Appendix E
Wetland Delineation Report

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WETLAND REPORT

Union Pacific Railroad
Second Mainline Track Project
Wasco County, OR

Union Pacific Railroad

October 2014

CDM Smith

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Section 1

Introduction

CDM Smith was retained by Union Pacific Railroad (UPRR) to conduct a delineation of wetlands under the jurisdiction of the Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act. The delineation was conducted to identify potential jurisdictional waters of the United States that occur within the project area for the proposed Second Mainline Track Project in Wasco County, Oregon.

CDM Smith conducted a field investigation for wetlands within the proposed project area on October 15-17, 2013. This delineation report documents our findings regarding the occurrence and extent of wetlands located in the project area. This report documents the field investigation, best professional judgment, and conclusions of CDM Smith scientists. However, the jurisdictional determination of wetland boundaries and associated permitting requirements for this region are the responsibility of the Portland District Regulatory Branch of USACE.

1.1 Project Area

The project area lies on the northeastern side of the Cascades Mountains in the Middle Columbia-Hood Watershed (HUC #17070105), near the City of Mosier in Wasco County, Oregon (**Figure 1**).

The project site is located along the existing UPRR right-of-way between approximately Mile Post 66.98 and Mile Post 72.35 in Wasco County, Oregon. The proposed project would consist of adding a second mainline track adjacent to the existing track. In addition, there would be expansion of the existing crossings over Rock Creek (an ephemeral stream) and Mosier Creek (a perennial stream). The proposed project area for construction of the new track, including areas that may be temporarily disturbed during construction, may include up to 150 feet on either side of the existing track. This potential disturbance area was investigated for the presence of wetlands and other waters.

1.2 Regulatory Background

This study was conducted to determine the presence and extent of any waters of the United States, including wetlands, that occur within the project area and that are under the jurisdiction of USACE in accordance with Section 404 of the Clean Water Act.

Waters of the United States is the encompassing term for areas that are regulated under Section 404 of the Clean Water Act. Waters of the United States include wetlands and other waters including but not limited to rivers, lakes, streams, wetlands, harbors, bays, stock ponds, and irrigation ditches. The portion of waters of the U.S. considered as jurisdictional by the USACE usually consists of those areas contained below the ordinary high water mark (OHWM). The OHWM is defined as the line where the incised portion of the bank meets the terrestrial vegetation (USACE 2005).

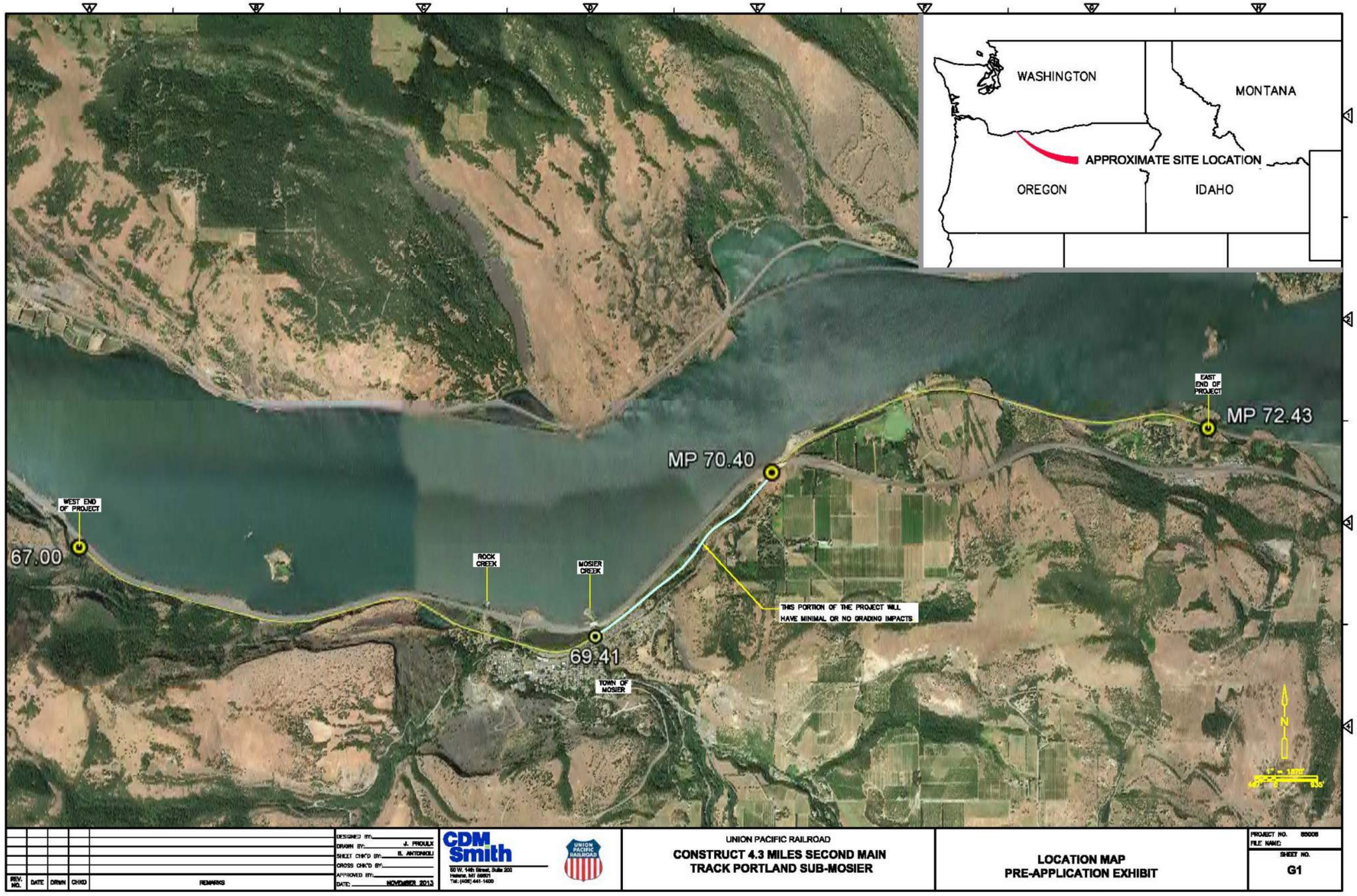

Figure 1. Vicinity Map of the Project Area

For regulatory purposes, wetlands are defined as:

"…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. Wetlands generally include swamps, marshes, bogs, and similar areas." (CFR 328.3, CFR 230.3).

In order to qualify as a wetland, all three wetland criteria must be met: presence of hydric soils, wetland hydrology, and at least 50 percent of the dominant plant species designated as obligate, facultative wet, or facultative. These designations represent the likelihood that a particular plant species would grow under wet conditions. Obligate plant species are always found in wetlands while facultative plants may be found equally frequently in wetlands as in uplands.

Other waters of the United States include unvegetated waterways and other water bodies with a defined bank and bed, such as lakes, rivers, creeks, and drainages. Typically, these waters do not have hydrophytic vegetation, and may lack hydric soils.

Section 2

Project Setting

2.1 Project Location and Land Use

The proposed project is located along the existing Union Pacific Railroad in the vicinity of the City of Mosier, Oregon between Mile Post 66.98 and Mile Post 72.35 in Wasco County, Oregon. Specifically, the project is located within Township 2 North, Range 11 East, Sections 2 and 3 and Township 3 North, Range 12 East, Sections 31 and 32. It extends from T2N R11E S3 on the western end to T3N R12E S32 on the eastern end. Land uses in the vicinity of the project site include freight rail, transportation, orchards, and rural residential with relatively more dense residential uses and some commercial within the City of Mosier (population approximately 420).

The project site is located primarilywithin the UPRR right-of-way on private lands. The following is contact information for the Union Pacific Railroad:

Stephen L. Cheney, P.E.
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1400 Douglas Street, Stop 0910
Omaha, Nebraska 68179-0910
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2.2 Climate

The project area is in a transitional location between weather dominated by wet marine airflow to the west and the dry continental climate of eastern Oregon. Most precipitation is received between late fall and early spring, starting with rain and changing to snow as winter progresses. Average annual precipitation for the project area is 35 inches. The field work for this wetland delineation was conducted in October, prior to the late fall/winter rainy season.

2.3 Hydrology

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) has mapped several potential wetlands in the project area. The adjacent Columbia River is classified on the USFWS NWI maps as L1UBHh - lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters. The Columbia River in this area is considered lacustrine because it is dammed. The limnetic system includes the littoral (shoreline) boundary and includes all deep-water habitats within the river. The unconsolidated bottom classification refers to having at least 25 percent cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30 percent. Permanently flooded means that water covers the land surface throughout the year in all years. Diked/impounded refers to having been created or modified by a man-made barrier or dam which obstructs the inflow or outflow of water (USFWS 2013).

In several areas, past construction of the railroad and/or freeway separated a part of the river impoundment from the rest of the river. The resulting ponds are given the same classification by NWI

as the Columbia River (L1UBHh). Other types of wetlands have been identified on NWI maps in the project area. These include the following classifications:

PSS1C and PSS1Ch – Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded wetland. The "h" special modifier indicates a diked/impounded wetland (USFWS 2013). The palustrine system of wetlands, as defined by the USFWS (2013), includes all non-tidal wetlands that are dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts in below 0.5 ppt. Scrub-shrub includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions. The subclass broad-leaved deciduous refers to woody angiosperms (trees or shrubs) with relatively wide, flat leaves that are shed during the cold or dry season. Seasonally flooded means that surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface (USFWS 2013).

PFO/SS1A and PFO/SS1Ch – Palustrine, forested wetlands/palustrine forested scrub-shrub wetlands. Forested wetlands are characterized by woody vegetation that is six meters tall or taller (USFWS 2013). They occur in the western U.S. where moisture is relatively abundant, particularly along rivers and in the mountains. Forested wetlands normally possess an overstory of trees, an understory of young trees or shrubs, and a herbaceous layer (USFWS 2013).

The "1" subclass indicates broad-leaved deciduous vegetation. The "A" modifier refers to a temporary flooded water regime where surface water is present for brief periods during growing season, but the water table usually lies well below the soil surface for most of the growing season. Plants that grow both in uplands and wetlands may be characteristic of this water regime. The "Ch" modifier refers to seasonally flood water regime in a diked/impounded wetland as described above.

PFO1C and PFO1Ch – Palustrine, forested, broad-leaved deciduous, seasonally flooded wetland, with some areas also having the "h" special modifier indicating a diked/impounded wetland.

PEM1Ch – Palustrine, emergent, persistent, seasonally flooded, diked/impounded wetland. Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. Persistent means the wetland is dominated by species that normally remain standing at least until the beginning of the next growing season (USFWS 2013).

PSS/EM1CH- Palustrine, scrub-shrub/emergent, persistent, seasonally flooded, diked/impounded wetland.

PUBHh- Palustrine, unconsolidated bottom, permanently flooded, diked/impounded wetland.

The project area is located within the floodplain of the Columbia River as it has been modified by the construction of the dams. Federal Emergency Management Agency (FEMA) flood maps indicate that while the railroad right-of-way is generally above the floodplain, some portions of the project area directly adjacent to the railroad are within Zone A or Zone AE, indicating they are inside the 100-year floodplain (FEMA 2013).

2.4 Soils

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) identifies the following soil types within the project area (NRCS 2013).

- Rock outcrop-Bodell-Bald complex, 0 to 30 percent slopes - The parent material is loess and volcanic ash over colluvium derived from basalt. It has 5 to 30 percent slopes, is well drained, and has a depth to water table of greater than 80 inches. There is no frequency of flooding or ponding. The typical profile consists of unweathered bedrock from 0 to 60 inches.
- Wyeth very gravelly loam, 45 to 75 percent slopes - The parent material is colluvium derived from basalt, mixed with volcanic ash and loess. It has 45 to 75 percent slopes, is well drained, and has a depth to water table of greater than 80 inches. There is no frequency of flooding or ponding. The typical profile consists of very gravelly loam from 0 to 22 inches; extremely gravelly loam from 22 to 40 inches; and cobbly loam from 40 to 62 inches.
- Rock outcrop-Rubble land complex – This soil type has 30 to 100 percent slopes and consists of unweathered bedrock from 0 to 60 inches.
- Rock outcrop-Xeropsamments complex – This soil type has 0 to 30 percent slopes, is well drained, and has a depth to water table of greater than 80 inches. There is no frequency of flooding or ponding. The typical profile consists of loamy sand from 0 to 60 inches.
- Wamic-Skyline complex, 2 to 20 percent slopes – The parent material is volcanic ash and loess over alluvium or colluvium derived from basalt or andesite. It is well drained and has a depth to water table of greater than 80 inches. There is no frequency of flooding or ponding. The typical profile consists of loam to 44 inches over weathered bedrock.
- Wind River fine sandy loam, 0 to 8 percent slopes and 8 to 12 percent slopes - The parent material of this soil type is old alluvium. It is well drained with a depth to water table of greater than 80 inches and no frequency of flooding or ponding. The typical profile is fine sandy loam to a depth of 44 inches over sandy loam.

All soil types identified in the project area are considered nonhydric (NRCS 2013).

2.5 Vegetation

Vegetation in the project area is characterized as temperate evergreen needleleaf forest type dominated by a mixture of evergreen/deciduous and broadleaf/needleleaf woody species. Douglas fir (*Pseudotsuga menziesii),* ponderosa pine (*Pinus ponderosa*), and Oregon oak white oak (*Quercus garryana*) savannahs are typical. Riparian vegetation consists of deciduous trees and shrubs including Oregon ash *(Fraxinus latifolia)*, willows (*Salix* sp.), and black cottonwood (*Populus balsamifera*). Himalayan blackberry (*Rubus armeniacus)* is a common understory plant throughout the project area, while reed canarygrass (*Phalaris arundinacea*) dominates the understory of wetland areas.

Vegetation species identified during sampling within the project area, their status as wetland indicator species are listed in **Table 1**.

Table 1. Plant Species Observed during Wetland Delineation.

Common Name	Scientific Name	Wetland Status *
Bigleaf maple	*Acer macrophyllum*	FACU
Common yarrow	*Achillea millefolium*	FACU
Indian hemp	*Apocynum cannabinum*	FAC
Oat grass	*Avena sativa*	UPL
Brome	*Bromus sp.*	FAC- FACU
Black hawthorn	*Crataegus douglasii*	FAC
Red osier dogwood	*Cornus sericea*	FACW
Beaked hazelnut	*Corylus cornuta*	FACU
Fuller's teasel	*Dipsacus fullonum*	FAC
Fringed willowherb	*Epilobium ciliatum*	FACW
Field horsetail	*Equisetum arvense*	FAC
Oregon ash	*Fraxinus latifolia*	FACW
Honey-locust	*Gleditsia triacanthos*	FAC
Oceanspray	*Holodiscus discolor*	FACU
Black walnut	*Juglans nigra*	UPL
Oregon grape	*Mahonia aquifolium*	FACU
Reed canarygrass	*Phalaris arundinacea*	FACW
Ponderosa pine	*Pinus ponderosa*	FACU
English plantain	*Plantago major*	FAC
Western sword fern	*Polystichum munitum*	FACU
Black cottonwood	*Populus balsamifera*	FAC
Choke cherry	*Prunus virginiana*	FACU
Douglas-fir	*Pseudotsuga menziesii*	FACU
Oregon white oak	*Quercus garryana*	FACU
Black locust	*Robinia pseudoacacia*	FACU
Nootka rose	*Rosa nutkana*	FAC
Himalayan blackberry	*Rubus armeniacus*	FACU
Blackcap	*Rubus leucodermis*	FACU
Pacific willow	*Salix lasiandra*	FACW
Northwest sandbar willow	*Salix sessilifolia*	FACW
Scouler's willow	*Salix scouleriana*	FAC
Blue elderberry	*Sambucus nigra*	FACU

Common Name	Scientific Name	Wetland Status *
Douglas' spiraea	*Spiraea douglasii*	FACW
Snowberry	*Symphoricarpos alba*	FACU
Pacific American-aster	*Symphyotrichum chilense*	FAC
Pacific poison oak	*Toxicodendron diversilobum*	FAC
Broadleaf cattail	*Typha latifolia*	OBL
Great mullein	*Verbascum thapsus*	FACU
Tiny vetch	*Vicia hirsuta*	NL

**Wetland status as defined in USACE 2013 National Wetland Plant List. Available at: http://rsgisias.crrel.usace.army.mil/NWPL/.*

FAC = Facultative plant. Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

FACU = Facultative upland plant. Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).

FACW = Facultative wetland plant. Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.

NL = not listed.

OBL = Obligate wetland plant. Occurs almost always (estimated probability 99%) under natural conditions in wetlands.

UPL = Obligate upland plant. Occurs almost always (estimated probability 99%) under natural conditions in non-wetlands. If a species does not occur in wetlands in any region, it is not on the National List (USACE 2013).

Section 3

Methods

Wetlands within the project area were delineated and mapped by CDM Smith biologists on October 15-17, 2013. Wetland areas are shown in Project Area Plates 1 through 8 in **Appendix A**. The delineation methodology conformed to the guidelines presented in the Corps Wetlands Delineation Manual, Technical Report Y-87-1 (USACE 1987) and the 2010 USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). Sampling points and wetland boundary locations were recorded with a hand-held GPS with submeter accuracy. Wetland delineation data sheets were completed for each sampling point and are included in **Appendix B**. Additionally, photographs were taken to illustrate the current site conditions (**Appendix C**). Following is a brief description of the three criteria used to evaluate potential wetlands at the project site.

3.1 Wetland Vegetation

Hydrophytic vegetation was assessed through identification of dominant species present in a wetland patch and comparison with the National List of Wetland Plants for the Western Valleys, Mountains, and Coast region (USACE 2013). At each sampling point, a visual assessment of the dominant plant species within a 6-foot radius was made. Dominant species were assessed using the recommended "50/20" rule. Change in dominant vegetation was also noted along with topography. Plants were designated as upland (UPL), facultative-upland (FACU), facultative (FAC), facultative-wetland (FACW), or obligate-wetland (OBL) species. If more than 50 percent of the plant species identified in an area are designated OBL, FACW, or FAC, the area fulfills the hydrophytic vegetation requirement needed to be considered a wetland. Additionally, there are two other tests, Prevalence Index and Morphological Adaptations that may also be conducted if the Dominance Test is failed but wetland soils and hydrology are evident.

3.2 Wetland Soils

Due to wetness during the growing season, hydric soils usually develop certain morphological properties that can be readily observed in the field. Prolonged anaerobic soil conditions typically lower the soil redox potential and cause a chemical reduction of some soil components, mainly iron oxides and manganese oxides. This reduction affects solubility, movement, and aggregation of these oxides. Reduction is reflected in the soil color and other physical characteristics that are usually indicative of hydric soils.

Soils were assessed by digging test pits in a potential wetland area and checking for hydric soil indicators, including: histosols, histic epipedons, sulfidic material, aquic moisture regimes, reducing soil conditions, mottles, metal concretions, or gleyed or low-chroma colors. Soil colors were verified using the Munsell Color Chart (Munsell 2000). Test pits varied in total depth from 6 to 12 inches below ground surface. The presence of bedrock at the surface prohibited reaching depths of more than a few inches in many areas. Test pits were also dug in upland soils to provide a basis for comparison.

3.3 Wetland Hydrology

The wetland hydrology requirement was assessed through observations of primary and secondary field indicators. Examples of primary indicators include visible observation of surface water, saturation within the upper 12 inches (i.e., typical plant root zone), or signs of recent inundation such as drainage patterns, watermarks, driftlines, or sediment deposits. Oxidized root channels were also noted, if present. Examples of secondary indicators include water-stained leaves, flow lines, and debris. If one primary or two secondary indicators were present, then wetland hydrology was assumed to be present.

3.4 Survey Area and Selection of Sample Sites

The project area was visually surveyed to identify areas with potential wetlands within proposed construction areas, including access roads, staging, and materials storage areas as they were known at the time of the survey. Areas with potential wetland vegetation, depressional areas, and areas with standing water were investigated more closely during the delineation field work.

At each potential wetland area, vegetation was observed, soil sampling was conducted, and indicators of wetland hydrology were noted. Most of the wetland edges were clearly identifiable by changes in topography that restrict hydrology and/or changes in dominant vegetation community.

A total of 9 soil sample points were taken in the project survey area. Soil sample data sheets are provided in **Appendix B** and photos are included in **Appendix C**.

3.5 Wetlands Functional Assessment

A functional assessment of wetlands within the project area was conducted based on the Oregon Freshwater Wetland Assessment Methodology (Roth et al. 1996). Nine wetland functions were assessed for each wetland area identified. Each function is described as intact, degraded, or lost for each wetland area. Findings of the functional assessment are provided in **Section 4.2**.

Section 4

Results and Conclusions

CDM Smith delineated 21 potential wetland areas within the project area, as described below and shown in **Project Area Plates 1** through **8** in **Appendix A**. The figures present the project area from west to east while the wetlands are described in the order in which they were delineated. Wetland 1 is located in the eastern portion of the project area and wetlands 3 through 8 are located to the east of Wetland 1. Wetlands 9 through 20 are located to the west of Wetland 1.

Wetland area 2 was determined to not have wetland characteristics and it is described below but it was not delineated. Wetland 10 and Wetland 12B are ditch-like features excavated in uplands with no surface water connection to any other water of the U.S. These areas would likely not fall under the jurisdiction of USACE. Most of the rest of the wetlands are separated from other waters of the U.S. by either the railroad or the interstate embankments, but would have connections to other waters of the U.S. if those man-made structures were not present. These wetlands would likely fall under the jurisdiction of USACE.

4.1 Wetland Descriptions

4.1.1. Wetland 1

Wetland 1 is associated with Thompsons Lake and an associated wetland area is located to the east side of the lake, just west of Mile Post 72. Thompsons Lake is classified on NWI maps as PUBHh - palustrine, unconsolidated bottom, permanently flooded, diked/impounded wetland. The associated wetland, Wetland 1, is classified as PSS/EM1CH - palustrine, scrub-shrub/emergent, persistent, seasonally flooded, diked/impounded wetland (USFWS 2013). This wetland is likely fed by groundwater moving downslope from the adjacent hillslope to the south and ponding along the railroad embankment east of the lake. Culverts appear to connect Thompsons Lake with the Columbia River.

There is very little vegetation around Thompsons Lake. The west and northern edges are rock ballast while the southern edge is a rock cliff. Only the eastern edge supports wetland vegetation, with a fringe of cattails transitioning into somewhat drier adjacent wetland area. Wetland vegetation is dominated by Pacific willow, northwest sandbar willow, and Indian hemp, with an understory of reed canarygrass. Soils in the wetland were loam with depleted matrix (SS2). Adjacent upland areas supported non-native annual grasses and scattered herbaceous vegetation. Upland soils were loam with bedrock at a depth of 0-6 inches (SS1). The open water lake area is referred to as Lake 1 or Thompsons Lake in this document and in the Joint Permit Application (JPA).

4.1.2 Wetland 2

A very small area located at approximately Mile Post 72.2, north of the railroad on a small terrace above the Columbia River was noted as a potential wetland. Riparian vegetation was observed, including a Scouler's willow. Due to the inaccessibility of this area, no soil sampling was conducted. During a subsequent field visit, the area was observed from below while walking along the Columbia River to map the ordinary high water mark. Upon further observation, the hydrology of this area does not appear to support its classification as a wetland. It is not mapped as a wetland on NWI maps

(USFWS 2013) and it is not shown on the figures in this report. The designation W2 was applied to this area for tracking purposes during the field survey.

4.1.3 Wetland 3

Wetland 3 is located along the Columbia river north of the railroad at approximately Mile Post 72.3. This area is a terrace sitting above the river on bedrock outcrops. Vegetation consists of Northwest sandbar willow and honey-locust. This area is not classified as a wetland on NWI maps (USFWS 2013).

A soil sampling point was located upslope from this area within an area dominated by Oregon white oak with Oregon grape and annual grasses in the understory. Soils in this upland area did not demonstrate wetland characteristics (SS3).

4.1.4 Wetland 4

Wetland 4 is located at approximately Mile Post 72.3, just north of the railroad embankment within a depressional area dominated by black cottonwood. There was evidence of ponding in this area, including water-stained leaves and drift deposits.

4.1.5 Wetland 5

Wetland 5 is located just east of Wetland 4 and may be hydrologically connected to Wetland 4. Vegetation was dominated by black cottonwood overstory. Soils in Wetland 5 consisted of sandy loam with depleted matrix (SS4). Neither Wetland 4 nor Wetland 5 are classified as wetlands on NWI maps (USFWS 2013).

4.1.6 Wetland 6

Wetland 6 is located east of Wetlands 4 and 5 at approximately Mile Post 72.35. Like Wetlands 4 and 5, Wetland 6 is located just north of the railroad embankment where water appears to pond seasonally. Along the southern edge of Wetland 6 (along the railroad embankment), vegetation is dominated by Oregon ash and Northwest sandbar willow. To the north in the wetland, the vegetation changes to scrub-shrub dominated by Douglas' spiraea. Outside of the wetland, vegetation species include Oregon grape and poison oak, extending to an open grassy field on a terrace above the Columbia River. The NWI maps show a potential wetland area to the east of Wetland 6 on the edge of the Columbia River; however, this area is perched above the Columbia River at the top of a small cliff and is not connected to the river as a riparian wetland edge as shown on the maps (see Appendix A photos).

4.1.7 Wetland 7

Wetland 7 is located on the south side of the railroad embankment at approximately Mile Post 72.35. Vegetation in this area is dominated by Oregon ash with little to no ground cover. There is evidence of ponding. This area is not classified as a wetland on NWI maps (USFWS 2013).

4.1.8 Wetland 8

Wetland 8 is located on the western edge of an associated large pond or lake located at approximately Mile Post 72.5. The wetland area is dominated by red osier dogwood. The northern and eastern edges of the lake are rocky cliffs that do not support vegetation. The lake is labeled Lake 8 for the purposes of this report and the JPA and is classified on the NWI maps as PUBHh (palustrine, unconsolidated bottom, permanently flooded, diked/impounded wetland). Wetland 8 on the western end of the lake is

classified as PSS1Ch (palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded wetland); however, this wetland area is much smaller than shown on the NWI maps (USFWS 2013). Culverts appear to connect the lake with the Columbia River.

4.1.9 Wetland 9

Wetland 9 is located south of the railroad at approximately Mile Post 71.5. The wetland area is located within a swale running along the base of the railroad embankment. Vegetation consists of Oregon ash with scattered Pacific willow and an understory of reed canarygrass. To the south of Wetland 9 is a pond that was apparently constructed as part of an old fire station for the railroad. Wetland 9 is separately hydrologically from the pond via a berm. Wetland 9 is mapped by NWI as PSS1Ch-palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded wetland (USFWS 2013).

4.1.10 Wetland 10

Wetland 10 is a series of discontinuous ditch-like structures located between Wetland 9 and Wetland 11 in an area where the railroad is placed through a rock cut that rises up on both sides of the tracks. The ditch-like linear depression is formed at the base of the rock cut slope and the ballast and subgrade of the railroad. Water appears to be retained in these “ditches” as they are situated on top of the bedrock and do not connect laterally to any other surface drainage or waters of the U.S. The bedrock would also prevent any groundwater connection with offsite areas. The vegetation in these areas consist primarily of cattails. Areas in between the areas mapped on the figures in Appendix A are unvegetated or support predominantly upland vegetation. These areas appear to meet the definition for isolated wetlands. These areas are not shown on the NWI maps (USFWS 2013).

4.1.11 Wetland 11

Wetland 11 is located at both ends of a large pond or lake south of the railroad embankment, and extends from approximately Mile Post 70.8 to Mile Post 71. The pond, labeled as Lake 11 for this report and the JPA, was apparently formed when the railroad was constructed, cutting off this portion of the Columbia River impounded reservoir. Thus, it is classified on the NWI maps as part of the Columbia River (L1UBHh - lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters) (USFWS 2013). An old railroad embankment forms the southern edge of the lake and the wetland. The old railroad embankement is lined with poplar trees. Another large area of open water exists on the south side of the old railroad embankment. Culverts appear to connect the lake with the Columbia River.

Wetland 11 extends both east and west of the lake and is constrained to the north and south by both the old and the existing railroad embankments. These areas are primarily classified on the NWI maps as PFO/SS1Ch (palustrine, forested/scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded wetlands) (USFWS 2013). Vegetation is dominated by Oregon ash, black cottonwood, and black hawthorn.

4.1.12 Wetland 12

Wetland 12 is located just west of Wetland 11 but appears to be disconnected from Wetland 11 by a berm constructed at the Mosier signal house located at Mile Post 70.79. In the absence of the berm, Wetland 12 would be connected to Wetland 11 and to the Columbia River through the culverts under the existing railroad embankment from Lake 11. Like Wetland 11, Wetland 12 is bounded by the existing railroad embankment and an old railroad embankment to the south. Vegetation is dominated

by black hawthorn. Evidence of ponding was observed as water stained leaves and bare or sparsely vegetated ground surface. This area is classified on the NWI maps as PEM1Ch (palustrine emergent, persistent, seasonally flooded, diked/impounded wetland) (USFWS 2013).

4.1.13 Wetland 12B

Similar to Wetland 10, Wetland 12B is a small discontinuous ditch-like structure located west of Wetland 12 near to the I-84 overpass. There is a low rock cut at this location and the juxtaposition of the railroad track bed and the rock cut forms a small area where water ponds on the underlying bedrock. The area does not connect laterally to any other surface drainage or waters of the U.S. The bedrock would also prevent any groundwater connection with offsite areas. It appears that the rock outcrop was created when the railroad was constructed by cutting away the surrounding upland topography to create a suitably graded road bed. This small area supports some facultative plant species. This area is not shown on the NWI maps (USFWS 2013).

4.1.14 Wetland 13

Wetland 13 extends along the north side of the railroad from approximately Mile Post 69.8 to Mile Post 70.1. This area is constrained between the railroad embankment on the south and the I-84 freeway embankement on the north. The western portion of this area is shown on NWI maps as PSS1C (palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded wetland). The eastern portion is shown on NWI maps as PFO1C (palustrine, forested, broad-leaved deciduous, seasonally flooded wetland) (USFWS 2013). Although there does not appear to be any surface water connection from Wetland 13, there would be a connection to the Columbia River in the absence of the I-84 freeway embankment.

The forested portion of Wetland 13 is dominated by black cottonwood and Pacific willow with an understory of reed canarygrass. There is evidence of standing water within the forested area. The reed canarygrass extends west into the scrub-shrub wetland, with Indian hemp and Nootka rose also prevalent. Soils in Wetland 13 were found to have a depleted matrix (SS8). Further west, outside of the wetland boundary, the vegetation changes to Himalayan blackberry where soils are dryer. Ballast rock and bedrock at the surface prevented placement of a soil pit in this dryer area.

4.1.15 Wetland 14

Wetland 14 is located at approximately Mile Post 69.6 on the north side of the railroad. The vegetation is dominated by black cottonwood with an understory of reed canarygrass and Indian hemp. At the eastern end of Wetland 14, Himalayan blackberry dominates the understory as the black cottonwood forest extends to the east into a dryer area. On the western end of Wetland 14, the I-84 freeway embankment pinches off the vegetated area against the railroad embankment. Although there does not appear to be an existing surface water connection from this wetland, it would be connected to the Columbia River in the absence of the I-84 freeway embankment. Oregon white oak trees exist outside of Wetland 14 near the base of the I-84 freeway embankment. This area is not shown as a wetland on NWI maps (USFWS 2013).

4.1.16 Wetland 14B and Wetland 15

Wetland 14B is located on the east side of Mosier Creek at approximately railroad Mile Post 69.4. Wetland 15 is located on the west side of the existing Mosier Creek channel within a former channel of Mosier Creek. Both areas are shown on NWI maps as PFO1Ch (palustrine, forested, broad-leaved

deciduous, seasonally flooded, diked/impounded wetland) (USFWS 2013). The wetlands are part of the riparian fringe of Mosier Creek.

Vegetation within these wetlands consists of reed canarygrass and honey-locust, with scattered black cottonwood and Pacific willow saplings. The soil is sandy and cobbly.

4.1.17 Wetland 16

Wetland 16 consists of the wetland fringe associated with a large pond or lake between Mosier Creek and Highway 30, from approximately Mile Post 69.1 to Mile Post 69.4. The lake, labeled Lake 16 for this report and the JPA, sits between the railroad to the south and the I-84 freeway to the north, and appears to have been formed when the I-84 freeway was constructed, cutting off this portion of the Columbia River reservoir impoundment. Thus, it is shown on NWI maps as part of the Columbia River reservoir - L1UBHh (lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters) (USFWS 2013). Lake 16 is also locally called "Harmony Lake". Wetland 16 extends to both the east and west ends of the lake and wraps around a portion of the south side. This wetland edge is shown on NWI maps as PSS1Ch (palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded wetland) (USFWS 2013). There is a surface water connection between the lake and Mosier Creek in the vicinity of the I-84 bridge over Mosier Creek that contained water at the time of the field visit.

Vegetation within Wetland 16 consists of Oregon ash and Pacific willow. The northern edge of the lake along the I-84 freeway embankment is largely unvegetated as is a section in the southwest quadrant alongside the railroad embankment. Upland areas between the railroad and the wetland are dominated by ponderosa pine and Himalayan blackberry.

4.1.18 Wetland 17

Wetland 17 is located at the east and west ends of a large pond or lake located north of the railroad from approximately Mile Post 68.6 to 68.9. The lake, labeled Lake 17 for this report and the JPA, is shown as part of the Columbia River reservoir on the NWI maps and classified as L1UBHh (lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters) (USFWS 2013). Lake 17 is also known locally as West Lake. Wetland 17 extends to the east of the open water lake area and is classified as PSS1Ch and PFO1Ah, with the "A" modifier referring to the temporary flooding regime associated with the far eastern end of the wetland. Vegetation in this area is dominated by reed canarygrass with scattered willows. There is a small vegetated wetland area on the western end of the lake as well. The southern, western, and northern edges of the lake are largely unvegetated and consist of ballast rock down into the water. There does not appear to be any culvert connection under I-84 between Wetland 17 and the Columbia River. The NWI maps do not show a connection to either Rock Creek or the Columbia River. The area close to I-84 was not investigated at the time of the field visit but the topography would indicate that there is not a connection. The lack of a surface water connection between Lake 17 and the Columbia River or Rock Creek has been confirmed by Oregon Department of Fish and Wildlife staff.

4.1.19 Wetland 18

Wetland 18 is a narrow vegetated fringe around portions of a large pond or lake located south of the railroad embankment across from Wetland 17. The lake associated with Wetland 18 is labeled Lake 18 for this report and the JPA. Like lake 17, Lake 18 is classified as part of the Columbia River - L1UBHh (lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters) (USFWS 2013). The lake is bounded on the eastern and western ends by rock revetment

devoid of vegetation. The edge adjacent to the railroad embankment does not support any vegetation and most of the southern edge is a sheer rock cliff that also does not support vegetation. Culverts appear to connect Lake 18 with Lake 17 on the other side of the railroad.

4.1.20 Wetland 19

Wetland 19 is located west of the railroad tunnel and south of the railroad at Mile Post 66.8. It is also associated with a large pond or lake, labeled Lake 19 for this report and the JPA. Lake 19 is classified on the NWI maps as part of the Columbia River - L1UBHh (lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters) (USFWS 2013). Rock revetment surrounds the entire lake, and the lake edge is devoid of vegetation. The southern edge of the pond is a sheer rock cliff that does not support any vegetation. There is a small vegetated area on the eastern end of the lake with some emergent vegetation and a small stream that enters the lake through this area from higher topography to the east and south. Poison oak dominates the vegetation along this narrow stream channel.

4.1.21 Wetland 20

Wetland 20 is located on the east side of the railroad tunnel and south of the railroad at Mile Post 67. It is associated with a large pond or lake, labeled Lake 20 for this report and the JPA. The lake is classified as part of the Columbia River - L1UBHh (lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded waters) (USFWS 2013). The lake is bounded by large piles of ballast rock in the northwest quadrant, sheer rock cliffs on the southern edge, and rock ballast embankment on the north and eastern edges. There are a few Oregon ash and some blackberry along the periphery of the lake. Wetland 20 is mostly located at the west end of the lake where there is an area of lower topography and some vegetation. Culverts appear to connect the lake with the Columbia River.

4.1.22 Other Hydrologic Features

Between Wetland 9 and Wetland 10, at Mile Post 71.36 is a culvert that carries runoff from the plateau above and to the south down under the railroad embankment to the Columbia River to the north. At the northern end of the culvert is a small area that was investigated for wetland characteristics. Although the area appeared to potentially have appropriate hydrology, it did not contain hydric soils or a preponderance of wetland vegetation (SS5).

West of the I-84 overpass and north of the railroad (but east of Wetland 13) are several forested depressional areas that may hold water in the winter months. However, soil sampling and analysis of the vegetation indicate that these areas are not wetlands (SS6 and SS7).

Mosier Creek crosses the project area between Wetland 14B and Wetland 15. The ordinary high water mark (OHWM) was mapped for approximately 100 feet up and downstream of the existing railroad bridge using the same handheld GPS unit used to map the wetland boundaries. On the south side of the railroad bridge, Mosier Creek makes a sharp turn through a deep pool that appears to provide fishing and wind surfer access. Just upstream of the bridge, past the sharp curve, there is a small beaver dam that is impounding water up against the western bridge abutment. South of the existing bridge, the stream banks rise up quickly from the water's edge and are heavily vegetated in Himalayan blackberry. North of the existing bridge, the eastern bank supports a narrow riparian wetland fringe (Wetland 14B) before rising steeply above the creek. On the western bank, Wetland 15 is located in an old creek channel, but the bank quickly steps up to a terrace dominated by ponderosa pine.

Rock Creek crosses the project area west of Highway 30 and east of Wetlands 17 and 18. The OHWM was mapped for approximately 100 feet up and downstream of the existing railroad bridge using the same handheld GPS unit used to map the wetland boundaries. The creek was dry at the time of the field visit and is reported to be dry most of the time. The creek bed is gravel with a fringe of willows along the edge.

As described under the wetland sections, there are a number of lakes that appear to have been formed when embankments for the interstate highway and the railroad isolated small portions of reservoir pool of the Columbia River. Many of these areas are connected to the river via culverts under those embankments. Lakes in the project area include Lake 1/Thompsons Lake, Lake 8, Lake 11, Lake 16/Harmony Lake, Lake 17, Lake 18, Lake 19, and Lake 20. These lakes are described in the above sections with their associated wetland areas.

4.2 Functional Assessment

Based on the Oregon Freshwater Wetland Assessment Methodology (Roth et al. 1996), the following nine wetland functions were assessed for wetlands in the project area: wildlife habitat, fish habitat, water quuality (with respect to pollutant removal potential), hydrologic control (flood control and water supply), sensitivity to future impacts, enhancement potential, education, recreation, and aesthetic quality. A summary of the functional assessment is provided in **Table 2**.

The project area is not part of a designated federal, state, or local preserve or Important Bird Area, and does not contain rare or unique wetland types (e.g., vernal pools, old-growth forested wetlands, etc.). There are no wetlands of special interest, wetland mitigation sites, or restoration sites. The area is located within the Columbia River Gorge National Scenic Area and thus provides important aesthetic resources, although many wetlands are not visible from either the interstate or the Columbia River and views of others are obscured from the Interstate (I-84) freeway.

There is some potential for federally listed salmonids, including Chinook and Coho salmon, steelhead, and bull trout, to be present in wetlands that are connected by culverts to the Columbia River. However, the condition of culverts for fish passage was not evaluated and connectivity has not been confirmed. Mosier Creek provides migration, spawning, and rearing habitat for summer and winter steelhead, and Coho salmon, and Rock Creek (an ephemeral stream), is designated as migration, spawning, and rearing habitat for winter steelhead and Coho salmon.

The project area is somewhat protected from future impacts due to its use as a transportation corridor for both I-84 and the railroad. There is no active draining, diking, or irrigation uses impacting the wetlands; however, flow in the Columbia River is controlled by the dams. The general inaccessibility of the project area limits its capacity for educational and recreational uses. Surrounding land uses are primarily rural, including state park recreational lands and some agricultural lands that are not directly adjacent to the project area. Light urban use occurs within the City of Mosier, and this is the only location where the public may have some access to wetland areas.

Some of the wetlands support vegetation including emergent, scrub-shrub, and/or forest that provides wildlife habitat and may help to remove nutrients. Many of the wetlands may be considered to be part of the Bonneville pool on the Columbia River and take the form of open water ponds or lakes formed by the construction of the railroad and/or freeway. The banks of these “lakes” have been stabilized with rock revetment or are bounded by rock cliffs and are largely devoid of vegetation. With a few exceptions, most of the lakes are connected to the Bonneville pool on the Columbia via culverts

and may be assumed to fluctuate with river levels. The hydrology of most of the other wetlands is associated with seasonal high groundwater rather than connection to other surface waters.

The nutrient removal capacity of most wetlands in the project area is limited by the small amount of vegetation present and the limited connectivity to the Columbia River or other surface waters. There is some opportunity for nutrient removal by wetlands located in and near the City of Mosier.

Table 2. Summary of Wetlands Functional Assessment

Wetland ID/ Description	Wildlife Habitat	Fish Habitat	Water Quality (pollutant removal)	Hydrologic Control (flood control and water supply)	Sensitivity to Future Impacts	Enhancement Potential	Education	Recreation	Aesthetic Quality
W1- wetland associated with Thompsons Lake. Palustrine, scrub-shrub/emergent persistent, seasonally flooded, diked/ impounded	Degraded- little vegetation around lake, scrub-shrub and emergent vegetation provides some habitat diversity	Degraded- culvert connection to Columbia River	Intact- but limited potential due to rural land use; surrounded by protected state park	Degraded- unknown if culverts are blocked or sized correctly. Flow in CR controlled by dams	Intact- surrounding land use is state park, but not generally accessible	Intact- opportunity for structural and habitat improvements	Lost- not accessible; location adjacent to active railroad makes it unsafe for educational programming	Lost- not accessible	Degraded- not visible from I-84 or CR
W2- not a wetland	NA	NA	NA	NA	NA	NA	NA	NA	NA
W3- Riparian area directly adjacent to CR. Scrub-shrub vegetation	Intact- provides riparian habitat along CR (native and non-native vegetation)	Degraded- provides limited shallow water habitat in CR	Degraded- limited vegetation for nutrient removal	Degraded- hydrology of CR controlled by dams	Intact- accessible only by boat in CR	Degraded- small area, limited opportunity for habitat improvements along CR	Degraded- accessible only by boat	Intact- fishing from CR	Intact- view from CR
W4, W5, and W6- scrub/shrub and forested wetland above CR floodplain	Intact- provides small area of scrub/shrub habitat on slopes above CR	Intact – provides nutrient removal and attenuation of runoff upstream of the CR.	Intact- opportunity for nutrient removal during flooding	Degraded- hydrology likely from ponded surface water drainage.	Intact- accessible only by boat in CR	Degraded- small area, limited opportunity for habitat improvements	Degraded- not accessible	Degraded- some wildlife viewing opportunity from CR	Degraded- not visible from CR
W7- forested wetland along south side of railroad	Intact- provides forested habitat corridor	Degraded- no connection to CR	Intact- but limited potential due to rural land use	Degraded- hydrology likely from groundwater. Provides flood capacity.	Intact- surrounding land use is open space and state park, not accessible	Intact- some opportunity for habitat restoration	Degraded- not accessible	Degraded- not accessible	Degraded- view only from railroad
W8- wetland associated with lake. Palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded	Degraded- little vegetation around lake, small scrub-shrub habitat	Degraded- culvert connection to CR	Intact- but limited potential due to rural land use and limited emergent wetland area	Degraded- unknown if culverts are blocked or sized correctly. Flow in CR controlled by dams	Intact- surrounding land use is open space and state park, not accessible	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- Only visible from railroad
W9- palustrine, scrub-shrub, broad-leaved	Intact- provides scrub/shrub	Degraded- no connection to	Intact- but limited potential	Degraded- hydrology likely	Intact- surrounding land	Intact- some opportunity for habitat	Lost- not accessible	Lost- not accessible	Degraded- Not visible from any

Wetland ID/ Description	Wildlife Habitat	Fish Habitat	Water Quality (pollutant removal)	Hydrologic Control (flood control and water supply)	Sensitivity to Future Impacts	Enhancement Potential	Education	Recreation	Aesthetic Quality
deciduous, seasonally flooded, diked/impounded	habitat	Columbia River	due to rural land use	from groundwater. Provides flood capacity	use is open space, not accessible; development restricted by scenic area regulations	restoration			viewpoint
W10- series of discontinuous isolated ditches	Degraded- small isolated patches of cattails	Degraded- no connection to Columbia River	Intact- but small area and limited potential due to rural land use	Degraded- hydrology from ponded surface water	Intact- surrounding land use is open space, not accessible	Degraded- small area, little opportunity for habitat enhancement	Lost- not accessible	Lost- not accessible	Degraded- only visible from railroad
W11- associated with lake. Palustrine, forested/scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded	Intact- provides forested and scrub/ shrub habitat	Degraded- culvert connection to CR	Intact- some potential to filter agricultural pollutants- limited by surrounding old railroad embankments	Degraded- unknown if culverts to CR are blocked or sized correctly. Wetland is surrounded by RR berms.	Degraded- may be susceptible to agricultural land use to the south	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- visible only from railroad and private agricultural land
W12- palustrine emergent, persistent, seasonally flooded, diked/impounded	Intact- provides forested habitat	Degraded- no connection to CR	Intact- some potential to filter agricultural pollutants- limited by surrounding old railroad embankments	Degraded- hydrology likely from groundwater. Provides some stormwater runoff storage	Degraded- may be susceptible to agricultural land use to the south	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- visible only from railroad
W12B – isolated depression	Degraded – small isolated patch of cattails	Degraded- no connection to Columbia River	Intact- but small area and limited potential due to rural land use	Degraded- hydrology from ponded surface water	Intact- surrounding land use is agricultural, not accessible	Degraded- small area, little opportunity for habitat enhancement	Lost- not accessible	Lost- not accessible	N/A
W13- palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded and palustrine, forested, broad-leaved deciduous, seasonally flooded	Intact- provides forested habitat	Degraded- no connection to CR	Intact- potential to filter pollutants from I-84	Degraded- hydrology likely from groundwater. Provides some stormwater runoff storage	Intact- surrounding land use is open space, not accessible	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- view from I-84 may be obscured

Wetland ID/ Description	Wildlife Habitat	Fish Habitat	Water Quality (pollutant removal)	Hydrologic Control (flood control and water supply)	Sensitivity to Future Impacts	Enhancement Potential	Education	Recreation	Aesthetic Quality
W14- forested/scrub-shrub	Intact- provides wildlife habitat (mix of native and non-native vegetation)	Degraded- no connection to CR	Intact- potential to filter pollutants from I-84	Degraded- hydrology likely from groundwater. Provides some stormwater runoff storage	Intact- surrounding land use is open space, not accessible	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- view from I-84 may be obscured
W14B and W15- palustrine, forested, broad-leaved deciduous, seasonally flooded, diked/impounded	Intact- provides wildlife habitat and corridor along Mosier Creek	Intact- provides shallow water habitat adjacent to Mosier Creek	Intact- potential to filter pollutants from urban and highway uses	Intact- unrestricted floodplain of Mosier Creek	Degraded- surrounding light urban land use	Intact- opportunity for structural and habitat improvements	Intact- accessible for wildlife viewing	Intact- accessible for wildlife viewing	Intact- view from streets in the City of Mosier; view from I-84 may be obscured
W16- palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded	Degraded- rock revetment along shore of lake, wildlife habitat present in forested wetland fringe	Degraded- likely connected to Mosier Creek seasonally. Carp observed in lake.	Intact- potential to filter pollutants from urban and highway uses	Degraded- lake is bermed, some potential for flood control	Degraded- surrounding light urban land use	Intact- opportunity for structural and habitat improvements	Intact- accessible for wildlife viewing via trail next to lake and wildlife observation post	Intact- accessible for wildlife viewing via trail next to lake and wildlife observation post	Intact- accessible via trail next to lake; views from I-84 may be obscured
W17- palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded, diked/impounded	Degraded- rock revetment along shore of lake	Degraded- no apparent connection to CR or Rock Creek	Degraded- potential to filter pollutants from urban and highway uses	Degraded- lake is bermed, some potential for flood control	Degraded- surrounding light urban land use. Future changes unlikely due to proximity of railroad and highway.	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- view from I-84 may be obscured
W18- lake with rock revetment connected to W17 via culvert	Degraded- rock revetment along shore of lake	Degraded- no apparent connection to CR or Rock Creek	Degraded- limited potential to filter pollutants from urban and highway uses due to limited vegetation	Degraded- lake is bermed, some potential for flood control	Degraded- surrounding light urban land use	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- view from I-84 may be obscured

Wetland ID/ Description	Wildlife Habitat	Fish Habitat	Water Quality (pollutant removal)	Hydrologic Control (flood control and water supply)	Sensitivity to Future Impacts	Enhancement Potential	Education	Recreation	Aesthetic Quality
W19- lake with rock revetment	Degraded- rock revetment along shore of lake	Degraded- culvert connection to CR	Degraded- limited vegetation for nutrient removal	Degraded- lake is bermed, some potential for flood control	Intact- surrounding land use is open space, not accessible	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- view from I-84 may be obscured
W20- lake with rock revetment	Degraded- rock revetment along shore of lake	Degraded- culvert connection to CR	Degraded- limited vegetation for nutrient removal	Degraded- lake is bermed, some potential for flood control	Intact- surrounding land use is open space, not accessible	Intact- opportunity for structural and habitat improvements	Lost- not accessible	Lost- not accessible	Degraded- view from I-84 may be obscured

4.3 Conclusions

CDM Smith identified several potentially jurisdictional wetlands and two creeks within the construction boundary as described above and shown on the plates in **Appendix A**. Approximately 21 wetlands were found to meet the USACE Western Mountains, Valleys, and Coast Region manual definition and are summarized in **Table 3** below. With the exception of Wetland 10 and 12B, these wetlands and the two creeks are considered potential jurisdictional waters of the United States.

Table 3. Summary of Wetland and Lake Areas

Wetland ID (W)	Vegetated Wetland (feet^2)	Vegetated Wetland (acres)	Open Water (feet^2)	Open Water (acres)
W1	26,516	0.61		
Lake 1/ Thompsons Lake			69,167	1.59
W3	2,730	0.06	0	0
W4	1,011	0.02	0	0
W5	2,509	0.06	0	0
W6	10,422	0.24	0	0
W7	7,254	0.17	0	0
W8	5,503	0.13		
Lake 8			47,621	1.09
W9	10,257	0.24	0	0
W10	1,596	0.04	0	0
W11	50,129	1.15		
Lake 11			80,880	1.86
W12	6,091	0.14	0	0
W12B	2,297	0.05	0	0
W13	142,618	3.27	0	0
W14	3,272	0.08	0	0
W14B	644	0.01	0	0
W15	3,087	0.07	0	0
W16	64,649	1.48		
Lake 16/ Harmony Lake			342,962	7.87
W17	71,895	1.65		
Lake 17/ West Lake			152,878	3.51
W18	8895	0.20		
Lake 18			185,305	4.25
W19	11,140	0.26		
Lake 19			40,787	0.94
W20	6,689	0.15		
Lake 20			72,127	1.66

Section 5

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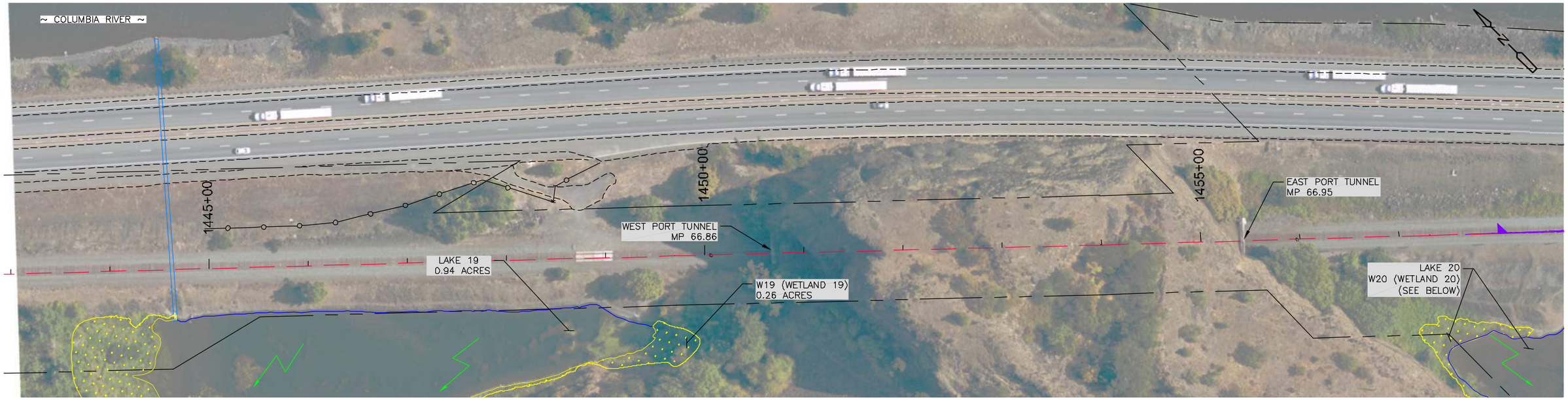
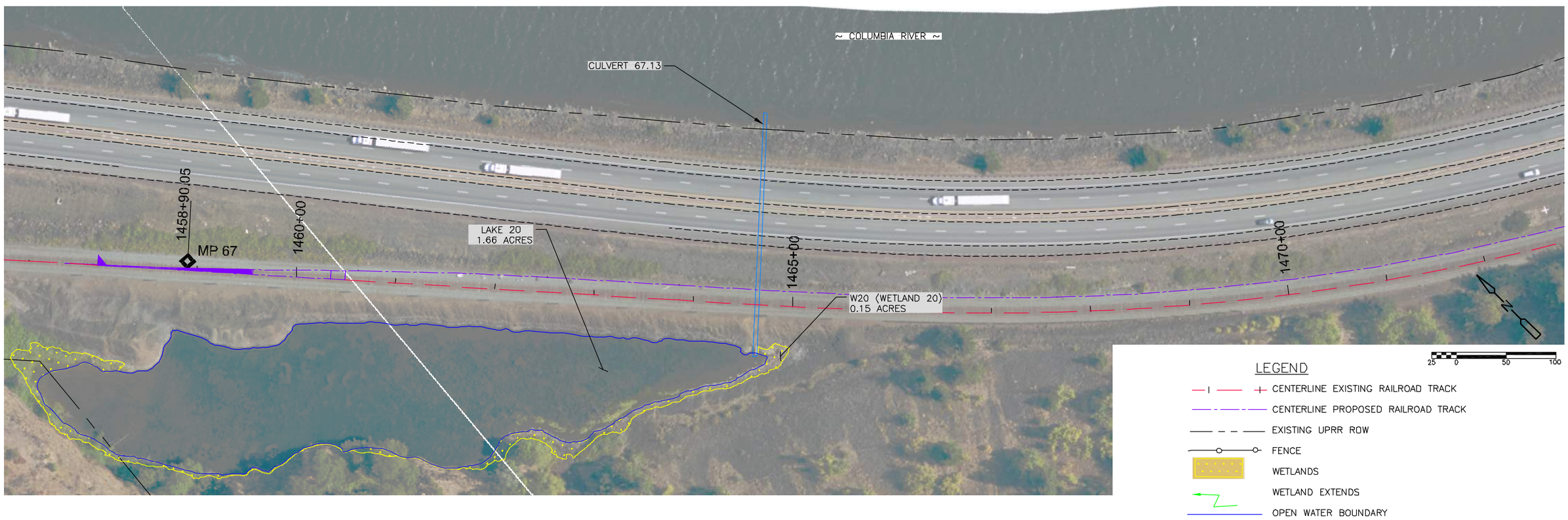
Appendix A

Project Area Plates

CDM Smith





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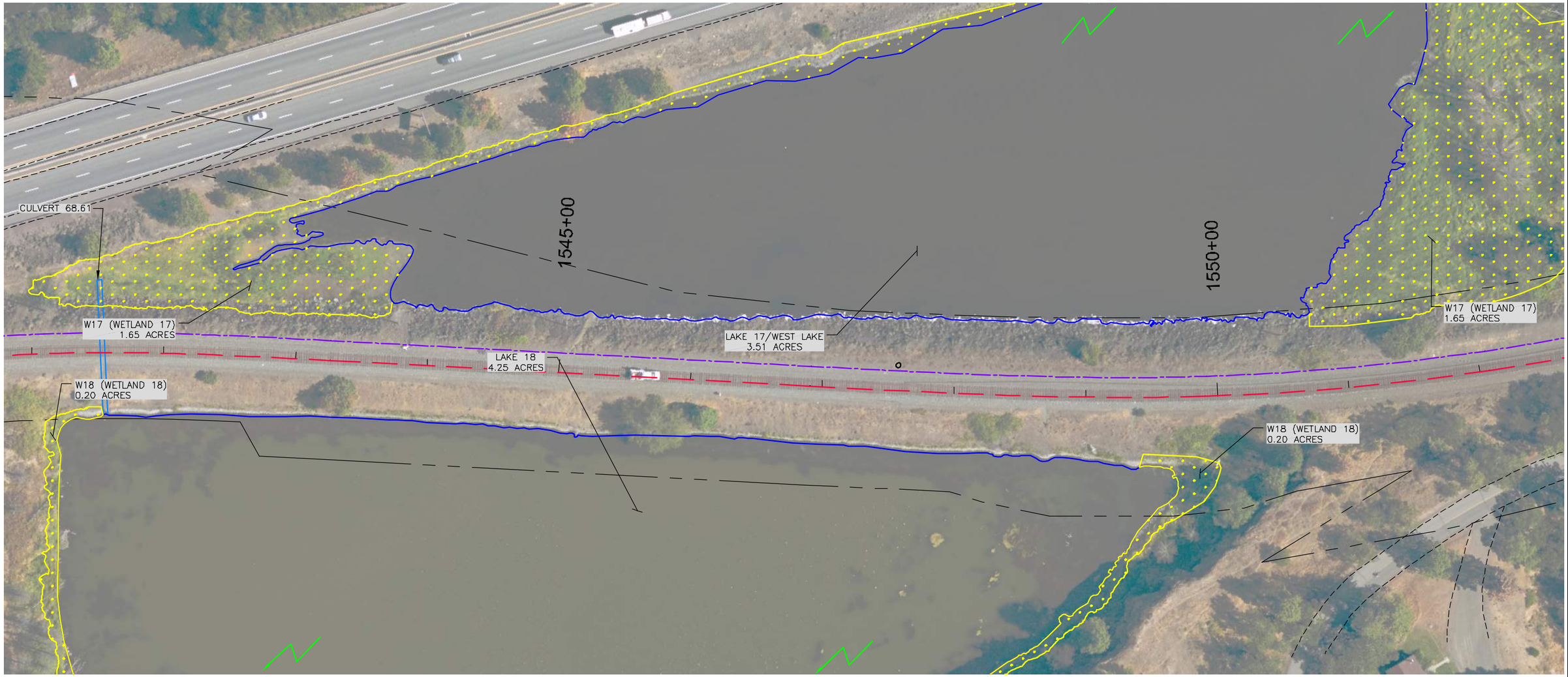
CDM Smith

UNION PACIFIC RAILROAD

SECOND MAINLINE TRACK PROJECT
WASCO COUNTY, OREGON

FIGURE 1
WETLANDS DELINEATION
SEPTEMBER 2014



LEGEND

- CENTERLINE EXISTING RAILROAD TRACK
- CENTERLINE PROPOSED RAILROAD TRACK
- EXISTING UPRR ROW
- FENCE
- WETLANDS
- WETLAND EXTENDS
- OPEN WATER BOUNDARY

N

18.75 0 37.5 75

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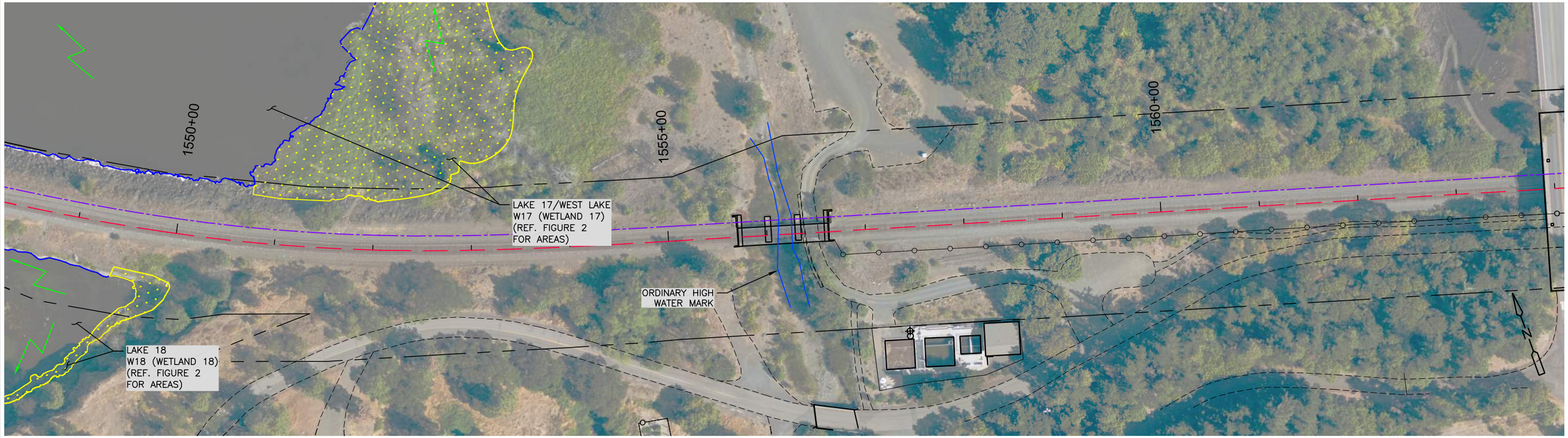
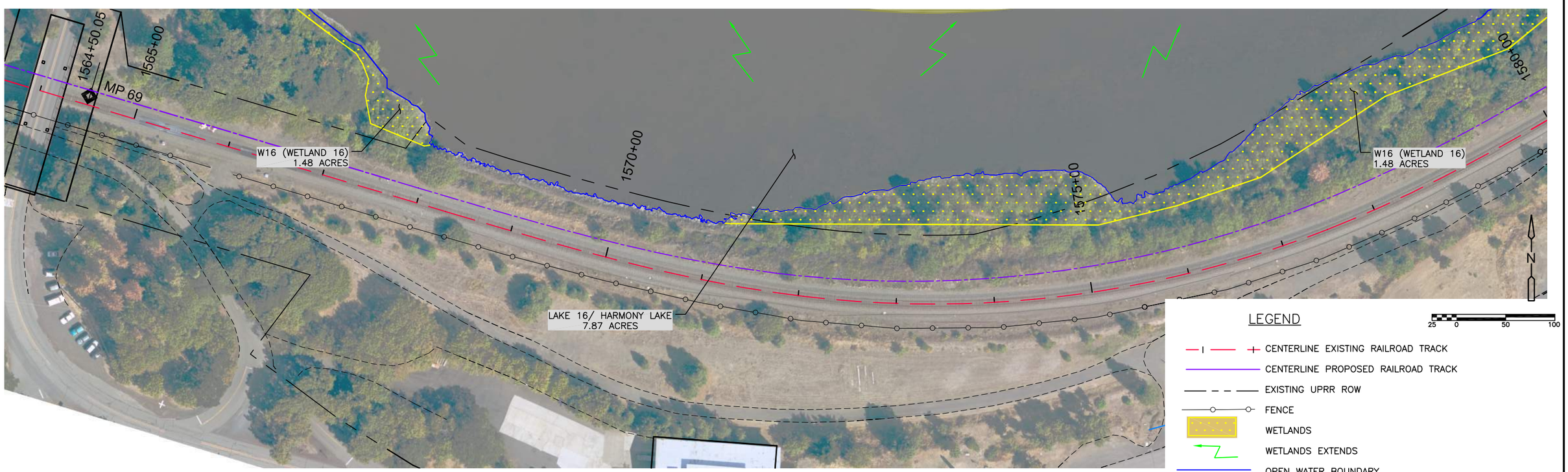
UNION PACIFIC RAILROAD

SECOND MAINLINE TRACK PROJECT
WASCO COUNTY, OREGON

FIGURE 2
WETLANDS DELINEATION
SEPTEMBER 2014





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CDM Smith

UNION PACIFIC RAILROAD

SECOND MAINLINE TRACK PROJECT
WASCO COUNTY, OREGON

FIGURE 3
WETLANDS DELINEATION
SEPTEMBER 2014

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WASCO COUNTY, OREGON

FIGURE 4
WETLANDS DELINEATION
SEPTEMBER 2014

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FIGURE 5
WETLANDS DELINEATION
SEPTEMBER 2014

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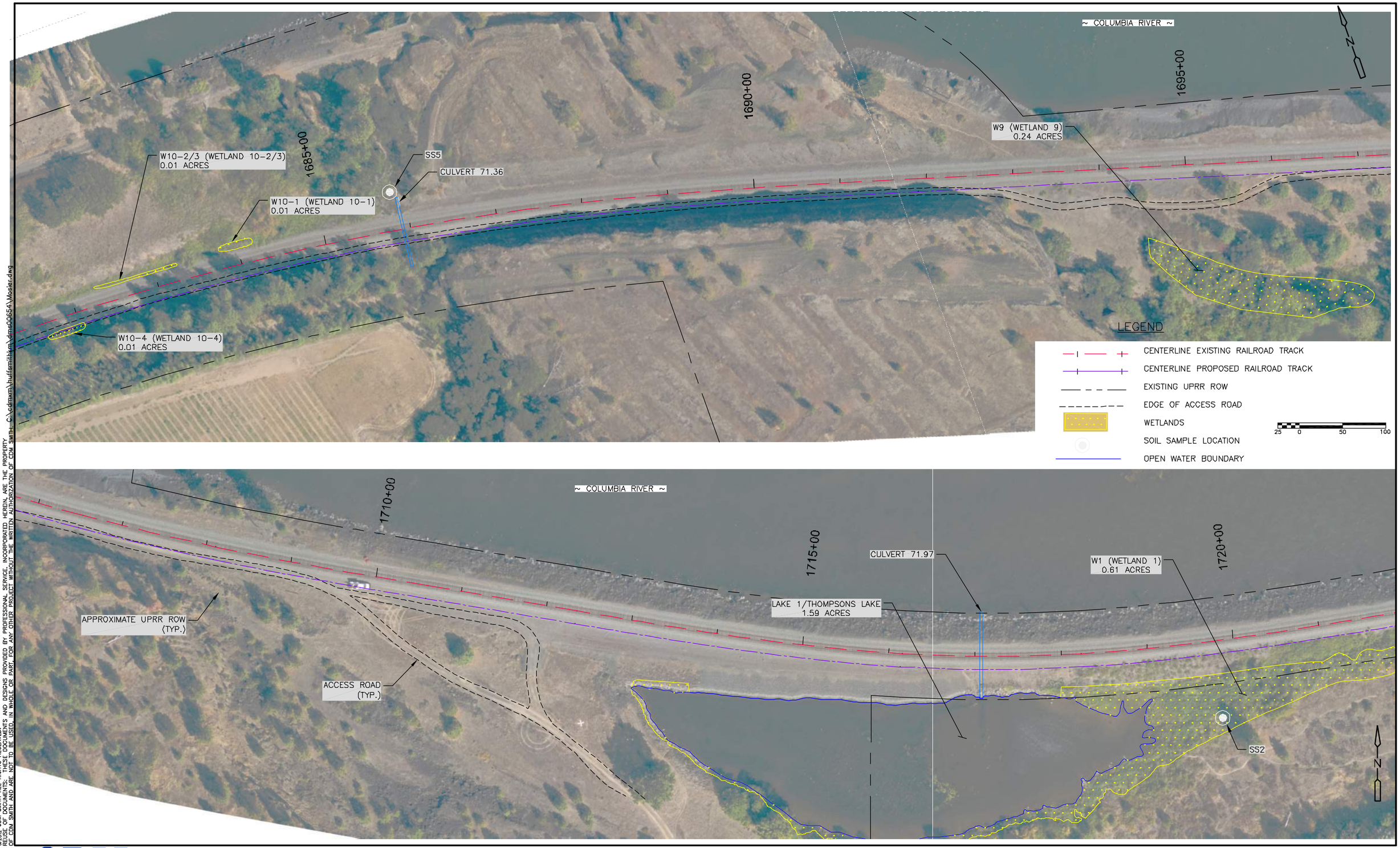
WASCO COUNTY, OREGON

FIGURE 6
WETLANDS DELINEATION
SEPTEMBER 2014



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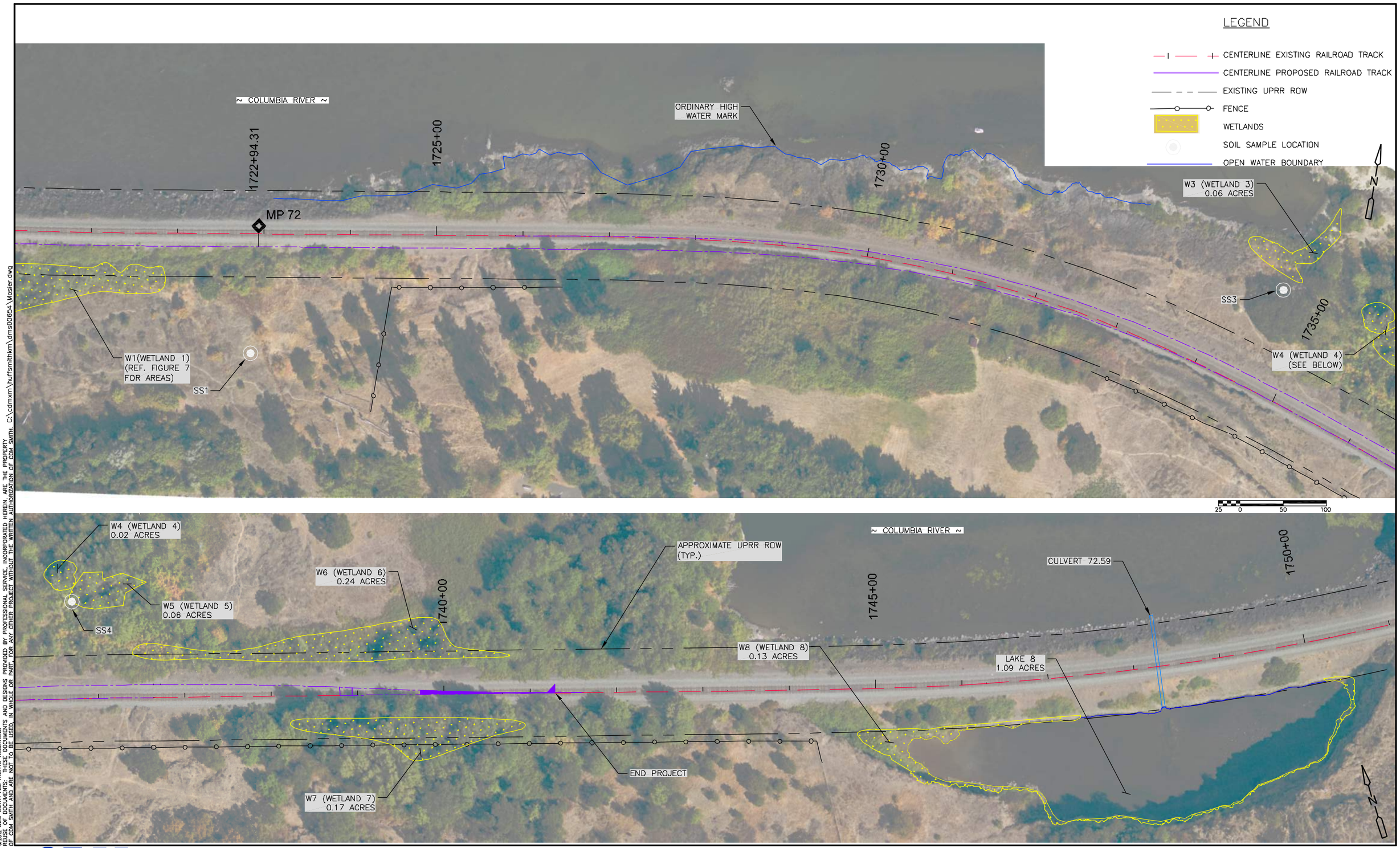
UNION PACIFIC RAILROAD

SECOND MAINLINE TRACK PROJECT-
WASCO COUNTY, OREGON

FIGURE 7
WETLANDS DELINEATION
SEPTEMBER 2014



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UNION PACIFIC RAILROAD

SECOND MAINLINE TRACK PROJECT-
WASCO COUNTY, OREGON

FIGURE 8
WETLANDS DELINEATION
SEPTEMBER 2014

Appendix B

Wetland Delineation Field Data Sheets

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/15/13
Applicant/Owner: UPRR State: OR Sampling Point: SS1
Investigator(s): KS, JJ Section, Township, Range: OR T2N R12E S32
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 3-5
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Rock outcrop-Xeropsamments complex NWI classification: none
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: east of Thompson's Lake in grassy meadow upslope

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Bromus (nonnative grass)	100	Y	FAC
2. Avena sativa	20	Y	UPL
3. Vicia hirsuta	5	N	NL
4. Epilobium ciliatum	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	130 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

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 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	5	x 2 =	10
FAC species	100	x 3 =	300
FACU species		x 4 =	
UPL species	25	x 5 =	125
Column Totals:	130 (A)		435 (B)

Prevalence Index = B/A = 3.3

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:

SOIL

Sampling Point: 551

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5YR 2.5/2	100					loam	soil dry
9-								basalt - refusal

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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 - dark surface soils to basalt

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

drainage approx. 15' east of SS point. no evidence of hydrology but could stay wet long enough

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/15/13
Applicant/Owner: UPRR State: OR Sampling Point: SS2
Investigator(s): KS, JJ Section, Township, Range: OR T2N R12E S32
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Classified as "Water" on NRCS maps NWI classification: PSSEMICH
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: SS2 is located just east of pond

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Salix sessilifolia	40	Y	FACW
2. Salix lasiandra	40	Y	FACW
3.			
4.			
5.			
	80 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Phalaris arundinacea	60	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. Rubus armeniacus	20	Y	FACU
2.			
	20 = 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: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ 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:

SOIL

Sampling Point: 552

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 2.5/3	95	7.5YR 4/6	5	D	M	loam	Soil moist

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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: White patches in soil - likely fungal hyphae

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/15/13
Applicant/Owner: UPRR State: OR Sampling Point: SS3
Investigator(s): KS, JJ Section, Township, Range: OR T2N R12E S32
Landform (hillslope, terrace, etc.): hillslope/terrace Local relief (concave, convex, none): none Slope (%): 2-3
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Rock outcrops-xerepsamments complex NWI classification: none
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: River side of tracks near end of project area within oak woodland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus garryana	60	Y	FACU
2.			
3.			
4.			
	60 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Mahonia aquifolium	20	Y	FACU
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Bromus (nonnative grass)	60	Y	FAC
2. Achillea millefolium	10	N	FACU
3. Equisetum arvense	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	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 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ 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:

SOIL

Sampling Point: SS3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 4/2	100					Sand	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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 along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/15/13
Applicant/Owner: UPRR State: OR Sampling Point: SS4
Investigator(s): KS, JJ Section, Township, Range: OR T2N R12E S32
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Rock outcrop-Xerosamments complex NWI classification: none
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: w/in cottonwood patch river side

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	60	Y	FAC
2. Fraxinus latifolia	30	Y	FACW
3.			
4.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Rosa nutkana	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. Rubus armeniacus	10	Y	FACU
2.			
	10 = Total Cover		

% Bare Ground in Herb Stratum 100

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- ___ 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:

SOIL

Sampling Point: 854

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/2	95	7.5YR 5/6	5	D	M	sandy loam	soil moist
6-12	"	80	"	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 Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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)
- X 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)
- X Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/15/13
Applicant/Owner: UPRR State: OR Sampling Point: SS5
Investigator(s): KS, JJ Section, Township, Range: OR T2N R12E S31
Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): none Slope (%): 1-2
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Rock outcrop-Xerosamments complex NWI classification: none
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:
just W. of culvert N. of RR tracks

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus garryana	5	Y	FACU
2. Juglans nigra	5	Y	UPL
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Toxicodendron diversilobum	15	Y	FAC
2. Symphoricarpos albus	10	Y	FACU
3. Mahonia aquifolium	5	Y	FACU
4. Quercus garryana	5	Y	FACU
5.			
	35 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Nonnative grass - bromus	50	Y	FAC
2. Equisetum arvense	40	Y	FAC
3. Achillea millefolium	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. Rubus leucodermis	5	Y	FACU
2.			
	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: 8 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 37.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ 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:

SOIL

Sampling Point: SS5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0 – 6	7.5YR 4/4	100					loamy sand	dry
								rock – either basalt or RR ballast

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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 along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks: SS5 is at end of culvert. Appears water does not stand here but moves downslope (wheafi culvert carries water)

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/16/13
Applicant/Owner: UPRR State: OR Sampling Point: SS6
Investigator(s): KS, JJ Section, Township, Range: OR T2N R12E S36
Landform (hillslope, terrace, etc.): terrace/slope Local relief (concave, convex, none): none Slope (%): 1-2
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Rock outcrop - Xerosamments complex NWI classification: none
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: approx 75' N. of RR tracks and 5 in 60' W. of Fairy crossing

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Crataegus douglasii	80	Y	FAC
2. Fraxinus latifolia	20	Y	FACW
3.			
4.			
	100 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Toxicodendron diversilobum	10	Y	FAC
2. Acer macrophyllum	5	Y	FACU
3. Quercus garryana	5	Y	FACU
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: ____)			
1. non-native grass - bromus	60	Y	FAC
2. Equisetum arvense	20	Y	FAC
3. Plantago major	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 5

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 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- ___ 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:

SOIL

Sampling Point: DS6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/3	100					sand	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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 along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/16/13
Applicant/Owner: UPRR State: OR Sampling Point: SS7
Investigator(s): KS, JJ Section, Township, Range: OR T2N R11E S1
Landform (hillslope, terrace, etc.): slope/terrace Local relief (concave, convex, none): none Slope (%): 1-2
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Rock outcrop-Xerosamments complex NWI classification: PEOIC
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: within slight depressional area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus latifolia	20	Y	FACW
2. Acer macrophyllum	20	Y	FACU
3.			
4.			
	40 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Quercus garryana	10	Y	FACU
2. Corylus cornuta	10	Y	FACU
3. Acer macrophyllum	10	Y	FACU
4. Rosa nutkana	10	Y	FAC
5. Prunus virginica	10	Y	FACU
	50 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Equisetum arvense	40	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. Rubus leucodermis	10	Y	FACU
2.			
	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: 9 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ 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:

SOIL

Sampling Point: 557

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	10					loamy sand	moist
4-12	10YR 4/3	90						
4-12	10YR 4/3	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 Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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)
- X Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks: depressional area but upland plants

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/16/13
Applicant/Owner: UPRR State: OR Sampling Point: SS8
Investigator(s): KS, JJ Section, Township, Range: OR T2N R11E S1
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): slightly concave Slope (%): 0-1
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Rock outcrop-Xerosamments complex NWI classification: PSS1C
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 _____	**Is the Sampled Area within a Wetland?**	**Yes** ✓ **No** _____
Wetland Hydrology Present? Yes ✓ No _____		

Remarks: on lower edge floodplain

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	75	Y	FAC
2.			
3.			
4.			
	75 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Populus balsamifera	20	Y	FAC
2. Salix lasiandra	10	Y	FACW
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	80	Y	FACW
2. Equisetum arvense	40	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	120 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 60

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
__ 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:

SOIL

Sampling Point: SS8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 3/2	80	7.5YR 4/6	20	D	M	loamy sand	very cobbly soil is moist

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- X 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)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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)
- X 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)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

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

Project/Site: UPRR Mosier City/County: Wasco County Sampling Date: 10/16/13

Applicant/Owner: UPRR State: OR Sampling Point: SS9

Investigator(s): KS, JJ Section, Township, Range: OR T2N R11E S1

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

Subregion (LRR): A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: PFO1Ch

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.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Gleditsia triacanthos	15	Y	FAC
2. Populus balsamifera	10	Y	FAC
3. Salix lasiandra	10	Y	FACW
4.			
5.			
	35 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	90	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	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 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 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:

SOIL

Sampling Point: SS9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 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 Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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 along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

Appendix C

Photographs of the Project Area

Vegetation within Wetland 1.

Looking north from soil sampling point SS1 within upland area from Wetland 1.

Wetland 3.

Oregon white oak at soil sampling point SS3 located upland of Wetland 3 area.

Columbia River's edge north of Wetland 8 and east of Wetland 6.

Eastern end of Lake 8 –Algal Blooms Visible in Lake.

Western end of Lake 20 Looking Toward Vegetated Wetland Area.