. 4/8/2014.

Photo 82. Looking SE. Shovel is located on wetland/upland interface. Wetland to the right of shovel. 4/8/2014.

Photo 83. Looking SW. Linear wetland mapped by NWI as an intermittent stream. 4/8/2014.

Photo 84. Looking S. Larson Slough. 4/7/2014.

Photo 85. Looking SW. Upland drainage swale connects to Larson Slough. 4/7/2014.

Photo 86. Looking E. Standing on south edge facing east. 4/7/2014.

Photo 87. Looking S. View from east side of Lewis Road. 4/7/2014.

Photo 88. Looking N. Drainage ditch along Lewis Road. 4/7/2014.

Photo 89. Looking E. Wetland to the right of shovel. 4/7/2014.

Photo 90. Looking W. View at excavated ditch. 4/7/2014.

Photo 91. Looking SW. Shovel is located on wetland/upland interface. Wetland to the right of shovel. 4/7/2014.

Photo 92. Looking NE. Overview photo of WET M. 4/7/2014.

Photo 93. Looking SW. Shovel is located on wetland/upland interface. Wetland infront of shovel. 4/7/2014.

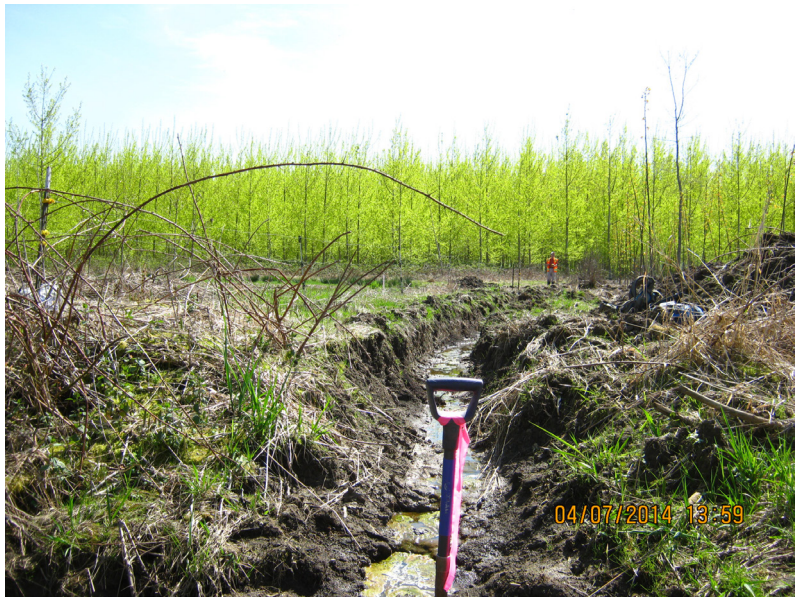

Photo 94. Looking SW. Recently excavated drainage ditch through tree plantation. 4/7/2014.

Photo 95. Looking N. View downstream of drainage ditch. 5/23/2013.

Photo 96. Looking S. Standing on edge of boundary. View across wetland that is devoid of trees. 5/23/2013.

Photo 97. Looking E. Shovel is located in wetland plot. 4/7/2014.

Photo 98. Looking E. View upstream from left bank. 5/23/2013.

Photo 99. Looking E. View at perennial drainage ditch engulfed with vegetation. 5/23/2013.

Photo 100. Looking SW. Shovel is located on wetland/upland interface. Wetland is to the right of the shovel. 5/29/2014.

Photo 101. Looking N. View downstream from right bank. 5/29/2014.

Photo 102. Looking N. Shovel is located on wetland/upland interface. Wetland is to the right of the shovel. 5/28/2013.

Photo 103. Looking SE. Shovel is located in upland plot. Wetland is to the right of the shovel. 5/29/2014.

Photo 104. Looking SE. Shovel is located on wetland/upland interface. Wetland is to the left of the shovel. 5/29/2014.

Photo 105. Looking W. View downstream from left bank. 5/29/2014.

Photo 106. Looking W. Shovel is located on wetland/upland interface. Wetland is to the right of the shovel. 5/28/2014.

Photo 107. Looking S. Shovel is located on wetland/upland interface. Wetland is to the right of the shovel. 5/28/2014.

Photo 108. Looking E. Drainage ditch from left bank. 5/28/2014.

Photo 109. Looking NW. View downstream at Confluence with STRM 23. 5/28/2014.

Photo 110. Looking S. View is across WET RR. Shovel in sample plot. 5/28/2014.

Photo 111. Looking W. View is downstream from right bank of a drainage ditch. 5/28/2014.

Photo 112. Looking E. Shovel is located on wetland/upland interface. Wetland is to the left. Biologist in the upland. 5/28/2014.

Photo 113. Looking SE. View upstream of a drainage ditch. 5/28/2014.

Photo 114. Looking E. Shovel is located on the interface where there is subtle topographic change. Wetland is to the left of the shovel. 5/28/2014.

Photo 115. Looking E. Plot located to confirm wetlands in mint field where there is evidence of ponding. 5/28/2014.

Photo 116. Looking NW. Excavated drainage ditch. 5/28/2014.

Photo 117. Looking W. Shovel in sample plot (SP PP-03). 5/28/2014.

Photo 118. Looking SE. Uncultivated edge of the mint field. 5/28/2014.

Photo 119. Looking W. Wetland located to the left of the shovel. 5/29/2014.

Photo 120. Looking N. View across wetland. Biologist on the upland edge near railroad tracks. 5/29/2014.

Photo 121. Looking SE. Overview of wetland in landscape. 5/29/2014.

Photo 122. Looking S. Intermittent drainage from PGE Plant draining into WET VV. 5/29/2014.

Photo 123. Looking S. Intermittent drainage from PGE Plant. 5/29/2014.

Photo 124. Looking NE. Rip rap lined pond. 5/29/2014.

Photo 125. Looking SE. Drainage ditch located in PGE Plant area. 5/29/2014.

Photo 126. Looking E. Wetland to the left of the shrubs in depression. 5/29/2014.

Photo 127. Looking NW. Drainage ditch located in PGE Plant area. 5/29/2014.

Photo 128. Looking NW. Artificial concrete lined pond. 5/29/2014.

Photo 129. Looking SW. Long linear wetland below pipe, located between fence and berm. 5/29/2014.

Photo 130. Looking E. Pond located on edge of study area. 5/29/2014.

Photo 131. Looking E. Drainage ditch located in PGE Plant area. 5/29/2014.

Photo 132. Looking N. Intermittent stream in PGE Plant area. 5/29/2014.

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APPENDIX D: TABLES

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Table D-1: Daily Precipitation Totals for Clatskanie											
MAY 2013		JULY 2013		MARCH 2014		APRIL 2014		MAY 2014		January/February 2015	
Day	Amount (in)	Day	Amount (in)	Day	Amount (in)	Day	Amount (in)	Day	Amount (in)	Day	Amount (in)
1	0.02	1	0	24	0	1	0.31	13	0	29-Jan	0.01
2	0	2	0	25	0.05	2	0.03	14	0	30-Jan	0
3	0	3	0	26	0.32	3	0	15	0	31-Jan	0.01
4	0	4	0	27	0.21	4	0.17	16	0	1-Feb	0.23
5	0	5	0	28	0.39	5	0.28	17	0	2-Feb	0.56
6	0	6	0	29	0.95	6	0.3	18	0	3-Feb	0.13
7	0	7	0	30	0.97	7	0.03	19	0	4-Feb	0.17
8	0	8	0	31	0.03	8	0	20	0	5-Feb	1.13
9	0	9	0			9	0.02	21	0	6-Feb	1.65
10	0	10	0			10	0	22	0	7-Feb	1.25
11	0	11	0			11	0	23	0.05	8-Feb	0.25
12	0	12	0					24	0.04	9-Feb	0.39
13	0.04	13	0					25	0	10-Feb	0
14	0.08	14	0					26	0.38	11-Feb	0
15	0	15	0					27	0	12-Feb	0.01
16	0.07	16	0					28	0		
17	0.05	17	0					29	0.25		
18	0.66	18	0					30	0		
19	0.06							31	0		
20	0										
21	0.3										
22	0.28										
23	0.94										
24	0.82										
25	0.09										
26	0.18										
27	0.49										
28	0.2										
29	0.77										
30	0.06										
31	0.03										

Source: Clatskanie (351643) Observed Daily Data (NRCS 2014)

Table D-2: Wetlands Delineated									
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin**	**HGM**	**Sample Plots**	**Photo Number**	**Additional Notes**
WET OO	South Route 2.2	A-5.1.1	45.9987987	-123.2598	PEMI	Depression	SP OO-01, 02	3	Boundary determination method: gradual break in topography, hydrology. Wetland occurs entirely within study area.
WET Y	South Route 1.8	A-5.1.4	46.0381764	-123.29109	PEMA	Depression	SP Y-01, 02	4	Boundary determination method: abrupt break in topography and vegetation. Roadside ditch less than 10 ft wide. Wetland occurs entirely within study area.
WET A	North Route 0.6	A-5.1.15	46.0533591	-123.29204	PEMC	Slope headwater	SP A-01, 02	10	Boundary determination method: abrupt break in topography, soil, hydrology, vegetation. Visible change in vegetation community. Wetland occurs entirely within study area.
WET B	North Route 0.6	A-5.1.15	46.054052	-123.29246	PEMC	Riverine Flow Through	SP B-01, 02	12	Boundary determination method: abrupt break in topography, hydrology, vegetation. Visible change in vegetation community. Wetland occurs entirely within study area.
WET V	North Route 2.4	A-5.1.26	46.0781287	-123.29062	PEMC	Riverine Flow Through	SP V-01, 02	17	Boundary determination method: abrupt break in hydrology, vegetation. Gradual break in topography. Wetland continues off site to the northeast.
WET R	North Route 2.6	A-5.1.26	46.0781367	-123.28691	PEMA	Riverine Flow Through	SP R-01, 02	23	Boundary determination method: abrupt break in topography, soil, hydrology. Gradual break in vegetation. Wetland occurs entirely within study area.
WET S	North Route 2.6	A-5.1.26	46.0785751	-123.2879	PEMA	Flat	SP S-01, 02	22	Boundary determination method: abrupt break in topography, soil, hydrology, vegetation. Wetland edge is in at toe of slope. Roadside ditch less than 10 ft wide. Flows into stream or wetland. Wetland occurs entirely within study area.

Table D-2: Wetlands Delineated									
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin**	**HGM**	**Sample Plots**	**Photo Number**	**Additional Notes**
WET X	North Route 2.6	A-5.1.26	46.0788222	-123.28784	PEMC	Riverine Flow Through	SP X-01, 02	21	Boundary determination method: abrupt break in topography, hydrology, vegetation. Wetland continues off site to the north.
WET W	North Route 2.6	A-5.1.26	46.0788888	-123.28814	PEMC	Riverine Flow Through	SP W-01, 02	20	Boundary determination method: abrupt break in topography, hydrology, vegetation. Subtle break in soil. Wetland continues off site to the northeast, northwest.
WET D	North Route 3.5	A-5.1.31	46.0855162	-123.2796	PEMC	Riverine Flow Through	SP D-01, 02	28	Boundary determination method: abrupt break in topography, soil, hydrology. Gradual break in vegetation. Wetland occurs entirely within study area.
WET KK	North Route 6.9	A-5.1.47	46.1117339	-123.23719	PEMH	Riverine Flow Through	SP KK-01, 02	37	Boundary determination method: abrupt break in topography, hydrology, vegetation. Wetland continues off site to the west, southwest.
WET LL	North Route 7.0	A-5.1.48	46.1137239	-123.23631	PEME	Riverine Flow Through	SP LL-01, 02	40	Boundary determination method: abrupt break in topography, hydrology, vegetation. Wetland continues off site to the west.
WET MM	North Route 7.1	A-5.1.48	46.1148588	-123.23516	PEMA	Riverine Flow Through	SP MM-01, 02	42, 44	Boundary determination method: abrupt break in topography, hydrology, vegetation. Roadside ditch less than 10 ft wide. Wetland continues off site to the west.
WET NN	North Route 7.2	A-5.1.48, A-5.1.49, A-5.1.50	46.1166596	-123.23421	PEMAd	Riverine Flow Through	SP NN-01,02	48	Boundary determination method: abrupt break in topography, hydrology. Gradual break in vegetation. Roadside ditch less than 10 ft wide. Wetland continues off site to the north.

Table D-2: Wetlands Delineated									
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin**	**HGM**	**Sample Plots**	**Photo Number**	**Additional Notes**
WET HH	North Route 7.9	A-5.1.52, A-5.1.53, A-5.1.54	46.1222601	-123.22982	PEMAd	Depression	SP HH-03, 04, 05, 06, 07, 08	53, 55, 59, 61	Boundary determination method: gradual break in topography, hydrology. Subtle break in vegetation. Difficult site with subtle changes in indicators. NWI Cowardin rating is incorrect. Wetland continues off site to the north, east, west.
WET GG	North Route 8.3	A-5.1.56, A-5.1.57	46.1252266	-123.21791	PEMC	Riverine Flow Through	SP GG-01, 02	63	Boundary determination method: abrupt break in topography, hydrology, vegetation. Excavated. Wetland continues off site to the northwest and south east.
WET II	North Route 8.3	A-5.1.55, A-5.1.56, A-5.1.57	46.1264541	-123.21979	PEM_PFOAh	Depression	SP II-01	64, 65	Boundary determination method: gradual break in topography, hydrology, vegetation. Excavated. Wetland continues off site to the east, west.
WET EE	North Route 8.9	A-5.1.59, A-5.1.60	46.1278235	-123.21136	PEM_PFOA	Flat	SP EE-01, 02, 03	67, 68	Boundary determination method: gradual break in hydrology, vegetation. Subtle break in in topography, soil. Difficult site with subtle changes in indicators. Wetland continues off site to the east, west.
WET FF	North Route 8.8	A-5.1.62	46.1321068	-123.2143	PEM_PFOB	Flat	SP FF-01, 02	71	Boundary determination method: gradual break in vegetation. Subtle break in in topography. Difficult site with subtle changes in indicators. Wetland continues off site to the north, west, southwest.
WET K	North Route 8.8	A-5.1.63	46.134765	-123.21514	PEMAf	Flat	SP K-01, 02	70	Boundary determination method: gradual break in topography, soil, hydrology, vegetation. Visible change in vegetation community. Wetland occurs entirely within study area.

Table D-2: Wetlands Delineated									
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin**	**HGM**	**Sample Plots**	**Photo Number**	**Additional Notes**
WET BBB	North Route 9.4	A-5.1.66	46.1381546	-123.21083	PEMBx	Slope/Flat	SP BBB-01, 02	76	Boundary determination method: abrupt break in topography, hydrology. Wetland continues off site to the west.
WET AAA	North Route 9.4	A-5.1.66	46.1388722	-123.2108	PEMBx	Slope/Flat	SP AAA-01, 02	78	Boundary determination method: abrupt break in topography, hydrology. Wetland continues off site to the west.
WET DD1	North Route 10.0	A-5.1.69, A-5.1.70	46.1460924	-123.20757	PEMC	Riverine Flow Through	SP DD-01, 02	82	Boundary determination method: abrupt break in topography, hydrology. Gradual break in vegetation. Excavated. Wetland continues off site to the west.
WET DD2	North Route 10.0	A-5.1.69, A-5.1.70	46.146552	-123.20645	PEMA	Flat	SP DD-03, 04	83	Boundary determination method: gradual break in topography, hydrology. Difficult site with subtle changes in indicators. Wetland continues off site to the east, and west
WET CC	North Route 10.5	A-5.1.72	46.1516023	-123.20123	PEMA	Depression	SP CC-01, 02	89	Boundary determination method: gradual break in topography, hydrology. Wetland continues off site to the east.
WET BB	North Route 10.5	A-5.1.72	46.1523294	-123.2008	PFO_PEMA	Flat	SP BB-01, 02	91	Boundary determination method: gradual break in topography, hydrology. Wetland continues off site to the northwest.
WET M	North Route 10.6	A-5.1.72, A-5.1.73	46.1529953	-123.19976	PEMA	Flat	SP M-01, 02, 03, 04	92, 93	Boundary determination method: gradual break in topography, vegetation. Subtle break in soil. Difficult site with subtle changes in indicators. Wetland continues off site to the west, northwest.

Table D-2: Wetlands Delineated									
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin**	**HGM**	**Sample Plots**	**Photo Number**	**Additional Notes**
WET L	North Route 10.8	A-5.1.73, A-5.1.74	46.1555578	-123.1972	PEMA	Flat	SP L-01, 02	96	Boundary determination method: gradual break in hydrology, vegetation. Subtle break in topography. Soil. Difficult site with subtle changes in indicators. Wetland continues off site to the northwest.
WET AA	North Route 10.9	A-5.1.74	46.1561944	-123.19603	PFO_PEMA	Flat	SP AA-01, 02	97	Boundary determination method: abrupt break in hydrology. Gradual break in hydrology. Subtle break in in vegetation. Difficult site with subtle changes in indicators. Wetland continues off site to the southeast.
WET N	North Route 11.0	A-5.1.74, A-5.1.75	46.1586525	-123.19361	PEMA	Flat	SP N-01, 02, 03, 04	100	Boundary determination method: gradual break in vegetation. Subtle break in topography, soil. Visible change in vegetation community. Wetland continues off site to the northwest, southeast.
WET P	North Route 11.2	A-5.1.75, A-5.1.76	46.1604426	-123.19182	PEMA	Flat	SP P-01, 02	102	Boundary determination method: gradual break in vegetation. Subtle break in topography, soil. Visible change in vegetation community. Difficult site with subtle changes in indicators. Wetland continues off site to the southeast
WET TT	North Route 11.2	A-5.1.76	46.1606095	-123.19125	PEMB	Depression	SP TT-01, 02	103	Boundary determination method: gradual break in topography, vegetation. Wetland continues off site to the south.
WET UU	North Route 11.3	A-5.1.76	46.1614434	-123.19059	PEM_PFOB	Depression	SP UU-01, 02	104	Boundary determination method: subtle break in in topography, vegetation. Difficult site with subtle changes in indicators. Wetland continues off site to the east, northeast, southeast.

Table D-2: Wetlands Delineated									
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin**	**HGM**	**Sample Plots**	**Photo Number**	**Additional Notes**
WET SS	North Route 11.5	A-5.1.76, A-5.1.77	46.1623699	-123.18987	PEM_PFOB	Flat	SP SS-01, 02, 03, 04	106, 107	Boundary determination method: subtle break in topography, vegetation. Difficult site with subtle changes in indicators. Wetland continues off site to the east, west, northeast, northwest, southeast, southwest.
WET RR	North Route 11.6	A-5.1.77, A-5.1.78	46.1651722	-123.187	PEMB	Flat	SP RR-01, 02	110	Boundary determination method: abrupt break in hydrology. Wetland continues off site to the east, west, northeast, northwest, southeast, southwest.
WET QQ	North Route 11.7	A-5.1.78, A-5.1.79	46.1668349	-123.1855	PEMB	Depression	SP QQ-01, 02	112	Boundary determination method: gradual break in topography, vegetation. Wetland continues off site to the west.
WET PP	North Route 11.9	A-5.1.79, A-5.1.80, A-5.1.83	46.169159	-123.18152	PEMB	Depression	SP PP-01, 02, 03, 04, 05, 06	114, 117, 118	Boundary determination method: gradual break in topography. Visible change in vegetation community. Difficult site with subtle changes in indicators. NWI Cowardin rating is incorrect. Wetland continues off site to the north, south.
WET VV	North Route 12.2	A-5.1.80, A-5.1.83, A-5.1.84	46.1706165	-123.17855	PEMC	Depression	SP VV-03, 04	119, 120, 121	Boundary determination method: abrupt break in topography, vegetation. Gradual break in hydrology. Excavated. Wetland continues off site to the northwest, southeast.
WET XX	North Route 12.1	A-5.1.84	46.1742025	-123.18241	PEMB	Depression	SP XX-01, 02	126	Boundary determination method: abrupt break in topography. Wetland occurs entirely within study area.
WET WW	North Route 12.2	A-5.1.84, A-5.1.85, A-5.1.86	46.1749357	-123.1793	PEMC	Depression	SP WW-01, 02	129	Boundary determination method: abrupt break in topography, vegetation. Wetland occurs entirely within study area.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
EPH 52	South Route 2.2	A-5.1.1	45.9989013	-123.25987	Ephemeral	Ephemeral	1.5	0.25	2	Channel is single thread. Flow direction is west. Feature originates within study area and flows out of study area. Roadside ditch is less than 10 ft wide.
EPH 12	South Route 1.8	A-5.1.4	46.0382487	-123.29098	Ephemeral	Ephemeral	2	.5	5	Channel is single thread. Flow direction is southwest. Feature entirely within study area. Roadside ditch is less than 10 ft wide.
EPH 11	South Route 1.6	A-5.1.4, A-5.1.5	46.0388661	-123.28861	Ephemeral	Ephemeral	2	.5	6	Channel is single thread. Flow direction is northeast. Feature entirely within study area. Roadside ditch is less than 10 ft wide.
EPH 13	South Route 1.1	A-5.1.7	46.0457374	-123.28849	Ephemeral	Ephemeral	1	.5	7	Channel is single thread. Flow direction is north. Feature entirely within study area. Roadside ditch is less than 10 ft wide.
EPH 10	South Route 1.0	A-5.1.8	46.0471618	-123.28875	Ephemeral	Ephemeral	3	.5	8	Channel is single thread. Flow direction is northeast. Feature flows into study area. Roadside ditch is less than 10 ft wide.
STRM 01	North Route 0.6	A-5.1.15	46.053297	-123.29233	R4SB3	Intermittent	4	0.5	9	Channel is single thread. Flow direction is west. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank, top of the zone of washed roots, and slope angle break in bank.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 02	North Route 0.6	A-5.1.15	46.0539159	-123.29267	R4SB3	Intermittent	1	0.5	11	Channel is single thread. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank, lowest extent of woody vegetation, and slope angle break in bank.
EPH 01	North Route 1.9	A-5.1.22	46.0707186	-123.28917	Ephemeral	Ephemeral	1	.5	14	Channel is single thread. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: textural change of depositional sediment or soil. Roadside ditch less than 10 ft wide.
EPH 02	North Route 2.3	A-5.1.24	46.0756029	-123.29116	Ephemeral	Ephemeral	2	.5	15	Channel is single thread. Flow direction is northwest. Feature entirely within study area.
EPH 03	North Route 2.4	A-5.1.25	46.0775906	-123.2912	Ephemeral	Ephemeral	1	.5	16	Channel is single thread. Flow direction is northeast. Roadside ditch less than 10 ft wide.
STRM 24	North Route 2.8	A-5.1.27	46.0780473	-123.28434	R3UB1	Perennial	12	.5	25	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and textural change of depositional sediment or soil.
STRM 27	North Route 2.4	A-5.1.25, A-5.1.26	46.0782551	-123.2903	R3UB1	Perennial	5	1	18	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and textural change of depositional sediment or soil.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 25	North Route 2.6	A-5.1.26	46.0783532	-123.28657	R2UB1	Perennial	4	.5	24	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, presence of litter, debris, silt stained leaves, silt lines on tree trunks, lowest extent of woody vegetation, and textural change of depositional sediment or soil.
EPH 26	North Route 2.5	A-5.1.26	46.0785696	-123.28834	Ephemeral	Ephemeral	1	.2	19	Channel is single thread. Flow direction is east. Feature flows into/out of study area. Roadside ditch is less than 10 ft wide.
STRM 04	North Route 3.5	A-5.1.31	46.0858412	-123.27929	R3UB1	Perennial	4	1	29	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank, change in vegetation, and textural change of depositional sediment or soil.
EPH 05	North Route 3.4	A-5.1.30, A-5.1.31	46.0859148	-123.27991	Ephemeral	Ephemeral	2	0.5	27	Channel is single thread. Flow direction is southeast. Feature entirely within study area. Roadside ditch is less than 10 ft wide.
STRM 05	North Route 3.6	A-5.1.31	46.0859943	-123.278	R4SB3	Intermittent	3	0.5	30	Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and textural change of depositional sediment or soil.
POND 01	North Route 3.6	A-5.1.31	46.0861063	-123.27726	PUB	PUB	15	0	31	Small pond in forest. Egg masses in pond.
EPH 06	North Route 5.6	A-5.1.41	46.1043571	-123.25463	Ephemeral	Ephemeral	1	.5	33	Channel is single thread. Flow direction is northeast. Roadside ditch is less than 10 ft wide.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
POND 02	North Route 5.5	A-5.1.41	46.1044208	-123.25552	PUBHUB3	Pond	300 x 300	10	32	Pond located on edge of study area.
POND 03	North Route 6.1	A-5.1.43	46.1068672	-123.24441	PUBHxUB3	Pond	80 x 50	5	34	Pond.
STRM 60	North Route 6.9	A-5.1.47, A-5.1.48, A-5.1.49	46.1129275	-123.23606	R3RB1UB1	Perennial	3	1	38, 45, 47	Channel is single thread. Flow direction is north. Feature originates within study area and flows out of study area. OHWL field indicators: change in vegetation, and textural change of depositional sediment or soil.
STRM 61	North Route 7.0	A-5.1.48	46.1136714	-123.2357	R4SB3	Intermittent	2	0.5	39	Channel is single thread. Flow direction is east. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, change in vegetation.
SS 50	North Route 7.0	A-5.1.48	46.1141624	-123.23525	SeepSpring	SeepSpring	3	0.4	41	Seep/spring on hillside.
STRM 62	North Route 7.1	A-5.1.48	46.1146301	-123.23496	R4SB3	Intermittent	1	.5	43	Channel is single thread. Flow direction is east. Feature originates within study area and flows out of study area. OHWL field indicators: textural change of depositional sediment or soil. Located in clear cut.
SS 52	North Route 7.2	A-5.1.49	46.116118	-123.23463	SeepSpring	SeepSpring	1	.25	46	Seep/spring on hillside draining to WET NN.
SS 51	North Route 7.3	A-5.1.49	46.117434	-123.23415	SeepSpring	SeepSpring	1	.25	49	Seep/spring on hillside.
STRM 08	North Route 7.4	A-5.1.50	46.1185847	-123.23369	R3RB1	Perennial	4	1.5	50	Channel is single thread. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and textural change of depositional sediment or soil.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
EPH 07	North Route 7.4	A-5.1.50	46.1190183	-123.23344	Ephemeral	Ephemeral	1	0.5	51	Channel is single thread. Flow direction is west. Feature originates within study area and flows out of study area.
EPH 51	North Route 7.5	A-5.1.52	46.1206049	-123.23259	Ephemeral	Ephemeral	2	2	52	Channel is single thread. Flow direction is west. Feature flows into/out of study area. Roadside ditch is less than 10 ft wide.
STRM 57	North Route 7.5	A-5.1.52	46.1209663	-123.23233	R2UB3	Perennial	8	4	54	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 104	North Route 7.6	A-5.1.52	46.1221048	-123.23209	R2UB3	Perennial	15	2	#N/A	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows in/out of study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank.
STRM 09	North Route 7.9	A-5.1.54, A-5.1.53	46.123319	-123.22591	R2UB3	Perennial	6	5	58	Channel is single thread, excavated drainage ditch. Flow direction is southeast. OHWL field indicators: clear, natural line impressed on the bank, presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 10	North Route 8.0	A-5.1.54, A-5.1.55	46.1238629	-123.22365	R3UB3	Perennial	150	10	60	Clatskanie River. Channel is single thread. Flow direction is north. Feature flows into and out of study area. OHWL field indicators: slope angle break in bank and change in vegetation.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 54	North Route 8.9	A-5.1.60	46.1298128	-123.21109	R2UB3	Perennial	7	3	69	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: slope angle break in bank.
STRM 55	North Route 8.8	A-5.1.62	46.1322109	-123.2139	R2UB3	Perennial	5	1.5	72	Channel is single thread, excavated drainage ditch. Flow direction is southwest. Feature flows into/out of study area. OHWL field indicators: change in vegetation.
STRM 12	North Route 9.1	A-5.1.58, A-5.1.64	46.1343339	-123.21056	R2UB3	Perennial	150	10	66, 73	Beaver Slough. Channel is single thread. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: change in vegetation.
STRM 103	North Route 9.2	A-5.1.65	46.1356147	-123.2103	R2UB3	Perennial	0	5	75	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank, and change in vegetation.
STRM 102	North Route 9.4	A-5.1.66	46.1382159	-123.21049	R2UB3	Perennial	0	2	77	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 100	North Route 9.5	A-5.1.64, A-5.1.65, A-5.1.66, A-5.1.67, A-5.1.68	46.1384518	-123.21065	R2UB3	Perennial	10	6	74	Channel is single thread, drainage ditch. Flow direction is south. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank, change in vegetation

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 101	North Route 9.5	A-5.1.67	46.1401999	-123.21089	R2UB3	Perennial	0	3	79	Channel is single thread, drainage ditch. Flow direction is east. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank, slope angle break in bank.
STRM 53	North Route 9.7	A-5.1.68	46.1423922	-123.21057	R2UB3	Perennial	8	4	80	Channel is single thread, excavated drainage ditch. Flow direction is west. OHWL field indicators: presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 52	North Route 9.7	A-5.1.68	46.1425254	-123.2106	R2UB3	Perennial	8	4	81	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: change in vegetation.
STRM 14	North Route 10.1	A-5.1.70	46.1470369	-123.20593	R2UB3	Perennial	10	3	84	Channel is single thread, excavated drainage ditch. Flow direction is east. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 15	North Route 10.3	A-5.1.71	46.149291	-123.20335	R2UB3	Perennial	6	3	86	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 16	North Route 10.3	A-5.1.71	46.1504294	-123.20248	R2UB3	Perennial	7	3	87	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 17	North Route 10.4	A-5.1.71, A-5.1.72	46.1506386	-123.20227	R2UB3	Perennial	4	2	88	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 51	North Route 10.4	A-5.1.72	46.1516864	-123.20159	R2SB5UB3	Perennial	5	1	90	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature originates within study area and flows out of study area. OHWL field indicators: change in vegetation.
EPH 50	North Route 10.6	A-5.1.72, A-5.1.73	46.1530681	-123.19948	Ephemeral	Ephemeral	2.5	1	94	Channel is single thread, excavated drainage ditch. Flow direction is northeast. Feature flows into/out of study area.
STRM 18	North Route 10.6	A-5.1.72, A-5.1.73	46.1534494	-123.19917	R2UB3	Perennial	0	0	95	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 19	North Route 10.9	A-5.1.74	46.1570001	-123.19541	R2UB3	Perennial	10	5	98	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 20	North Route 10.9	A-5.1.74	46.1571599	-123.19524	R2UB3	Perennial	5	1	99	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear and natural line impressed on the bank.
STRM 21	North Route 11.2	A-5.1.76	46.1608944	-123.19133	R2UB3	Perennial	10	4	101	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank and slope angle break in bank.
STRM 22	North Route 11.3	A-5.1.76	46.1617927	-123.19041	R2UB3	Perennial	15	6	105	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and slope angle break in bank.
STRM 23	North Route 11.5	A-5.1.77	46.1640744	-123.18812	R2UB3	Perennial	12	5	108	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank and slope angle break in bank.
STRM 66	North Route 11.5	A-5.1.77	46.1641506	-123.18844	R2UB3	Perennial	8	3	109	Channel is single thread, excavated drainage ditch with evidence of being mowed and grazed. Flow direction is northwest. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank, presence of litter, debris, silt stained leaves, and silt lines on tree trunks.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 65	North Route 11.7	A-5.1.78	46.166249	-123.18591	R2UB3	Perennial	12	3	111	Channel is single thread, excavated drainage ditch with evidence of being mowed and grazed. Flow direction is west. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank, presence of litter, debris, silt stained leaves, and silt lines on tree trunks.
STRM 64	North Route 11.8	A-5.1.79	46.1675459	-123.18468	R2UB3	Perennial	8	3	113	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: presence of litter, debris, silt stained leaves, silt lines on tree trunks, and change in vegetation.
STRM 63	North Route 12.0	A-5.1.79, A-5.1.80	46.1690157	-123.18181	R2UB3	Perennial	12	3	116	Channel is single thread, excavated drainage ditch in a plowed field. Flow direction is northwest. Feature flows into/out of study area. OHWL field indicators: clear, natural line impressed on the bank, and slope angle break in bank.
STRM 67	North Route 12.2	A-5.1.83	46.1715217	-123.17914	R4SB3	Intermittent	1	.25	122, 123	Channel is single thread, excavated drainage ditch. Flow direction is southeast. Feature originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank.

Table D-3: Waters Delineated										
Feature Name	**Nearest Milepost**	**Map Number**	**Latitude**	**Longitude**	**Cowardin Class**	**Flow Duration**	**OHWL Width (feet)**	**OHWL Height (feet)**	**Photo Number**	**Additional Notes**
STRM 70	North Route 12.2	A-5.1.84	46.1737867	-123.18218	R4SB3	Intermittent	1	0.25	125	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.
POND 53	North Route 12.2	A-5.1.84, A-5.1.85	46.1739703	-123.18157	PUBHR	PUBHR	280 x 50	5	124	Artificial pond.
STRM 71	North Route 12.2	A-5.1.84, A-5.1.85	46.174073	-123.1818	R4SB3	Intermittent	1	.25	127	Channel is single thread, excavated drainage ditch. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank.
POND 52	North Route 12.2	A-5.1.84, A-5.1.85	46.1741522	-123.1809	PUBHR	PUBHR	45 x 50	5	128	Artificial pond.
POND 51	North Route 12.2	A-5.1.86	46.1746964	-123.1756	PUBC	PUBC	70 x 35	0.5	130	Seasonally flooded pond.
STRM 69	North Route 12.2	A-5.1.86	46.1757268	-123.1764	R4SB4	Intermittent	3	.5	131	Channel is single thread, excavated drainage ditch. Flow direction is west. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank.
STRM 68	North Route 12.2	A-5.1.86	46.1758647	-123.17506	R4SB3	Intermittent	1	1	132	Channel is single thread, excavated drainage ditch. Flow direction is north. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.

Table D-4: Other Features					
Feature Name	**Map Number**	**Latitude**	**Longitude**	**Photograph Number**	**Feature Characteristics**
SP 53	A-5.1.1	45.9985317	-123.260516	1	Plot confirming uplands. No hydric soils or hydrology present.
XBB 01	A-5.1.21	46.0684483	-123.288579	13	Upland swale; no defined bed and bank.
XBB 02	A-5.1.30, A-5.1.30	46.0861604	-123.280281	26	Water is channel from recent rains, but no defined bed and bank.
SP 02	A-5.1.43	46.1069352	-123.243831	35	Plot confirming uplands. No hydrology present.
SP 03	A-5.1.43, A-5.1.44	46.1073669	-123.244367	36	Plot confirming uplands. No hydric soils or hydrology present.
SP 51	A-5.1.51	46.1214012	-123.244591	56	Plot confirming uplands. No hydrology present.
SP 52	A-5.1.51	46.1220383	-123.242778	57	Plot confirming uplands. No hydrology present.
SP 04	A-5.1.55	46.1248006	-123.220444	62	Plot confirming uplands. No hydrology present.
XBB 50	A-5.1.70	46.147533	-123.205587	85	Upland drainage swale connects to Larson Slough. No defined bed and bank.

Table D-5: Deviations from National Wetlands Inventory							
Feature Name	**Map Number**	**Latitude**	**Longitude**	**Photograph Number**	**NWI Classification**	**Field Cowardin Classification**	**Reason for Deviation**
STRM 24	A-5.1.27	46.0780473	-123.284338	25	R4SBC	R3UB1	Stream mapped by NWI as intermittent, but confirmed to be perennial.
STRM 04	A-5.1.31	46.0858446	-123.279288	29	R4SBC	R3UB1	Stream mapped by NWI as intermittent, but confirmed to be perennial.
STRM 60	A-5.1.47, A-5.1.48, A-5.1.49	46.1159972	-123.234171	38, 45, 47	R4SBC	R3RB1UB1	Stream mapped by NWI as intermittent, but confirmed to be perennial.
WET HH	A-5.1.52, A-5.1.53, A-5.1.54	46.1224431	-123.229684	53, 55, 59, 61	PEMC	PEMAd	Wetland mapped by NWI as seasonally flooded, confirmed to be a temporarily flooded ditch.
STRM 10	A-5.1.54, A-5.1.55	46.1238626	-123.223645	60	R1UBV	R3UB3	Stream mapped by NWI to be tidal, confirmed perennial.
SP 04	A-5.1.55	46.1248006	-123.220444	62	PEMC	N/A	Plot confirming uplands located in area mapped by NWI as PEM.
STRM 12	A-5.1.58, A-5.1.64	46.1295373	-123.217546	66, 73	R1UBV	R2UB3	Stream mapped by NWI to be tidal, confirmed perennial.
WET PP	A-5.1.79, A-5.1.80, A-5.1.83	46.1691589	-123.181522	114, 117, 118	PEMC	PEMB	Wetland mapped by NWI as seasonally flooded, confirmed to be saturated.

ATTACHMENT J-3:

JOINT PERMIT APPLICATON

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Joint Permit Application

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

U.S. Army Corps of Engineers Portland District	Oregon Department of State Lands
Corps Action ID Number	DSL Number

(1) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ☑ Consultant ☐ Contractor
Contact Name	Michael J Hayward	*Section 1.1*	Jennifer D'Avanzo
Business Name	NW Natural		Tetra Tech, Inc.
Mailing Address 1	220 NW 2nd Ave		1750 SW Harbor Way
Mailing Address 2			Suite 400
City, State, Zip	Portland, OR 97217		Portland, OR 97217
Business Phone			503.727.8073
Cell Phone	503.226.4211 ext 4327		
Fax	503 220.2586		503.227.1287
Email	mjh@nwnatural.com		Jennifer.davanzo@tetratech.com

(2) PROJECT INFORMATION

A. Provide the project location. See Section 2-1, Figures A in Attachment A

Project Name	Tax Lot #	Latitude & Longitude*	
North Mist Expansion Project	*Refer to Table 2-1 and 2-2*	*Refer to Table 2-1 and 2-2*	
Project Address / Location	City (nearest) Clatskanie	County Columbia	
Township *Refer to Table 2-1 and 2-2*	Range *Refer to Table 2-1 and 2-2*	Section *Refer to Table 2-1 and 2-2*	Quarter/Quarter *Refer to Table 2-1 and 2-2*

Brief Directions to the Site

From Portland: Take I-5 North to Exit 36. Take WA 432 W to WA-433 onto the Lewis and Clark Bridge. Merge on to HWY 30 W. After 11 miles take OR 47 S. Left at Tunnel Road. And left into Project Area.

Refer to Attachment A: Figure A: Project Location Maps

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

☑ River / Stream ☑ Non-Tidal Wetland ☑ Lake / Reservoir / Pond
☐ Estuary or Tidal Wetland ☐ Other ☐ Pacific Ocean

Waterbody or Wetland Name** *Refer to Tables 4-1 and 4-2*	River Mile	6th Field HUC Name *Refer to Tables 4-1 and 4-2*	6th Field HUC (12 digits) *Refer to Tables 4-1 and 4-2*

(2) PROJECT INFORMATION

C. Indicate the project category. (Check all that apply.)

☐ Commercial Development	☐ Industrial Development	☐ Residential Development
☑ Institutional Development	☐ Agricultural	☐ Recreational
☐ Transportation	☐ Restoration	☐ Bank Stabilization
☐ Dredging	☑ Utility lines	☐ Survey or Sampling
☑ In- or Over-Water Structure	☐ Maintenance	☐ Other:

* In decimal format (e.g., 44.9399, -123.0283)
** If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").

(3) PROJECT PURPOSE AND NEED

Provide a statement of the purpose and need for the overall project.

Refer to Section 3.1:– *need to include a brief description of any related activities needed to accomplish the project objectives and would satisfy a public need*

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

A. Describe the existing physical and biological characteristics of each wetland or waterway. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.

Refer to Section 4.1

Table 4 – 1 Wetland Table
Table 4 - 2 Water Table

Refer to Attachment E – Wetland Delineation Report

Table 4-3 State and Federal Listed Species and Critical Habitat

Figure 4-1: 100 year floodplain

B. Describe the existing navigation, fishing and recreational use of the waterway or wetland.

OAR § 141-085-0565(3)(c) states that the Department of State Lands will issue a permit if it determines the project "would not unreasonably interfere with the paramount policy of this state to preserve the use of its waters for navigation, fishing and public recreation, when the project is on state-owned lands."

No impacts to wetlands or other waters are proposed on state-owned land.

(5) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland.
Refer to Section 5.1 and Table 5-1: Alternative s analysis

Attachment D- Erosion and Sediment Control Plan.

(6) PROJECT DESCRIPTION

A. Briefly summarize the overall project including work in areas both in and outside of waters or wetlands.

Refer to Section 6.1

B. Describe work within waters and wetlands.
Refer to Section 6.2
Attachment C-1 for Construction Typicals
Attachment C-2 for Site Specific Drawings

C. Construction Methods. Describe how the removal and/or fill activities will be accomplished to minimize impacts to waters and wetlands.

Refer to Section 6.2
Attachment C-2 – Site specific Cross sections

D. Describe source of fill material and disposal locations if known.

(6) PROJECT DESCRIPTION

Refer to Section 6- 1

(6) PROJECT DESCRIPTION

E. Construction timeline.

What is the estimated project start date?
May 2017

What is the estimated project completion date?
October 2018

Is any of the work underway or already complete? ☐ Yes ☑ No
If yes, describe.

F. Fill Volumes and Dimensions (if more than 4 impact sites, include a summary table as an attachment)
*Refer to **Section 6.3 Table 6-2***

Wetland / Waterbody Name *	Fill Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq.ft. or ac.)	Volume (c.y.)		
EPH 06	447.3	1	8	0.010	132.54	Temporary	Native Soil
EPH 03	76.0	1	8	0.002	22.51	Temporary	Native Soil
EPH 01	54.3	1	8	0.001	16.08	Temporary	Native Soil
EPH 05	122.1	2	8	0.006	72.35	Temporary	Native Soil
EPH 10	59.9	3	8	0.004	53.27	Temporary	Native Soil
EPH 11	183.8	2	8	0.008	108.93	Temporary	Native Soil
EPH 11	43.6	2	8	0.002	25.85	Temporary	Native Soil
EPH 11	536.0	2	8	0.025	317.63	Temporary	Native Soil
EPH 13	103.6	1	8	0.002	30.71	Temporary	Native Soil
SS 52	16.4	1	8	0.001	4.85	Temporary	Native Soil
STRM 55	80.8	5	8	0.012	119.70	Temporary	Native Soil
STRM 67	18.8	1	8	0.000	5.57	Temporary	Native Soil
STRM 70	19.7	1	8	0.000	5.84	Temporary	Native Soil
STRM 71	293.8	1	8	0.007	87.05	Temporary	Native Soil
WET FF			8	0.335	4322.00	Temporary	Native Soil
WET HH			8	0.906	11694.85	Temporary	Native Soil
WET KK			8	0.055	711.60	Temporary	Native Soil
WET LL			8	0.000	3.30	Temporary	Native Soil
WET MM			8	0.015	189.96	Temporary	Native Soil
WET PP			8	0.351	4530.02	Temporary	Native Soil
WET VV			8	0.150	1939.89	Temporary	Native

G. Total Fill Volumes and Dimensions – *Refer to Section 6.2 Table 6.3*

Fill Impacts to Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Fill to Wetlands		1.812	23,391.62
Total Fill Below Ordinary High Water	2,056.1	0.082	1,002.88

Total Fill Below Highest Measured Tide	NA	NA	NA
Total Fill Below High Tide Line	NA	NA	NA
Total Fill Below Mean High Water Tidal Elevation	NA	NA	NA

H. Removal Volumes and Dimensions (if more than 4 impact sites, include a summary table as an attachment)
Refer to Section 6.3 Table 6-4

Wetland / Waterbody Name*	Removal Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
EPH 06	447.3	1	8	0.010	132.54	Temporary	Silt/Clay, Sand, Gravel
EPH 03	76.0	1	8	0.002	22.51	Temporary	Silt/Clay
EPH 01	54.3	1	8	0.001	16.08	Temporary	Silt/Clay, Sand, Gravel
EPH 05	122.1	2	8	0.006	72.35	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 10	59.9	3	8	0.004	53.27	Temporary	Silt/Clay, Sand, Gravel
EPH 11	183.8	2	8	0.008	108.93	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 11	43.6	2	8	0.002	25.85	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 11	536.0	2	8	0.025	317.63	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 13	103.6	1	8	0.002	30.71	Temporary	Silt/Clay, Sand, Gravel
SS 52	16.4	1	8	0.001	4.85	Temporary	Native
STRM 55	80.8	5	8	0.012	119.70	Temporary	Silt/Clay
STRM 67	18.8	1	8	0.000	5.57	Temporary	Gravel
STRM 70	19.7	1	8	0.000	5.84	Temporary	Silt/Clay, Sand, Gravel
STRM 71	293.8	1	8	0.007	87.05	Temporary	Silt/Clay, Sand, Gravel
WET FF			8	0.335	4322.00	Temporary	Native Soil
WET HH			8	0.906	11694.85	Temporary	Native Soil
WET KK			8	0.055	711.60	Temporary	Native Soil
WET LL			8	0.000	3.30	Temporary	Native Soil
WET MM			8	0.015	189.96	Temporary	Native Soil
WET PP			8	0.351	4530.02	Temporary	Native Soil
WET VV			8	0.150	1939.89	Temporary	Native Soil

I. Total Removal Volumes and Dimensions – *Refer to Section 6.3 Table 6-5*

Removal Impacts to Waters	Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)
Total Removal to Wetlands		1.812	23,391.62
Total Removal Below Ordinary High Water	2,056.1	0.082	1,002.88
Total Removal Below Highest Measured Tide	NA	NA	NA
Total Removal Below High Tide Line	NA	NA	NA
Total Removal Below Mean High Water Tidal Elevation	NA	NA	NA

* If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").
** Indicate the days, months or years the fill or removal will remain. Enter "permanent" if applicable. For DSL, permanent removal or fill is defined as being in place for 24 months or longer.
*** Example: soil, gravel, wood, concrete, pilings, rock etc.

(7) ADDITIONAL INFORMATION

Are there any state or federally listed species on the project site? ☑ Yes ☐ No ☐ Unknown
Table 4.3 in Block 4

Is the project site within designated or proposed critical habitat? ☑ Yes ☐ No ☐ Unknown
Table 4.3 in Block 4

(7) ADDITIONAL INFORMATION

Is the project site within a national Wild and Scenic River?	☐ Yes	☑ No	☐ Unknown
Is the project site within the 100-year floodplain? *Figure 4-1 in Block 4*	☑ Yes	☐ No	☐ Unknown

*** If yes to any of the above, explain in Block 4 and describe measures to minimize adverse effects to these resources in Block 5.**

Is the project site within the Territorial Sea Plan (TSP) Area?	☐ Yes	☑ No	☐ Unknown

*** If yes, attach TSP review as a separate document for DSL.**

Is the project site within a designated Marine Reserve?	☐ Yes	☑ No	☐ Unknown

*** If yes, certain additional DSL restrictions will apply.**

Will the overall project involve construction dewatering or ground disturbance of one acre or more? *ATTACHMENT G NPDES PERMIT*	☑ Yes	☐ No	☐ Unknown

*** If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).**

Is the fill or dredged material a carrier of contaminants from on-site or off- site spills?	☐ Yes	☑ No	☐ Unknown
Has the fill or dredged material been physically and/or chemically tested?	☐ Yes	☑ No	☐ Unknown

***If yes, explain in Block 4 and provide references to any physical/chemical testing report(s).**

Has a cultural resource (archaeological) survey been performed on the project area? *Refer to Section 7.4*	☑ Yes	☐ No	☐ Unknown

*** If yes, provide a copy of the survey with this application. Do not describe any resources in this document.**

Identify any other federal agency that is funding, authorizing or implementing the project.

Agency Name	Contact Name	Phone Number	Most Recent Date of Contact

List other certificates or approvals/denials required or received from other federal, state or local agencies for work described in this application. For example, certain activities that require a Corps permit also require 401 Water Quality Certification from Oregon DEQ. -

Approving Agency	Certificate/ approval / denial description	Date Applied

Other DSL and/or Corps Actions Associated with this Site (Check all that apply.)

☐ Work proposed on or over lands owned by or leased from the Corps

☐ State owned waterway — DSL Waterway Lease #

☐ Other Corps or DSL Permits — Corps # — DSL #

☐ Violation for Unauthorized Activity — Corps # — DSL #

☐ Wetland and Waters Delineation — Corps # — DSL #

☑ A wetland / waters delineation has been completed (if so, provide a copy with the application) *ATTACHMENT E*

☑ The Corps has approved the wetland / waters delineation within the last 5 years

☑ DSL has approved the wetland / waters delineation within the last 5 years

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

A. Describe unavoidable environmental impacts that are likely to result from the proposed project. Include permanent, temporary, direct, and indirect impacts.

Refer to Tables 4-1, 4-2, 6-1, 6-2, 6-3, 6-4 and 6-5.
Attachment B, Figure B

B. For temporary removal or fill or disturbance of vegetation in waterways, wetlands or riparian (i.e., streamside) areas, discuss how the site will be restored after construction.

ATTACHMENT H Restoration and Rehabilitation Site Plan for Temporary Impacts

Compensatory Mitigation - Not Applicable. No permanent impacts

C. Proposed mitigation approach. Check all that apply: N/A

☐ Permittee-responsible Onsite Mitigation	☐ Permittee-responsible Offsite mitigation	☐ Mitigation Bank or in-lieu fee program	☐ Payment to Provide (not approved for use with Corps permits)

D. Provide a brief description of mitigation approach and the rationale for choosing that approach. If you believe mitigation should not be required, explain why.

N/A

Mitigation Bank / In-Lieu Fee Information:
Name of mitigation bank or in-lieu fee project:
Type of credits to be purchased:

If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?
☐ Yes. Submit the plan with this application and complete the remainder of this section.
☐ No. A mitigation plan will need to be submitted (for DSL, this plan is required for a complete application).

Mitigation Location Information (Fill out only if permittee-responsible mitigation is proposed)

Mitigation Site Name/Legal Description	Mitigation Site Address	Tax Lot #
County	City	Latitude & Longitude (in DD.DDDD format)

Township	Range	Section	Quarter/Quarter

(9) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE *See Section 9.1*		
☐ **Pre-printed mailing labels of adjacent property owners attached**	**Project Site Adjacent Property Owners**	**Mitigation Site Adjacent Property Owners**

(10) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT (TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)

I have reviewed the project described in this application and have determined that:

- ☐ This project is not regulated by the comprehensive plan and land use regulations.
- ☐ This project is consistent with the comprehensive plan and land use regulations.
- ☐ This project will be consistent with the comprehensive plan and land use regulations when the following local approval(s) are obtained:
  - ☐ Conditional Use Approval
  - ☐ Development Permit
  - ☐ Other Permit (see comment section)
- ☐ This project is not consistent with the comprehensive plan. Consistency requires:
  - ☐ Plan Amendment
  - ☐ Zone Change
  - ☐ Other Approval or Review (see comment section)

An application ☐ has ☐ has not been filed for local approvals checked above.

Local planning official name (print)	Title	City / County (circle one)

Signature	Date

Comments:

(11) COASTAL ZONE CERTIFICATION

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. A public notice will be issued with the certification statement, which will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050.

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Name	Title

Signature	Date

(12) SIGNATURES

See Attachment I

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance.
To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.

Fee Amount Enclosed	$

Applicant Signature

Print Name: Mike Hayward	Title: Environmental Manager
Signature	Date 4-21-15

Authorized Agent Signature

Print Name: Jennifer D'Avanzo	Title: Biologist
Signature:	Date: April 16, 2015

Landowner Signature(s)

Landowner of the Project Site (if different from applicant)

Print Name	Title
Signature	Date

Landowner of the Mitigation Site (if different from applicant)

Print Name	Title
Signature	Date

Department of State Lands, Property Manager (to be completed by DSL)

If the project is located on state-owned submerged and submersible lands, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.

Print Name	Title
Signature	Date

Block 13

☐ **Drawings (items in bold are required)**

☑ **Location map with roads identified**

ATTACHMENT A- Figures A

☑ **U.S.G.S topographic map**

ATTACHMENT A - FIGURE A

☐ **Tax lot map**

ATTACHMENT A - FIGURE A

☑ **Site plan(s)**

ATTACHMENT B - FIGURE B
ATTACHMENT C-2 Site Specific Drawings

☐ **Cross section drawing(s)**

ATTACHMENT C-1 Construction Typicals

ATTACHMENT C-2 Site Specific Drawings

☑ **Recent aerial photo**

ATTACHMENT B– Figure B

☑ Project photos

ATTACHMENT E: Wetland Delineation Report

☑ Erosion and Pollution Control Plan(s), if applicable

ATTACHMENT D

☐ DSL/Corps Wetland Concurrence letter and map, if approved and applicable

☑ Pre-printed labels for adjacent property owners (Required if more than 5)

Refer to Section 9.1

☑ Restoration plan or rehabilitation plan for temporary impacts

ATTACHMENT H

☐ Mitigation plan

Block 13

☐ Wetland functional assessment and/or stream functional assessment

☑ Alternatives analysis

Refer to Section 5.1

☐ Biological assessment (if requested by Corps project manager during pre-application coordination.)

☐ Stormwater management plan (may be required by the Corps or DEQ)

☑ Other:

☑ Signtures:

Attachment I

☐

Send Completed form to:

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GP
PO Box 2946
Portland, OR 97208-2946
Phone: 503-808-4373

Counties:
Baker, Clackamas, Clatsop, Columbia, Gilliam, Grant, Hood River, Jefferson, Lincoln, Malheur, Marion, Morrow, Multnomah, Polk, Sherman, Tillamook, Umatilla, Union, Wallowa, Wasco, Washington, Wheeler, Yamhill

OR

U.S. Army Corps of Engineers
ATTN: CENWP-OD-GE
211 E. 7th AVE, Suite 105
Eugene, OR 97401-2722
Phone: 541-465-6868

Counties:
Benton, Coos, Crook, Curry, Deschutes, Douglas Jackson, Josephine, Harney, Klamath, Lake, Lane, Linn

Send Completed form to:

DSL - West of the Cascades:

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Phone: 503-986-5200

OR

DSL - East of the Cascades:

Department of State Lands
1645 NE Forbes Road, Suite 112
Bend, Oregon 97701
Phone: 541-388-6112

Send all Fees to:
Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
Pay by Credit Card by Calling 503-986-5253

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Attachment C, Cross Sections
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Attachment H, Site Restoration Plan
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BLOCK 1 APPLICANT AND LANDOWNER CONTACT INFORMATION

Section 1.1 Property Ownership

A list of property owners is provided in accordance with OAR 141-085-0550 (A).

Campbell Global
PO BOX 99,
Cathlamet, WA 98612*

Weyerhaeuser Columbia Timberlands, LLC
10 International Way,
Longview, WA 98632**

Lower Columbia Tree Farm
1500 SW First Ave, 1150
Portland, OR 97201**

Russell and April Spaulding
PO Box 1459
Clatskanie, OR 97016*

Gary and Heidi Bailey
PO Box 361,
Clatskanie, OR 97016**

OR DOT HWY DIV
6000 SW Raab Rd,
Portland, OR 97221*

Jim and Lawanna Castle
PO Box 1291,
Clatskanie, OR 97016*

Evenson Logging Co.
PO Box 127
Clatskanie, OR 97016**

Mark and Katrina Kynsi
15694 Luxford Rd,
Clatskanie, OR 97016*

Claruth Inc, Willna Inc, Franbea Inc, Ea 1/3
PO Box 127,
Clatskanie, OR 97016**

Port of St. Helens
Portland General Electric Lessee
121 SW Salmon St #1WTC0510
Portland, OR 97204**

Portland General Electric
121 SW Salmon St,
Portland, OR 97204*

George and Karen Poysky
224 SW 153rd St, PMB 258,
Seattle, WA 98166*

Port of St. Helens
PO BOX 190,
Columbia, OR 97018**

John & Rose Castle
77343 Palm Hill Rd.
Clatskanie, OR 97016*

KEY:
* Easement Required
** Easement Required,
Water impact

BLOCK 2 PROJECT INFORMATION

Section 2.1: Project Location

Northwest Natural (NWN) proposes to construct the North Mist Expansion Pipeline Project (Project) near Mist and Clatskanie, in Columbia County.

Legal Descriptions, Latitude and Longitude

Legal descriptions of tax lots that will have impacts to wetlands or other waters are presented in tabular format in **Tables 2-1** and **2-2**, for impacted wetlands and other waters, respectively.

Copies of tax lot maps (see **Attachment A: Figures A-1.1** through **A-1.6**) for removal or fill sites are included as a map set following **Tables 2-1** and **2-2**. These maps also show roads to serve as directions to the sites.

Table 2-1. Legal Descriptions, Tax Lots and Tax Maps for Impacted Wetland Sites

Feature	Township and Range	Section	QQ Section	Tax Lot	Latitude	Longitude
WET KK	T07N R04W, T07N R05W	07, 12	O NWNW, NENE	7N4W 700 1000, 7N5W1200 100	46.11173392	-123.2371853
WET LL	T07N R04W	06	O SWSW	7N4W 600 1400	46.11372392	-123.2363098
WET MM	T07N R04W	06	O SWSW	7N4W 600 1400	46.11485884	-123.2351565
WET NN	T07N R04W	06	O SWSW	7N4W 600 1400	46.11665965	-123.2342065
WET HH	T07N R04W	06	O SWNW	7N4W 600 300	46.12226005	-123.2298168
WET EE	T07N R04W, T08N R04W	05, 32	L 1, L 6	8N4W3200 1100	46.12782348	-123.2113585
WET FF	T08N R04W	32	L 5	8N4W3200 1100	46.13210683	-123.2143021
WET K	T08N R04W	00	(blank)	8N4W3200 1100	46.13476505	-123.2151393
WET CC	T08N R04W	29	SENE	8N4W2800 200	46.15160227	-123.2012324
WET M	T08N R04W	29	NENE, SENE	8N4W2800 200	46.15299534	-123.1997581
WET L	T08N R04W	29	NENE	8N4W2800 101	46.15555779	-123.1971987
WET AA	T08N R04W	28	NWNW	8N4W2800 101	46.15619444	-123.1960318
WET N	T08N R04W	21	SWSW	8N4W2100 400	46.15865249	-123.1936129
WET P	T08N R04W	21	NWSW, SWSW	8N4W2100 400	46.16044263	-123.191821
WET TT	T08N R04W	21	NESW	8N4W2100 500	46.16060946	-123.1912484
WET UU	T08N R04W	21	NESW	8N4W2100 500	46.16144344	-123.1905869
WET SS	T08N R04W	21	L 2, NESW	8N4W2100 500	46.16236986	-123.189874
WET RR	T08N R04W	21	L 2, SWNE	8N4W2100 100	46.16517217	-123.186998
WET QQ	T08N R04W	21	SWNE	8N4W2100 100	46.16683489	-123.1855035
WET PP	T08N R04W	21	L 1	8N4W2100 700	46.16915904	-123.1815215
WET VV	T08N R04W	16, 21, DC 37	L 8, NENE	8N4W1600 300, 8N4W2100 700	46.17061648	-123.1785548

Table 2-2. Legal Descriptions, Tax Lots, and Tax Maps for Impacted Other Waters Sites						
Feature	**Township and Range**	**Section**	**QQ Section**	**Tax Lot**	**Latitude**	**Longitude**
EPH 11	T06N R05W, T07N R05W	03, 34	L 2, L3, SWSE	6N5W00 600, 6N5W00 700, 7N5W00 4500, 7N5W00 4600	46.038866 14	-123.2886136
EPH 13	T07N R05W	34	NWSE	7N5W00 4600	46.045737 42	-123.2884895
EPH 10	T07N R05W	34	SWNE	7N5W00 4700	46.047161 77	-123.2887469
EPH 01	T07N R05W	22	SWSE	7N5W00 1300	46.070718 58	-123.2891673
EPH 03	T07N R05W	22	SENW	7N5W00 1300	46.077590 63	-123.2912013
EPH 05	T07N R05W	14	SWSW	7N5W00 1300	46.085914 85	-123.2799096
EPH 06	T07N R05W	12	NWSW	7N5W1200 201	46.104357 11	-123.2546303
SS 52	T07N R04W	06	O SWSW	Within Road ROW	46.116117 62	-123.2346291
STRM 55	T08N R04W	32	L 5	8N4W3200 1100	46.132210 94	-123.2139022
STRM 67	T08N R04W	16, 21	L 8, NENE	8N4W1600 300	46.171521 68	-123.1791373
STRM 70	T08N R04W	DC 37	(blank)	8N4W1600 300	46.173786 71	-123.1821821
STRM 71	T08N R04W	DC 37	(blank)	8N4W1600 300	46.174072 99	-123.1818028

Directions to the Site

Maps identifying impact sites on wetlands and other waters are included as **Attachment A, Figures A-1.1** through **A-1.6**. These figures include roads and other landmarks to serve as directions to the removal fill sites.

B, Wetland/Waterway

There are no permanent impacts to wetlands and waterways. Temporary impact are proposed to 21 wetlands and 11 waterways. Features impacted by the Project are described individually in **Tables 4-1** and **4-2** and in **Tables 6-1** through **6-4**.

BLOCK 3 PROJECT PURPOSE AND NEED

Section 3.1 Purpose and Need

NW Natural proposes to develop a new underground gas storage capacity through the development of the Adams reservoir. Facilities include one compressor station capable of delivering 120 MMscfd to the Port Westward Industrial Park (PWIP) facilities near the Beaver terminus of the Kelso Beaver (KB) Pipeline, and new pipeline to accommodate current needs and reasonably foreseeable future customer load requirements. This capacity will serve peak and flexible gas supply to meet immediate needs for Portland General Electric's (PGE) electric generation facilities near Clatskanie, Oregon. It may also serve other large industrial, electrical generation, or manufacturing customers who choose to connect along the pipeline route, or request interstate services through the KB Pipeline.

The new transmission pipeline, up to 24-inches in diameter, will traverse generally north from the Storage Facility. The pipeline will paralleling the original 12" North Mist Feeder pipeline where it is practical to do so. The line will then extend to the northeast past the terminus of North Mist Feeder pipeline for approximately six miles to the pipeline network at the Beaver, which is the end of the KB pipeline just south of the Columbia River. The total pipeline distance will be approximately 13 miles.

In order to minimize impacts to natural resources and agricultural lands, a significant portion of the transmission pipeline will be installed utilizing horizontal directional drilling (HDD) methods. A little less than one-half of the pipeline is proposed to be installed by HDD method, with nine bore pads within the flood plain area. As the pipeline emerges from the agricultural area near the Columbia River, the final bore pad is proposed for location within the PGE-owned PWIP property.

BLOCK 4 DESCRIPTION OF RESOURCES IN THE PROJECT AREA

Section 4.1 Description of existing physical and biological characteristic of each wetland and waterway.

Wetlands and other waters proposed for impact are described in **Tables 4-1** and **4-2**, respectively, below. **Attachment B, Figures B-1.1** through **B-1-34** exhibit the location of each impacted feature.

Table 4-1. Wetland Resources

WETLAND ID	Milepost	Permanent Impact Acreage	Temporary Impact Acreage	Cowardin	HGM	Hydrology Source	Sample Plot Numbers	6th Field HUC	6th Field HUC Name	Dominant Plants - Herb	Dominant Plants - Shrub	Dominant Plants - Trees	Listed Species	Figure #
WET KK	North Route 6.9	0.0	0.06	PEMH	Riverine Flow Through	Ground_W_Source	SP KK-01, 02	170800	Lower Columbia	*Lysichiton americanum*	*NA*	*NA*	None	Figure B-1.19
WET LL	North Route 7.0	0.0	0.00	PEME	Riverine Flow Through	Ground_W_Source	SP LL-01, 02	170800	Lower Columbia	*Glyceria elata, Equisetum hyemale*	*NA*	*NA*	None	Figure B-1.20
WET MM	North Route 7.1	0.0	0.10	PEMA	Riverine Flow Through	Ground_W_Source	SP MM-01, 02	170800	Lower Columbia	*Phalaris arundinacea, Lysichiton americanum, Geum macrophyllum*	*NA*	*NA*	None	Figure B-1.20
WET NN	North Route 7.2, North Route 7.3	0.0	0.09	PEMAd	Riverine Flow Through	Ground_W_Source	SP NN-01,02	170800	Lower Columbia	*Phalaris arundinacea, Oenanthe sarmentosa*	*Alnus rubra, Salix sessilifolia*	*NA*	None	Figure B-1.20
WET HH	North Route 7.6	0.0	0.91	PEMAd	Depression	Ground_W_Source	SP HH-01,02,03,04, 05, 06, 07, 08	170800	Lower Columbia	*Phalaris arundinacea, Poa trivialis, Juncus effusus*	*NA*	*NA*	None	Figure B-1.22
WET EE	North Route 8.6, North Route 8.9	0.0	0.31	PEM_PFOA	Flat	Ground_W_Source	SP EE-01, SP EE-02, SP EE-03	170800	Lower Columbia	*Juncus effusus, Gramineae sp.*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.25
WET FF	North Route 8.8	0.0	0.33	PEM_PFOB	Flat	Precip_Source	SP FF-01, SP FF-02	170800	Lower Columbia	*Juncus effusus, Gramineae sp.*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.24, Figure B-1.26
WET K	North Route 8.8	0.0	0.03	PEMAf	Flat	Precip_Source	SP K-01, SP K-02	170800	Lower Columbia	*Alopecurus geniculatus, Trifolium repens*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.26
WET CC	North Route 10.4	0.0	0.04	PEMA	Depression	Precip_Source	SP CC-01, SP CC-02	170800	Lower Columbia	*Phalaris arundinacea, Poa trivialis*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.29
WET M	North Route 10.6	0.0	0.34	PEMA	Flat	Precip_Source	SP M-1, SP M-2, SP M-3, SP M-4	170800	Lower Columbia	*Alopecurus geniculatus, Trifolium repens*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.29
WET L	North Route 10.8	0.0	0.10	PEMA	Flat	Precip_Source	SP L-1, SP L-2	170800	Lower Columbia	*Juncus effusus, Polygonum lapathifolium*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.29
WET AA	North Route 10.9	0.0	0.05	PFO_PEMA	Flat	Precip_Source	SP AA-01, SP AA-02	170800	Lower Columbia	*Poa trivialis*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.29, Figure B-1.30

Table 4-1. Wetland Resources

WETLAND ID	Milepost	Permanent Impact Acreage	Temporary Impact Acreage	Cowardin	HGM	Hydrology Source	Sample Plot Numbers	6th Field HUC	6th Field HUC Name	Dominant Plants - Herb	Dominant Plants - Shrub	Dominant Plants - Trees	Listed Species	Figure #
WET N	North Route 11.0	0.0	0.88	PEMA	Flat	Precip_Source	SP N-01, SP N-02, SP N-03, SP N-04	170800	Lower Columbia	*Alopecurus geniculatus, Phalaris arundinacea*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.30
WET P	North Route 11.2	0.0	0.18	PEMA	Flat	(blank)	SP P-01, SP P-02	170800	Lower Columbia	*Alopecurus geniculatus*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.30
WET TT	North Route 11.2	0.0	0.00	PEMB	Depression	Over_Flow_Source	SP TT-01, 02	170800	Lower Columbia	*Poa trivialis, Holcus lanatus, Juncus bufonius*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.30
WET UU	North Route 11.3	0.0	0.18	PEM_PFOB	Depression	Over_Flow_Source	SP UU-01, 02	170800	Lower Columbia	*Poa trivialis*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.30
WET SS	North Route 11.5	0.0	0.88	PEM_PFOB	Flat	Precip_Source	SP SS-01, 02, 03, 04	170800	Lower Columbia	*Impatiens capensis, Persicaria hydropiper, Juncus effusus*	*NA*	*Populus balsamifera*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.30, Figure B-1.31
WET RR	North Route 11.6, North Route 11.7	0.0	1.09	PEMB	Flat	Precip_Source	SP RR-01, 02	170800	Lower Columbia	*Holcus lanatus, Persicaria maculata, Agrostis stolonifera*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.31
WET QQ	North Route 11.7	0.0	0.32	PEMB	Depression	Over_Flow_Source	SP QQ-01, 02	170800	Lower Columbia	*Alopecurus geniculatus*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.31
WET PP	North Route 11.8	0.0	0.35	PEMB	Depression	Precip_Source	SP PP-01, 02, 03, 04, 05, 06	170800	Lower Columbia	*Alopecurus geniculatus, Phalaris arundinacea*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.31
WET VV	North Route 12.1, North Route 12.2	0.0	0.15	PEMC	Depression	Over_Flow_Source	SP VV-03 and 04	170800	Lower Columbia	*Scirpus microcarpus, Phalaris arundinacea*	*NA*	*NA*	Columbian white-tailed deer *Odocoileus virginianus*	Figure B-1.31, Figure B-1.32

Table 4-2. Water Resources

Water ID	Milepost	Permanent Impact Acreage	Temporary Impact Acreage	Streamflow Regime	OHWM Field indicators	OHWM Height	Channel Width	Stream Substrate	Riparian Vegetation Composition	Listed Species	6th Field HUC	6th Field HUC Name	In-water work window	Figure #
EPH 11	South Route 1.6	0.0	0.035	Ephemeral	Channel is single thread. Flow direction is northeast. Feature entirely within study area. Roadside ditch is less than 10 ft. wide.	0.5	2.0	Silt/Clay, Sand, Gravel, Silt/Clay, Cobble	Riparian vegetation is in bed and banks: full; Riparian vegetation is in non-wetland riparian zone: full	NA	171002	Northern Oregon Coastal	NA	Figure B-1.2
EPH 13	South Route 1.1	0.0	0.002	Ephemeral	Channel is single thread. Flow direction is north. Feature entirely within study area. Roadside ditch is less than 10 ft. wide.	0.5	1.0	Silt/Clay Sand, Gravel, Silt/Clay	Riparian vegetation is in bed and banks: sparse; Riparian vegetation is in non-wetland riparian zone: full	NA	171002	Northern Oregon Coastal	NA	Figure B-1.3
EPH 10	South Route 1	0.0	0.004	Ephemeral	Channel is single thread. Flow direction is northeast. Feature flows into study area. Roadside ditch is less than 10 ft. wide.	0.5	3.0	Silt/Clay, Sand, Gravel, Silt/Clay	Riparian vegetation is in non-wetland riparian zone: full	NA	171002	Northern Oregon Coastal	NA	Figure B-1.4
EPH 01	North Route 1.9	0.0	0.001	Ephemeral	Channel is single thread. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: textural change of depositional sediment or soil. Roadside ditch less than 10 ft. wide.	0.5	1.0	Silt/Clay, Sand, Gravel, Silt/Clay	Riparian vegetation absent	NA	171002	Northern Oregon Coastal	NA	Figure B-1.9
EPH 03	North Route 2.4	0.0	0.002	Ephemeral	Channel is single thread. Flow direction is northeast.	0.5	1.0	Silt/Clay, Gravel, Silt/Clay	Riparian vegetation absent	NA	170800	Lower Columbia	NA	Figure B-1.10
EPH 05	North Route 3.4	0.0	0.006	Ephemeral	Channel is single thread. Flow direction is southeast. Feature entirely within study area. Roadside ditch is less than 10 ft. wide.	0.5	2.0	Silt/Clay, Sand, Gravel, Silt/Clay, Cobble	Riparian vegetation is in non-wetland riparian zone: moderate	NA	170800	Lower Columbia	NA	Figure B-1.12
EPH 06	North Route 5.6	0.0	0.010	Ephemeral	Channel is single thread. Flow direction is northeast. Roadside ditch is less than 10 ft. wide.	0.5	1.0	Silt/Clay, Sand, Gravel, Silt/Clay	Riparian vegetation is in bed and banks: sparse	NA	170800	Lower Columbia	NA	Figure B-1.16
SS 52	North Route 7.2	0.0	0.007	Seep/Spring	Seep/spring on hillside draining to WET NN.	0.25	1.0				170800	Lower Columbia		Figure B-1.20
STRM 55	North Route 8.8	0.0	0.012	Perennial	Channel is single thread, excavated drainage ditch. Flow direction is southwest. Feature flows into/out of study area. OHWL field indicators: change in vegetation.	1.5	5.0	Silt/Clay	Riparian vegetation is in bed and banks: moderate	NA	170800	Lower Columbia	NA	Figure B-1.24
STRM 67	North Route 12.2	0.0	0.000	Intermittent	Channel is single thread, excavated drainage ditch. Flow direction is southeast. Feature	0.25	1.0	Gravel	Riparian vegetation absent	NA	170800	Lower Columbia	NA	Figure B-1.32

Table 4-2. Water Resources														
Water ID	**Milepost**	**Permanent Impact Acreage**	**Temporary Impact Acreage**	**Streamflow Regime**	**OHWM Field indicators**	**OHWM Height**	**Channel Width**	**Stream Substrate**	**Riparian Vegetation Composition**	**Listed Species**	**6th Field HUC**	**6th Field HUC Name**	**In-water work window**	**Figure #**
					originates within study area and flows out of study area. OHWL field indicators: clear, natural line impressed on the bank.									
STRM 70	North Route 12.2	0.0	0.000	Intermittent	Channel is single thread, excavated drainage ditch. Flow direction is northwest. Feature flows into study area. OHWL field indicators: clear, natural line impressed on the bank.	0.25	1.0	Silt/Clay Sand, Gravel, Silt/Clay	Riparian vegetation absent	NA	170800	Lower Columbia	NA	Figure B-1.32
STRM 71	North Route 12.2	0.0	0.007	Intermittent	Channel is single thread, excavated drainage ditch. Flow direction is southwest. Feature entirely within study area. OHWL field indicators: clear, natural line impressed on the bank.	0.25	1.0	Silt/Clay Sand, Gravel, Silt/Clay	Riparian vegetation absent	NA	170800	Lower Columbia	NA	Figure B-1.32

Wetland Delineation Report

The North Mist Pipeline Expansion Project Wetland Delineation Report is Attachment E. The report will be submitted to DSL and the USACE in April 2015.

Navigation, Fishing and Recreation Use

OAR § 141-085-0565(3)(c) states that the Department of State Lands will issue a permit if it determines the project "will not unreasonably interfere with the paramount policy of this state to preserve the use of its waters for navigation, fishing and public recreation, when the project is on state-owned lands."

No impacts to wetlands or other waters are proposed on state-owned land.

State and Federally Listed Species

A summary of state and federally-listed species potentially occurring within the Site Boundary is provided in **Table 4-3**.

Table 4-3. Federal or State Listed Threatened and Endangered Species Potentially Present within the Project Site (Site Boundary)

Common Name[1/] *Scientific Name*	Federal Status	State Status	Critical Habitat Present	Present in Wetlands or Other Waters	Occurrence within Analysis Area[2/,3/]
Wildlife					
Columbian white-tailed deer *Odocoileus virginianus leucurus*	E	SV	No	Assumed	Assumed
Fish					
Lower Columbia River chinook Salmon *Oncorhynchus tshawytscha*	T	SC	Yes	Assumed	Assumed
Lower Columbia River coho salmon *Oncorhynchus kisutch*	T	E	Yes	Assumed	Assumed
Columbia River chum salmon *Oncorhynchus keta*	T	SC	Yes	Assumed	Assumed
Plants					
Tall bugbane *Cimicifuga elata*	—	C	No	No	Yes
Willamette Valley larkspur *Delphinium oreganum*	SOC	C	No	No	No
Coast Range fawn-lily *Erythronium elegans*	SOC	T	No	No	No
queen-of-the-forest *Filipendula occidentalis*	SOC	C	No	No	No
Howellia *Howellia aquatilis*	T	T	No	No	No
Howell's montia *Montia howellii*	—	C	No	No	No
Saddle Mt. saxifrage *Saxifraga hitchcockiana* (syn. *Micranthes hitchockiana*)	SOC	C	No	No	No

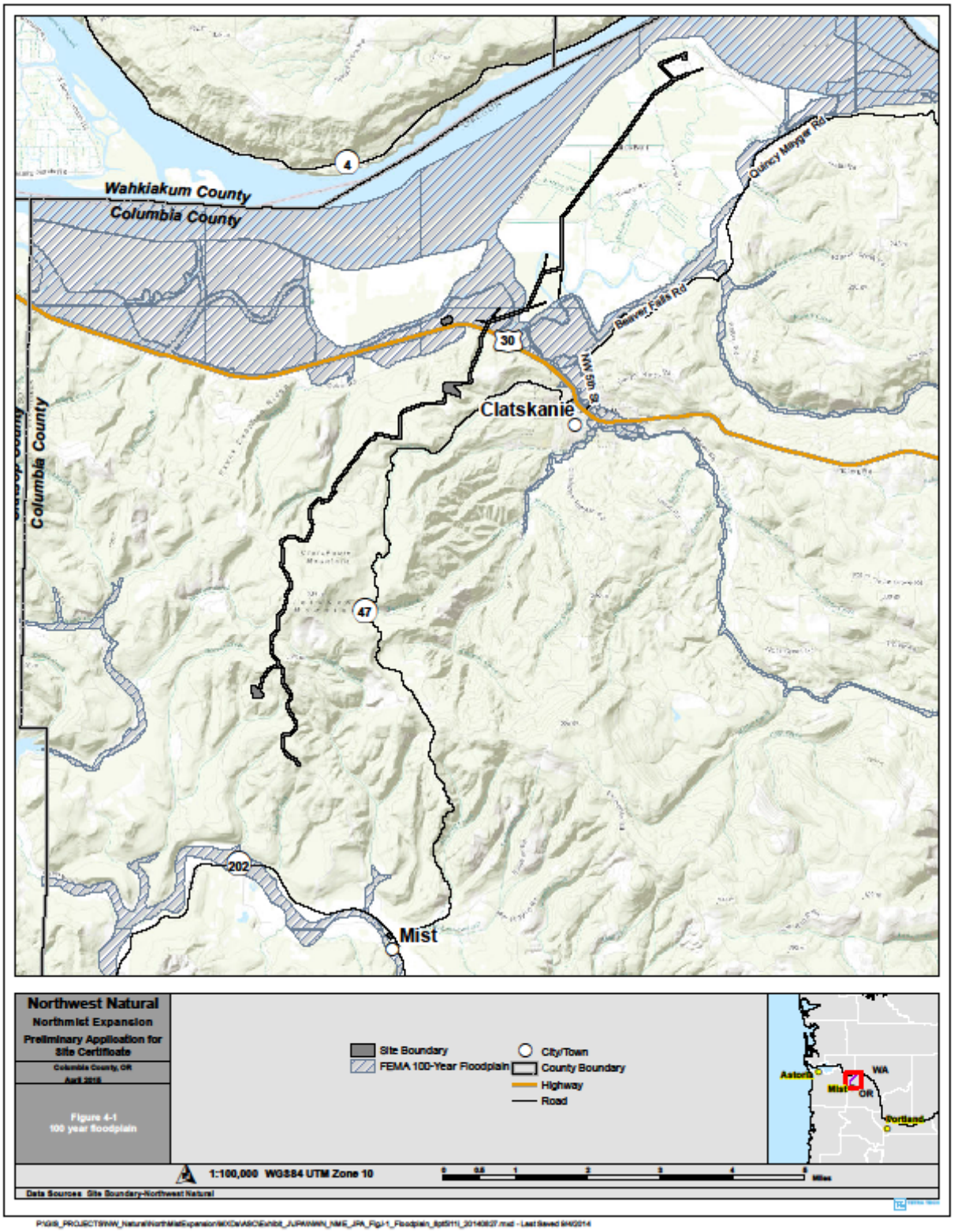
Table 4-3. Federal or State Listed Threatened and Endangered Species Potentially Present within the Project Site (Site Boundary)

Common Name[1/] *Scientific Name*	Federal Status	State Status	Critical Habitat Present	Present in Wetlands or Other Waters	Occurrence within Analysis Area[2/,3/]
meadow checkermallow *Sidalcea campestris*	—	C	No	No	No
bristly-stemmed sidalcea *Sidalcea hirtipes*	SOC	C	No	No	No
Nelson's sidalcea *Sidalcea nelsoniana*	T	T	No	No	No
Oregon sullivantia *Sullivantia oregano*	SOC	C	No	No	No

1/ Species shown include only those that are listed as threatened, endangered, or candidate species on Oregon and/or federal lists. Other Oregon or federal designation categories are only shown for species that fit one of the primary listing categories.
2/ Plant occurrence is based on documented field surveys combined with ORBIC occurrence data. Fish occurrence is based on StreamNet distribution data. Mammal, bird, and amphibian occurrence is based on ORBIC data combined with observational data during general biological/habitat categorization surveys.
3/ The analysis area for species is the Site Boundary.
Federal Definitions: T = Threatened, E = Endangered, C = Candidate, SOC = Species of Concern
Oregon Definitions: T = Threatened, E = Endangered, C = Candidate, SV = Sensitive Vulnerable, SC = Sensitive Critical

100-year Floodplain

The Project is within the 100-year floodplain of Columbia River. See **Figure 4-1**.


Wahkiakum County
Columbia County
Columbia County
Clatskanie
Mist
Quincy Mayger Rd
Beaver Falls Rd
NW 6th St
4
30
47
202
Northwest Natural
Northmist Expansion
Preliminary Application for Site Certificate
Columbia County, OR
April 2015
Figure 4-1
100 year floodplain
Site Boundary
FEMA 100-Year Floodplain
City/Town
County Boundary
Highway
Road
Astoria
Mist
WA
OR
Portland
1:100,000 WGS84 UTM Zone 10
Miles
Data Sources Site Boundary-Northwest Natural

BLOCK 5 PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Section 5.1 Alternatives Analysis

Since the start of project planning and design, NWN has made efforts to avoid and minimize impacts to wetlands and other waters. NWN considered alternative overall routes for the Project, and the current alignment represents the only practical route to comply with the purpose and need including land use, public health and safety, and environmental concerns. NWN utilized existing corridors were feasible. New utility corridors will be utilized in locations where it was unsafe to site two pipelines together, or where it the topography was too steep to safe construct, or could not utilize HDD. At the Project level, NWN utilized NWI and NHD data during the design phase to site the pipeline and other Project facilities away from wetlands and other waters to the maximum extent feasible.

Once the corridor was proposed, field studies for wetlands, special status plants, wildlife, and cultural resources commenced. After the wetland delineation in 2013 and 2014, site specific data were used to confirm the micrositing of the pipeline and other facilities to avoid and minimize impacts at a site-specific level. Well pads and pipe storage yards have been sited on lands devoid of wetlands and streams. Bore pads and laydown areas have been minimized in size and width where a wetland or a water feature present. HDD will be used in eight locations north of Highway 30 to minimize direct impacts to wetland and streams. For example, HDD will be used to cross waters such as Beaver Slough, Clatskanie River and Larson Slough. In locations south of Highway 30, NWN will narrow the construction footprint to within the existing logging road to avoid wetlands and will construct the pipeline to traverse over or under culverts to avoid direct impacts to other waters to the maximum extent feasible.

Impacts on remaining wetlands and other waters will be further minimized by keeping the construction footprint as small as possible while enabling construction to work safely.

The construction contractor will be required to avoid and minimize unnecessary impacts on wetlands during construction. Wetlands in the vicinity of construction zones, but not within, will be clearly marked with flagging to ensure vehicles do not inadvertently access them. Best management practices for erosion control will be used to ensure sediment from construction does not enter wetlands or other waters (see Attachment D for NWN's Erosion and Sediment Control Plan). A site specific alternatives analysis (Table 5-1) details individual wetlands and other waters impacts for the route.

Measures to Minimize Impacts

NWN is dedicated to avoiding and minimizing impacts to wetland and waters. Where practicable, NWN will avoid impacts to wetland and waters by:

- Altering the pipeline route or boring under wetlands or waterways to avoid impacts;
- Constructing the pipeline in road rights-of-way where possible;

- Minimizing the width of the construction corridor in wetlands, riparian areas, and waterways to avoid impacts; and
- Using existing roads that have previously been impacted.

NWN will minimize impacts to wetland and waterways by:

- Directionally boring under sensitive wetlands and waterways when feasible;
- Working from construction mats in wetland areas to minimize disturbance to soil and plants;
- Restoring wetland and waterway soil stratums to pre-construction topography and structure;
- Mulching and hydroseeding sensitive areas prone to erosion; and
- Install water breaks along pipeline, as necessary, to prevent lateral movement of groundwater within the pipeline trench backfill.

NWN will minimize impact to water quality by:

- Constructing in wetlands and waterways during late summer or early fall when water levels are low;
- Limiting disturbance to vegetation within wetlands, and waterways by minimizing the construction width to 80 feet or less;
- Constructing the pipeline outside of wetlands or waterways prior to installation;
- Limiting use of machinery in wetlands or waterways; and
- Using Best Management Practices (BMP) in accordance with local and state water quality regulations during and after construction. BMPs may include the use of sediment fences, hay bales, wattles, hydroseeding and other sediment control devises in the construction area.

NWN will minimize impact to listed species by:

- Boring under important wetland habitats used by listed species;
- Minimizing the width of the construction corridor;
- Avoiding constructing in wetlands during crucial life stages of listed species or at the time of year when a threatened species is known to occur, if the occurrence is seasonal;
- Removing any flow diversion, and restoring the hydrology of the site so that the preconstruction hydrology is reestablished;
- Restoring stream channels to preconstruction condition, including riffle and pool morphology and stream channel substrate; and

- Implementing erosion and sediment control procedures within construction areas to minimize sediment input into streams.

Erosion and Sediment Control Plan

The Project Erosion and Sediment Control Plan located in **Attachment D**.

Table 5-1. Avoidance and Minimization Actions											
Feature	**MP start**	**MP end**	**Pre-review Proposed Impact (ac)**	**Impact Cause**	**Impact Type**	**Able to avoid impact?**	**Able to reduce impact?**	**Proposed Impact after review (ac)**	**Impact delta (ac)**	**Action taken to avoid or reduce impact**	**Explanation if unable to avoid**
Staging Areas near Mist											
WET OO	NA	NA	0.023	Staging Area	Temporary	Yes		0	-0.023	Reduced size of foot print	
EPH 52	NA	NA	0.002	Staging Area	Temporary	Yes		0	-0.002	Reduced size of foot print	
Conduit											
EPH 12	1.8	1.8	0.002	Trenching	Temporary	Yes		0	-0.002	Narrowed down workspace	
EPH 11	1.5	1.7	0.035	Trenching	Temporary	No	No	0.035	0		Additional conduit located on road edge connecting to existing conduit. Cannot move to opposite side of road.
EPH 13	1.1	1.1	0.002	Trenching	Temporary	No	No	0.002	0		
EPH 10	0.9	1	0.004	Trenching	Temporary	No	No	0.004	0		
Mainline											
WET A	0.5	0.6	0.016	Trenching	Temporary	Yes		0	-0.016	Narrowed down workspace	
STRM 01	0.5	0.6	0	Trenching	Temporary	Yes		0	0	Narrowed down workspace	
WET B	0.6	0.7	0.006	Trenching	Temporary	Yes		0	-0.006	Narrowed down workspace	
STRM 02	0.6	0.7	0	Trenching	Temporary	Yes		0	0	Narrowed down workspace	
EPH 01	1.8	1.9	0.001	Trenching	Temporary	No	No	0.001	0		Road side ditch on edge of road
EPH 03	2.3	2.4	0.002	Trenching	Temporary	No	No	0.002	0		Road side ditch on edge of road
STRM 03	2.4	3.4	0.053	Trenching	Temporary	Yes		0	-0.053	Rerouted due to safety and steep banks	
EPH 04	2.4	3.4	0.116	Trenching	Temporary	Yes		0	-0.116	Rerouted due to safety and steep banks	
STRM 27	2.4	2.5	0.002	Trenching	Temporary	Yes		0	-0.002	Narrowed down workspace	

Table 5-1. Avoidance and Minimization Actions											
Feature	**MP start**	**MP end**	**Pre-review Proposed Impact (ac)**	**Impact Cause**	**Impact Type**	**Able to avoid impact?**	**Able to reduce impact?**	**Proposed Impact after review (ac)**	**Impact delta (ac)**	**Action taken to avoid or reduce impact**	**Explanation if unable to avoid**
EPH 26	2.5	2.6	0.008	Trenching	Temporary	Yes		0	-0.008	Narrowed down workspace	
WET X	2.5	2.6	0.003	Trenching	Temporary	Yes		0	-0.003	Narrowed down workspace	
WET S	2.5	2.6	0.04	Trenching	Temporary	Yes		0	-0.04	Narrowed down workspace	
STRM 25	2.6	2.8	0.002	Trenching	Temporary	Yes		0	-0.002	Narrowed down workspace	
STRM 24	2.6	2.8	0.003	Trenching	Temporary	Yes		0	-0.003	Narrowed down workspace	
EPH 05	3.4	3.5	0.0125	Trenching	Temporary	No	Yes	0.006	0.006	Narrowed down workspace	Road side ditch on edge of road
STRM 04	3.4	3.6	0.002	Trenching	Temporary	Yes		0	-0.002	Narrowed down workspace	
WET D	3.4	3.6	0.004	Trenching	Temporary	Yes		0	-0.004	Narrowed down workspace	
STRM 05	3.4	3.6	0.003	Trenching	Temporary	Yes		0	-0.003	Narrowed down workspace	
POND 01	3.4	3.6	0.006	Trenching	Temporary	Yes		0	-0.006	Narrowed down workspace	
WET F	4.9	5.4	0.022	Trenching	Temporary	Yes		0	-0.022	Reroute due to wetlands and other waters and steep terrain	
WET E	4.9	5.4	0.026	Trenching	Temporary	Yes		0	-0.026	Reroute due to wetlands and other waters and steep terrain	
EPH 06	5.5	5.7	0.01	Trenching	Temporary	No	No	0.01			Area utilized to store soil
POND 03	6.1	6.2	0.047	Trenching	Temporary	Yes		0	-0.047	Narrowed down workspace	
WET KK	6.9	7	0.104	Trenching	Temporary	No	YES	0.055	0.049	Narrowed down workspace	Area utilized for HDD
WET LL	7	7.2	0.004	Laydown Area	Temporary	No	YES	0.001	0.003	Narrowed down workspace	Area utilized for HDD and to store soil

Table 5-1. Avoidance and Minimization Actions											
Feature	**MP start**	**MP end**	**Pre-review Proposed Impact (ac)**	**Impact Cause**	**Impact Type**	**Able to avoid impact?**	**Able to reduce impact?**	**Proposed Impact after review (ac)**	**Impact delta (ac)**	**Action taken to avoid or reduce impact**	**Explanation if unable to avoid**
WET MM	7	7.2	0.11	Laydown Area	Temporary	No	YES	0.097	0.013	Narrowed down workspace	Area utilized for HDD and to store soil
SS 52	7.1	7.2	0.002	Trenching and Laydown Area	Temporary	No	No	0.002	0		Area utilized for workspace and to store soil
WET NN	7.2	7.5	0.174	Trenching	Temporary	No	YES	0.085	0.089	HDD	Area used for HDD
STRM 08	7.2	7.5	0.007	Trenching	Temporary	Yes		0	-0.007	HDD	
North of HWY 30											
WET JJ	Staging Area		0.169	Staging	Temporary	Yes		0	-0.169	Reconfigured borepad	
STRM 59	Staging Area		0.142					0	-0.142		
WET HH	7.5	7.9	5.082	Trenching and Borepad	Temporary	No	Yes	0.906	4.176	HDD	Area used for borepad
STRM 57	7.5	7.6	0.022	Trenching	Temporary	Yes		0	-0.022	HDD	
STRM 104	7.6		0.009	Borepad	Temporary	Yes		0	-0.009	Reconfigured borepad	
STRM 09	7.9	8.1	0.016	Trenching	Temporary	Yes		0	-0.016	HDD	
STRM 10	7.9	8.1	0.985	Trenching	Temporary	Yes		0	-0.985	HDD	
WET II	8.3	8.4	0.018	Trenching	Temporary	Yes		0	-0.018	HDD	
WET GG	8.3	8.4	0.058	Trenching	Temporary	Yes		0	-0.058	HDD	
STRM 12	8.5	8.6	0.329	Trenching	Temporary	Yes		0	-0.329	HDD	
WET K	North of 8.7		0.114	Laydown for HDD	Temporary	No	YES	0.031	0.083	Narrowed down workspace	Space need to safely conduct HDD
WET FF	8.8	8.9	0.335	Trenching	Temporary	No	No	0.335	0		Cannot safely cross by HDD due to Beaver slough on either side and there will be issues dewatering and having cave ins.

Table 5-1. Avoidance and Minimization Actions											
Feature	**MP start**	**MP end**	**Pre-review Proposed Impact (ac)**	**Impact Cause**	**Impact Type**	**Able to avoid impact?**	**Able to reduce impact?**	**Proposed Impact after review (ac)**	**Impact delta (ac)**	**Action taken to avoid or reduce impact**	**Explanation if unable to avoid**
STRM 55	8.8	8.9	0.012	Trenching	Temporary	No	No	0.012	0		Cannot safely cross by HDD due to Beaver slough on either side and there will be issues dewatering and having cave ins.
	South of 9.0		0.306	Laydown for HDD	Temporary	No	No	0.306	0		Space is need to safely conduct HDD
WET EE											
STRM 54	South of 9.0		0.005	Laydown for HDD	Temporary	No	No	0	0.005		Space is need to safely conduct HDD
STRM 12	9	9.7	0.381	Trenching	Temporary	Yes		0	-0.381	HDD	
STRM 103	9	9.7	0.002	Trenching	Temporary	Yes		0	-0.002	HDD	
STRM 100	9	9.7	1.014	Trenching	Temporary	Yes		0	-1.014	HDD	
WET BBB	9	9.7	0.002	Trenching	Temporary	Yes		0	-0.002	HDD	
STRM 102	9	9.7	0.012	Trenching	Temporary	Yes		0	-0.012	HDD	
WET AAA	9	9.7	0.003	Trenching	Temporary	Yes		0	-0.003	HDD	
STRM 53	9	9.7	0.014	Trenching	Temporary	Yes		0	-0.014	HDD	
STRM 52	9	9.7	0.018	Trenching	Temporary	Yes		0	-0.018	HDD	
WET DD	9.8	10.4	0.114	Trenching	Temporary	Yes		0	-0.114	HDD	
STRM 14	9.8	10.4	0.047	Trenching	Temporary	Yes		0	-0.047	HDD	
STRM 15	9.8	10.4	0.018	Trenching	Temporary	Yes		0	-0.018	HDD	
STRM 16	9.8	10.4	0.046	Trenching	Temporary	Yes		0	-0.046	HDD/Mat Bridge	
STRM 17	9.8	10.4	0.025	Trenching	Temporary	Yes		0	-0.025	HDD/Mat Bridge	
WET CC	10.4	10.6	0.058	Temporary extra workspace	Temporary	No	Yes	0.035	0.022	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
WET M	10.4	10.6	0.536	Temporary extra workspace	Temporary	No	Yes	0.344	0.192	HDD./Narrowed workspace used for soil storage	Workspace needed to store soils

Table 5-1. Avoidance and Minimization Actions

Feature	MP start	MP end	Pre-review Proposed Impact (ac)	Impact Cause	Impact Type	Able to avoid impact?	Able to reduce impact?	Proposed Impact after review (ac)	Impact delta (ac)	Action taken to avoid or reduce impact	Explanation if unable to avoid
WET L	10.8	10.9	0.158	Temporary extra workspace	Temporary	No	Yes	0.1	0.057	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
WET AA	10.8	10.9	0.07	Temporary extra workspace	Temporary	No	Yes	0.051	0.019	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
STRM 19	10.9	11	0.034	Trenching	Temporary	Yes		0	-0.034	HDD/Mat Bridge	
STRM 20	10.9	11	0.022	Trenching	Temporary	Yes		0	-0.022	HDD/Mat Bridge	
WET N	11	11.8	1.318	Temporary extra workspace	Temporary	No	Yes	0.882	0.436	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
WET P	11	11.8	0.276	Temporary extra workspace	Temporary	No	Yes	0.182	0.095	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
STRM 21	11	11.8	0.063	Trenching	Temporary	Yes		0	-0.063	HDD/Mat Bridge	
WET TT	11	11.8	0.011	Temporary extra workspace	Temporary	No	Yes	0.002	0.009	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
WET UU	11	11.8	0.287	Temporary extra workspace	Temporary	No	Yes	0.181	0.106	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
STRM 22	11	11.8	0.027	Trenching	Temporary	Yes		0	-0.027	HDD/Mat Bridge	
WET SS	11	11.8	1.394	Temporary extra workspace	Temporary	No	Yes	0.876	0.518	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
STRM 23	11	11.8	0.051	Trenching	Temporary	Yes		0	-0.051	HDD/Mat Bridge	
WET RR	11	11.8	1.737	Temporary extra workspace	Temporary	No	Yes	1.085	0.652	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
STRM 65	11	11.8	0.027	Trenching	Temporary	Yes		0	-0.027	HDD/Mat Bridge	
WET QQ	11	11.8	0.496	Temporary extra workspace	Temporary	No	Yes	0.319	0.177	HDD/Narrowed workspace used for soil storage	Workspace needed to store soils
STRM 64	11.8	12.2	0.032	Trenching	Temporary	Yes		0	-0.032	HDD/Mat Bridge	
WET PP	11.8	12.2	3.123	Borepad	Temporary	Yes		0.351	2.772	HDD	Borepad

Table 5-1. Avoidance and Minimization Actions											
Feature	**MP start**	**MP end**	**Pre-review Proposed Impact (ac)**	**Impact Cause**	**Impact Type**	**Able to avoid impact?**	**Able to reduce impact?**	**Proposed Impact after review (ac)**	**Impact delta (ac)**	**Action taken to avoid or reduce impact**	**Explanation if unable to avoid**
STRM 63	11.8	12.2	0.075	Trenching	Temporary	Yes		0	-0.075	HDD	
PGE Plant											
WET VV	PGE PLANT		0.15	Trenching	Temporary	No	No	0.15	0		Workspace needed at the plant.
STRM 67	PGE PLANT		0.0004	Trenching	Temporary	No	No	0.0004			Workspace needed at the plant.
WET XX	PGE PLANT		0.017	Trenching	Temporary	Yes		0	-0.017	Narrow downed workspace	
STRM 70	PGE PLANT		0.0004	Trenching	Temporary	No	No	0.0004			Workspace needed at the plant.
STRM 71	PGE PLANT		0.007	Trenching	Temporary	No	No	0.007			Workspace needed at the plant.
WET WW	PGE PLANT		0.156	Trenching	Temporary	Yes		0	-0.156	Shifted work space	
STRM 69	PGE PLANT		0.023	Trenching	Temporary	Yes		0	-0.023	Shifted work space	
POND 51	PGE Plant		0.056	Staging area	Temporary	Yes		0	-0.056	Reconfigured size and shape	
TOTAL			**20.357**					**6.456**			

BLOCK 6 PROJECT DESCRIPTION

Section 6.1 Project Description

A: Briefly summarize the overall project including work in areas in and outside of waters and wetlands.

Introduction

Pipeline Construction

NW Natural (NWN) proposes to construct the North Mist Expansion Project (Project), approximately 3 miles north of NWN's existing Miller Station compressor facility near the town of Mist in Columbia County, Oregon. The new facility will be an expansion of the NWN South Mist underground gas storage infrastructure. The Project will provide approximately 2.5 billion cubic feet of storage capacity and natural gas withdrawal deliveries up to 120 million cubic feet per day by May 2016. In addition to the gas storage facility, the Project is comprised of a 24-inch diameter, 13-mile transmission pipeline, a well site facility, a 2.5-mile conduit line, and temporary workspaces.

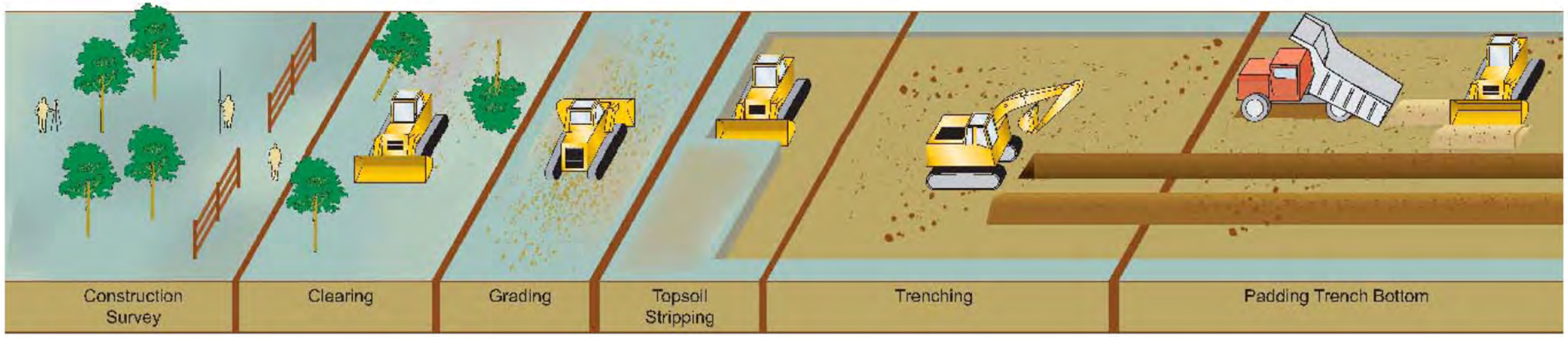
Standard pipeline construction includes survey and staking of the right-of-way, clearing and grading, trenching, pipe stringing and bending, welding and coating pipe, lowering-in pipe and backfilling, hydrostatic testing, right-of-way cleanup, and restoration (**Figure 6.1**). NWN proposed to use a standard 80-foot wide construction right-of-way (ROW) to install the pipeline. In wetland situations, where feasible, the construction ROW will be narrowed to 50 feet or less in width to reduce impacts (See Waterbody Crossing Methods, below). Total temporary ground disturbance for the Project will be approximately 6.456 acres including removal and fill areas (1.894 acres) and laydown area impacts (4.562 acres; no removal or fill). The total excavation and fill will be 24,394.50 and 24,394.50 cubic yards, respectively (See **Tables 6-2** and **6.4**). There are no permanent impacts to wetlands and waterways.

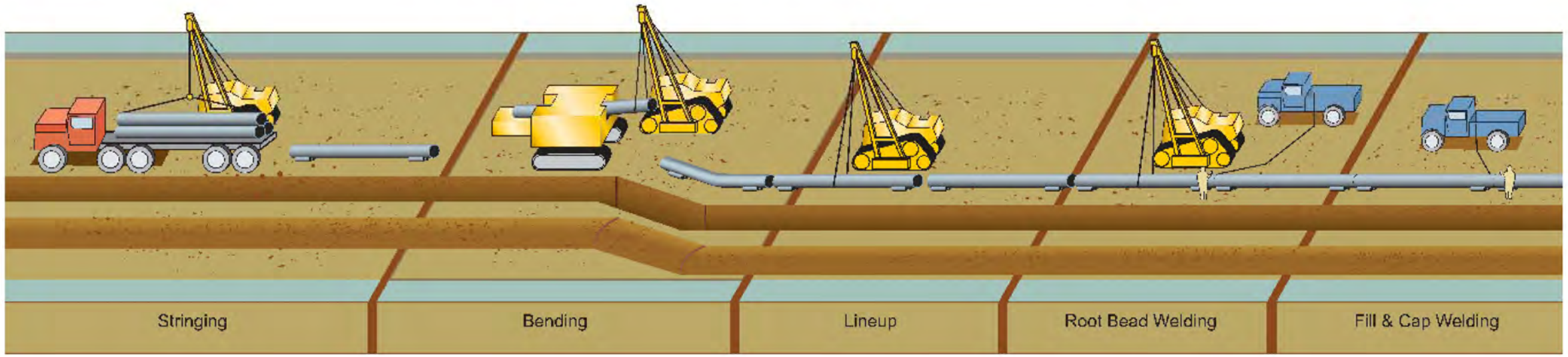
Table 6-1: Summary of Impacts

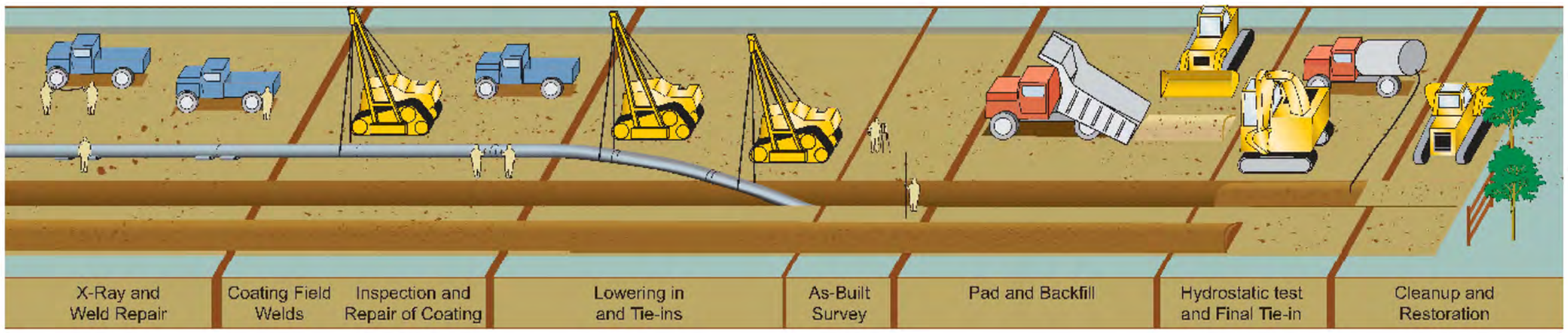
Type of Water	Number of Permanent Impact Sites	Permanent (acres)	Number of Temporary Impact Sites	Temporary (acres)	Number of Features Impacted
PEM	0	0	25	4.626	16
PFO	0	0	6	1.697	4
PFO-PEM	0	0	1	0.051	1
Ephemeral	0	0	9	0.06	7
Intermittent	0	0	4	0.008	3
Perennial	0	0	1	0.012	1
Pond	0	0	0	0	0
Seep/spring	0	0	2	0.002	1
TOTAL		**0**		**6.456**	

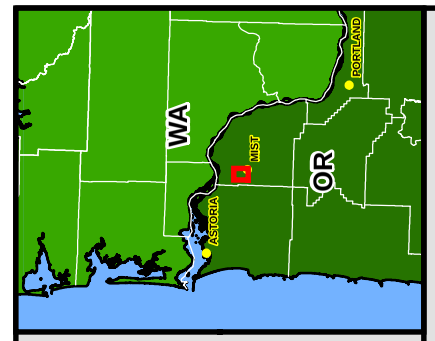
Pre-Construction

Prior to any construction activities, survey crews will stake the outside limits of the construction ROW, the centerline of the pipeline trench, and temporary workspace areas with color-coded flagging. Sensitive areas to be avoided may be marked using specific flagging tape or construction fencing to maintain separation from construction activities, and wetland boundaries will be clearly indicated using easily identifiable temporary signage.









NW Natural
North Mist Expansion Project
Request for Amendment No. 11

Columbia County, OR
April 2015

Figure 6-1
Overall NMTP Construction Typical

Data Source: NW Natural North Mist Expansion Project

I:\GIS\projects\Emerald\Emerald\workspace\2015.04.21 NMEP Amendment 11 B-5 Overall NMTP Construction Typical.mxd 4/21/2015

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Clearing and Grading

Vegetation will be cleared and the construction corridor graded, as needed, to provide safe and efficient operation of construction equipment. In forested areas, timber will be cut and cleared from the ROW using standard logging techniques, in accordance with landowner requirements. NWN is continuing to talk with landowners about timing of clearing of planted poplar forested areas. The landowner will most likely clear forested areas based on planation rotation. Space will be provided for temporary storage of spoil material and segregated topsoil. The width of the construction corridor will be restricted to avoid undue surface disturbance to adjacent resources. Temporary workspaces will all be within the boundaries of the studied corridor, and will be clearly staked or flagged. Temporary erosion control devices will be installed at the end of clearing activities.

When grading is required, trees, brush, and shrubs within the construction corridor will be cut or scraped at or near the ground level. Low brush will be scraped up and stored with the topsoil. Timber and larger brush will be stored adjacent to the ROW and placed on the ROW during final clean-up or removed from ROW. Slash will be spread back across the ROW, chipped and spread on the ROW, or removed from the ROW, subject to landowner approval and applicable law. All clearing activities will utilize existing access roads and ROWs permitted for the Project, and the Project does not include construction of additional access roads.

The construction area will be graded to create a suitable work surface for construction vehicles. The terrain along the Project varies from relatively flat on lands north of Highway 30 to steep with significant side slopes on lands south of Highway 30.

Trenching

Excavation of the pipeline trench will follow clearing and grading of the ROW. The majority of the excavation will be accomplished using machinery such as ditching machines, backhoes, or trackhoes. The depth of the trench will vary according to site-specific conditions; however, the trench will be excavated to a sufficient depth to provide the minimum depth of cover required by the Pipeline and Hazardous Materials Safety Administration, within the U.S. Department of Transportation (DOT). The depth of cover will be at least 30 or 36 inches, depending on the consolidated rock conditions, between the top of the pipe and the final land surface after backfilling.

Lowering and Backfilling

Once pipe sections have been welded, the pipeline will be lowered into the trench. Side boom tractors will be used to lift the pipe, position it over the trench, and lower it into place. The pipeline and trench will be inspected to verify that minimum cover is provided, that the trench is free of rock or debris, that external pipe coating is not damaged, and that the pipe is properly fitted and installed into the trench. Trench dewatering may be necessary at certain times during the lowering-in process. Any trench dewatering will be accomplished in a manner designed to prevent heavily silt-laden water from flowing into wetlands or waterbodies.

After the pipe is lowered into the trench, the pipeline will be padded and the trench will be backfilled. Backfill material generally consists of the material excavated from the trench. Padding or

other protective coating will be used to prevent damage to the pipe coating. This padding will typically consist of subsoil removed from the trench that has been screened to remove larger rocks. Alternatively, other suitable material (e.g., soil or sand) may be imported to the site from other areas along the ROW. Topsoil will not be used for padding. Previously excavated materials will be pushed back into the trench using bladed equipment, or backhoes.

Hydrostatic Testing

The pipeline will be hydrostatically tested before being placed into service to verify its integrity and to ensure its ability to operate at the maximum allowable operating pressure. Water for hydrostatic testing will be obtained from local sources with valid water rights. Topography and the availability of test water will determine the length of each test segment. Pipeline test segments will be capped and filled with water, then pressurized in accordance with DOT regulations (49 CFR Part 192). Any leaks detected will be repaired and that section of pipeline re-tested.

Upon completion of the test, the water may be pumped to the next segment for testing, or discharged. The test water will ultimately be discharged in accordance with the National Pollutant Discharge Elimination System (NPDES) hydrostatic discharge permit requirements (See **Attachment G**). Only clean pipe will be tested, and no chemicals will be added. Once a pipe segment has been successfully tested and dried, the test cap and manifold will be removed and that section of the pipe will be connected to the remainder of the tested pipeline.

Clean-up and Restoration

After backfilling is complete, disturbed areas will be final graded and erosion control measures will be implemented. During final cleanup and initial restoration, drainage ditches, culverts, and other structures that may have been temporarily removed or damaged during construction will be permanently repaired, returned to their pre-construction condition, or replaced. In addition, final cleanup typically will involve a series of steps, including off-site waste disposal and equipment removal. Streambanks will be stabilized, and permanent erosion control devices will be installed. The right-of-way will be mulched, seeded, and revegetated.

All areas disturbed by construction will be restored and revegetated, as described Attachment H: Restoration and Rehabilitation Site Plan for Temporary Impacts. The ROW will be regraded and topographic contours and drainage patterns returned to as close as preconstruction conditions as possible. In forested lands, NWN will reseed across the construction ROW and permanent easement. The landowner will be allowed to replant up to 5 feet on either side of the pipeline centerline.

Road and Railroad Crossings

Construction of pipelines across major paved highways, railroads, paved roads, and unpaved roads where traffic cannot be interrupted will be accomplished by boring under the roadbed. Smaller unpaved roads and drives will be crossed by open trenching and then restored to pre-construction or better condition. NWN will also repair road damage caused by construction of the pipeline. The

pipeline will be buried to the depth required by applicable road crossing permits/approvals and will be designed to withstand anticipated external loadings.

Railroad crossings will be installed (typically using a bore) in accordance with the requirements of the railroad.

Access to the Construction Right-of-Way

Typical pipeline construction equipment includes, pipe trucks, flat-bed trucks, mowers, bulldozers, graders, front-end loaders, backhoes, bending machines, side-booms, welding machines, padding machines, winch trucks, water trucks, dump trucks, pick-up trucks, and other miscellaneous equipment. Equipment involved in pipeline construction will be moved onto the right-of-way using approved access roads, and will then generally proceed down the right-of-way performing their job tasks. Part of the construction right-of-way will include a travel lane for construction equipment and related project vehicles, accommodated within the standard 80-foot wide construction right-of-way. When access is no longer required, the travel lane will be removed and the right-of-way restored. NWN will place mats over any wetlands which could not be avoided along the travel lane.

Typical construction drawings are presented in **Attachment C-1**.

B and C: Describe work within waters and wetlands and construction methods

Waterbody and Wetland Crossings

The proposed pipeline corridor crosses both streams and wetlands. There are a number of different construction methods that could potentially be used for any given crossing. Presented below is a brief description of the available construction methods and a description of their potential applicability to the Project. Several features are common to all of the construction methodologies. Typical construction drawings are presented in **Attachment C-1**.

The best available environmental practices pertinent to each construction methodology will be employed. These practices include, but are not necessarily limited to the following:

- Site-specific erosion and sedimentation controls will be used for each wetland and stream crossing. Filter fencing will be used during construction to minimize sedimentation and to deter construction equipment operators from venturing further than absolutely necessary into sensitive areas. Other control measures could include straw mulch, sediment traps and ponds, and temporary interceptor traps and ponds.
- All erosion and sediment controls will be inspected weekly or during storm events, well-maintained, and cleared of accumulated debris and sediment whenever needed.
- To the extent possible, construction through wetlands and streams will occur when water levels are low. Turbid water that is pumped from the pipeline trench during construction will be routed to temporary surface water detention facilities prior to discharge.
- During construction at stream crossings, turbidity levels will be monitored 100 feet above and below the crossing. If downstream turbidity exceeds upstream levels by10 percent, construction will be halted until the downstream turbidity level drops below the maximum 10 percent increase. If necessary, additional erosion and sedimentation controls will be

used to bring the downstream turbidity level within the guidelines.

- Ditch areas will be returned to their original contour, mulched, and replanted with salvaged vegetation as soon as possible after construction is complete.
- In wetlands, plants and their root stocks will be removed with the topsoil, stored separately from the subsoil, and replaced at the top of the backfilled pipeline trench along with the topsoil.
- At a minimum, all spoil will be contained within sediment filter devices.
- The trench will be excavated 8 feet deep by 4 feet wide for the pipeline installation. Topsoil and subsoil will be stockpiled separately near the trench. Upon installation of the pipeline, the trench will be backfilled with the excavated material in the reverse order. Once complete, backfilled soil should resemble pre-construction soil profiles. The area will be returned as nearly as possible to pre- construction grade.
- To maintain surface and sub-surface hydrology characteristics, impermeable soil layers located within the pipeline trench will be identified. During the backfilling, either the native onsite material, or imported clay or bentonite will be installed to insure that the impermeable layer is restored and site hydrology is not affected.
- Two environmental inspectors will be on site every day during construction

Trenching

Installation of a pipeline crossing by trenching can be accomplished either in the wet or in the dry, with preference being given to the dry approach as a means of enhancing protection of aquatic resources. Dry trenching occurs by definition when the crossing is installed during a time when there is no flow or inundation present. Dry trenching can be accomplished when flows or inundation are present at crossings through the use of structures that temporarily create a dry area within which the work is completed.

Wet Trench Method

The wet trench method is proposed for crossing wetlands only. Potential constraints to installing the pipeline by wet trenching across a wetland are inadequate equipment access and insufficient upland staging areas to place spoils and temporary detention facilities.

In the wet trench method the trench is excavated with a backhoe through shallow standing water and/or saturated soils. The backhoe will work either from the adjacent upland area or from construction mats placed on the surface of the wetland area. The work area in the wetland will be limited to 80 feet or less in width and the only part of the equipment that will come directly into contact with the aquatic environment will be the bucket of the backhoe.

The excavation will be accomplished in two passes in order to segregate the topsoil from the underlying materials. The excavated material will be placed in holding areas outside of the wetland area. Filtering media will be used to clean the water, which will then be allowed to flow out of the holding area and eventually return to the wetland. Pre-constructed segments of pipe of sufficient length to span the wetland will then be positioned above and lowered into the trench by equipment

operating from either the adjacent upland area or construction mats placed on the surface of the wetland area.

If other portions of the pipeline have already been installed adjacent to the crossing point, the crossing line will be tied into those portions. If the adjacent portions of the pipeline have not yet been installed, the ends of the crossing will be fitted with temporary caps to prevent water or debris from entering the pipe. This will allow the trench to be filled immediately and the crossing to be tied into the remainder of the pipeline at a later time without further disturbance to the wetland.

Pipe burial depth will be verified, the stockpiled materials will be placed back into the trench in the reverse order of their removal, and the disturbed area over the trench will be replanted with vegetation salvaged during the trenching activities. In these situations, sediments will not be carried away and impacts will be confined to the construction corridor.

The wet trench method is proposed for wetlands since the use of diversion barriers is not necessary or helpful due to very low flow velocity and volume. Because the flow velocity is low or non-existent, sediments disturbed during the construction phase are expected to settle quickly and not result in elevated downstream sediment levels. Impacts from the wet trench method can be minimized by carefully selecting the crossing location to avoid unstable slopes and trees in the wetland buffer, using erosion and sediment controls during and after construction, and replanting vegetation after construction. The wet trench method will be used for all trenched crossings of wetlands, except those that are dry during construction.

Dry Stream Trench Method

The dry stream trench method is proposed for watercourses where the stream is dry at the time of construction. It consists of constructing the pipeline through a dry stream channel in the absence of surface water. The dry stream trench method can be used in any situation where the surface features will support normal cross-country pipeline construction. Construction in the stream will typically be completed within 8 hours.

This crossing method utilizes standard cross-country construction techniques with the following exceptions:

- Provisions will be made for handling water coming down the channel if a rainstorm occurs during construction.
- The width of the construction corridor through the streams will be limited to 80 feet or less.

Potential impacts from the dry stream trench method include leaving sediments where they can be suspended by later stream flows, streambed erosion and stream bank instability, loss of riparian vegetation, and risk of spill from scour and pipeline damage. Impacts from the dry trench method can be minimized by carefully selecting the crossing location to avoid unstable stream banks and trees in the riparian zone, using erosion and sediment controls during and after construction, stabilizing stream banks after construction, and burying the pipeline at sufficient depth to prevent scour from damaging the pipe.

The dry stream trench method will only be used for dry stream channels. All trenched crossings where water is present will use the following method.

Waterbody Crossing Methods

Over/Under Existing Culverts

The fill over and under existing culverts may be suitable for crossing streams or wetlands without impacts to the aquatic ecosystem. The fill must be deep enough to allow installation of the pipe while maintaining adequate clearance from the culvert and adequate cover over the pipeline. The pipeline may either be buried in the roadbed or fog-line (shoulder) of the road. This method will be used when crossing stream culverts that meet the requirements listed above.

Horizontal Directional Drilling

HDD is a method of installing a pipeline underground by drilling a slightly over-sized hole at a very shallow angle under surface features and pulling a pre-assembled string of pipe through that hole. Pipe used for HDD will have an additional 40-nun Lily 20/40Lockguard protective coating. This method requires the preparation of an entrance (i.e., drill) site and an exit site. The process includes the drilling of a pilot hole using a drill bit and an injection of bentonite slurry under pressure to remove the cuttings and hold the hole open. After the pilot hole is completed, a reamer and bentonite slurry combination is used to enlarge the hole and then the pipe is pulled through.

The entrance site requires an area that is approximately 150 feet to 200 feet long and 200 feet wide on level ground with an all-weather road access. A hardstand is constructed on this site with fill, wooden mats, or steel plates. The exit site requires a rectangular area approximately 150 feet to 200 feet long and 150 feet to 200 feet wide, and the construction of a dry, flat hardstand similar to the entrance site. Similar access is also required, and a bentonite pit is constructed to collect the bentonite slurry discharged from the drill hole. These sites must be located at least 75 feet from the edge of the stream or wetland to achieve minimum adequate cover at the boundary of the aquatic feature. They must also be located at least 50 feet from the base of electric transmission towers and must provide for standard safety clearances between equipment and conductors to be maintained during construction.

The pipeline corridor or other clear area of similar width must extend in a straight line beyond the exit site for a distance slightly greater than the length of the bore. This area is needed to assemble and test the pipe string that will be installed.

For the horizontal directional bore method, the maximum depth is about 100 feet in loose soils, 200 feet in consolidated soils, and 250 feet in soft rock. The minimum horizontal distance is approximately 500 feet and the maximum horizontal distance is 5,000 feet. Some types of substrate are unsuitable for HDD, such as hard fractured rock or soft peat soils.

Potential impacts from HDD are the loss of upland vegetation and slight potential for a spill of bentonite. Impacts from HDD can be minimized by analysis of the substrate prior to design, revegetation of cleared staging areas, and not staging in sensitive areas.

Because HDD methodology impacts large areas during the construction of entrance and exit sites and staging the pipe, it is not practical for crossing small streams and wetlands. The areas impacted by the entrance and exit areas of the directional bore are often in forested land or wetlands and impact 20,000 to 40,000 square feet of land as opposed to the 3,000 to 4,200 square feet of riparian habitat impacted by trenching. Another problem with many of the crossings is the minimum distance of 1,200 feet required in a straight line. Steep hills or bends in the pipeline route often make HDD impractical. Steep terrain or the unwillingness of landowners to allow construction at the entrance, exit, or staging sites can also prevent the use of HDD methodology.

There will be eight HDD crossings. HDD will be utilized to cross Highway 30 and railroad tracks, Clatskanie River and levees, Beaver Slough and levees, Larson Slough and levees, Lewis Road, Poplar Tree Farms, Collins Road, Hermo Road, blueberry fields, and mint farm (see **Attachment C-2** for site-specific drawings).

Inadvertent Return Response Plan

NWN prepared an Inadvertent Return Response Plan for locations where the HDD and boring construction methods will be utilized (See Attachment F). The HDD pipeline construction method will use bentonite as a drilling fluid, and to fill in the area around the installed pipeline. In case of an accidental release of bentonite, either through a vent through the soil profile, or at the installation point, the release point will be fully encircled with siltation fencing and the bentonite will be allowed to vent and flow into the enclosed area. When the enclosure becomes near full, a vacuum truck or pump will remove the bentonite. The siltation fencing will remain in place during the boring, back reaming, pipe pulling procedures and after completion to ensure the vent has sealed. The enclosure will only be removed after all evidence of the release has ceased.

D: Describe the source of fill material and disposal locations

Fill material will consist of gravel, silt, clay, sand, loam, rock, and crushed rock, depending on the construction site and job to be accomplished. No material will be excavated from waters of the state for use as fill material. Excavated material will be properly disposed of at upland disposal sites, and no excavated material will be disposed of in waters of the state.

E: Construction Timeline

Estimated project start date and completion date: May 2017 to October 2018.

Section 6.2 Removal Fill Dimensions and Volumes

F: Fill Volumes and Dimensions

Table 6-2 provides fill volumes for wetlands and waters crossed by the Project.

Table 6-2. Fill Volume and Dimensions							
Feature Name	Fill Dimensions					Duration of Impact	Material
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (ac)	Volume (cy)		
EPH 06	447.3	1	8	0.010	132.54	Temporary	Native Soil
EPH 03	76.0	1	8	0.002	22.51	Temporary	Native Soil
EPH 01	54.3	1	8	0.001	16.08	Temporary	Native Soil
EPH 05	122.1	2	8	0.006	72.35	Temporary	Native Soil
EPH 10	59.9	3	8	0.004	53.27	Temporary	Native Soil
EPH 11	183.8	2	8	0.008	108.93	Temporary	Native Soil
EPH 11	43.6	2	8	0.002	25.85	Temporary	Native Soil
EPH 11	536.0	2	8	0.025	317.63	Temporary	Native Soil
EPH 13	103.6	1	8	0.002	30.71	Temporary	Native Soil
SS 52	16.4	1	8	0.001	4.85	Temporary	Native Soil
STRM 55	80.8	5	8	0.012	119.70	Temporary	Native Soil
STRM 67	18.8	1	8	0.000	5.57	Temporary	Native Soil
STRM 70	19.7	1	8	0.000	5.84	Temporary	Native Soil
STRM 71	293.8	1	8	0.007	87.05	Temporary	Native Soil
WET FF			8	0.335	4322.00	Temporary	Native Soil
WET HH			8	0.906	11694.85	Temporary	Native Soil
WET KK			8	0.055	711.60	Temporary	Native Soil
WET LL			8	0.000	3.30	Temporary	Native Soil
WET MM			8	0.015	189.96	Temporary	Native Soil
WET PP			8	0.351	4530.02	Temporary	Native Soil
WET VV			8	0.150	1939.89	Temporary	Native Soil
TOTAL	**2056.1**			**1.894**	**24,394.50**		

G: Total Fill Volumes and Dimensions

Table 6-3 provides total fill volumes and dimensions for wetland and waters crossed by the Project.

Table 6-3. Total Fill Volume and Dimension			
Fill Impacts	Length (ft.)	Area (ac)	Volume (cy)
Wetlands	NA	1.812	23,391.62
Waters	2,056.1	0.082	1,002.88
TOTAL	2,056.1	1.894	24,394.50

H: Removal Volumes and Dimensions

Table 6-4 provides removal volumes for wetlands and waters crossed by the Project.

Table 6-4 Removal and Volume Dimensions							
Feature Name	**Removal Dimensions**					**Duration of Impact**	**Material**
	Length (ft.)	**Width (ft.)**	**Depth (ft.)**	**Area (ac)**	**Volume (cy)**		
EPH 06	447.3	1	8	0.010	132.54	Temporary	Silt/Clay, Sand, Gravel
EPH 03	76.0	1	8	0.002	22.51	Temporary	Silt/Clay
EPH 01	54.3	1	8	0.001	16.08	Temporary	Silt/Clay, Sand, Gravel
EPH 05	122.1	2	8	0.006	72.35	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 10	59.9	3	8	0.004	53.27	Temporary	Silt/Clay, Sand, Gravel
EPH 11	183.8	2	8	0.008	108.93	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 11	43.6	2	8	0.002	25.85	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 11	536.0	2	8	0.025	317.63	Temporary	Silt/Clay, Sand, Gravel, Cobble
EPH 13	103.6	1	8	0.002	30.71	Temporary	Silt/Clay, Sand, Gravel
SS 52	16.4	1	8	0.001	4.85	Temporary	Native
STRM 55	80.8	5	8	0.012	119.70	Temporary	Silt/Clay
STRM 67	18.8	1	8	0.000	5.57	Temporary	Gravel
STRM 70	19.7	1	8	0.000	5.84	Temporary	Silt/Clay, Sand, Gravel
STRM 71	293.8	1	8	0.007	87.05	Temporary	Silt/Clay, Sand, Gravel
WET FF			8	0.335	4322.00	Temporary	Native Soil
WET HH			8	0.906	11694.85	Temporary	Native Soil
WET KK			8	0.055	711.60	Temporary	Native Soil
WET LL			8	0.000	3.30	Temporary	Native Soil
WET MM			8	0.015	189.96	Temporary	Native Soil
WET PP			8	0.351	4530.02	Temporary	Native Soil
WET VV			8	0.150	1939.89	Temporary	Native Soil
TOTAL	**2056.1**			**1.894**	**24,394.50**		

I: Total Removal Volumes and Dimensions

Table 6-5 provides total fill volumes and dimensions for wetland and waters crossed by the Project.

Table 6-5. Total Removal Volume and Dimensions			
Fill Impacts	**Length (ft.)**	**Area (ac)**	**Volume (cy)**
Wetlands	NA	1.812	23,391.62
Waters	2,056.1	0.082	1,002.88
TOTAL	**2,056.1**	**1.894**	**24,394.50**

BLOCK 7 ADDITIONAL INFORMATION

Section 7.1: State and Federally Listed Species

See **Table 4-3** Block 4

Section 7.2: 100-year Floodplain

See **Figure 4-1** in Block 4

Section 7.3: Construction Dewatering or Ground Disturbance

1200-C Permit, see **Attachment G** (NPDES Permit).

Section 7.4: Cultural Resources Survey

NWN conducted cultural resource investigations for the proposed Project, which consisted of pedestrian survey of a pipeline, conduit lines, a compressor station, and various laydown areas and the excavation of 39 shovel probes. No archaeological resources have been previously recorded within the APE, and no archaeological resources were identified as a result of this survey. Three historic-era buildings and structures were newly recorded during the current fieldwork however the recommendation of finding is *no historic properties affected* for the project.

Table 7-1. Cultural Resources

Resource	Description	Location	Recommended Eligibility	Assessment of Effect
Burlington Northern Railroad	Consists of modern elements. The railroad was built in 1898 and has been in continued use since that time.	MP 7.45	Eligible	No Historic Property Affected
77434 Palm Hill Road	Property with a number of buildings and structures west of APE	MP 7.4	Not Eligible	No Historic Property Affected
Clatskanie Guard Station at 76781 Palm Hill Road	Three buildings were identified just west of the APE	MP 6.6	Not Eligible	No Historic Property Affected

BLOCK 8 IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

A. Unavoidable environmental impacts.

Features that will be impacted by the Project are itemized in **Tables 4-1, 4-2, 6-1, 6-2, 6-3,** and **6-4** and exhibited in **Attachment B, Figure B1**.

B. Site Restoration Plan Temporary Impacts

Temporary Impact Restoration Plan (Attachment H)

A restoration plan for rehabilitation of temporary impacts has been prepared and is attached to this application.

BLOCK 9 ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE

Section 9.1 Pre-printed Labels of Adjacent Property owners for Project and Mitigation Site

Northwest Natural Gas Co.
220 2nd Ave. NW
Portland, OR 97209

Kristin M Bergseng & Christine M Ruch
77870 Erickson Dike Rd.
Clatskanie, OR 97016

Lillian H Palm
76886 Palm Hill Rd.
Clatskanie, OR 97016

Ralph J. a Helen L Kleger Revocable Living Trust
9658 SW Denney Rd.
Beaverton, OR 97008

Patricia Ann Cink
6105 Rexroth Ave.
Bakersfield, CA 93306

Judith Bergman
15910 Elliott Rd.
Clatskanie, OR 97016

Cascade Kelly Holdings LLC
81200 Kallunki Rd.
Clatskanie, OR 97016

George and Karen Poysky
224 SW 153rd St, PMB 258
Seattle, WA 98166*

Lawrence and Wanda Derby
81036 Erickson Dike Rd.
Clatskanie, OR 97016

Hopville Farms, LLC
PO Box 361
Terrebonne, OR 97760

Collins Road Clatskanie, LLC
1521 Westbranch Dr., Ste. 200
McLean, VA 22102

Ronald and Julie Webster
16127 Highway 30
Clatskanie, OR 9701

BLOCK 10 CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT

Not Applicable

BLOCK 11 COASTAL ZONE CERTIFICATION

Not Applicable

BLOCK 12 SIGNATURES

See Attachment I: Signatures

BLOCK 13 ATTACHMENTS

Attachment A, Project Location Drawings

Impact site location maps are provided F**igures A-1.1 – A-1.6**

Attachment B, Site Plans

Impact site plan depicting temporary impacts to wetlands and waters are provided in **Figures B-1.1 – B-1.34**.

Attachment C, Cross Sections

Attachment C-1: Typical Construction site plans and cross sections for construction in wetlands and other waters.

Attachment C-2: Site-specific waterbody crossings.

Attachment D, Erosion and Sediment Control Plan

Attachment E, Wetland Delineation Report

Attachment F, Inadvertent Return Response Plan

Attachment G, NPDES Permit

Attachment H, Site Restoration Plan

Attachment I, Signatures

ATTACHMENT A: PROJECT LOCATION DRAWINGS

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NW Natural

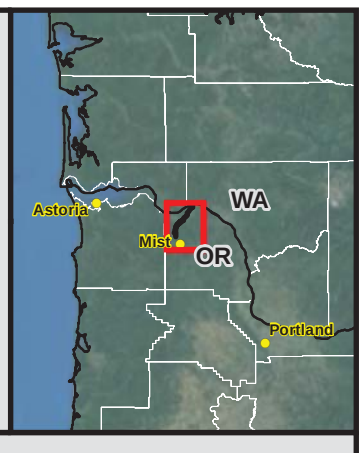
North Mist Expansion Project

JPA

Columbia County, OR
April 2015

Figure A-1
Project Location Map

Site Boundary
Map Grid
City/Town
Secondary Highway
Secondary Road
County Boundary
State Boundary



1:75,000 WGS84 UTM Zone 10

0 0.125 0.25 0.5 0.75 1 Miles

Data Sources NW Natural: project facilities / Tetra Tech: survey area, habitat type and category / ESRI: roads, political boundaries, background imagery

TETRA TECH

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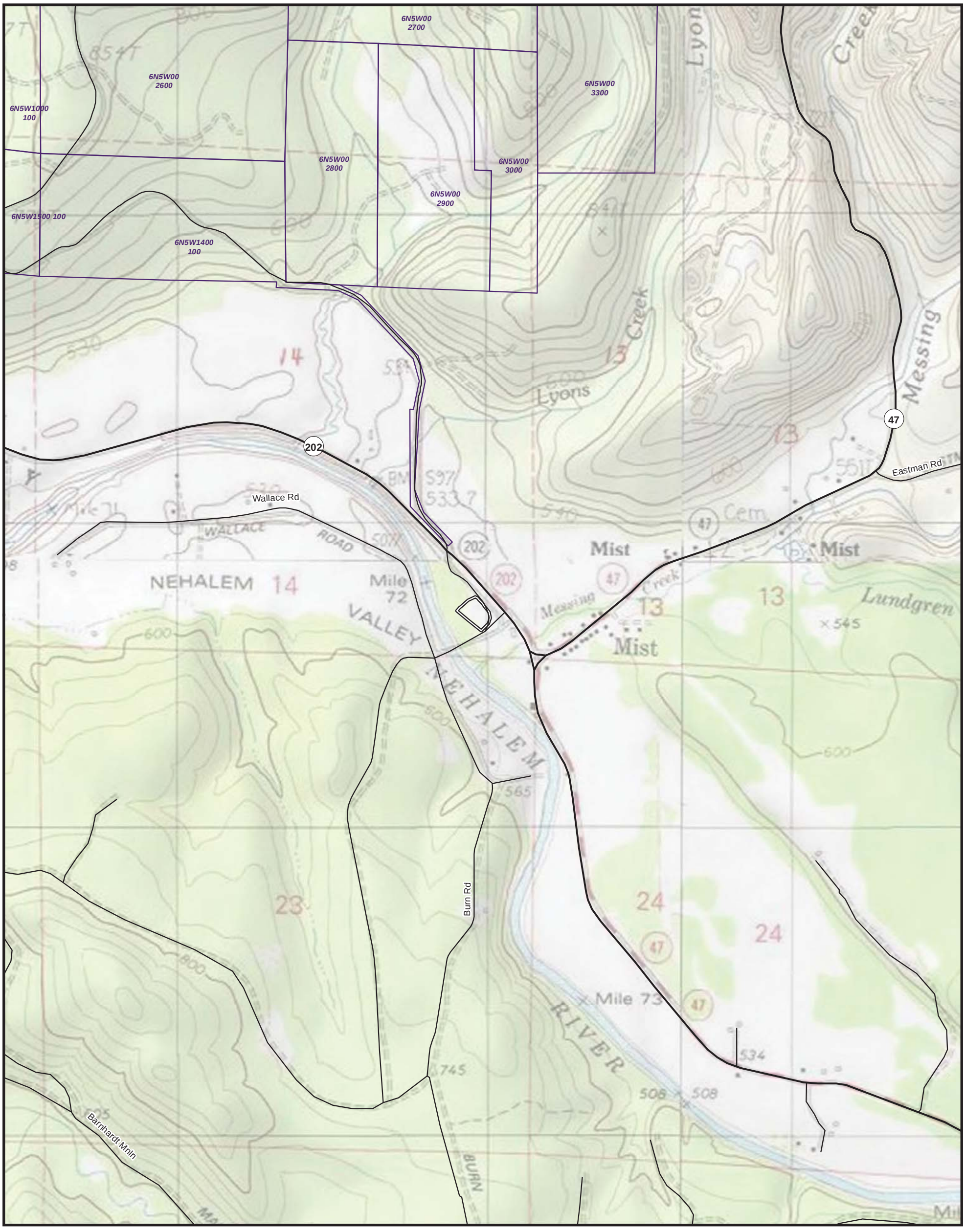

NW Natural

North Mist Expansion Project

JPA

Columbia County, OR
April 2015

Figure A-1.1

Project Location Map

Site Boundary

Taxlot Boundary

1:12,000 1 inch = 1,000 feet WGS84 UTM Zone 10

0 1,000 2,000 4,000 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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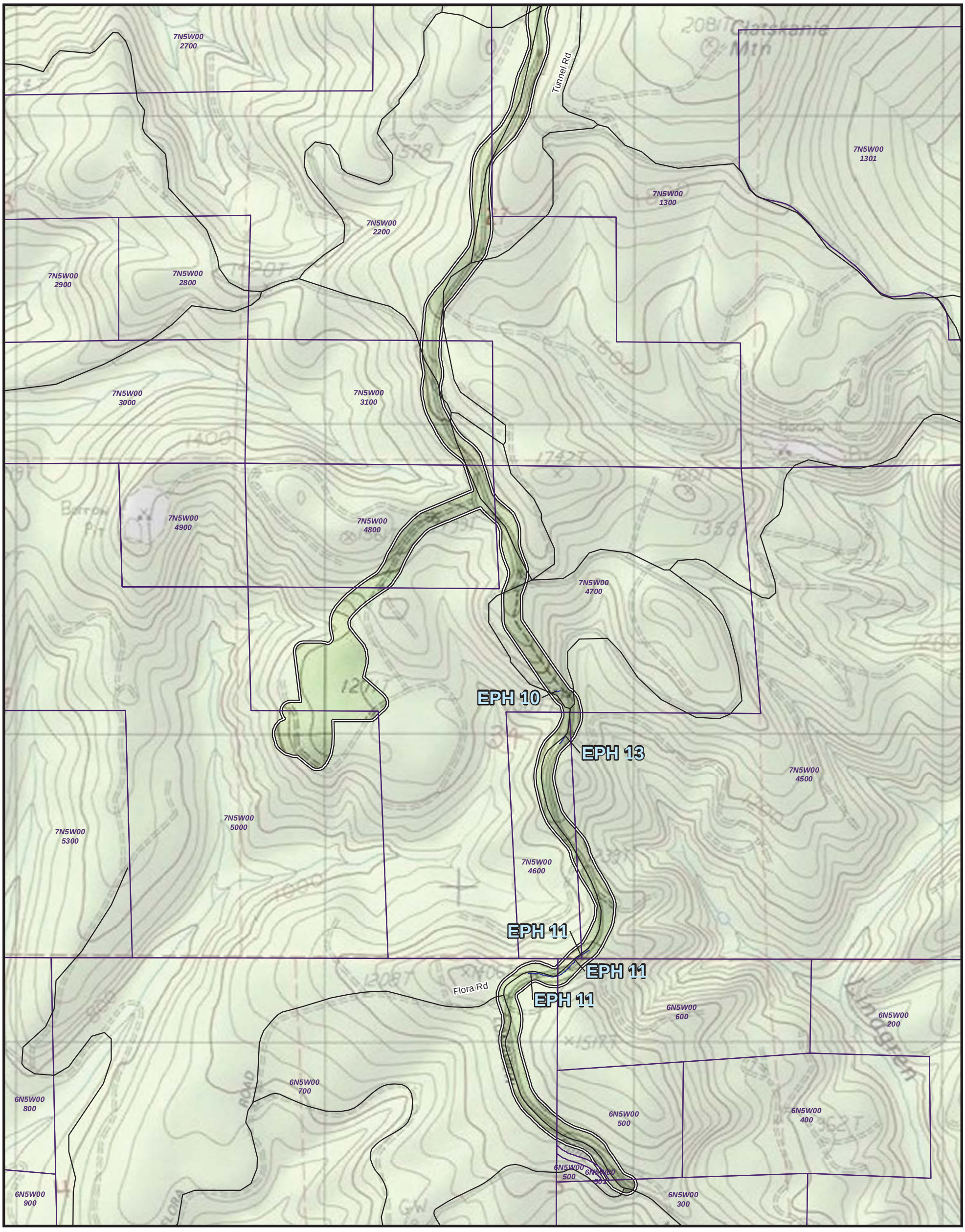

NW Natural

North Mist Expansion Project

JPA

Columbia County, OR
April 2015

Figure A-1.2

Project Location Map

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Taxlot Boundary

1:12,000 1 inch = 1,000 feet WGS84 UTM Zone 10

0 1,000 2,000 4,000 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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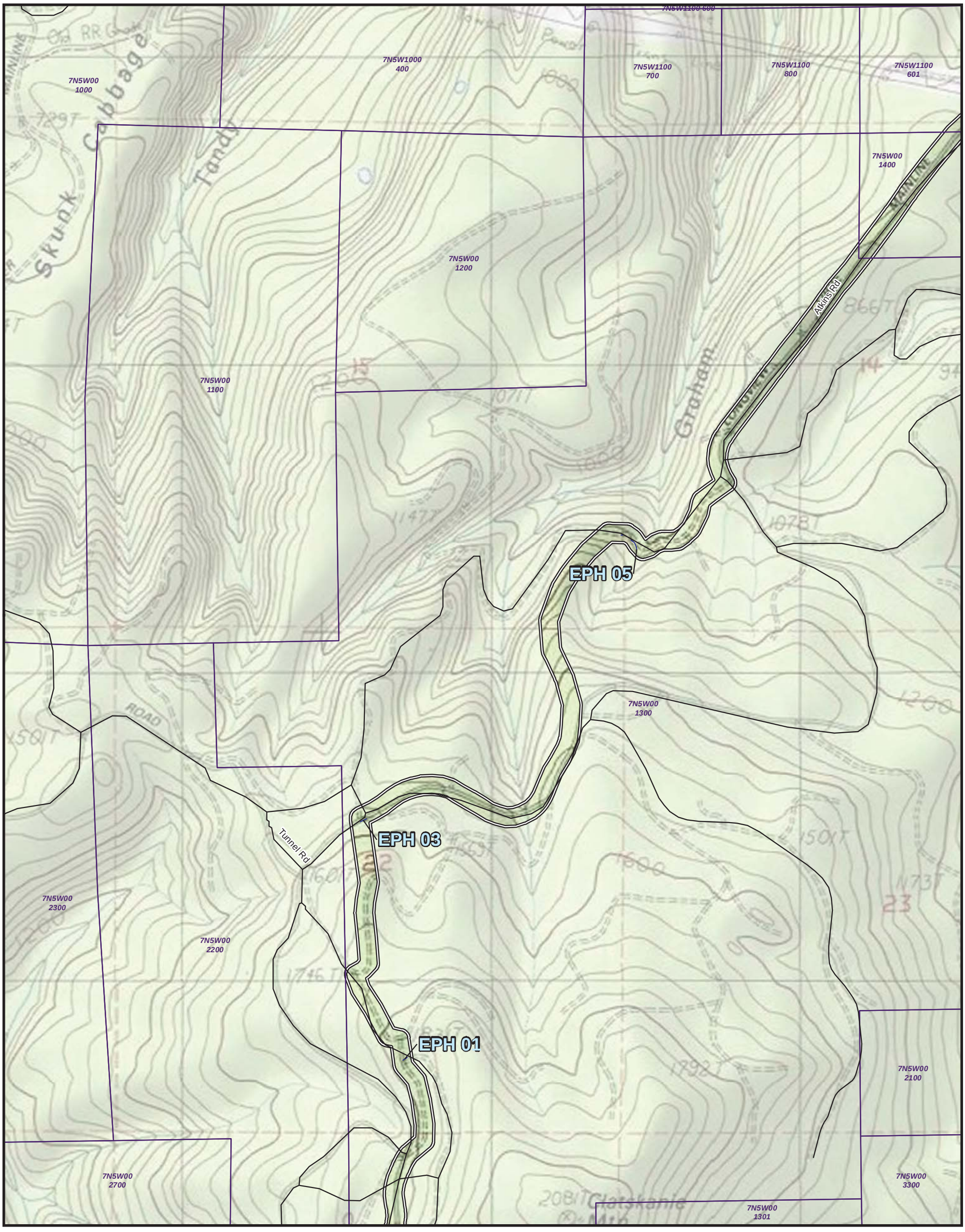

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Figure A-1.3

Project Location Map

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Taxlot Boundary

1:12,000 1 inch = 1,000 feet WGS84 UTM Zone 10

0 200 400 600 800 1,000 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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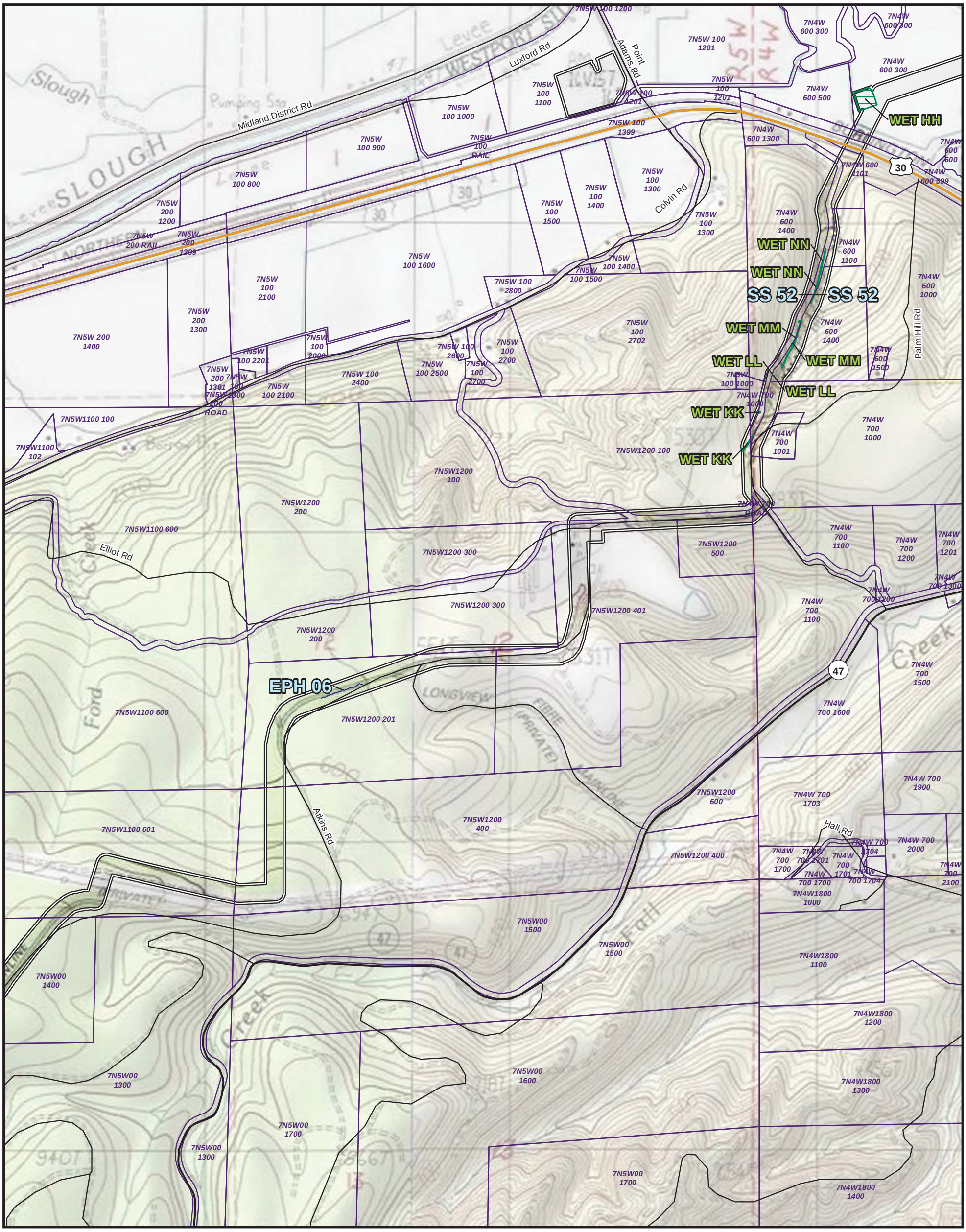

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Figure A-1.4

Project Location Map

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetland
- Taxlot Boundary

1:12,000 1 inch = 1,000 feet WGS84 UTM Zone 10

0 1,000 2,000 4,000 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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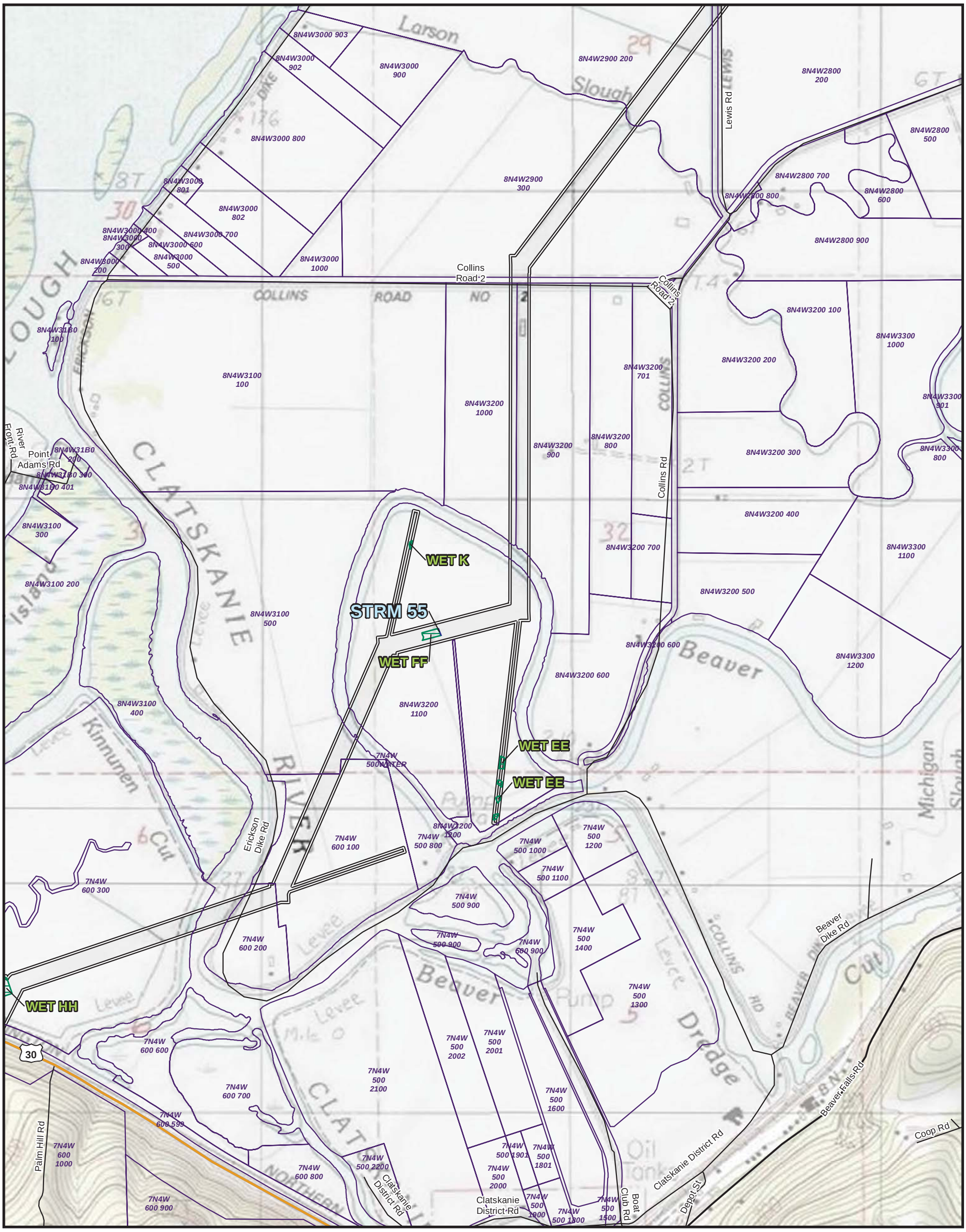

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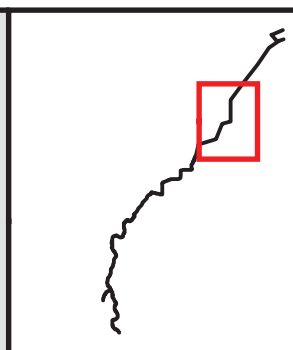
Figure A-1.5

Project Location Map

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetland
- Taxlot Boundary



1:12,000 1 inch = 1,000 feet WGS84 UTM Zone 10

0 500 1,000 2,000 3,000 4,000 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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4

Port Westward

Erickson Dike Rd

STRM 71

STRM 70

STRM 67

WET VV

WET VV

WET VV

WET QQ

WET PP

WET RR

WET RR

WET SS

WET SS

WET UU

WET P

WET TT

WET P

WET N

WET AA

WET L

WET M

WET M

WET CC

8N4W1600 100

8N4W1500 100

8N4W1500 200

8N4W1600 200

8N4W1600 400

8N4W1500 600

8N4W1600 300

8N4W1500 500

8N4W2100 301

8N4W2100 300

8N4W2100 200

8N4W2100 100

8N4W2100 700

8N4W2200 1100

8N4W2000 200

8N4W2200 300

8N4W2100 501

8N4W2200 600

8N4W2200 400

8N4W2200 500

8N4W2100 600

8N4W2000 300

8N4W2100 500

8N4W2200 800

8N4W2100 400

8N4W2200 900

Collins Road 1

Collins Rd

COLLINS ROAD NO 1

8N4W2800 101

8N4W2800 100

8N4W2700 100

Slough

Collins Rd

Hermo Rd

8N4W2900 200

8N4W2800 300

8N4W2700 200

Lewis Rd

8N4W2800 200

8N4W2800 400

8N4W2800 1200

Collins Rd

8N4W2800 500

8N4W2800 700

8N4W2800 1400

8N4W2700 1600

8N4W2800 600

8N4W2800 800

8N4W2900 300

8N4W2800 1100

8N4W2800 900

8N4W2800 1000

Bassie Ln

8N4W3200 200

McLean

Hermo

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Figure A-1.6

Project Location Map

- Site Boundary
- Surveyed Water (Maximum OHWL Width)
- Wetland
- Taxlot Boundary

1:12,000 1 inch = 1,000 feet WGS84 UTM Zone 10

0 500 1,000 2,000 3,000 4,000 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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ATTACHMENT B: SITE PLANS

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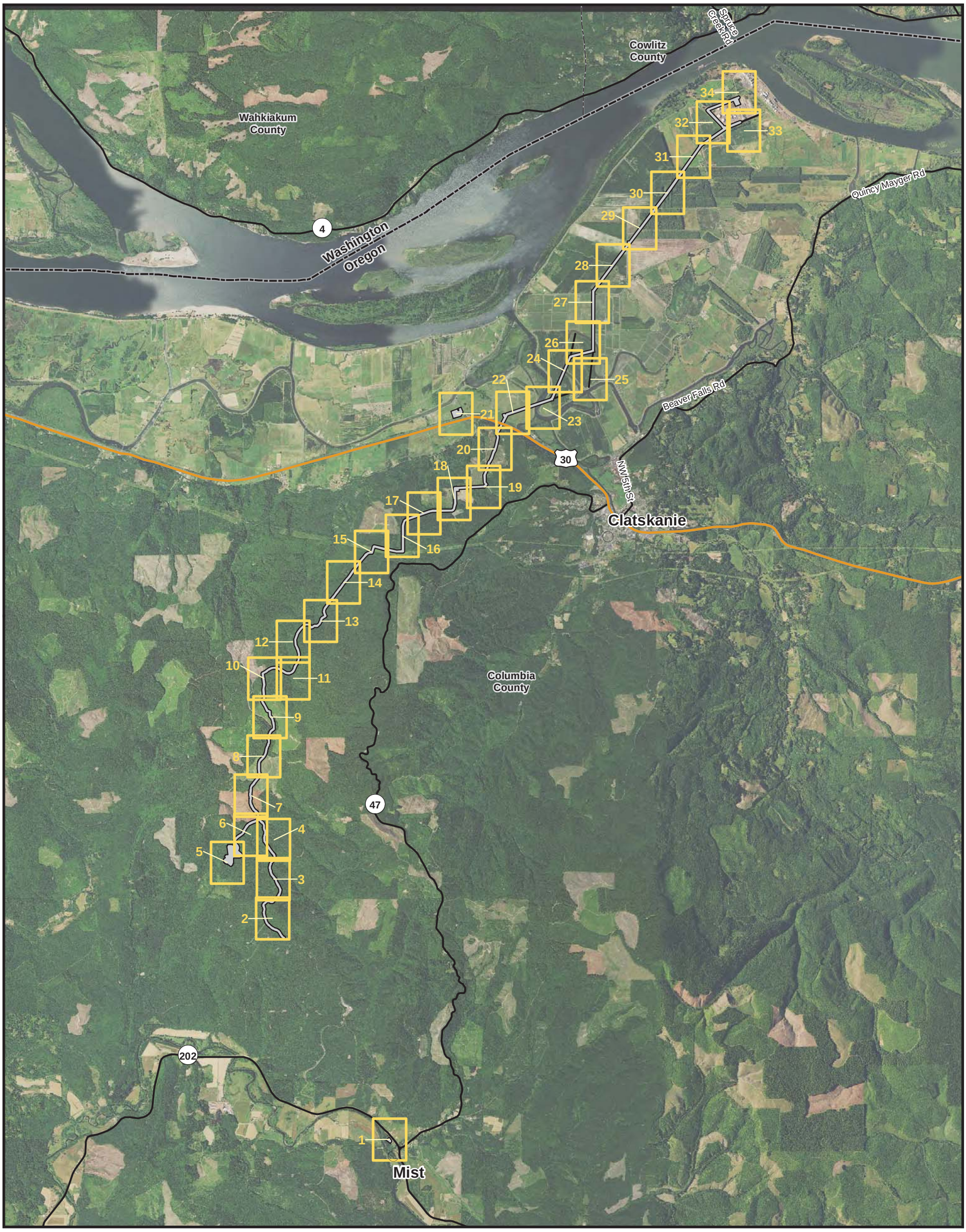

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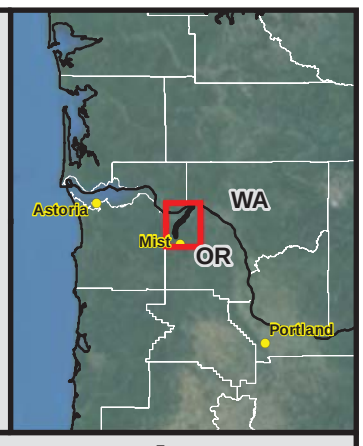
Figure B-1
Wetlands and Other Waters Impact Areas

Site Boundary
Map Grid
City/Town
Secondary Highway
Secondary Road
County Boundary
State Boundary



1:70,000 WGS84 UTM Zone 10

0 0.5 1 2 3 4 5 Miles

Data Sources NW Natural: project facilities / Tetra Tech: survey area, habitat type and category / ESRI: roads, political boundaries, background imagery

TETRA TECH

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EPH 52

WET OO

NO IMPACTS TO WETLANDS AND OTHER WATERS

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Figure B-1.1
Wetlands and Other Waters Impact Areas

- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Site Boundary
- Pipe Storage
- Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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Figure B-1.2
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Proposed Conduit
- Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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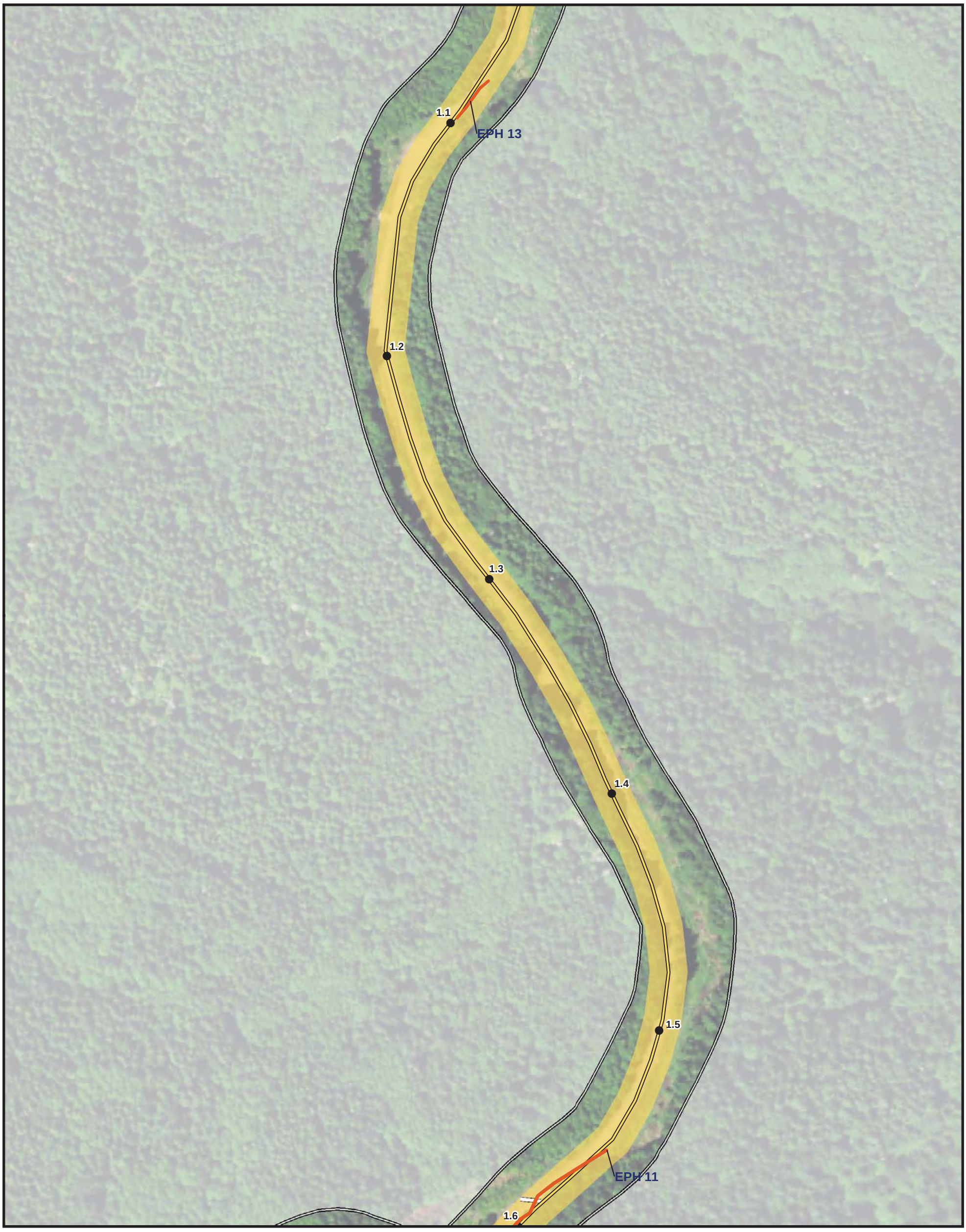

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Figure B-1.3
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Proposed Conduit
- Temporary Impact

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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0.6

0.7

0.8

0.9

EPH 10

1.0

EPH 13

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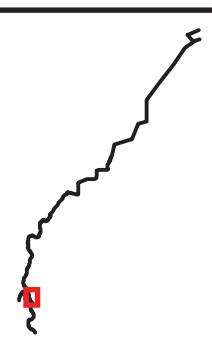
Figure B-1.4
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Trench
- Proposed Conduit
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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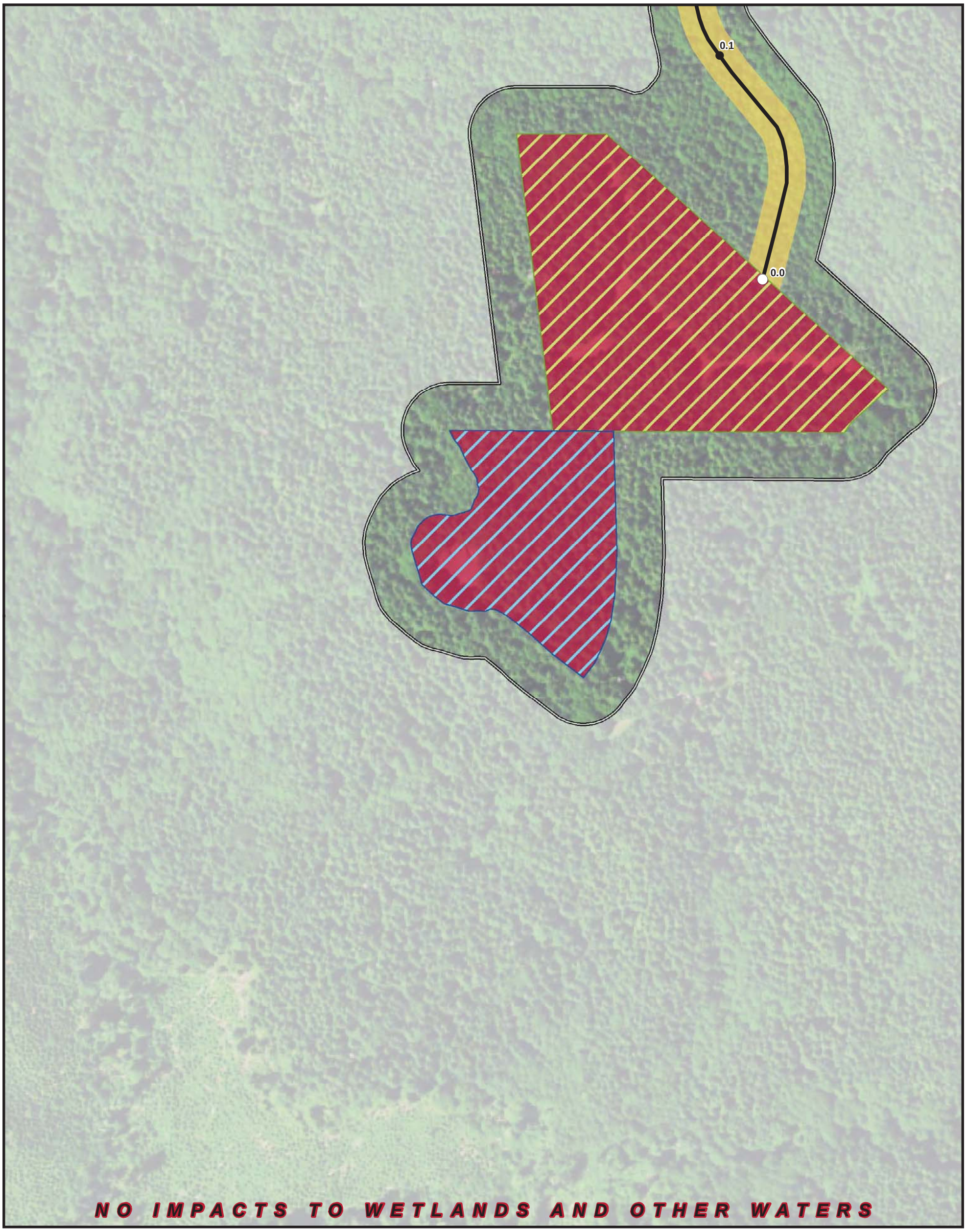

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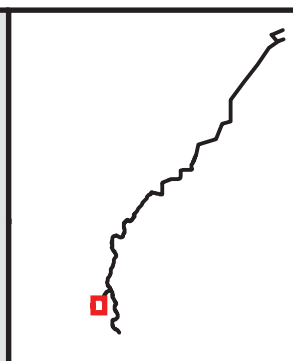
Figure B-1.5
Wetlands and Other Waters Impact Areas

- Site Boundary
- Mile Post
- 1/10 Mile Post
- Permanent Impact
- Temporary Impact

Corridor

- Trench
- Compressor Station
- Well Pad



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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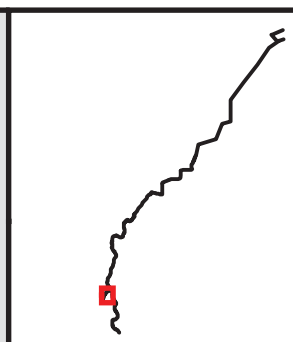
Figure B-1.6
Wetlands and Other Waters Impact Areas

- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Trench
- Proposed Conduit
- Compressor Station
- Temporary Extra Work Space
- Permanent Impact
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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NO IMPACTS TO WETLANDS AND OTHER WATERS

1.1
1.0
0.9
0.8
0.7
0.6
STRM 02
WET B
STRM 02
WET A

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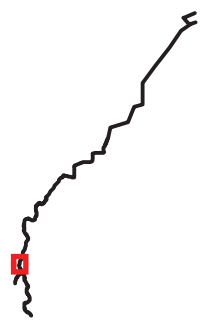
Figure B-1.7
Wetlands and Other Waters Impact Areas

Surveyed Water (Maximum OHWL Width)
Wetlands
Culvert
Site Boundary
Mile Post
1/10 Mile Post

Corridor
Trench
Temporary Extra Work Space
Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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NO IMPACTS TO WETLANDS AND OTHER WATERS

1.6

1.5

1.4

1.3

1.2

1.1

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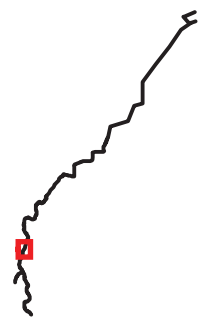
Figure B-1.8
Wetlands and Other Waters Impact Areas

Culvert
Site Boundary
1/10 Mile Post

Corridor

Trench
Temporary Extra Work Space
Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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2.1

2.0

1.9

EPH 01

1.8

1.7

1.6

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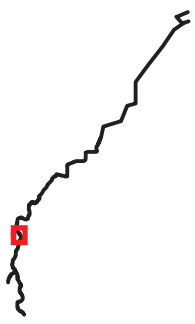
Figure B-1.9
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Trench
- Temporary Extra Work Space
- Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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Figure B-1.10
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Trench
- Temporary Extra Work Space
- Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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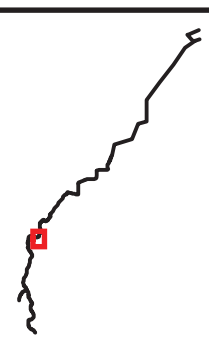
Figure B-1.11
Wetlands and Other Waters Impact Areas

Surveyed Water (Maximum OHWL Width)
Wetlands
Culvert
Site Boundary
1/10 Mile Post

Corridor
Trench
Temporary Extra Work Space
Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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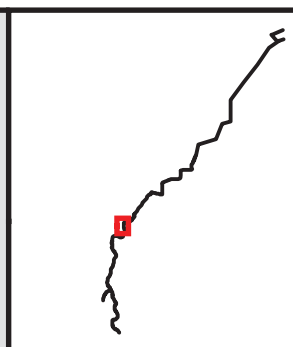
Figure B-1.12
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Trench
- Temporary Extra Work Space
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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Figure B-1.13
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Trench
- Temporary Extra Work Space
- Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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4.4

4.3

4.2

4.1

4.0

3.9

NO IMPACTS TO WETLANDS AND OTHER WATERS

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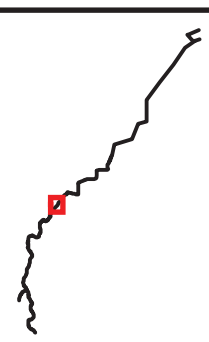
Figure B-1.14
Wetlands and Other Waters Impact Areas

Site Boundary
Mile Post
1/10 Mile Post

Corridor

Trench
Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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4.8

4.9

4.7

4.6

4.5

4.4

NO IMPACTS TO WETLANDS AND OTHER WATERS

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Figure B-1.15
Wetlands and Other Waters Impact Areas

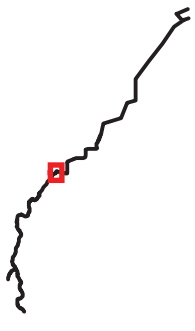
Site Boundary

1/10 Mile Post

Corridor

Trench

Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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POND 02

EPH 06

EPH 06

5.6

5.5

5.4

5.3

5.2

5.1

5.0

4.9

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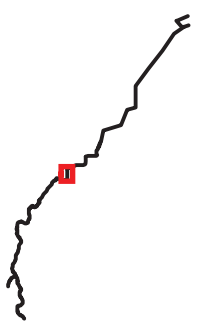
Figure B-1.16
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Trench
- Temporary Extra Work Space
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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POND 02

5.6

5.7

5.8

5.9

EPH 06

EPH 06

NW Natural

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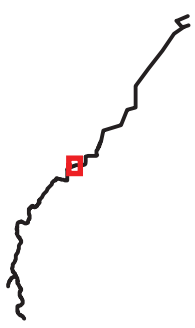
Figure B-1.17
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Trench
- Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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6.5
6.4
Mainline Block Valve
6.3
6.2
POND 03
6.1
5.9
6.0

NO IMPACTS TO WETLANDS AND OTHER WATERS

NW Natural

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April 2015

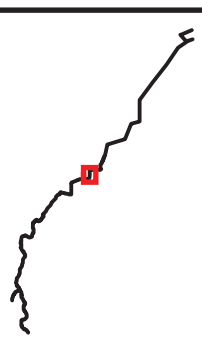
Figure B-1.18
Wetlands and Other Waters Impact Areas

- Surveyed Water (Maximum OHWL Width)
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Trench

- Mainline Block Valve
- Pipe Storage
- Temporary Extra Work Space
- Permanent Impact
- Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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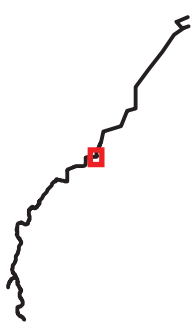
Figure B-1.19
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Trench
- Laydown
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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7.4
EPH 07
STRM 08
7.3
SS 51
WET NN
7.2
SS 52
STRM 60
7.1
WET MM
STRM 62
SS 50
WET LL
7.0
STRM 61
STRM 60
WET KK

NW Natural

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Figure B-1.20
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Bore
- Trench
- Laydown
- Temporary Impact

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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Figure B-1.21
Wetlands and Other Waters Impact Areas

Site Boundary
Pipe Storage
Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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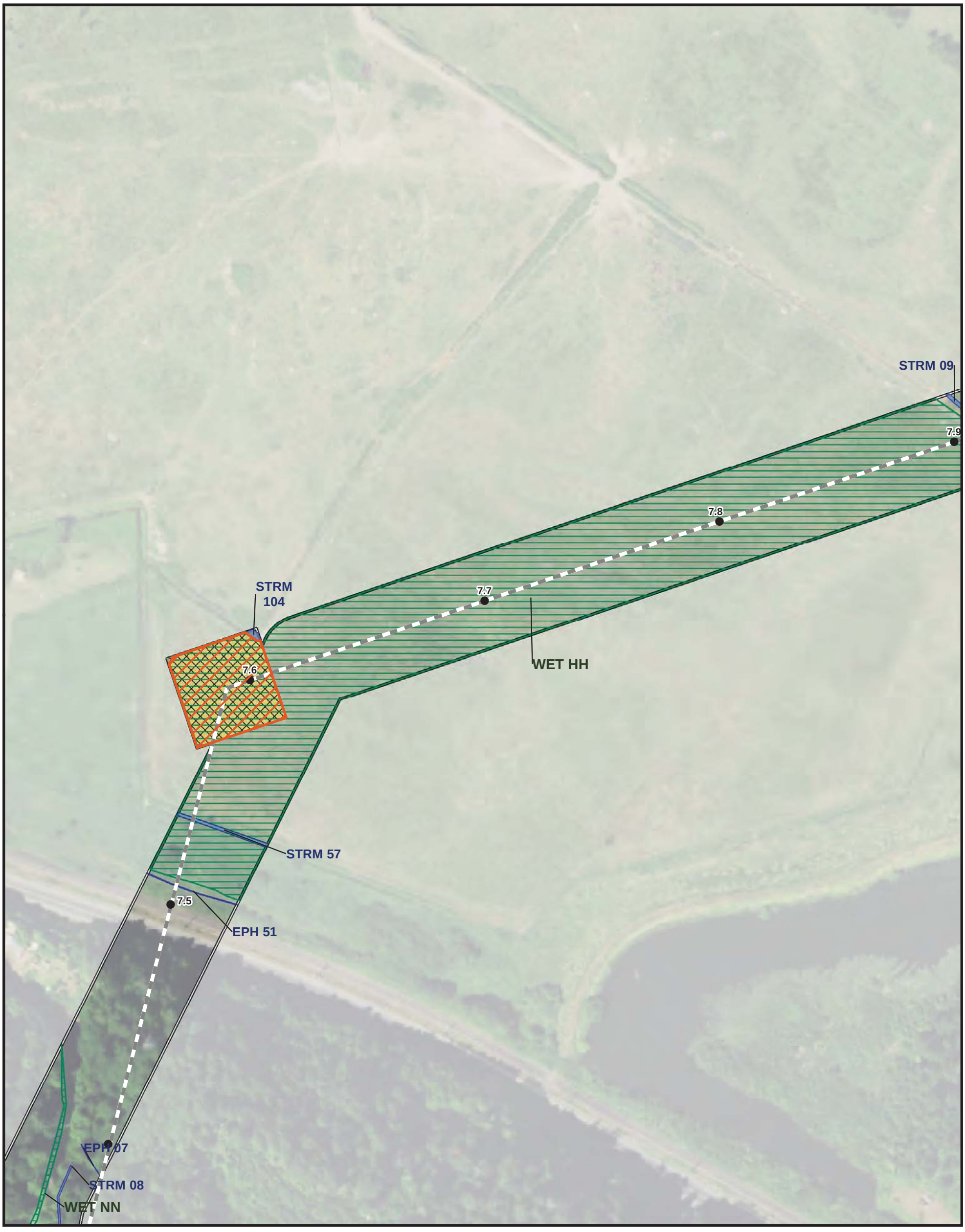

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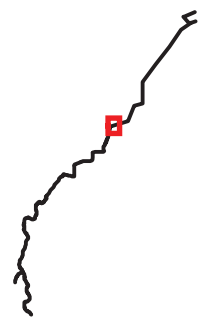
Figure B-1.22
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Site Boundary
- 1/10 Mile Post

Corridor

- Bore
- Bore Pad
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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WET II

8.3

8.2

STRM 10

8.1

8.0

STRM 09

7.9

WET HH

NO IMPACTS TO WETLANDS AND OTHER WATERS

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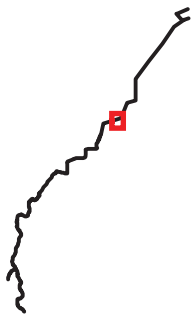
Figure B-1.23
Wetlands and Other Waters Impact Areas

- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Bore
- Bore Pad
- Laydown
- Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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STRM 55

8.8

WET FF

8.7

8.6

STRM 12

8.5

8.4

WET GG

WET II

8.3

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Figure B-1.24
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Site Boundary
- 1/10 Mile Post

Corridor

- Bore
- Trench
- Bore Pad
- Laydown
- Temporary Impact

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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STRM 54

WET EE

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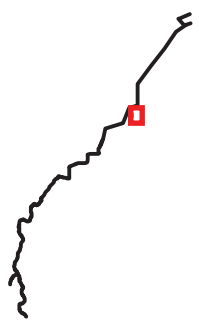
Figure B-1.25
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- Laydown
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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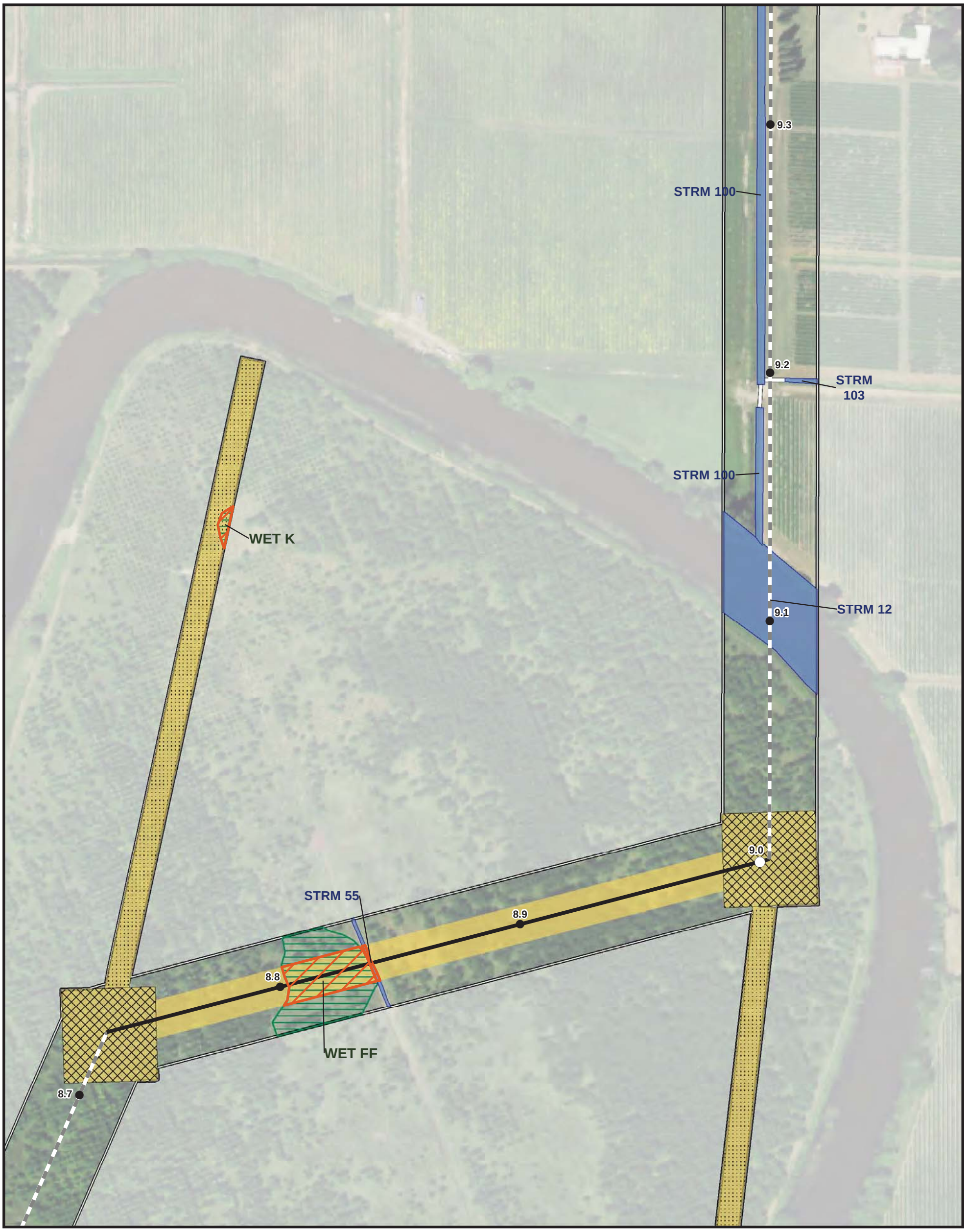

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Figure B-1.26
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Bore
- Trench
- Bore Pad
- Laydown
- Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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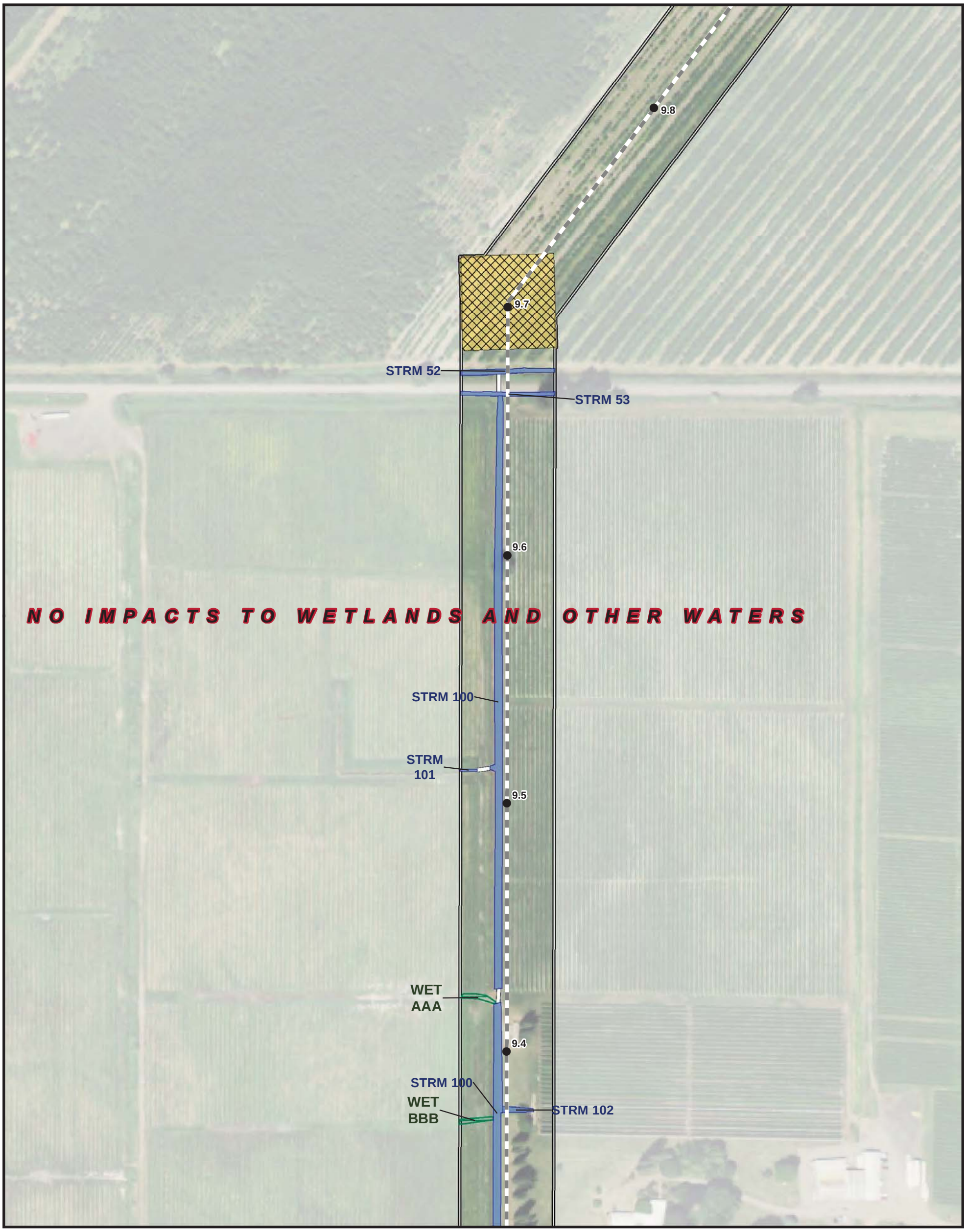

NW Natural

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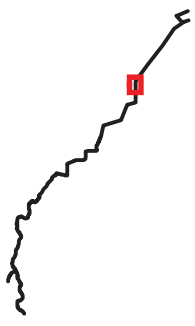
April 2015

Figure B-1.27
Wetlands and Other Waters Impact Areas

- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Bore
- Bore Pad
- Temporary Impact



1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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STRM 17

STRM 16

STRM 15

10.3

10.2

10.1

STRM 14

10.0

WET DD2

WET DD1

9.9

9.8

NO IMPACTS TO WETLANDS AND OTHER WATERS

NW Natural

North Mist Expansion Project

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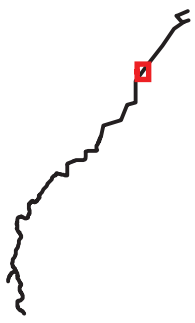
Figure B-1.28
Wetlands and Other Waters Impact Areas

Surveyed Water (Maximum OHWL Width)
Wetlands
Culvert
Site Boundary
Mile Post
1/10 Mile Post

Corridor
Bore
Bore Pad
Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

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STRM 20
STRM 19
10.9
WET AA
WET L
10.8
10.7
STRM 18
EPH 50
WET M
10.6
WET BB
10.5
WET CC
STRM 51
10.4
STRM 17
STRM 16

NW Natural

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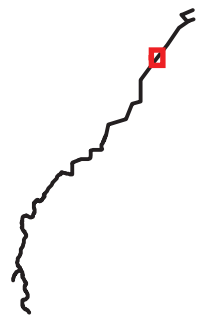
Figure B-1.29
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Site Boundary
- 1/10 Mile Post

Corridor

- Bore
- Bore Pad
- Laydown
- Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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WET SS
11.4
STRM 22
11.3
STRM 21
WET UU
WET P
WET TT
11.2
11.1
WET N
11.0
STRM 20
STRM 19
10.9
WET AA

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Figure B-1.30
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Bore
- Bore Pad
- Laydown
- Temporary Impact

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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STRM 63
11.9
WET PP
STRM 64
11.8
STRM 64
WET QQ
11.7
STRM 65
11.6
WET RR
STRM 66
STRM 23
11.5
WET SS
11.4

NW Natural

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April 2015

Figure B-1.31
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- 1/10 Mile Post

Corridor

- Bore
- Bore Pad
- Laydown
- Temporary Impact

1:2,400 1 inch = 200 feet WGS84 UTM Zone 10

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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WET WW

WET XX

POND 52

STRM 71

POND 53

STRM 70

STRM 67

STRM 67

STRM 67

12.2

WET VV

12.1

WET PP

12.0

STRM 63

STRM 63

11.9

NW Natural

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April 2015

Figure B-1.32
Wetlands and Other Waters Impact Areas

- Temporary Impact
- Temporary Impact
- Surveyed Water (Maximum OHWL Width)
- Wetlands
- Culvert
- Site Boundary
- Mile Post
- 1/10 Mile Post

Corridor

- Bore
- Trench
- Bore Pad
- Laydown
- Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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April 2015

Figure B-1.33
Wetlands and Other Waters Impact Areas

Site Boundary

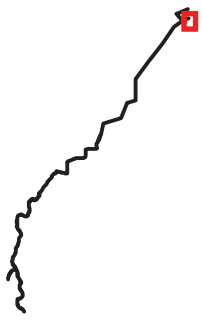
Corridor

Trench

Bore Pad

Laydown

Temporary Impact



1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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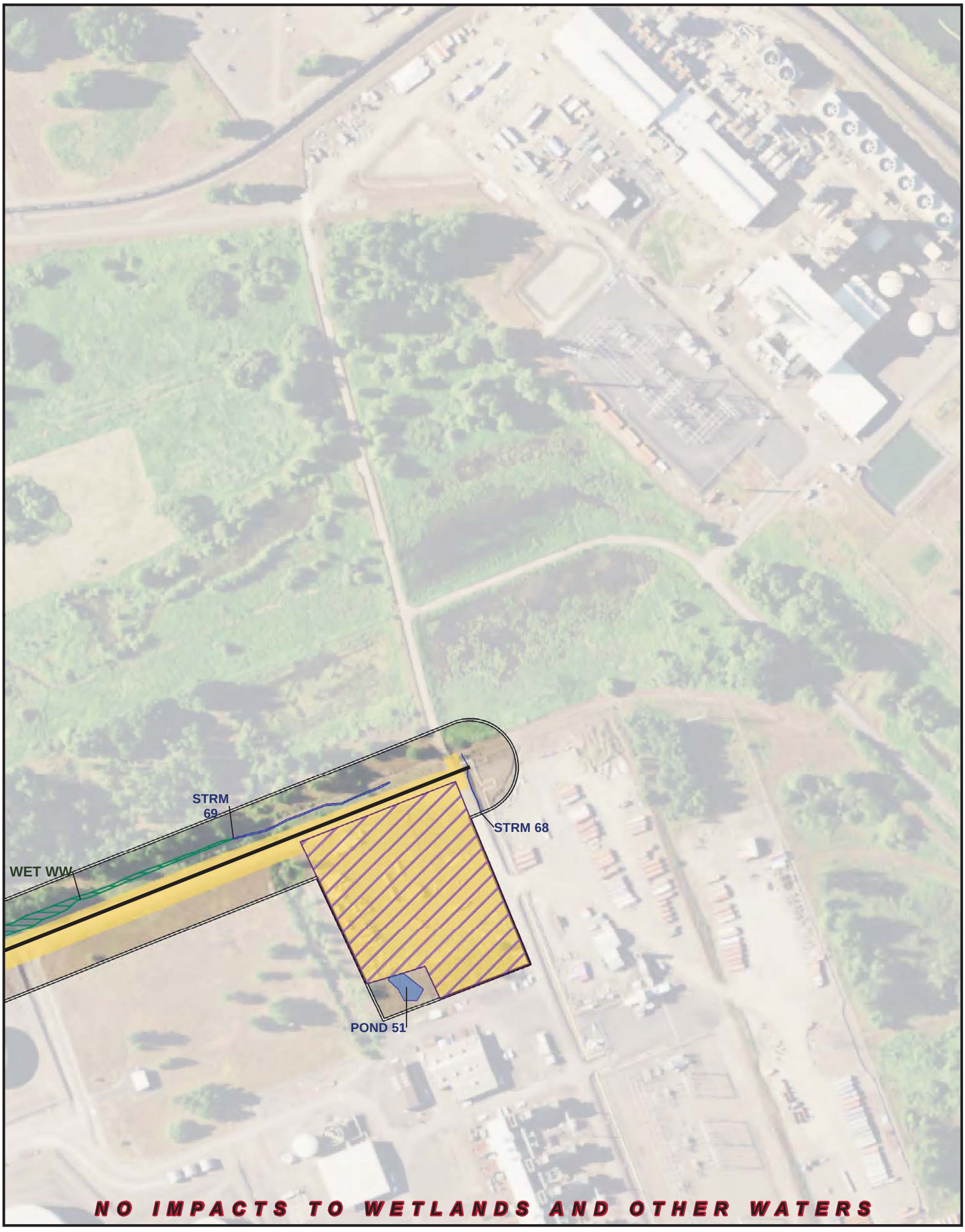

NW Natural

North Mist Expansion Project

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Columbia County, OR
April 2015

Figure B-1.34
Wetlands and Other Waters Impact Areas

Surveyed Water (Maximum OHWL Width)
Wetlands
Site Boundary

Corridor

Trench
Pipe Storage

Temporary Impact

1:2,400 **1 inch = 200 feet** **WGS84 UTM Zone 10**

0 50 100 200 300 400 Feet

Data Sources NW Natural: project facilities / ESRI: roads, political boundaries / USDA: NAIP Imagery (2014)

TETRA TECH

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ATTACHMENT C-1: CONSTRUCTION TYPICALS

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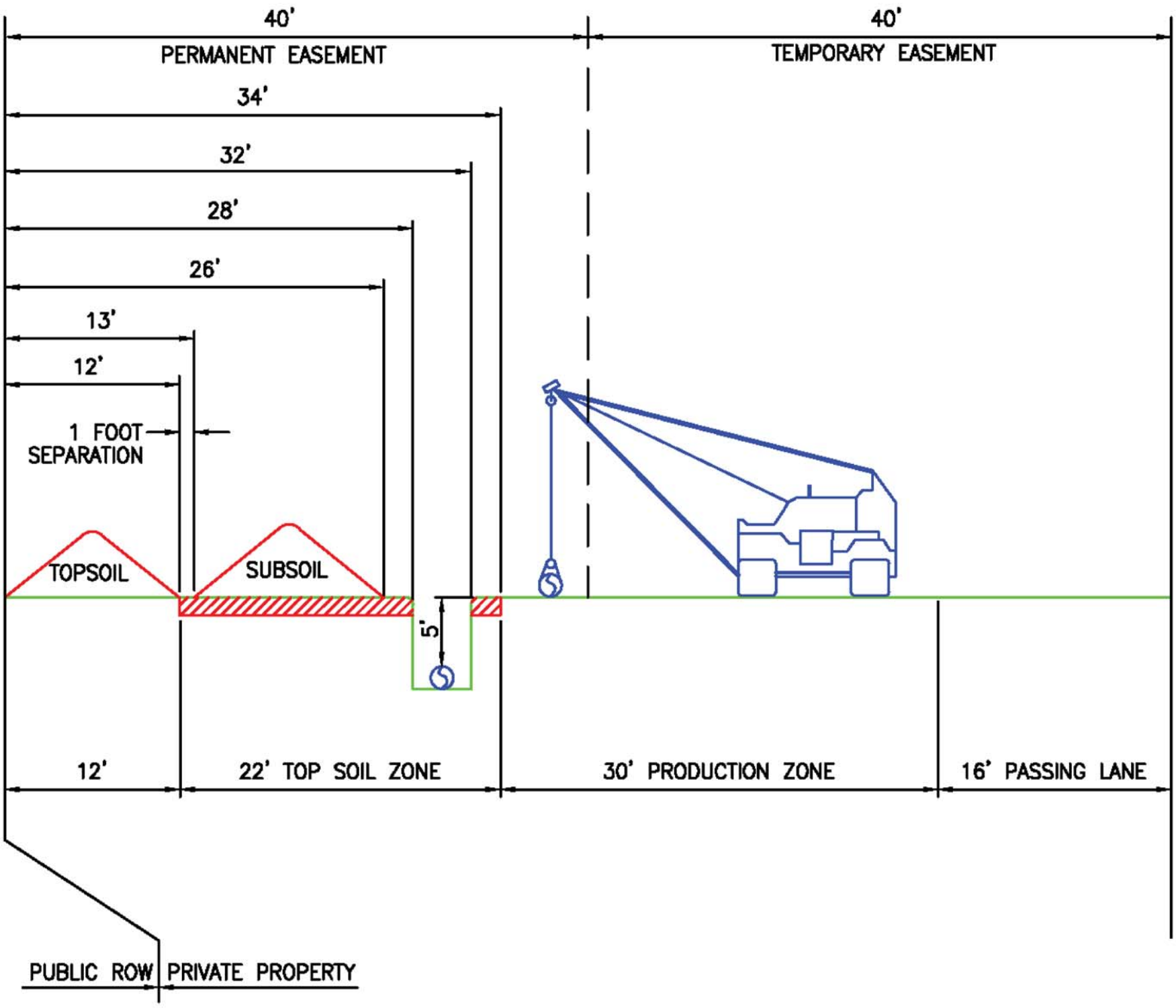


NOTES:

1. FOR AGRICULTURAL AREAS.
2. EXCAVATED SUBSOIL SHALL NOT BE MIXED WITH STRIPPED TOPSOIL.
3. STORE TOPSOIL SEPARATELY FROM SUBSOIL WITH A MINIMUM 1 FOOT SEPARATION.
4. THE CONSTRUCTION WORK AREA MAY EXCEED A WIDTH OF 80 FEET FOR CERTAIN SITE-SPECIFIC CONDITIONS AS IDENTIFIED IN THE CONSTRUCTION LINE LIST OR BY OTHER DESIGNATED PROJECT PROCEDURES.
5. THE ARRANGEMENT OF THE PERMANENT EASEMENT AND THE TEMPORARY WORK SPACE MAY VARY AND THE LOCATION OF THE PIPELINE WITHIN THE PERMANENT EASEMENT MAY VARY, AS DETERMINED BY NW NATURAL.

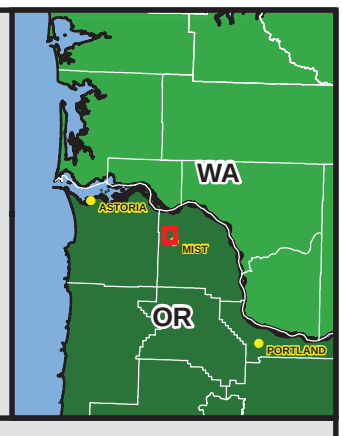
NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

Columbia County, OR
April 2015

Construction Typical
5ft of Cover
Over Pipleline



Data Source: NW Natural North Mist Expansion Project

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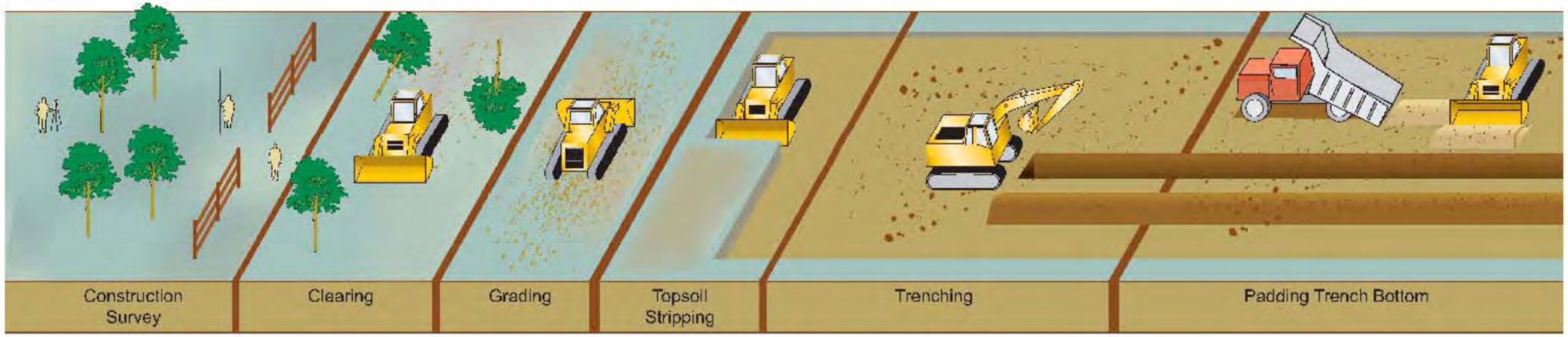
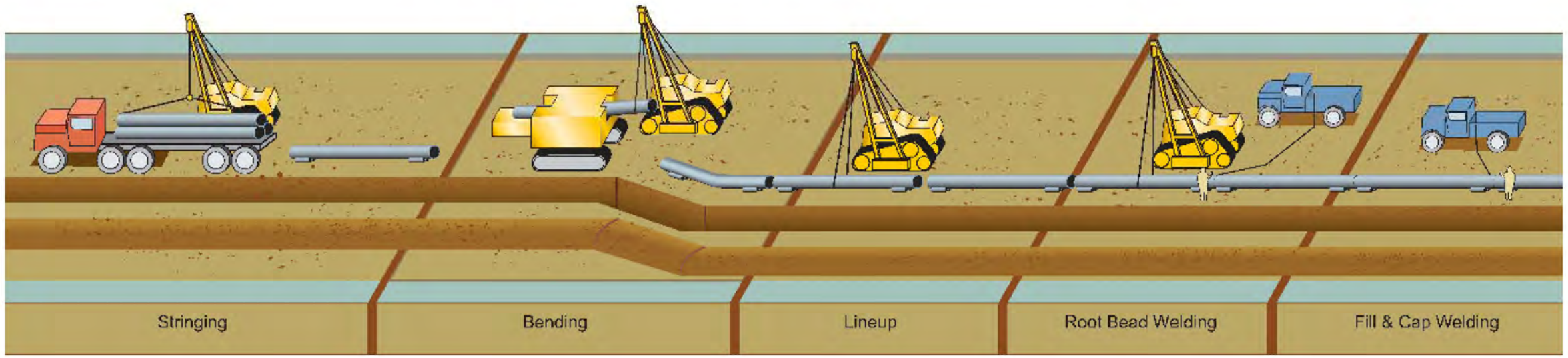
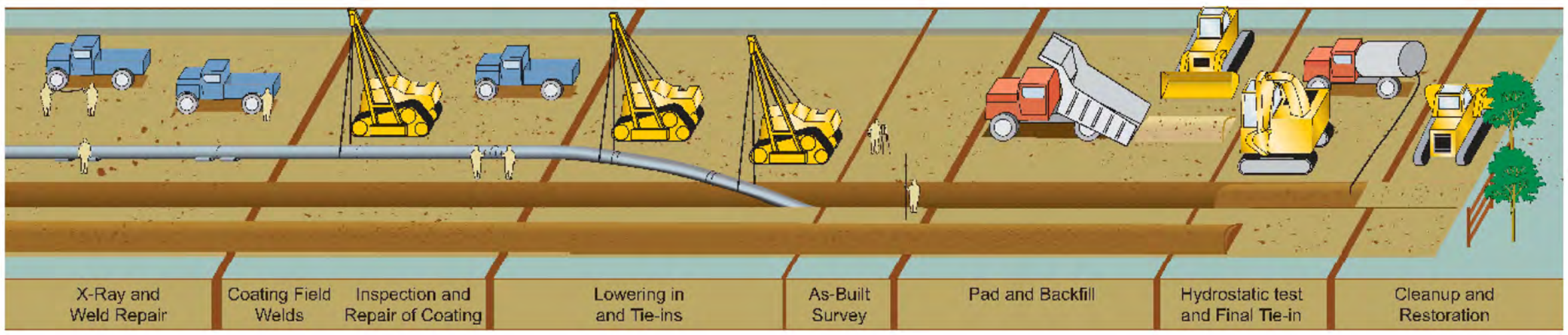
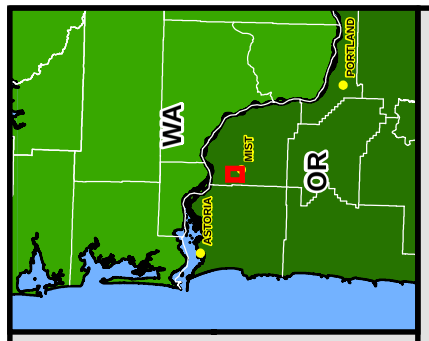








NW Natural

North Mist Expansion Project

Request for Amendment to Site Certificate

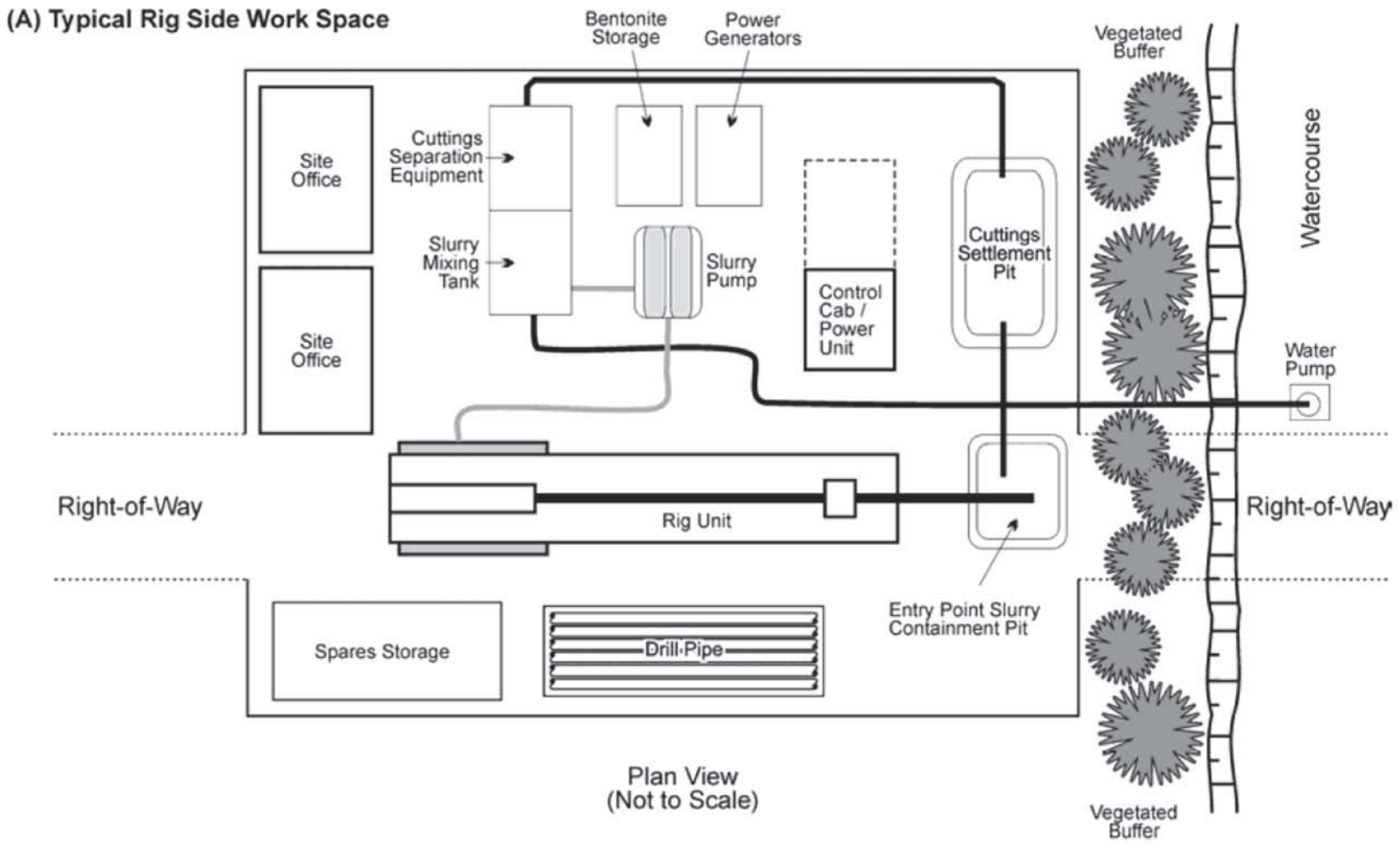
Columbia County, OR
April 2015

Construction Typical Pipeline Sequencing

Data Source: NW Natural North Mist Expansion Project

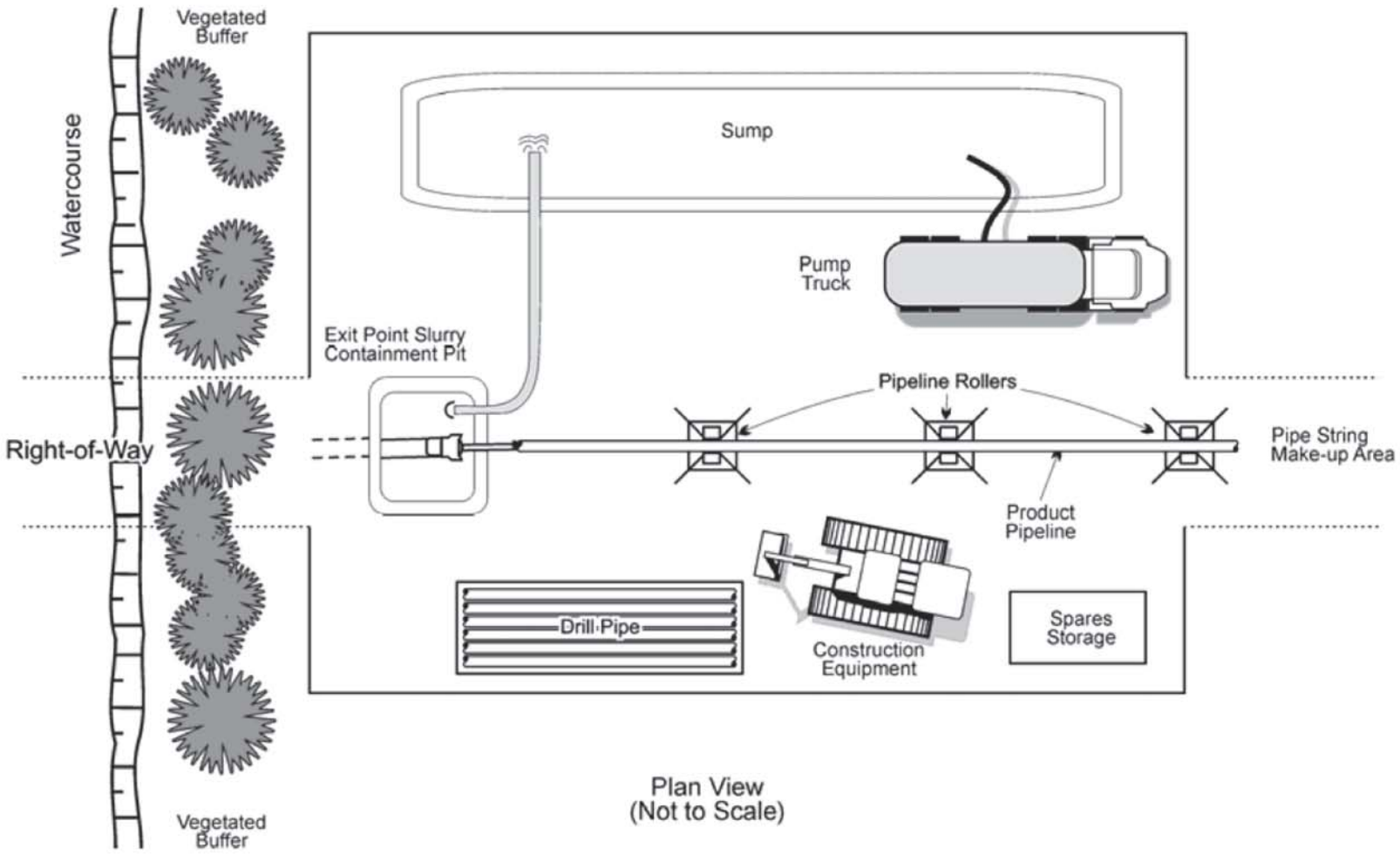
T:\GIS\projects\Emerald\Emerald\workspace\2015.04.21 NMEP Amendment 11 B-5 Overall NMTP Construction Typical.mxd 4/21/2015

(A) Typical Rig Side Work Space



Plan View
(Not to Scale)

(B) Typical Pipe Side Layout



Plan View
(Not to Scale)

Source: Adapted from ASCE 1996

NW Natural

North Mist Expansion Project

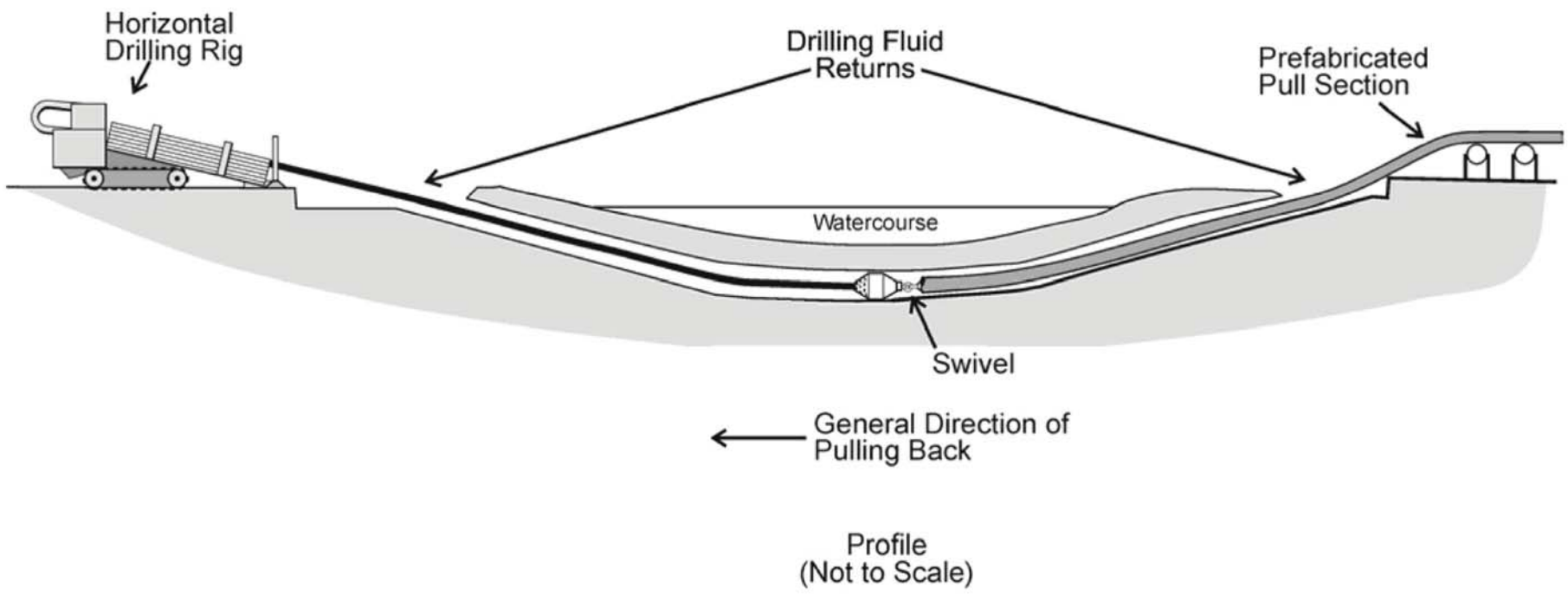
Request for Amendment to Site Certificate

Columbia County, OR
April 2015

Construction Typical HDD Layout

Data Source: NW Natural North Mist Expansion Project

I:\GISprojects\Emerald\Emerald\workspace\2015.03.30 NMEP Amendment Figure8c.mxd 3/31/2015



Profile
(Not to Scale)

Source: Adapted from ASCE 1996, TERA 1998

NW Natural

North Mist Expansion Project

Request for Amendment
to Site Certificate

Columbia County, OR
April 2015

Construction Typical
HDD Layout #2

Data Source: NW Natural North Mist Expansion Project

I:\GISprojects\Emerald\Emerald\workspace\2015.03.30 NMEP Amendment Figure8d.mxd 3/31/2015

ATTACHMENT C-2: CROSS SECTIONS

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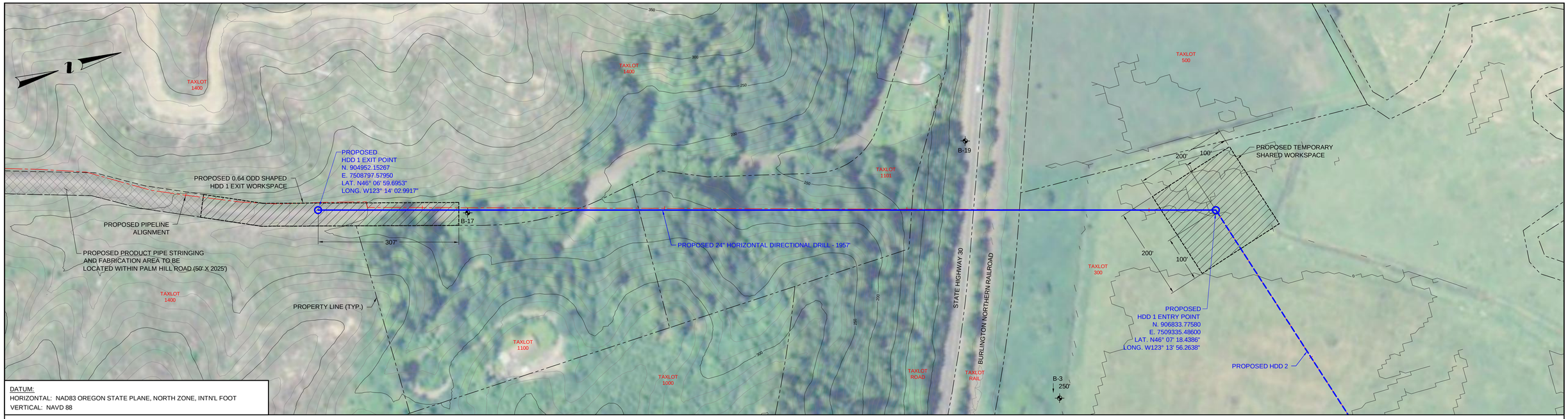
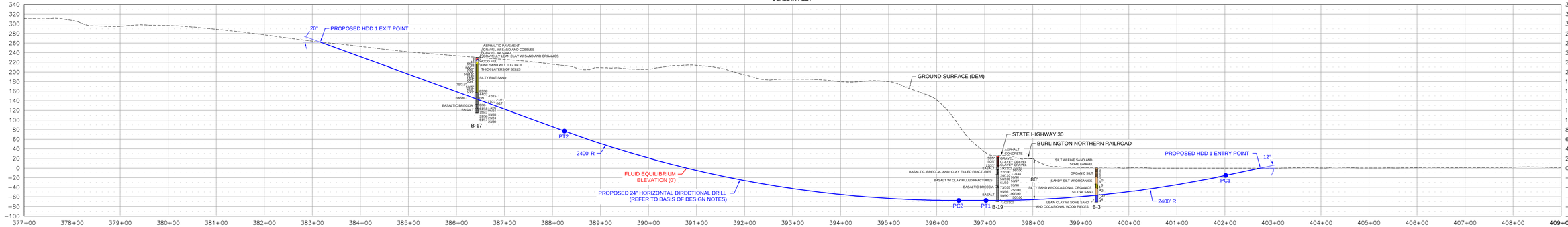


DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN

100' 0 100'
SCALE IN FEET

MAJOR CONTOUR INTERVAL = 50'
MINOR CONTOUR INTERVAL = 10'



PROFILE

100' 0 100'
HORIZONTAL SCALE IN FEET

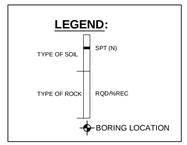
100' 0 100'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 1		
DESCRIPTION	STATION * (FT)	ELEVATION (FT)
ENTRY @ 12°	402+73.80	0.02
P C 1 (12.00° @ 2,400 FT R.)	402+01.77	-15.30
P T 1	397+02.78	-67.74
P C 2 (20.00° @ 2,400 FT R.)	396+45.94	-67.74
P T 2	388+25.09	77.00
* EXIT @ 20°	383+16.80	262.00
HORIZONTAL DISTANCE = 1,957.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 2,011.81 FT		

* THE STATIONING IS BASED ON AN ARBITRARY REFERENCE POINT

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:



DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
2. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) = 809 psi

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

NOTES

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
2. WORK SPACE: MAXIMUM WORK SPACE LIMITS ARE DEPICTED. RESTRICT CLEARING TO THE WORK SPACE INDICATED AT THE ENTRY AND EXIT POINTS AND PRODUCT PIPE STRINGING AND FABRICATION AREA ALONG THE CONSTRUCTION RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS REQUIRES PRIOR APPROVAL FROM THE ENVIRONMENTAL INSPECTOR AND IS LIMITED TO THE AMOUNT NECESSARY TO STRING SURVEY WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
3. WATER SOURCE: DRILL WATER AND HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
4. HYDROSTATIC TEST: PRE-INSTALLATION AND POST-INSTALLATION HYDROSTATIC TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE HYDROSTATIC TEST PLAN. TEST WATER SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE TEST WATER SHALL BE DISCHARGED IN AN UPLAND AREA INTO AN EROSION CONTROL STRUCTURE OF STRAW BALES AND/OR SILT FENCES, GEOTEXTILE FILTER BAG, OR COLLECTED IN A TRUCK AND HAULED TO AN APPROVED DISPOSAL SITE. UPON COMPLETION OF DEWATERING AND DRYING, A CALIPER PIG SURVEY SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. SPILL-PREVENTION: REFUELING OF ALL EQUIPMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE SPCC PLAN.
6. EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
7. INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE APPROVED CONSTRUCTION RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN. AFTER THE PILOT HOLE IS COMPLETE, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO NORTHWEST NATURAL FOR APPROVAL. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULL BACK.
8. DRILLING FLUID DISPOSAL: CONTRACTOR SHALL DISPOSE OF EXCESS DRILLING FLUID AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS. UNDER NO CIRCUMSTANCES SHALL DRILLING FLUID BE DISPOSED OF IN WATER BODIES OR WETLANDS. ANY DRILLING FLUID WHICH INADVERTENTLY SURFACES AT POINTS OTHER THAN THE ENTRY OR EXIT POINTS SHALL BE CONTAINED AND COLLECTED TO THE EXTENT PRACTICAL AND DISPOSED OF AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS.
9. CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEEDED AS SPECIFIED IN THE CLEAN-UP AND RESTORATION REQUIREMENTS.
10. GEOTECHNICAL DATA: BORE HOLES ARE OFFSET FROM THE PIPELINE CENTERLINE AS SHOWN ON THE PLAN VIEW. THE GEOTECHNICAL INFORMATION PROVIDED ON THIS DRAWING IS A GENERAL SUMMARY. REFER TO THE APPLICABLE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS FOR MORE DETAILED INFORMATION.
11. IF THE TERRAIN ALLOWS AND ACCESS IS PERMITTED, CONTRACTOR SHALL UTILIZE LOW GROUND PRESSURE EQUIPMENT OR OTHER EQUIPMENT APPROVED BY OWNER, TO FACILITATE CONTAINMENT AND CLEAN-UP OF ANY INADVERTENT RETURNS THAT OCCUR DURING THE HDD INSTALLATION PROCESS.
12. THE MINIMUM ALLOWABLE THREE JOINT RADIUS SHALL NOT BE LESS THAN 1900 FEET.
13. AERIAL PHOTOS AND GROUND SURFACE DEM (1/9 ARC SECOND) DOWNLOADED FROM HTTP://VIEWER.NATIONALMAP.GOV/VIEWER/. BASE FILES PROVIDED BY NORTHWEST NATURAL.
14. CONTRACTOR IS RESPONSIBLE FOR CALLING OREGON ONE-CALL AND PHYSICALLY LOCATING ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. IF ANY UTILITY IS LOCATED WITHIN 15 FEET OF THE DESIGNED HDD PROFILE AND ALIGNMENT, CONTRACTOR SHALL OBTAIN APPROVAL FROM NORTHWEST NATURAL PRIOR TO INITIATING HDD OPERATIONS.
15. A SITE SPECIFIC SURVEY DOCUMENTING EXISTING UTILITIES HAS NOT BEEN CONDUCTED ALONG THE PROPOSED PIPELINE ALIGNMENT. A SITE SPECIFIC TOPOGRAPHIC AND UTILITY SURVEY SHOULD BE COMPLETED PRIOR TO FINAL ISSUANCE OF THESE PLANS. DURING CONSTRUCTION, IT IS THE CONTRACTORS RESPONSIBILITY TO IDENTIFY AND PROTECT ANY UTILITY THAT MAY BE AFFECTED BY THE HDD OPERATIONS.
16. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER NORTHWEST NATURAL SPECIFICATIONS, CONTRACT DOCUMENTS, AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.

REFERENCE DRAWINGS	
DRAWING NO.	TITLE

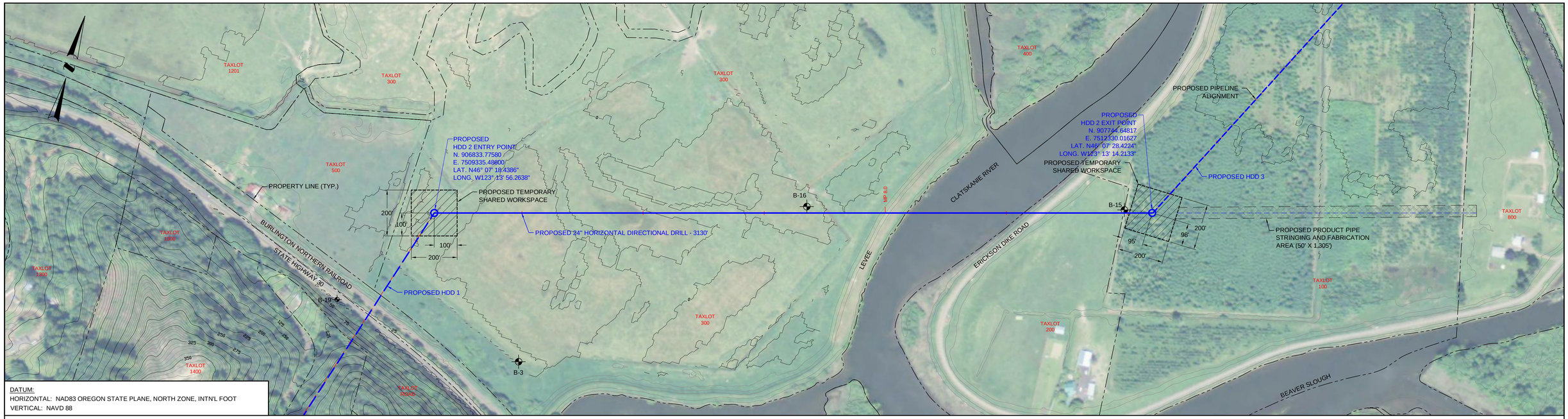
REVISIONS						
NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
B	04/20/15	BTL	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GEOENGINEERS
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
FAX: (503) 620-5940

NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 377+00 TO 409+00
HDD 1
COLUMBIA COUNTY, OREGON

NW Natural

DRAWN BY: MWC	DATE: 06/02/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/02/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 1	SHEET 1
WO:		TIME: 04:06 PM DATE: 04/20/15 PATH: P:\650\2415\70\ACAD\HDD 1_DRAFT Rev8.dwg	OF 1

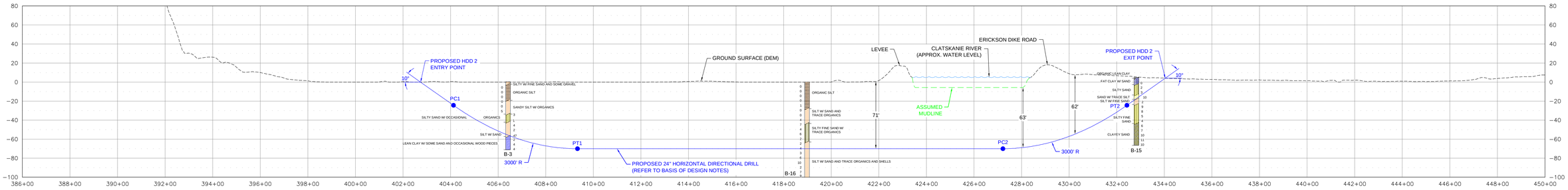


DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN

200' 0 200'
SCALE IN FEET

MAJOR CONTOUR INTERVAL - 25'
MINOR CONTOUR INTERVAL = 5'



PROFILE

200' 0 200'
HORIZONTAL SCALE IN FEET

50' 0 50'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 2		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 10°	402+73.75	0.01
P C 1 (10.00° @ 3,000 FT R.)	404+12.31	-24.42
P T 1	409+33.25	-70.00
P C 2 (10.00° @ 3,000 FT R.)	427+21.45	-70.00
P T 2	432+42.39	-24.42
EXIT @ 10°	434+03.75	4.03
HORIZONTAL DISTANCE = 3,130.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 3,139.94 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:
TYPE OF SOIL
SPT (N)
BORING LOCATION

DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
2. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) = 809 psi

NOTES

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
2. WORK SPACE: MAXIMUM WORK SPACE LIMITS ARE DEPICTED. RESTRICT CLEARING TO THE WORK SPACE INDICATED AT THE ENTRY AND EXIT POINTS AND PRODUCT PIPE STRINGING AND FABRICATION AREA ALONG THE CONSTRUCTION RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS REQUIRES PRIOR APPROVAL FROM THE ENVIRONMENTAL INSPECTOR AND IS LIMITED TO THE AMOUNT NECESSARY TO STRING SURVEY WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
3. WATER SOURCE: DRILL WATER AND HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
4. HYDROSTATIC TEST: PRE-INSTALLATION AND POST-INSTALLATION HYDROSTATIC TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE HYDROSTATIC TEST PLAN. TEST WATER SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE TEST WATER SHALL BE DISCHARGED IN AN UPLAND AREA INTO AN EROSION CONTROL STRUCTURE OF STRAW BALES AND/OR SILT FENCES, GEOTEXTILE FILTER BAG, OR COLLECTED IN A TRUCK AND HAULED TO AN APPROVED DISPOSAL SITE. UPON COMPLETION OF DEWATERING AND DRYING, A CALIPER PIG SURVEY SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
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7. INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE APPROVED CONSTRUCTION RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN. AFTER THE PILOT HOLE IS COMPLETE, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO NORTHWEST NATURAL FOR APPROVAL. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULL BACK.
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12. THE MINIMUM ALLOWABLE THREE JOINT RADIUS SHALL NOT BE LESS THAN 2400 FEET.
13. AERIAL PHOTOS AND GROUND SURFACE DEM (1/9 ARC SECOND) DOWNLOADED FROM HTTP://VIEWER.NATIONALMAP.GOV/VIEWER/. BASE FILES PROVIDED BY NORTHWEST NATURAL.
14. CONTRACTOR IS RESPONSIBLE FOR CALLING OREGON ONE-CALL AND PHYSICALLY LOCATING ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. IF ANY UTILITY IS LOCATED WITHIN 15 FEET OF THE DESIGNED HDD PROFILE AND ALIGNMENT, CONTRACTOR SHALL OBTAIN APPROVAL FROM NORTHWEST NATURAL PRIOR TO INITIATING HDD OPERATIONS.
15. A SITE SPECIFIC SURVEY DOCUMENTING EXISTING UTILITIES HAS NOT BEEN CONDUCTED ALONG THE PROPOSED PIPELINE ALIGNMENT. A SITE SPECIFIC TOPOGRAPHIC AND UTILITY SURVEY SHOULD BE COMPLETED PRIOR TO FINAL ISSUANCE OF THESE PLANS. DURING CONSTRUCTION, IT IS THE CONTRACTORS RESPONSIBILITY TO IDENTIFY AND PROTECT ANY UTILITY THAT MAY BE AFFECTED BY THE HDD OPERATIONS.
16. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER NORTHWEST NATURAL SPECIFICATIONS, CONTRACT DOCUMENTS, AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

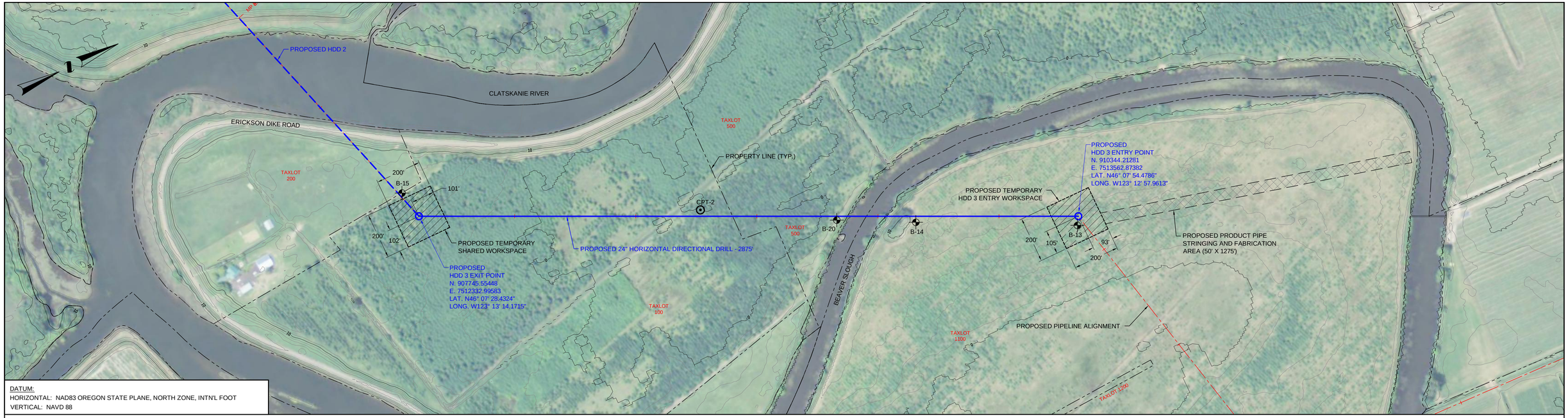
REFERENCE DRAWINGS		REVISIONS						
DRAWING NO.	TITLE	NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
		A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
		B	04/20/15	BTL	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GeoEngineers
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
FAX: (503) 620-5940

NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 386+00 TO 450+00
HDD 2
COLUMBIA COUNTY, OREGON

NW Natural

DRAWN BY: MWC	DATE: 06/02/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/02/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 2	SHEET 1
WO:		TIME: 06:44 PM DATE: 04/20/15 PATH: P:\65\0024157\5\6\CAD\HDD 2_DRAFT Rev8.dwg	OF 1

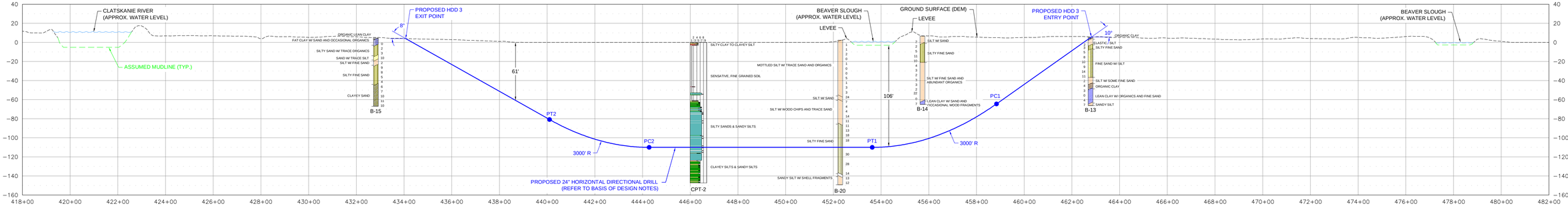


DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN

200' 0 200'
SCALE IN FEET

MAJOR CONTOUR INTERVAL - 10'
MINOR CONTOUR INTERVAL = 2'



DIRECTIONAL DRILL DATA HDD 3		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 10°	462+81.50	5.69
P C 1 (10.00° @ 3,000 FT R.)	458+83.87	-64.42
P T 1	453+62.93	-110.00
P C 2 (8.00° @ 3,000 FT R.)	444+27.40	-110.00
P T 2	440+09.88	-80.80
EXIT @ 8°	434+06.50	3.99
HORIZONTAL DISTANCE = 2,875.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 2,891.08 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:
TYPE OF SOIL
SPT (N)
BORING LOCATION

PROFILE

200' 0 200'
HORIZONTAL SCALE IN FEET
50' 0 50'
VERTICAL SCALE IN FEET

NOTES

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
2. WORK SPACE: MAXIMUM WORK SPACE LIMITS ARE DEPICTED. RESTRICT CLEARING TO THE WORK SPACE INDICATED AT THE ENTRY AND EXIT POINTS AND PRODUCT PIPE STRINGING AND FABRICATION AREA ALONG THE CONSTRUCTION RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS REQUIRES PRIOR APPROVAL FROM THE ENVIRONMENTAL INSPECTOR AND IS LIMITED TO THE AMOUNT NECESSARY TO STRING SURVEY WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
3. WATER SOURCE: DRILL WATER AND HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
4. HYDROSTATIC TEST: PRE-INSTALLATION AND POST-INSTALLATION HYDROSTATIC TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE HYDROSTATIC TEST PLAN. TEST WATER SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE TEST WATER SHALL BE DISCHARGED IN AN UPLAND AREA INTO AN EROSION CONTROL STRUCTURE OF STRAW BALES AND/OR SILT FENCES, GEOTEXTILE FILTER BAG, OR COLLECTED IN A TRUCK AND HAULED TO AN APPROVED DISPOSAL SITE. UPON COMPLETION OF DEWATERING AND DRYING, A CALIPER PIG SURVEY SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. SPILL-PREVENTION: REFUELING OF ALL EQUIPMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE SPCC PLAN.
6. EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
7. INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE APPROVED CONSTRUCTION RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN. AFTER THE PILOT HOLE IS COMPLETE, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO NORTHWEST NATURAL FOR APPROVAL. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULL BACK.
8. DRILLING FLUID DISPOSAL: CONTRACTOR SHALL DISPOSE OF EXCESS DRILLING FLUID AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS. UNDER NO CIRCUMSTANCES SHALL DRILLING FLUID BE DISPOSED OF IN WATER BODIES OR WETLANDS. ANY DRILLING FLUID WHICH INADVERTENTLY SURFACES AT POINTS OTHER THAN THE ENTRY OR EXIT POINTS SHALL BE CONTAINED AND COLLECTED TO THE EXTENT PRACTICAL AND DISPOSED OF AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS.
9. CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEEDED AS SPECIFIED IN THE CLEAN-UP AND RESTORATION REQUIREMENTS.
10. GEOTECHNICAL DATA: BORE HOLES ARE OFFSET FROM THE PIPELINE CENTERLINE AS SHOWN ON THE PLAN VIEW. THE GEOTECHNICAL INFORMATION PROVIDED ON THIS DRAWING IS A GENERAL SUMMARY. REFER TO THE APPLICABLE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS FOR MORE DETAILED INFORMATION.
11. IF THE TERRAIN ALLOWS AND ACCESS IS PERMITTED, CONTRACTOR SHALL UTILIZE LOW GROUND PRESSURE EQUIPMENT OR OTHER EQUIPMENT APPROVED BY OWNER, TO FACILITATE CONTAINMENT AND CLEAN-UP OF ANY INADVERTENT RETURNS THAT OCCUR DURING THE HDD INSTALLATION PROCESS.
12. THE MINIMUM ALLOWABLE THREE JOINT RADIUS SHALL NOT BE LESS THAN 2400 FEET.
13. AERIAL PHOTOS AND GROUND SURFACE DEM (1/9 ARC SECOND) DOWNLOADED FROM HTTP://VIEWER.NATIONALMAP.GOV/VIEWER/. BASE FILES PROVIDED BY NORTHWEST NATURAL.
14. CONTRACTOR IS RESPONSIBLE FOR CALLING OREGON ONE-CALL AND PHYSICALLY LOCATING ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. IF ANY UTILITY IS LOCATED WITHIN 15 FEET OF THE DESIGNED HDD PROFILE AND ALIGNMENT, CONTRACTOR SHALL OBTAIN APPROVAL FROM NORTHWEST NATURAL PRIOR TO INITIATING HDD OPERATIONS.
15. A SITE SPECIFIC SURVEY DOCUMENTING EXISTING UTILITIES HAS NOT BEEN CONDUCTED ALONG THE PROPOSED PIPELINE ALIGNMENT. A SITE SPECIFIC TOPOGRAPHIC AND UTILITY SURVEY SHOULD BE COMPLETED PRIOR TO FINAL ISSUANCE OF THESE PLANS. DURING CONSTRUCTION, IT IS THE CONTRACTORS RESPONSIBILITY TO IDENTIFY AND PROTECT ANY UTILITY THAT MAY BE AFFECTED BY THE HDD OPERATIONS.
16. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER NORTHWEST NATURAL SPECIFICATIONS, CONTRACT DOCUMENTS, AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.

DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
2. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) = 809 psi

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

REFERENCE DRAWINGS	
DRAWING NO.	TITLE

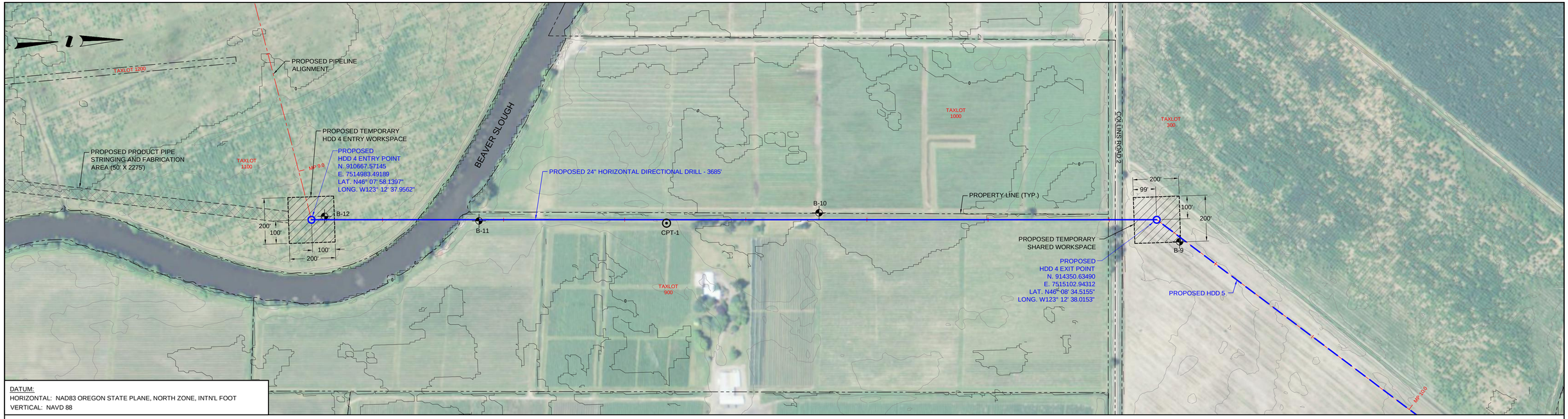
REVISIONS						
NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
B	04/20/15	BTL	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GEOENGINEERS
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
FAX: (503) 620-5940

NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 418+00 TO 482+00
HDD 3
COLUMBIA COUNTY, OREGON

NW Natural

DRAWN BY: MWC	DATE: 06/03/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/03/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 3	SHEET 1
WO:		TIME: 06:54 PM DATE: 04/20/15 PATH: P:\560\24\57\04\CAD\HDD 3_DRAFT Rev6.dwg	OF 1

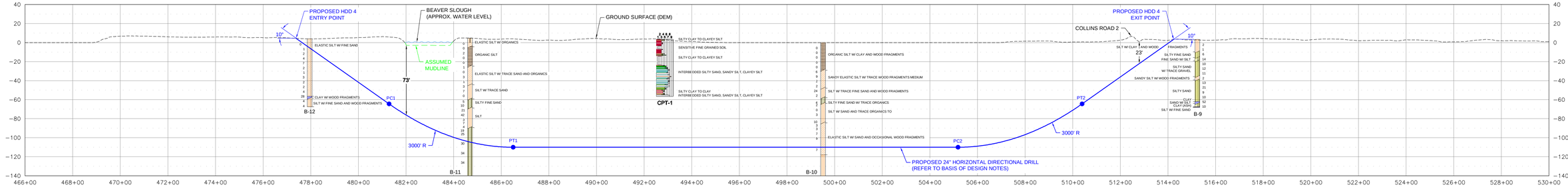


DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN

200' 0 200'
SCALE IN FEET

MAJOR CONTOUR INTERVAL = 10'
MINOR CONTOUR INTERVAL = 2'



PROFILE

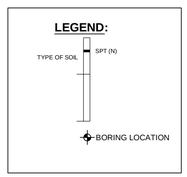
200' 0 200'
HORIZONTAL SCALE IN FEET

50' 0 50'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 4		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 10°	477+38.46	4.42
P C 1 (10.00° @ 3,000 FT R.)	481+28.90	-64.42
P T 1	486+49.84	-110.00
P C 2 (10.00° @ 3,000 FT R.)	505+18.21	-110.00
P T 2	510+39.16	-64.42
EXIT @ 10°	514+23.46	3.34
HORIZONTAL DISTANCE = 3,685.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 3,702.26 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED, UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:



DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
2. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) = 809 psi

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

NOTES

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
2. WORK SPACE: MAXIMUM WORK SPACE LIMITS ARE DEPICTED. RESTRICT CLEARING TO THE WORK SPACE INDICATED AT THE ENTRY AND EXIT POINTS AND PRODUCT PIPE STRINGING AND FABRICATION AREA ALONG THE CONSTRUCTION RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS REQUIRES PRIOR APPROVAL FROM THE ENVIRONMENTAL INSPECTOR AND IS LIMITED TO THE AMOUNT NECESSARY TO STRING SURVEY WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
3. WATER SOURCE: DRILL WATER AND HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
4. HYDROSTATIC TEST: PRE-INSTALLATION AND POST-INSTALLATION HYDROSTATIC TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE HYDROSTATIC TEST PLAN. TEST WATER SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE TEST WATER SHALL BE DISCHARGED IN AN UPLAND AREA INTO AN EROSION CONTROL STRUCTURE OF STRAW BALES AND/OR SILT FENCES, GEOTEXTILE FILTER BAG, OR COLLECTED IN A TRUCK AND HAULED TO AN APPROVED DISPOSAL SITE. UPON COMPLETION OF DEWATERING AND DRYING, A CALIPER PIG SURVEY SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. SPILL-PREVENTION: REFUELING OF ALL EQUIPMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE SPCC PLAN.
6. EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
7. INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE APPROVED CONSTRUCTION RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN. AFTER THE PILOT HOLE IS COMPLETE, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO NORTHWEST NATURAL FOR APPROVAL. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULL BACK.
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9. CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEEDED AS SPECIFIED IN THE CLEAN-UP AND RESTORATION REQUIREMENTS.
10. GEOTECHNICAL DATA: BORE HOLES ARE OFFSET FROM THE PIPELINE CENTERLINE AS SHOWN ON THE PLAN VIEW. THE GEOTECHNICAL INFORMATION PROVIDED ON THIS DRAWING IS A GENERAL SUMMARY. REFER TO THE APPLICABLE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS FOR MORE DETAILED INFORMATION.
11. IF THE TERRAIN ALLOWS AND ACCESS IS PERMITTED, CONTRACTOR SHALL UTILIZE LOW GROUND PRESSURE EQUIPMENT OR OTHER EQUIPMENT APPROVED BY OWNER, TO FACILITATE CONTAINMENT AND CLEAN-UP OF ANY INADVERTENT RETURNS THAT OCCUR DURING THE HDD INSTALLATION PROCESS.
12. THE MINIMUM ALLOWABLE THREE JOINT RADIUS SHALL NOT BE LESS THAN 2400 FEET.
13. AERIAL PHOTOS AND GROUND SURFACE DEM (1/9 ARC SECOND) DOWNLOADED FROM HTTP://VIEWER.NATIONALMAP.GOV/VIEWER/. BASE FILES PROVIDED NORTHWEST NATURAL.
14. CONTRACTOR IS RESPONSIBLE FOR CALLING OREGON ONE-CALL AND PHYSICALLY LOCATING ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. IF ANY UTILITY IS LOCATED WITHIN 15 FEET OF THE DESIGNED HDD PROFILE AND ALIGNMENT, CONTRACTOR SHALL OBTAIN APPROVAL FROM NORTHWEST NATURAL PRIOR TO INITIATING HDD OPERATIONS.
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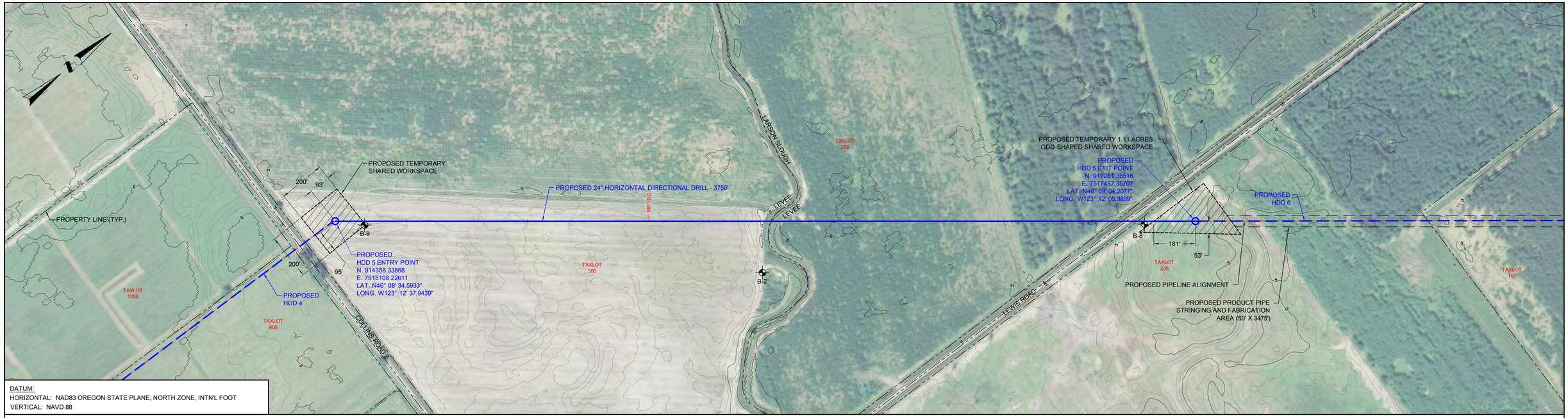
REFERENCE DRAWINGS		REVISIONS						
DRAWING NO.	TITLE	NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
		A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
		B	04/20/15	BTL	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GEOENGINEERS
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
FAX: (503) 620-5940

NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 466+00 TO 530+00
HDD 4
COLUMBIA COUNTY, OREGON

NW Natural

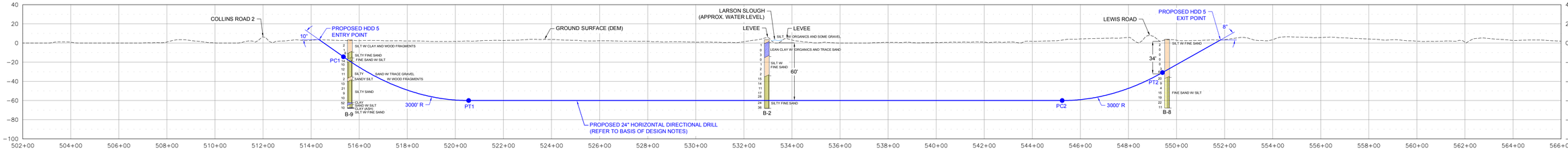
DRAWN BY: MWC	DATE: 06/03/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/03/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 4	SHEET 1
WO:		TIME: 06:59 PM DATE: 04/20/15 PATH: P:\560\2415\70\ECAD\HDD\4_DRAFT_Rev5.dwg	OF 1



DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN
200' 0 200'
SCALE IN FEET

MAJOR CONTOUR INTERVAL = 5'
MINOR CONTOUR INTERVAL = 1'



PROFILE
200' 0 200'
HORIZONTAL SCALE IN FEET
50' 0 50'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 5		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 10°	514+33.01	3.44
P C 1 (10.00° @ 3,000 FT R.)	515+34.32	-14.42
P T 1	520+55.26	-60.00
P C 2 (8.00° @ 3,000 FT R.)	545+24.15	-60.00
P T 2	549+41.66	-30.80
EXIT @ 8°	551+83.01	3.11
HORIZONTAL DISTANCE = 3,750.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 3,757.95 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:
TYPE OF SOIL
SPT (N)
BORING LOCATION

DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
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16. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER NORTHWEST NATURAL SPECIFICATIONS, CONTRACT DOCUMENTS, AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

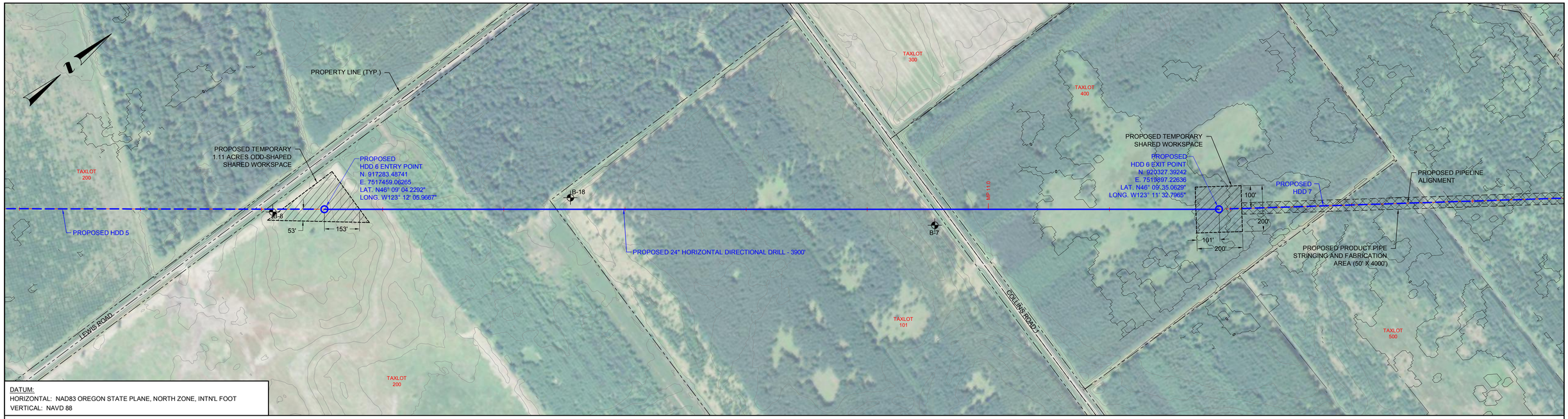
REFERENCE DRAWINGS		REVISIONS						
DRAWING NO.	TITLE	NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
		A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
		B	04/20/15	MWC	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GEOENGINEERS
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
FAX: (503) 620-5940

NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 502+00 TO 566+00
HDD 5
COLUMBIA COUNTY, OREGON

NW Natural

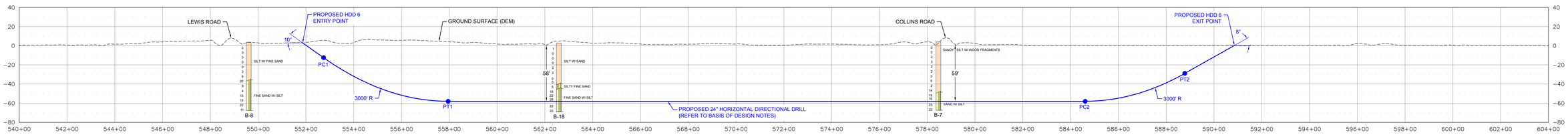
DRAWN BY: MWC	DATE: 06/04/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/04/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 5	SHEET 1 OF 1
WO:		TIME: 05:00 PM DATE: 04/20/15 PATH: C:\Users\mclevenger\Desktop\HDD 5_DRAFT Rev0.dwg	



DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN
200' 0 200'
SCALE IN FEET

MAJOR CONTOUR INTERVAL = 10'
MINOR CONTOUR INTERVAL = 2'



PROFILE
200' 0 200'
HORIZONTAL SCALE IN FEET
50' 0 50'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 6		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 10°	551+85.73	3.15
P C 1 (10.00° @ 3,000 FT R.)	552+74.05	-12.42
P T 1	557+95.00	-58.00
P C 2 (8.00° @ 3,000 FT R.)	584+60.82	-58.00
P T 2	588+78.34	-28.80
EXIT @ 8°	590+85.73	0.34
HORIZONTAL DISTANCE = 3,900.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 3,907.41 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:
SPT (N) — TYPE OF SOIL
BORING LOCATION

DRAFT

NOTES

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
2. WORK SPACE: MAXIMUM WORK SPACE LIMITS ARE DEPICTED. RESTRICT CLEARING TO THE WORK SPACE INDICATED AT THE ENTRY AND EXIT POINTS AND PRODUCT PIPE STRINGING AND FABRICATION AREA ALONG THE CONSTRUCTION RIGHT-OF-WAY. CLEARING BETWEEN THE ENTRY AND EXIT POINTS REQUIRES PRIOR APPROVAL FROM THE ENVIRONMENTAL INSPECTOR AND IS LIMITED TO THE AMOUNT NECESSARY TO STRING SURVEY WIRES AND INSTALL PUMPS AND PIPING TO OBTAIN WATER (WHERE APPROVED).
3. WATER SOURCE: DRILL WATER AND HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE.
4. HYDROSTATIC TEST: PRE-INSTALLATION AND POST-INSTALLATION HYDROSTATIC TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE HYDROSTATIC TEST PLAN. TEST WATER SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE TEST WATER SHALL BE DISCHARGED IN AN UPLAND AREA INTO AN EROSION CONTROL STRUCTURE OF STRAW BALES AND/OR SILT FENCES, GEOTEXTILE FILTER BAG, OR COLLECTED IN A TRUCK AND HAULED TO AN APPROVED DISPOSAL SITE. UPON COMPLETION OF DEWATERING AND DRYING, A CALIPER PIG SURVEY SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. SPILL-PREVENTION: REFUELING OF ALL EQUIPMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE SPCC PLAN.
6. EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
7. INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE APPROVED CONSTRUCTION RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN. AFTER THE PILOT HOLE IS COMPLETE, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO NORTHWEST NATURAL FOR APPROVAL. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULL BACK.
8. DRILLING FLUID DISPOSAL: CONTRACTOR SHALL DISPOSE OF EXCESS DRILLING FLUID AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS. UNDER NO CIRCUMSTANCES SHALL DRILLING FLUID BE DISPOSED OF IN WATER BODIES OR WETLANDS. ANY DRILLING FLUID WHICH INADVERTENTLY SURFACES AT POINTS OTHER THAN THE ENTRY OR EXIT POINTS SHALL BE CONTAINED AND COLLECTED TO THE EXTENT PRACTICAL AND DISPOSED OF AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS.
9. CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEEDED AS SPECIFIED IN THE CLEAN-UP AND RESTORATION REQUIREMENTS.
10. GEOTECHNICAL DATA: BORE HOLES ARE OFFSET FROM THE PIPELINE CENTERLINE AS SHOWN ON THE PLAN VIEW. THE GEOTECHNICAL INFORMATION PROVIDED ON THIS DRAWING IS A GENERAL SUMMARY. REFER TO THE APPLICABLE GEOTECHNICAL REPORT IN THE CONTRACT DOCUMENTS FOR MORE DETAILED INFORMATION.
11. IF THE TERRAIN ALLOWS AND ACCESS IS PERMITTED, CONTRACTOR SHALL UTILIZE LOW GROUND PRESSURE EQUIPMENT OR OTHER EQUIPMENT APPROVED BY OWNER, TO FACILITATE CONTAINMENT AND CLEAN-UP OF ANY INADVERTENT RETURNS THAT OCCUR DURING THE HDD INSTALLATION PROCESS.
12. THE MINIMUM ALLOWABLE THREE JOINT RADIUS SHALL NOT BE LESS THAN 2400 FEET.
13. AERIAL PHOTOS AND GROUND SURFACE DEM (1/9 ARC SECOND) DOWNLOADED FROM HTTP://VIEWER.NATIONALMAP.GOV/VIEWER/. BASE FILES PROVIDED BY NORTHWEST NATURAL.
14. CONTRACTOR IS RESPONSIBLE FOR CALLING OREGON ONE-CALL AND PHYSICALLY LOCATING ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. IF ANY UTILITY IS LOCATED WITHIN 15 FEET OF THE DESIGNED HDD PROFILE AND ALIGNMENT, CONTRACTOR SHALL OBTAIN APPROVAL FROM NORTHWEST NATURAL PRIOR TO INITIATING HDD OPERATIONS.
15. A SITE SPECIFIC SURVEY DOCUMENTING EXISTING UTILITIES HAS NOT BEEN CONDUCTED ALONG THE PROPOSED PIPELINE ALIGNMENT. A SITE SPECIFIC TOPOGRAPHIC AND UTILITY SURVEY SHOULD BE COMPLETED PRIOR TO FINAL ISSUANCE OF THESE PLANS. DURING CONSTRUCTION, IT IS THE CONTRACTORS RESPONSIBILITY TO IDENTIFY AND PROTECT ANY UTILITY THAT MAY BE AFFECTED BY THE HDD OPERATIONS.
16. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER NORTHWEST NATURAL SPECIFICATIONS, CONTRACT DOCUMENTS, AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
2. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) = 809 psi

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

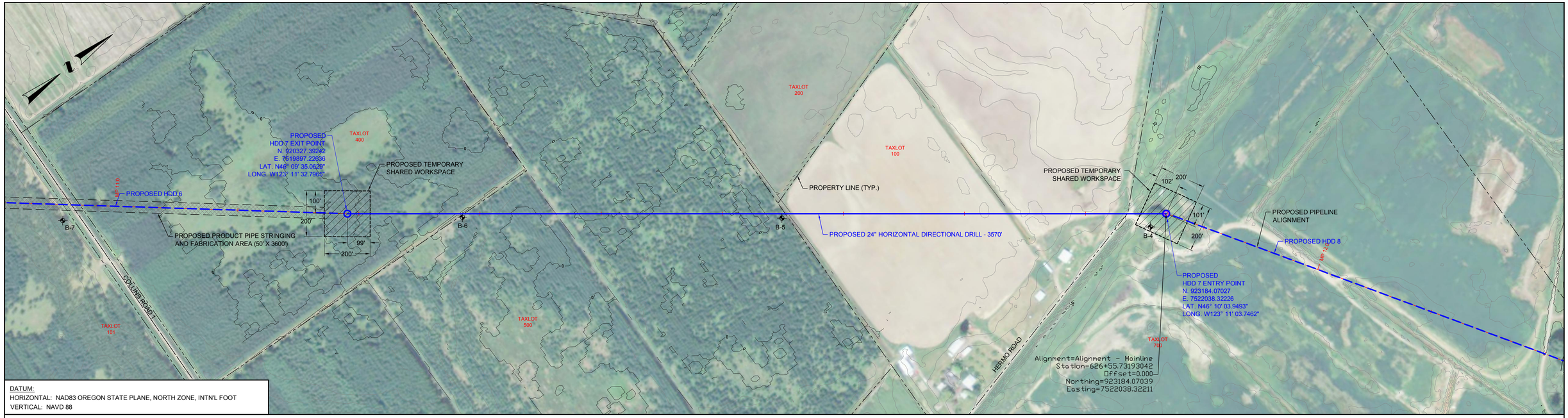
REFERENCE DRAWINGS		REVISIONS						
DRAWING NO.	TITLE	NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
		A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
		B	04/20/15	MWC	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GeoEngineers
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
FAX: (503) 620-5940

NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 540+00 TO 604+00
HDD 6
COLUMBIA COUNTY, OREGON

NW Natural

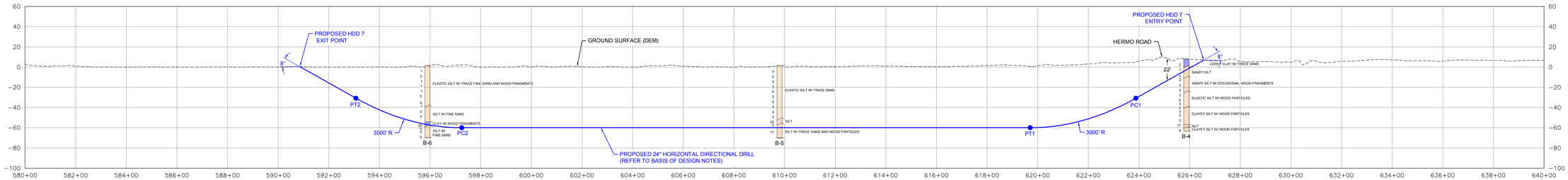
DRAWN BY: MWC	DATE: 06/05/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/05/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 6	SHEET 1
WO:		TIME: 05:01 PM DATE: 04/20/15 PATH: C:\Users\mclevenger\Desktop\HDD 6_DRAFT Rev5.dwg	OF 1



DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN
200' 0 200'
SCALE IN FEET

MAJOR CONTOUR INTERVAL = 10'
MINOR CONTOUR INTERVAL = 2'



PROFILE
200' 0 200'
HORIZONTAL SCALE IN FEET
50' 0 50'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 7		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 8°	626+55.73	6.88
P C 1 (8.00° @ 3,000 FT R.)	623+87.62	-30.80
P T 1	619+70.10	-60.00
P C 2 (8.00° @ 3,000 FT R.)	597+24.85	-60.00
P T 2	593+07.33	-30.80
EXIT @ 8°	590+85.73	0.34
HORIZONTAL DISTANCE = 3,570.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 3,577.53 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
PILOT HOLE EXIT ANGLE	INCREASE ANGLE UP TO 1° (STEEPER) OR DECREASE UP TO 2° (FLATTER).
PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:
SPT (N) — TYPE OF SOIL
BORING LOCATION

DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
2. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) = 809 psi

NOTES

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NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

REFERENCE DRAWINGS		REVISIONS						
DRAWING NO.	TITLE	NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
		A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
		B	04/20/15	TJB	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GEOENGINEERS
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NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 580+00 TO 640+00
HDD 7
COLUMBIA COUNTY, OREGON

NW Natural

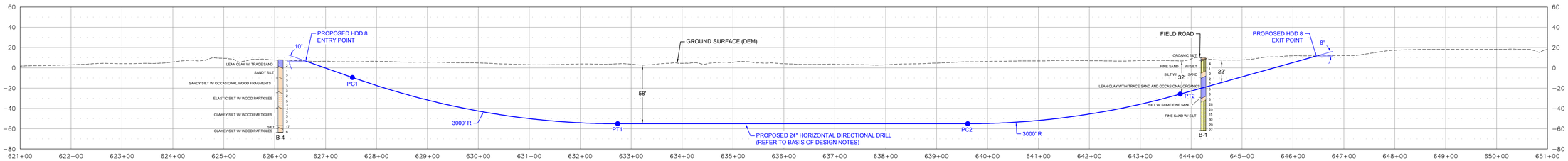
DRAWN BY: MWC	DATE: 06/05/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/05/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 7	SHEET 1
WO:		TIME: 05:05 PM DATE: 04/20/15 PATH: C:\Users\mclevenger\Desktop\HDD 7_DRAFT Rev5.dwg	OF 1

DATUM:
HORIZONTAL: NAD83 OREGON STATE PLANE, NORTH ZONE, INTN'L FOOT
VERTICAL: NAVD 88

PLAN

100' 0 100'
SCALE IN FEET

MAJOR CONTOUR INTERVAL = 10'
MINOR CONTOUR INTERVAL = 2'



PROFILE

100' 0 100'
HORIZONTAL SCALE IN FEET
50' 0 50'
VERTICAL SCALE IN FEET

DIRECTIONAL DRILL DATA HDD 8		
DESCRIPTION	STATION (FT)	ELEVATION (FT)
ENTRY @ 10°	626+60.88	6.75
P C 1 (10.00° @ 3,000 FT R.)	627+52.58	-9.42
P T 1	632+73.52	-55.00
P C 2 (8.00° @ 3,000 FT R.)	639+61.19	-55.00
P T 2	643+78.71	-25.80
EXIT @ 8°	646+45.88	11.74
HORIZONTAL DISTANCE = 1,985.00 FT		
DIRECTIONAL DRILL PIPE LENGTH = 1,993.05 FT		

RECOMMENDED TOLERANCES	
ITEM	TOLERANCE
PILOT HOLE ENTRY ANGLE	INCREASE ANGLE UP TO 1° (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
PILOT HOLE ENTRY LOCATION	AS PER COORDINATES PROVIDED BY COMPANY WITH NO CHANGES WITHOUT COMPANY APPROVAL.
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PILOT HOLE EXIT LOCATION	UP TO 20 FEET BEYOND OR 10 FEET SHORT OF THE EXIT STAKE. BETWEEN 5 FEET LEFT AND 5 FEET RIGHT OF CENTERLINE.
PILOT HOLE DEPTH	UP TO 2 FEET ABOVE THE DESIGN DRILL PROFILE ALLOWED. UP TO 10 FEET BELOW THE DESIGN DRILL PROFILE ALLOWED.
PILOT HOLE ALIGNMENT	SHALL REMAIN WITHIN 5 FEET LEFT OR RIGHT OF THE HDD ALIGNMENT.

LEGEND:

TYPE OF SOIL — SPT (N)

BORING LOCATION

DRAFT

BASIS OF DESIGN:

1. PRODUCT PIPE WILL CONSIST OF 24" O.D. X 0.500" W.T., API-5L X-52 PIPE WITH 14-16 MILS OF FUSION BONDED EPOXY (FBE) AND A MINIMUM OF 40 MILS OF ABRASION RESISTANT OVERLAY (ARO).
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NOTES

1. ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY OR FROM APPROVED ACCESS ROADS.
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16. CONTRACTOR SHALL ADHERE TO THE SPECIFICATIONS AND REQUIREMENTS PER NORTHWEST NATURAL SPECIFICATIONS, CONTRACT DOCUMENTS, AND SPECIAL PERMIT CONDITIONS, EXCEPT AS NOTED ON THIS DRAWING.

NOTE: THIS IS A FULL SIZE DRAWING THAT IS INTENDED TO BE PRINTED ON A 24" X 36" SHEET OF PAPER.

REFERENCE DRAWINGS	
DRAWING NO.	TITLE

REVISIONS							
NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
A	07/02/14	MWC	ISSUED AS DRAFT		BCR	TNH
B	04/20/15	TJB	ISSUED AS DRAFT (24-INCH REDESIGN)		BCR	TNH

GEOENGINEERS
15055 SW SEQUOIA PARKWAY
PORTLAND, OREGON 97224
TELEPHONE: (503) 624-9274
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NORTHWEST NATURAL
NORTH MIST EXPANSION PROJECT
STATION 621+00 TO 651+00
HDD 8
COLUMBIA COUNTY, OREGON

NW Natural

DRAWN BY: MWC	DATE: 06/05/14	ISSUED FOR BID:	SCALE: AS NOTED
CHECKED BY: BCR	DATE: 06/05/14	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: HDD 8	SHEET 1
WO:		TIME: 05:07 PM DATE: 04/20/15 PATH: C:\Users\mclevenger\Desktop\HDD 8_DRAFT Rev5.dwg	OF 1

ATTACHMENT D: EROSION CONTROL SEDIMENT PLAN

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The Erosion and Sediment Control Plan can be found as Attachment H-C to Exhibit H.

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ATTACHMENT E: WETLAND DELINEATION REPORT

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The Wetland Delineation Report can be found as Attachment J-2 to Exhibit J.

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ATTACHMENT F: INADVERTENT RETURN RESPONSE PLAN

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NW Natural

Inadvertent Return Response Plan

Wetlands and Perennial Streams

In the event of an Inadvertent Return (IR), or unintentional release of drilling mud under pressure into perennial streams or wetlands, the following response plan would be implemented.

1. **Pre-drilling**.

   Pipeline construction personnel and inspection staff would be adequately trained prior to construction to identify and use appropriate response materials. The following materials would be on-site during drilling and available for transport to the vent location within 30 minutes:

   - Vacuum Truck with sufficient capacity for an immediate response; arrangements for additional trucks as needed prior to commencing bores
   - Certified Weed Free Straw or hay bales
   - Stakes to secure bales
   - Silt fence
   - Sand bags
   - Leak-free hose(s) and pump(s)
   - Straw logs (wattles, or fiber rolls)
   - Heavy-duty push brooms
   - Light tower(s) (if necessary, deliver to site as soon as practicable)
   - Boat with appropriate personal safety equipment, of sufficient capacity to safely conduct clean up from (if necessary, deliver to site as soon as practicable)

   A sufficient pumping system would be in place to accommodate all drilling fluids at the bore entry and exit location to contain all drilling fluids within the bore entry and exit pits.

2. **Event response.**

   In addition to previously stated measures to avoid and minimize IR related impacts, the following response measures would be implemented upon discovery of the loss of drilling fluid into streams or wetlands:

   - Directional drilling will stop immediately.

- The drill fluids will be contained immediately. Types of containment may be straw bales, sediment fence, 55 gallon barrel, culvert, or sandbags. It is up to the Environmental Inspector to determine the appropriate containment method in order to best protect the site-specific resource.
- The following entities would be contacted by phone immediately, but no later than 24 hours; USACE, DSL, DEQ or Ecology, ODFW or WDFW, and FERC. NMFS and USFWS would also be contacted in the event of impacts to federally listed species.
- In flowing streams, qualified fisheries biologists would be on alert to conduct fish salvage operations (under the appropriate permits to be acquired prior to construction) in the reach prior to any bentonite removal activities, and block nets would be employed to ensure no fish or other aquatic species reenter the affected area until after the sediments are removed.
- In delineated wetlands, qualified wetland scientists would be on-site to identify resources and monitor effects.
- Commercially available non-toxic polymers may be used in an attempt to seal the fracture.
- If a fracture cannot be sealed, where practical, the drill pipe would be removed from the existing drill hole to a point where a new drill path can be attempted by drilling out of the existing hole and creating a new hole. The old hole would be abandoned.
- If the original drill path cannot be utilized, the drill rig would be moved to a new, adjacent location, staff would verify that the new, adjacent location meets the requirements of all applicable project permits and approvals.
- If a frac-out occurs during “pull-back”, adjustments to the pull-back operations will be made to minimize inadvertent returns.

In flowing streams the following approach would generally be followed after the vent (IR) is stopped. Due to the unpredictable nature of the location and environment in which vents may appear, this description cannot encompass all possible approaches to clean up under all conditions. Agency staff and other experts would be consulted with to the extent practicable to develop ad hoc clean up techniques as needed. The following are standard response techniques that would be applied:

- If the bentonite material flows overland prior to entering the stream, installation of silt fencing or sandbag dams at the point of entry would be used to reduce or stop the flow; if the vent is directly into the stream, other means to isolate the vent site from the flowing stream would be used.
- Using a vacuum truck, with a sufficient hose, personnel would remove the bentonite, working from downstream to upstream, to allow maximum visibility. Hand tools may be used to scarify the sediments and ensure removal to maximum extent practicable.

- If necessary water may be diverted using a coffer dam to isolate the impact area. Only a portion of the stream would be diverted to minimize dewatering impacts. Water would be able to pass through the site in its natural condition.
- If it is impracticable to remove the drill fluid from the stream, a clear, written explanation would be submitted to the Corps. The Corps would coordinate with USFWS and/or NOAA Fisheries. Any fluids left in the stream channel would receive a written approval from the Corps.
- Any disturbed soils would be stabilized immediately.
- Exposed mineral soils would be seeded with native vegetation immediately.
- Disturbance of vegetation would be kept to a minimum and all disturbed vegetation would be restored and/or replanted with native species, to eventually recreate the functional values of the lost vegetation
- Damaged riffle and pool sediment strata would be re-contoured to the extent practicable under the direction of Agency personnel.
- NWN would compensate for the loss of aquatic habitat by mitigating at a ratio of 2:1. A mitigation plan would be submitted to the Corps within 7 days of a frac-out occurring. The mitigation plan would include detailed information about the frac-out, how the drill fluid was contained and removed, the amount, if any, of drill fluid left in the stream, the impact area drawn on a map, the location of the mitigation site, type of mitigation to be performed, and types of plantings.

Ephemeral Streams

In the event of an Inadvertent Return (IR) into dry ephemeral streams, a response plan similar to the above described would be implemented, with the following exceptions:

- Fisheries personnel would not be required to respond unless the IR produced sufficient flow to introduce bentonite into downstream perennial streams.
- Qualified wetlands scientists would be on-site to evaluate conditions, and to assist with minimization of further impacts resulting from clean up activities (e.g. equipment entering sensitive wetland areas).
- Mitigation would only be required for material that must be left as permanent fill in a delineated wetland.

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ATTACHMENT G: NPDES PERMIT

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DEQ USE ONLY
File #:
Application #:
LLID/RM:
River Mile:
Legal Name Confirmed: ☐
Notes:

DEPARTMENT OF ENVIRONMENTAL QUALITY
APPLICATION FOR NEW NPDES GENERAL PERMIT 1200-C

For stormwater discharges to surface waters from construction activities disturbing one acre or more that do not meet automatic coverage requirements.*

DEQ USE ONLY
Date Received:
Amount: $
Check #:
Check Name:
Deposit #:
Receipt #:
Notes:

*A project *may* be eligible for "automatic coverage" under NPDES general permit 1200-CN if stormwater *does not* discharge to a water body with a TMDL or 303(d) listing for sediment or turbidity *and* it meets one of the following criteria (see 1200-CN at http://www.deq.state.or.us/wq/wqpermit/docs/general/npdes1200cn/1200CNPermit.pdf):

1) Disturbs less than one acre and is located in Gresham, Troutdale, or Wood Village.
2) Disturbs less than five acres and is located in Albany, Corvallis, Eugene, Milwaukie, Multnomah Co. (unincorporated areas), Springfield, West Linn, or Wilsonville.
3) Disturbs less than five acres and is within the jurisdictions of Clackamas Co. Water Environment Services [Gladstone, areas within Clackamas Co. Service Dist. #1 (excluding Happy Valley), and areas within the Surface Water Management Agency of Clackamas Co. (including Rivergrove)], Clean Water Services (Banks, Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, North Plains, Sherwood, Tigard, Tualatin, and Washington Co. within Urban Growth Boundary), or Rogue Valley Sewer Services (Central Point, Phoenix, Talent, and portions of Jackson Co. in NPDES MS4 permit area).

Please answer all questions.

A. PROJECT INFORMATION

1. NW Natural
Applicant (entity legally responsible for permit)

Andrew Bauer, RG
Contact Name (if different from applicant)

220 NW 2nd Avenue
Address

Portland | Oregon | 97209
City | State | Zip

503-226-4211 | andrew.bauer@nwnatural.com
Telephone | E-Mail Address

2. Invoicing information (person or entity legally responsible for payment of annual fee invoice; not a third party independent of the applicant)

Invoice Contact Name (if different from applicant)

Address

City | State | Zip

Telephone | E-Mail Address

3. GeoEngineers, Inc.
Architect/Engineering Firm (Erosion & Sediment Control Plan)

Brian C. Ranney, CEG, CESCL
Project Manager

503-624-9274 | branney@geoengineers
Telephone | E-Mail Address

4. Andrew Bauer
Applicant's Designated Erosion and Sediment Control Inspector

NW Natural
Company Name

503-226-4211 | andrew.bauer@nwnatural.com
Telephone | E-Mail Address

5. North Mist Expansion Project
Name of Project

N/A - Mist, Oregon to Portwestward, Oregon
Address or Cross Street

Multiple	Oregon	n/A
City	State	Zip

Columbia
County

6. Nature of Construction Activity
- ☐ Single Family (SIC Code 1521)
- ☐ Multi-Family Residential (SIC Code 1522)
- ☐ Commercial (SIC Code 1542)
- ☐ Industrial (SIC Code 1541)
- ☐ Highway (SIC Code 1611)
- ☒ Utilities (SIC Code 1623): natural gas pipeline
- ☐ Other (include SIC Code): _____

7. Approximate location of center of site:

Latitude: 46.0811

Longitude: -123.2780

For assistance: DEQ Location Tool at http://deqgisweb.deq.state.or.us/llid/llid.html

8. Project Size:

Total Site Acreage (acres): 142.38

Total Disturbed Area (acres): 142.01

Total Number of Lots (if applicable): N/A

9. Stormwater runoff during construction will flow to:
- ☐ Infiltration device(s)
- ☒ Creek/Stream (provide name): Clatskanie River, Beaver Slough, Graham Creek, Larson Slough, McCoon Creek
- ☐ Ditch (provide name of receiving stream for ditch): Beaver Slough, Columbia River, Larson Slough
- ☐ Municipal storm sewer or drainage system (provide name of receiving stream for system):
- ☐ Other:

10. Stormwater runoff during construction discharges directly to or through a storm sewer or drainage system that discharges to a water body with a Total Maximum Daily Load (TMDL) or 303(d) listing for turbidity or sedimentation? ☒ YES ☐ NO

- **For assistance: DEQ Lookup Tool at http://www.deq.state.or.us/WQ/TMDLs/basinmap.htm or DEQ Map/Table at http://deq12.deq.state.or.us/tmdl/default.aspx**

B. LAND USE COMPATIBILITY STATEMENT

Submit a DEQ Land Use Compatibility Statement (LUCS) form that has been completed by the local land use authority with this application. Attach the *original* LUCS and, if applicable, written findings by the local authority. DEQ will not process the application unless the local land use authority indicates on the LUCS form that the project is compatible with the local acknowledged comprehensive plan and land use regulations.

A copy of this form may be found at http://www.deq.state.or.us/pubs/permithandbook/lucs.htm

C. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

The legally authorized representative *must* sign the application.

I hereby certify that the information contained in this application is true and correct to the best of my knowledge and belief. In addition, I agree to pay all permit fees required by Oregon Administrative Rules 340-045. This includes a compliance determination fee invoiced annually by DEQ to maintain the permit.

Andrew Bauer, RG	Environmental Specialist
Name of Legally Authorized Representative (Type or Print)	**Title**
	April 6, 2015
Signature of Legally Authorized Representative	**Date**

APPLICATION AND FEE SUBMITTAL

To authorize permit registration, the following must be completed and submitted to the appropriate DEQ regional office or DEQ Agent (see list of offices in application instructions, pp. 3-4):

- ☐ DEQ application form signed by the Legally Authorized Representative and meeting the signature requirements below.
- ☐ DEQ LUCS by local land use authority indicating the activity is compatible with local acknowledged comprehensive plan and land use regulations. Include the Findings if so stated on the LUCS.
- ☐ Stormwater Erosion and Sediment Control Plan Narrative, if applicable.
- ☐ Stormwater Erosion and Sediment Control Plan Drawings; full-sized hard copy and electronic PDF files.
- ☐ Effective 12/1/14, the fee for a new application is $1,725 payable to Oregon DEQ and you must submit it with this application. Please note that DEQ will also invoice you for an annual fee of $875 if your project needs permit coverage for more than a year. These fees are subject to change; please visit http://www.deq.state.or.us/wq/wqpermit/stminfo.htm for current fees. If you are sending your application to a DEQ Agent, check with the DEQ Agent for appropriate fees and make check payable to the DEQ Agent.

Application Instructions

A. PROJECT INFORMATION

1. Enter the legal name of the applicant. Permit coverage will be issued to this entity. This is the person, business, public organization, or other entity responsible for ensuring that erosion and sediment controls are in place and in working order through the life of the project.
   - The name must be a legal, active name registered with the Oregon Department of Commerce, Corporation Division in Salem at 503-378-4752 or http://egov.sos.state.or.us/br/pkg_web_name_srch_inq.login, unless otherwise exempted by their rules. If the name of the applicant is not registered with the Corporation Division and the applicant is a business entity, attach legal documents that verify the entity's existence with the application. The applicant may not use an assumed business name.
   - Permit coverage may be transferred from one party to another. For example, a developer may apply for a permit and then transfer the permit to a contractor. Transfer forms are available from DEQ or at http://www.deq.state.or.us/wq/stormwater/constappl.htm.
2. Provide invoice contact information for billing of DEQ annual permit fee if different from the applicant in #1 above. This is the person or entity legally responsible for payment of the annual fee invoice, not a third party independent of the applicant.
3. Provide contact information for the Architect or Consulting Engineer who designed the Erosion and Sediment Control Plan (ESCP).
4. Provide information on the Erosion and Sediment Control Inspector. This is not a DEQ or DEQ Agent inspector; this is an inspector employed by the applicant. If the inspector has not been selected yet, please provide the name of consultant who prepared the ESCP and their ESC certification. When the inspector is selected, submit to DEQ or to the DEQ Agent, the name, contact information, training and experience (see condition A.12.b.iii of the 1200-C).
5. Provide the common name of the project (for example, the name of the subdivision), the location of the site with respect to crossroads in the area, and, if available, a street address.
6. Check the box that best describes the nature of the construction activity. If "other" is selected, describe the use and include a Standard Industrial Classification Code (visit http://www.osha.gov/pls/imis/sicsearch.html for codes).
7. Enter latitude and longitude for the approximate center of the site (DEQ Location Tool at http://deqgisweb.deq.state.or.us/llid/llid.html or at http://deqapp1/website/lit/data.asp).
8. Provide information on the project size as indicated (based on the total project and not just a single phase).
9. Indicate where stormwater runoff during construction will flow. Use your best judgment to determine the name of the receiving water body.
10. Indicate whether stormwater runoff during construction will discharge directly to or through a storm sewer or drainage system that discharges to a Total Maximum Daily Load (TMDL) or 303(d) listed water body for turbidity or sedimentation. To make this determination, the following tools are available on DEQ's website:
    - Map and table: http://www.deq.state.or.us/WQ/TMDLs/basinmap.htm
    - Lookup tool: http://deq12.deq.state.or.us/tmdl/default.aspx

B. LAND USE COMPATIBILITY STATEMENT

Complete as indicated.

C. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

DEFINITION OF LEGALLY AUTHORIZED REPRESENTATIVE:

Please also provide the information requested in brackets *[ ]*

- **Corporation** - president, secretary, treasurer, vice-president, or any person who performs principal business functions; or a manager of one or more facilities that is authorized in accordance to corporate procedure to sign such documents.
- **Partnership** - General partner *[list of general partners, their addresses, and telephone numbers]*.
- **Sole Proprietorship** - Owner(s) *[each owner must sign the application]*.
- **City, County, State, Federal, or other Public Facility** - Principal executive officer or ranking elected official.
- **Limited Liability Company** - Member *[articles of organization]*.
- **Trusts** – Acting trustee *[list of trustees, their addresses, and telephone numbers]*.

(please see 40 CFR §122.22 for more detail, if needed)

APPLICATION AND FEE SUBMITTAL

Submit this application, Narrative Parts I, II & III (if applicable), LUCS, Erosion and Sediment Control Plan(2 full-sized hard copies and 1 PDF copy), and the applicable fee to the appropriate DEQ regional office or DEQ Agent listed below. Contact the appropriate DEQ regional office or DEQ Agent for the best way to submit the electronic version of the ESCP.

- If you are in an area serviced by a DEQ Agent, check with the DEQ Agent for appropriate fees and make check payable to the DEQ Agent.
- If you are sending your application to DEQ, the fee for a new application is $1,725 payable to the Oregon DEQ. Please note that DEQ will also invoice you for an annual fee of $875 if your project needs permit coverage for more than a year. These fees are subject to change; visit http://www.deq.state.or.us/wq/wqpermit/stminfo.htm for current fees.

City of Eugene 99 W. 10th Avenue Eugene, OR 97401 541-682-2706	**City of Hermiston** 215 Gladys Avenue Hermiston, OR 97838 541-667-5025	**City of Troutdale** 342 SW 4th Street Troutdale, OR 97060 503-674-3300
Clean Water Services 2550 SW Hillsboro Highway Hillsboro, OR 97123 503-681-5101 *Includes Banks, Beaverton, Cornelius, Durham, Forest Grove, Gaston, Hillsboro, King City, North Plains, Sherwood, Tigard, Tualatin, and portions of Washington Co.*	**Rogue Valley Sewer Services** 138 West Vilas Road, PO Box 3130 Central Point, OR 97502 541-664-6300 *Includes Central Point, Phoenix, Talent, White City and portions of Jackson Co.*	**Clackamas Co. Water Environmental Services** 150 Beavercreek Road, Suite 430 Oregon City, OR 97045 503-742-4567 *Unincorporated Clackamas County and areas within the Cities of Rivergrove and Gladstone*

DEQ Northwest Region	DEQ Western Region		DEQ Eastern Region		
DEQ Northwest Region 2020 SW 4th Avenue, Suite 400 Portland, OR 97201-4987 503-229-5263 or 1-800-452-4011	**DEQ Western Region** 165 East 7th Avenue, Suite 100 Eugene, OR 97401 541-687-7326 or 1-800-844-8467		**DEQ Eastern Region** 800 SE Emigrant Avenue, Suite 330 Pendleton, OR 97801 541-278-4605 or 1-800-304-3513		
Clackamas	Benton	Lane	Baker	Hood River	Sherman
Clatsop	Coos	Lincoln	Crook	Jefferson	Umatilla
Columbia	Curry	Linn	Deschutes	Klamath	Union
Multnomah	Douglas	Marion	Gilliam	Lake	Wallowa
Tillamook	Jackson	Polk	Grant	Malheur	Wasco
Washington	Josephine	Yamhill	Harney	Marrow	Wheeler

Margaret D. Kirkpatrick
Vice President & General Counsel
Tel: 503.220.2356
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e-mail: mdk@nwnatural.com

NW Natural
220 NW 2ND AVENUE
PORTLAND, OR 97209
TEL 503.226.4211
800.422.4012
www.nwnatural.com

October 24, 2011

Oregon Department of Environmental Quality
811 SW 6th Avenue
Portland 97204-1390

Washington State Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Re: Signature Authority on behalf of Margaret Kirkpatrick for Oregon DEQ and Washington DOE Permit Applications for NW Natural.

To Whom It May Concern:

The following named individuals, accompanied by their sample signatures, are delegated the authority to sign permit applications with Oregon Department of Environmental Quality and Washington State Department of Ecology, whether by hand or electronically, for Northwest Natural Gas Company ("NW Natural"), on behalf of myself, Margaret D. Kirkpatrick, an officer of NW Natural. This delegation will remain in effect until I revoke the authority in writing, or in any event upon separation of the named individual's employment from NW Natural.

Andrew Bauer

Michael Hayward

Todd Jones

John McDonald

My contact information is noted on the letterhead. Please call me if you have any questions.

Very Truly Yours,

Margaret D. Kirkpatrick

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ATTACHMENT H: RESTORATION AND REHABILITATION OF TEMPORARY IMPACTS PLAN

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Site Rehabilitation of Temporary Impacts Plan

Prepared for:

Northwest Natural

Prepared by:

Tetra Tech, Inc.

April 2015

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1.0 Introduction

NW Natural (NWN) proposes to construct the North Mist Expansion Project (Project) approximately 3 miles north of NWN's existing Miller Station compressor facility near the town of Mist, in Columbia County, Oregon. Construction of the Project will result in temporary impacts to waters of the state. This site rehabilitation plan presents goals and objectives, jurisdictional authority, implementation, and follow-through methods for restoring temporary wetland impacts. Temporary impacts to wetlands include construction activities that do not result in permanent removal or fill, such as construction of staging areas, or temporary contouring allowing for access of equipment.

Once NWN has received a Site Certificate from the State of Oregon and necessary authorizations from the federal agencies, it will do final engineering on the final Project location. At this time, NWN will prepare a final Site Rehabilitation Plan for submittal to ODSL and USACE. The final Site Rehabilitation Plan will be updated prior to the submittal of the JPA.

1.1 Purpose

Rules regulating the rehabilitation of temporary wetland impacts are provided in Oregon Administrative Rule (OAR) 141-085-0715: Mitigation for Temporary Impacts (ODSL 2011a).

This OAR provides that a rehabilitation plan should be designed to:

- Re-establish the pre-existing contours of the site;
- Re-establish the pre-existing vegetation community; and
- Provide for rapid site stabilization to prevent erosion.

The Oregon Department of State Lands (ODSL) further provides rehabilitation guidelines for temporary impacts in A Guide to the Removal-Fill Permit Process (ODSL 2011b). The rehabilitation plan should include a grading plan and list of seeds and plants to be utilized, as applicable. A monitoring plan (including monitoring method, criteria and duration) must also be included to confirm successful re-establishment of the wetland and vegetation. Temporary impacts that are rectified within 24 months from the date the impacts generally occurred do not require compensatory mitigation; however, site rehabilitation and monitoring is required (ODSL 2011b).

1.2 Goals and Objectives

The primary goal of the rehabilitation plan is to assist NWN and its contractors in restoring wetland habitat affected by temporary impacts within 24 months of disturbance. This goal is established pursuant to the definitions of OAR 141-085-0510, which states:

- "Temporary Impacts" are adverse impacts to waters of this state that are rectified within 24-months from the date the impact occurred; and

- "Wetland Restoration" means to re-establish a former wetland.

The Plan provides measures that will be implemented prior to and during construction with the objective of minimizing wetland habitat impacts. It also provides details and measures that will be implemented following construction with the objectives of reestablishing, maintaining and monitoring wetlands temporarily impacted by construction.

2.0 Rehabilitation Plan

NWN will begin rehabilitation of disturbed sites as soon as practicable after construction is completed. The rehabilitation plan is applicable to all temporary wetland impacts along the pipeline right-of-way (ROW), staging areas, laydown areas associated with HHD and temporary work areas. Measures to be implemented to ensure successful rehabilitation include topsoil and subsoil segregation and stockpiling during construction, cleanup, appropriate surface recontouring, soil erosion control, seedbed preparation, application of ecologically site-specific seed mixes, weed abatement, and monitoring.

2.1 Site Preparation

Initial construction activities include marking wetland boundaries clearly with highly visible flagging and signs, installing temporary sediment controls, segregating and stockpiling topsoil, and grading for safe construction passage. Dense stands of noxious and invasive weeds would be treated with approved herbicides prior to vegetation clearing.

Prior to construction, topsoil would be stockpiled and separated from subsoil. NWN will minimize the length of time that topsoil is stockpiled. Surface soil thickness would vary throughout the construction area, depending on soil type; however, the top 1 foot of wetland topsoil would be preserved to the greatest extent feasible. Surface topsoil containing the seed reservoir and existing vegetation would be scraped and stored. The topsoil/vegetation mixture would not be mixed with underlying subsoil horizons. Oregon-certified weed-free erosion control blankets and/or silt fence would be used to contain and limit erosion at the stockpiles as needed. Surface soil and sub-surface soils would be replaced in the proper order during cleanup and final grading operations.

Trees in the poplar plantations, located north of Highway 30 will be cut down to the soils surface elevation by the landowner. NWN will disc stumps in place. If soils are wet, construction mats will be used to lessen impacts to soils.

2.2 Site Restoration

Restoration would include cleanup, soil decompaction, topsoil replacement, surface grading/contouring, installation of soil erosion and sediment control measures, and seedbed preparation.

Compacted soils would typically be associated along the pipeline ROW, staging areas, and temporary work areas. Subsoil decompaction would occur prior to surface soil replacement as

necessary to reduce soil bulk density. Identified locations would be decompacted by discing to a minimum depth of 6 – 12 inches.

The stockpiled topsoil/vegetation mixture would be re-spread after re-contouring is completed. In wetlands, the segregated top 1 foot of topsoil would be restored to its original location. The topsoil/vegetation mixture would provide seeds, vegetative propagules, and soil microbiota to facilitate vegetation establishment in temporary construction areas.

The pipeline ROW, staging area, and other temporary work areas would be graded and contoured to blend within the surrounding landscape. Topsoil would be returned to the surface area of any excavation creating a roughened surface to capture precipitation, decrease erosion, and provide micro-habitats for plant establishment. Contouring would emphasize restoration of existing drainage and landform patterns, to the greatest extent practicable.

Seedbed preparation would consist of grading/contouring, decompacting soils, and restoring surface soil as described above. Specific wetland Best Management Practices (BMPs) referenced in this plan will be employed in wetland areas to avoid rutting and damage from equipment. The seedbed would be firm but not compacted.

Soil erosion and sediment control would occur through establishing desirable wetland vegetation and adjacent upland/riparian vegetation using measures such as mulch, erosion and control blankets. The Project would establish a desirable wetland plant cover as quickly as possible to minimize soil erosion and control sedimentation. Mulch, certified weed-free erosion control blankets and sediment logs, and/or water bars may also be used as appropriate.

In general, the following construction BMPs for erosion and sediment control will be followed:

- Exposed soils will be stabilized during and after construction in order to prevent erosion and sedimentation.
- Filter bags, sediment fences, sediment traps or catch basins, leave strips or berms, or other measures will be used to prevent movement of soil into waterways and wetlands.
- Silt fence, impervious materials or other equally effective methods, will be used to protect stockpiled soil during rain events or when the stockpile site is not moved or reshaped for more than 48 hours.
- Where vegetation is used for erosion control on slopes steeper than 2:1, a tackified seed mulch will be used so the seed does not wash away before germination and rooting.
- Dredged or other excavated material will be placed on upland areas having stable slopes and will be prevented from eroding back into waterways and wetlands.
- Erosion control measures will be inspected and maintained as necessary to ensure their continued effectiveness until soils become stabilized.
- All erosion control structures will be removed when the project is complete and soils are stabilized and vegetated.

A specific list of the type and timing for each BMP is described in the Erosion and Sediment Control Plan included as an attachment of the Joint Permit Application (JPA).

Soil amendments are intended to minimize soil erosion and subsequent sedimentation, conserve soil moisture, provide cover, and moderate temperatures to facilitate the germination of seeds.

2.3 Revegetation

A native revegetation plan will be utilized to facilitate restoration of the temporary wetland impact areas within the ROW, extra workspaces, and access roads. Seeding would be the primary method of reestablishing herbaceous wetland plants. Revegetation efforts would be supplemented by the natural growth and regeneration of seed and plant propagules contained in the segregated and stockpiled wetland topsoil.

2.3.1 Design Basis

The design basis for this Plan is provided by the documentation from field surveys of pre-disturbance site conditions, including existing plant communities/associations, species occurrence and dominance, and percent cover.

2.3.2 Seed Planting Methods

Each site scheduled for rehabilitation will be evaluated to determine the most cost-effective means of establishing a suitable suite of plants as rapidly as possible. This evaluation will include a determination of how the site needs to be prepared to receive seeds and live plants, as well as what species to plant on the site. Planting would be done at the appropriate time of year to facilitate seed germination, based on weather conditions and the time of year when construction-related ground disturbance occurs. Choice of planting methods would be based on site-specific factors such as slope, erosion potential and the size of the site in need of revegetation. Disturbed ground may require chemical or mechanical weed control before weeds have a chance to go to seed.

Broadcasting seeding techniques would be used. Seeding would be done after ground-disturbing activities are complete and at the appropriate time of year (preferably in the fall or, if fall is not an option, the spring). If there is a lag time between the end of ground-disturbing activities and seeding, BMPs from the Stormwater Pollution Prevention Plan (SWPPP) will be implemented. Drill seeding would be the primary method for seeding. Broadcast seeding distributes the seed on top of the soil surface using a hand-held spreader, all-terrain vehicle–mounted cyclone-type seed spreader, or seed blower. Area where broadcast seeding is used would be hand-raked, or a harrow would be used to cover the seed.

Hydro-seeding and hydro-mulching would not be used in wetland areas or near water bodies. Should the water levels in the restoration areas rise above the hydro-seeded/mulched area prior to seed germination and establishment, the mulch, binder, and seed would float and wash away.

2.3.3 Seed Mixes by Ecoregion

The following sections provide information about the ecoregion the Project is located in, and provide suggested species for use in planting mixes. Species lists for planting presented here are not intended to be either exhaustive or limiting. They represent only a small fraction of species that may be suitable for use in the ecoregion and on a site by site basis.

The Project is located within the Level IV Volcanics ecoregion, which is in the Level III Coast Range ecoregion (Thorson et al. 2003). The ecoregion has different soil characteristics based on wetland types, requiring seed mixes and plants that would thrive under the site conditions. The mean annual precipitation is 70 – 200 inches. The land cover and land use for the Volcanics is mostly forested lands with logging activity and some pasturelands and some rural residential.

Table 1 shows the native trees, shrubs, and herbs that were documented during the wetland delineations in 2013, 2014 and 2015that may be used for site revegetation. The choice of seed mixtures would be dependent on the existing vegetation types, the availability of commercial, weed-free live seed at the time of seeding, and landowner approval.

Table 1. Native Plants Documented during Surveys

Scientific Name	Common Name	Wetland Indicator
Trees		
Acer circinatum	Vine Maple	FAC
Alnus rubra	Red Alder	FAC
Thuja plicata	Western Arborvitae	FAC
Tsuga heterophylla	Western Hemlock	FACU
Shrubs		
Berberis nervosa	Dwarf Oregon Grape	UPL
Menziesia ferruginea	Fool's-Huckleberry	FACU
Ribes lacustre	Bristly Black Gooseberry	FAC
Rubus parviflorus	Western Thimble-Berry	FACU
Rubus spectabilis	Salmon Raspberry	FAC
Rubus ursinus	California Dewberry	FACU
Salix sessilifolia	Sessile-Leaf Willow	FACW
Sambucus racemosa	Red Elderberry	FACU
Spiraea douglasii	Douglas' Meadowsweet	FACW
Vaccinium membranaceum	Square-Twig Blueberry	FACU
Vaccinium ovalifolium	Oval-Leaf Blueberry	UPL
Herbs		
Athyrium filix-femina	Subarctic Lady Fern	FAC
Blechnum spicant	Deer Fern	FAC
Cardamine angulate	Seaside Bittercress	FACW
Cardamine oligosperma	Little Western Bittercress	FAC
Carex amplifolia	Big-Leaf Sedge	OBL
Carex nebrascensis	Nebraska Sedge	OBL
Carex obnupta	Slough Sedge	OBL

Table 1. Native Plants Documented during Surveys		
Scientific Name	**Common Name**	**Wetland Indicator**
Chrysosplenium glechomifolium	Pacific Golden-Saxifrage	OBL
Claytonia sibirica	Siberian Springbeauty	FAC
Dicentra Formosa	Pacific Bleedinghearts	FACU
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum arvense	Field Horsetail	FAC
Equisetum hyemale	Tall Scouring-Rush	FACW
Equisetum telmateia	Giant Horsetail	FACW
Galium aparine	Sticky-Willy	FACU
Gaultheria shallon	Salal	FACU
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria elata	Tall Manna Grass	FACW
Hydrophyllum tenuipes	Pacific Waterleaf	FAC
Impatiens capensis	Spotted Touch-Me-Not	FACW
Juncus bufonius	Toad Rush	FACW
Juncus effuses	Lamp Rush	FACW
Juncus tenuis	Lesser Poverty Rush	FAC
Lysichiton americanus	Yellow-Skunk-Cabbage	OBL
Maianthemum dilatatum	Two-Leaf False Solomon's-Seal	FAC
Mentha X piperita	Peppermint	FACW
Myosotis laxa	Bay Forget-Me-Not	OBL
Oenanthe sarmentosa	Pacific Water-Dropwort	OBL
Oplopanax horridus	Devil's-Club	FAC
Oxalis oregano	Redwood-Sorrel	FACU
Petasites frigidus	Arctic Sweet-Colt's-Foot	FACW
Petasites palmatus	Western Colt's Foot	FAC
Poa palustris	Fowl Blue Grass	FAC
Polygonum lapathifolium	Pale Smartweed	FAC
Polystichum munitum	Pineland Sword Fern	FACU
Pteridium aquilinum	Northern Bracken Fern	FACU
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Stachys Mexicana	Mexican Hedge-Nettle	FACW
Tellima grandiflora	Fragrant Fringecup	FACU
Tolmiea menziesii	Piggyback-Plant	FAC
Vicia Americana	American Purple Vetch	FAC

2.3.4 Best Management Practices

Pertinent BMPs for wetland rehabilitation are included here for reference.

- Minimize the length of time that topsoil is segregated.
- Limit the operation of construction equipment within wetlands to that needed for clearing, facility installation, and restoration.

- Limit pulling of tree stumps and grading activities in wetlands located along laydown areas in poplar plantations.
- Limit grading impacts in saturated or standing-water wetlands and/or in wetlands where rutting may occur by using low ground-weight construction equipment or by operating normal equipment on prefabricated timber or terra mats.
- Segregate the top 1 foot of topsoil from the area disturbed, except in areas where standing water is present or soils are saturated or frozen. Immediately after cleanup, restore the segregated topsoil to its original location.
- Prohibit storage of hazardous materials, chemicals, fuels, and lubricating oils within 100 feet of a wetland boundary unless infeasible.
- Prohibit the refueling of equipment within 100 feet of wetlands unless infeasible.
- Establish stable surface and drainage conditions and the use of erosion control devices to minimize soil erosion and sedimentation. Sediment barriers will be installed prior to initial disturbance in wetlands and adjacent uplands to prevent sediment transport into the wetland.
- Re-establish terrain compatible with the surrounding landscape.
- Use native plant species for revegetation unless it is determined that: (1) suitable native species are not available; and (2) analysis of the site indicates that native species are unable to compete with invasive weeds.

3.0 Draft Monitoring Plan

The purpose of monitoring is to evaluate vegetative survival and establishment, soil moisture, sustaining hydrology, and occurrence of noxious weeds and to identify corrective measures that may be required to ensure successful restoration

3.1 Performance Standards for Rehabilitation

Goal 1: Restore wetland hydrology.

Objective 1: Restore pre-construction soil contours.

Performance Standard 1: Restored soil contours match existing contours of undisturbed soil surface adjacent to the disturbance site.

Objective 2: Restore pre-construction soil texture.

Performance Standard 1: Restored soil has drainage characteristics like undisturbed soil adjacent to the disturbance site; e.g., does not exhibit inappropriate ponding characteristic of compacted soil.

Goal 2: Establish wetland vegetation similar to the native plant component of the temporarily impacted wetlands.

Objective 1: Achieve similar densities of native vegetation at the temporary impact site as were present pre-construction.

Performance Standard 1: Meet or exceed woody stem counts per acre as determined from pre-disturbance conditions.

Performance Standard 2: Three years post-construction, vegetation communities will have relative cover of tree, shrub and herbaceous species within ten percent of similar adjacent or nearby wetlands.

3.2 Monitoring Schedule and Methodology

NWN will monitor temporary impact sites for three years. In years 1, 2, and 3, vegetation will be monitored by visually estimating and recording aerial cover of native verse non-native species. Monitoring events will occur annually during the growing season.

3.3 Reporting and Documentation

NWN will provide a post-construction report demonstrating as-built conditions 120 days from Project completion. It will include representative photographs of completed restoration areas, documentation of plant and seed materials received from the commercial sources, documentation of soil amendments used, and a summary of pertinent issues encountered during the implementation of the rehabilitation plan.

For annual reporting, NWN will document the monitoring results in an annual report. Annual reports are described in Section 6.0, below.

4.0 Maintenance Plan

Maintenance of plantings and seeded areas during the establishment period (i.e., the 24 months following construction) is an essential component of the rehabilitation plan. The objectives of post-installation maintenance are to prevent soil erosion, ensure establishment of trees and shrubs, and remove non-native vegetation that could inhibit native herbaceous plant establishment.

After each monitoring visit, a qualified investigator will report to NWN regarding the revegetation progress of each restored site. The investigator will make recommendations for reseeding or other remedial measures for sites that are not showing sufficient progress toward achieving revegetation success. For sites that fail to meet performance standards, see Section 5.0, Contingency Plan, below.

5.0 Contingency Plan

Where initial restoration and plant establishment efforts fail to meet plant establishment standards, reseeding, replanting, live cuttings, and/or transplanting may be required to ensure restoration success. Contingency measures that may be implemented include:

- Harvesting and transplanting herbaceous plugs, shrubs, and trees;
- Live cutting collection, storage, and planting; and
- Planting of commercially grown herbaceous plugs or potted shrubs and trees.

Given the 24-month timeframe associated with rehabilitation of temporary impacts, NWN will make a determination of the requirement for contingency measures at the end of the first growing season based on monitoring results.

6.0 Reporting

NWN will document the monitoring results in an annual report. It is expected that a single annual report will be prepared for the entire Project, and that this report will be submitted to ODSL and USACE. The reports will provide a summary of Project reclamation activities and observations, progress towards or achievement of success, identify any specific problem areas along the Project, and will include recommendations for additional corrective actions if necessary.

7.0 References

ODSL (Oregon Department of State Lands). 2011a. Oregon State Archives. Oregon Administrative Rules. Division 85. Administrative Rules Governing the Issuance and Enforcement of Removal-Fill Authorizations within Waters of Oregon Including Wetlands. Available at: http://arcweb.sos.state.or.us/pages/rules/oars_100/oar_141/141_085.html.

ODSL. 2011b. A Guide to the Removal-Fill Permit Process. Available at: http://www.oregonstatelands.us/DSL/PERMITS/docs/RFG_Portfolio_March_2011.pdf.

Thorson, T.D., Bryce, S.A., Lammers, D.A., Woods, A.J., Omernik, J.M., Kagan, J., Pater, D.E., and Comstock, J.A., 2003. Ecoregions of Oregon (color poster with figure, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (figure scale 1:1,500,000). Available online at http://www.epa.gov/wed/pages/ecoregions/or_eco.htm.

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ATTACHMENT I: SIGNATURES

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(12) SIGNATURES

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance.
To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.

Fee Amount Enclosed	$

Applicant Signature

Print Name	Title
Signature	Date

Authorized Agent Signature

Print Name	Title
Signature	Date

Landowner Signature(s)

Landowner of the Project Site (if different from applicant)

Print Name Rick Stonex	Title manager, Lower Columbia Tree Farm LLC
Signature Rick Stonex	Date March 26, 2015

Landowner of the Mitigation Site (if different from applicant)

Print Name	Title
Signature	Date

Department of State Lands, Property Manager (to be completed by DSL)

If the project is located on state-owned submerged and submersible lands, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.

Print Name	Title
Signature	Date

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