GOLDENDALE ENERGY STORAGE HYDROELECTRIC PROJECT

Federal Energy Regulatory Commission Project No. 14861

Klickitat County, Washington

DRAFT LICENSE APPLICATION Appendix B: Wetlands and Waters Delineation Report

For:

FFP Project 101, LLC



June 2019

TABLE OF CONTENTS

1.0	Introduction
1.1	Site Location
2.0	Desktop Review
2.1	Soil Survey Data
2.2	National Hydrography Dataset & National Wetland Inventory
3.0	Wetland and Waters Delineation Methodology
3.1	Determination of Hydrophytic Vegetation
3.2	Determination of Hydric Soils9
3.3	Determination of Wetland Hydrology10
3.4	Determination of Waterbodies
4.0	Results
4.0 4.1	Results
4.0 4.1 4.2	Results
4.0 4.1 4.2 4.3	Results
4.0 4.1 4.2 4.3 4.4	Results
4.0 4.1 4.2 4.3 4.4 4.5	Results
4.0 4.1 4.2 4.3 4.4 4.5 4.6	Results 10 S7 12 S8 12 P1 12 P2 12 S17 13 S24 13
4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7	Results 10 S7 12 S8 12 P1 12 P2 12 S17 13 S24 13 W6 13
4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 5.0	Results. 10 S7 12 S8 12 P1 12 P2 12 S17 13 S24 13 W6 13 Conclusions 14

List of Figures

Figure 1-1: Vicinity Map	2
Figure 1-2: Study Area	3
Figure 1.1-1: USGS Topographic Map	5
Figure 2.1-1: NRCS Soils	7
Figure 4-1: NHD and NWI Mapped Features	11

List of Tables

Table 2.1-1: Soil Map Units within the Study Area.	6
Table 3.1-1: Plant Indicator Status Categories	9
Table 4-7-1: Wetland and Water Features Confirmed in 2019 Delineation in the Proposed Project Boundary 1	4

List of Attachments

- Attachment 1: Wetland Determination Data Forms
- Attachment 2: Photograph Log

Acronyms and Abbreviations

ERM-West, Inc.
facultative plants
facultative wetland plants
hydrologic unit code
National Hydrography Database
National Wetlands Inventory
The Natural Resources Conservation Service
obligate wetland plants
ordinary high water mark
upland plants
United States Army Corps of Engineers
United States Department of Agriculture
United State Fish and Wildlife Service
United States Geological Survey

1.0 INTRODUCTION

Presented herein are findings of a desktop review and field delineation of wetland and waters within the Goldendale Pumped Storage Project (Project) footprint (the study area) located at the Columbia Gorge Aluminum Smelter property near Goldendale, Klickitat County, Washington. The location and layout of the study area are illustrated on Figures 1-1 and 1-2. ERM-West, Inc. (ERM) prepared this report on behalf of the FFP Project 101, LLC.

FFP Project 101, LLC intends to permit the Project and in doing so is required to identify and avoid or mitigate for wetlands and waters within their Project footprint. ERM completed a wetland and waters delineation within the study area in May 2019 to determine whether and where wetlands and waters exist within the study area.

This report documents the presence and geographic extent of wetlands and waters, and describes how these features were distinguished from uplands. This delineation is subject to agency verification and approval.





1.1 Site Location

The study area is located in Klickitat County, Washington near the Columbia River just downstream of the John Day Dam at river mile 215.6. The study area spans two U.S. Geological Survey (USGS) 8-digit hydrologic unit code (HUC) watersheds (USGS 2019). USGS topography of the area is shown on Figure 1.1-1. The upper portion of the study area is located in the 865,340-acre Klickitat River watershed (HUC 17070106), on lands that drain north then west to the Klickitat River, and ultimately to the Columbia River 35 miles downstream of the study area. The lower portion of the study area is within the 1,381,073-acre Middle Columbia-Hood (HUC 17070105) watershed, which spans both sides of the Columbia River in Oregon and Washington. Both watersheds are part of a larger Middle Columbia River Watershed.



2.0 DESKTOP REVIEW

Before commencing fieldwork, the following data sources were reviewed for information on vegetation patterns, topography, drainage, and potential or known critical areas, including wetlands, in the vicinity of the study area:

- USGS 7.5 Minute Topographical Quadrangles;
- U.S. Department of Agriculture (USDA), National Resource Conservation Service soil survey maps, 2019;
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory maps, 2019;
- USGS National Hydrography Database (NHD) maps, 2019;
- Aerial photographs (Google Earth and ESRI Topographic Web Mapping); and
- Priority Habitats and Species Mapper, Washington Department of Fish and Wildlife, 2019.

ERM reviewed the reference materials for preliminary identification of potential wetlands and waters and other critical areas within and abutting the study area.

2.1 Soil Survey Data

The Natural Resources Conservation Service (NRCS) soil survey identifies 13 soil map units within the study area (Table 2.1-1; Figure 2.1-1). None of the soil map units are considered hydric (USDA/NRCS 2019). The NRCS data identifies a portion of the study area south of Highway 14 as "water". This area corresponds to the former location of an artificial water impoundment associated with the Columbia Gorge Aluminum smelter (and later the NSC smelter). Review of Google Earth imagery suggests this impoundment was demolished between 2003 and 2005.

Map Unit	Map Unit name	Drainage Class	Hydric Soil Rating
Symbol			
14B	Rockly very gravelly loam, 2–30 percent slopes	Well drained	No
21	Rock outcrop-Rubble land complex, 65–90 percent slopes	Well drained	No
30A	Rockly-Lorena complex, 2–15 percent slopes	Well drained	No
94A	Lorena silt loam, 10–15 percent slopes	Well drained	No
105	Ewall loamy sand, 0–8 percent slopes	Excessively drained	No
108	Ewall-Rock outcrop complex, 0–15 percent slopes	Excessively drained	No
721	Rock outcrop-Rubble land-Haploxerolls complex, 30–90 percent slopes	Well drained	No
724C	Haploxerolls-Rubble land complex, 30–50 percent slopes	Well drained	No
732	Stacker-Horseflat complex, 30–65 percent slopes	Well drained	No
775	Horseflat cobbly silt loam, 2–15 percent slopes	Well drained	No
951	Lorena-Rockly complex, 30–65 percent slopes	Well drained	No
990	Goldendale-Lorena-Rockly complex, 2–30 percent slopes	Well drained	No
1032	Goodnoe-Swalecreek-Horseflat complex, 30–65 percent slopes	Well drained	No

Table 2.1-1: Soil Map Units within the Study Area

Source: USDA/NRCS 2019



Source: National Agricultural Imagery Program, July 2017, flown 1m per pixel; NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet

2.2 National Hydrography Dataset & National Wetland Inventory

The NHD is based on USGS data that represents the water drainage network of the U.S. with features such as rivers, streams, lakes, and ponds. The National Wetlands Inventory (NWI) includes wetlands and deep-water habitats identified by USFWS staff by analyzing aerial imagery. The NHD and NWI data show the following features within the study area (USGS 2019; USFWS 2019):

- Two perennial stream channels in the northern portion of the study area. The NWI identifies these features as riverine, unknown perennial, unconsolidated bottom, permanently flooded (R5UBH) streams.
- Two ponds in the northern portion of the study area. The NWI data only includes the northernmost pond, which is identified as a palustrine, unconsolidated bottom, permanently flooded, excavated (PUBHx) feature.
- An intermittent stream crossing Highway 14. The NWI data identifies this feature as a riverine, intermittent, streambed, seasonally flooded (R4SBC) stream.
- Two palustrine, scrub-shrub, broad-leaved deciduous, temporarily flooded (PSS1A) wetlands located near the intermittent stream on the northwest side Highway 14.

3.0 WETLAND AND WATERS DELINEATION METHODOLOGY

Wetland and upland conditions within the study area were identified and classified in accordance with the following standard protocols:

- Routine Determination Method described in the Corps of Engineers Wetland Delineation Manual (USACE 1987) and in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008)
- USFWS Classification System (Cowardin et al. 1979)

Wetlands are distinguished from uplands based on examination of the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to determine that a feature may be a wetland, all three parameters must be present. United States Army Corps of Engineers (USACE) Wetland Determination Data Forms were completed to aid in these determinations (included as Attachment 1). Photographs from the study are included as Attachment 2.

3.1 Determination of Hydrophytic Vegetation

Hydrophytic and upland vegetation were identified in the field by visual determination of dominant plant species (defined as plants that comprise 20 percent or more of the cover value observed at a given location). At each data point, herbaceous vegetation was analyzed within a 5foot diameter. Percent cover was visually estimated and recorded for each species present. Vegetation was observed within the growing season for the region. The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) defines the regional growing season as when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas exhibit one or more indicators of biological activity (e.g., emergence from the ground, appearance of new growth, or bud burst on woody plants) (USACE 2008).

The indicator status of each observed plant species was confirmed using the State of Washington 2016 Wetland Plant List (Lichvar et al. 2016). Species not listed were assumed to be upland plants (UPL), as directed by the 2008 Regional Supplement (USACE 2008). An area was considered to have hydrophytic vegetation when more than 50 percent of the dominant species were obligate wetland plants (OBL), facultative wetland plants (FACW), or facultative plants (FAC). Indicator status categories are defined in Table 3.1-1.

Indicator Category*	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1%) in non-wetlands.
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67%) in wetlands, but also occur (estimated probability 1% to 33%) in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability 33 to 67%) of occurring in both wetlands and non-wetlands**.
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1 to <33%) in wetlands, but occur more often (estimated probability >67 to 99%) in non-wetlands.
Upland Plants	UPL	Plants that occur rarely (estimated probability <1%) in wetlands, but occur almost always (estimated probability >99%) in non-wetlands under natural conditions.

Table 3.1-1: Plant Indicator Status Categories

*Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel.

3.2 Determination of Hydric Soils

ERM examined soil profiles in and along the perimeter of potential wetlands and identified the soil type(s) using the Munsell soil chart (USDA 2009), descriptions in the Field Indicators of Hydric Soils in the United States (USDA 2018), and the USDA/NRCS Soil Survey data (USDA/NRCS 2019). The Munsell System includes three components to classify soil color: hue (soil color), value (lightness and darkness), and chroma (color intensity) that are defined in a book of color chips. Hydric soils were identified using the Field Indicators of Hydric Soils in the United States (USDA 2018).

3.3 Determination of Wetland Hydrology

Wetland hydrology was determined to be present if one or more of the following characteristics were present:

- Landscape position and surface topography convey and concentrate water (e.g., the position of the site relative to an upslope water source, location within a distinct wetland drainage pattern, or concave surface topography with accumulated water).
- Inundation or saturation for a long duration (defined by the NRCS as inundation in a single event that ranges from 7 days to 1 month) is either inferred based on field indicators or observed during field surveys.
- Residual evidence of ponding or flooding is observed (e.g., scour marks, sediment deposits, algal matting, and drift lines).

Assessment of hydrologic criteria was based on primary and secondary indicators. Primary indicators observed in the study area included observations of water marks and algal mat or crust. If the data point was situated above the level of seasonal inundation or saturation, the criteria were not met; conversely, if it was situated below the elevation of seasonal inundation or saturation, the criteria were met. Secondary indicators observed in the study area included drainage patterns, geomorphic position, and the FAC-neutral test of vegetation.

3.4 Determination of Waterbodies

Regulated waterbodies are stream channels or impoundments with a defined ordinary high water mark (OHWM). The USACE defines an OHWM as the "line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (USACE 2005).

4.0 **RESULTS**

ERM delineated two ephemeral streams, two ponds, one intermittent stream and one seep within the study area (Figure 4-1). Table 4.7-1 summarizes the results of the field investigation.



Legend





- Riverine
- Freshwater Pond

Palustrine Scrub/Shrub

2015 NWI

Notes:

NHD: National Hydrography Dataset NHD credit: US Geological Survey NWI: National Wetlands Inventory. NWI credit: US Fish and Wildlife Service

Figure 4-1

NHD and NWI Mapped Features Wetland and Waters Delineation Report Goldendale Energy Storage Project Goldendale, WA

Environmental Resources Management www.erm.com



Source: National Agricultural Imagery Program, July 2017, flown 1m per pixel; NAD 1983 StatePlane Washington South FIPS 4602 Feet

4.1 S7

Feature S7 is identified as a perennial watercourse in both the NHD and NWI datasets that is located near the upper reservoir. However, based on observations during the May 2019 wetland and waters delineation this feature is an ephemeral stream channel that is 16 to 24 inches wide, 1 to 3 inches deep, and extends approximately 995 feet into the study area. The NHD and NWI both show this feature is about 950 feet longer and connects to pond P2; however, there is no evidence of an OHWM between P2 and the upper extent of S7 as mapped by ERM. Evidence of an OHWM included an incised bed and bank, sediment sorting and debris wracking. Substrate consists of small cobbles, gravels, and fines. Although no flowing water was observed, much of the substrate was covered with algal matting. Vegetation along S7 consists of bulbous bluegrass (*Poa bulbosa*), cheatgrass (*Bromus tectorum*), smallflower woodland-star (*Lithophragma parviflorum*), barestem biscuitroot (*Lomatium nudicaule*), and Hood River milk-vetch (*Astragalus hoodianus*).

4.2 S8

Feature S8 is identified as a perennial watercourse in both the NHD and NWI datasets that is located near the upper reservoir. However, based on observations during the May 2019 wetland and waters delineation this feature is an ephemeral stream channel that is 12 to 24 inches wide, 1 to 3 inches deep, and extends approximately 990 feet into the study area; the NHD and NWI show this feature about 770 feet shorter than the extent mapped by ERM. Evidence of an OHWM included an incised bed and bank, sediment sorting, and debris wracking. Substrate consists of small cobbles, gravels, and fines. Although no flowing water was observed, several pockets of standing water were observed and much of the substrate was covered with algal matting. Vegetation along S8 is similar to the species described along S7.

4.3 P1

Feature P1 is identified as a perennial pond in both the NHD and NWI datasets that is located in the northern portion of the study area. The pond appears to be artificially created in uplands to support cattle grazing on the surrounding property; there is no outlet or channel connecting it to S7. At the time of the May 2019 delineation, the pond appeared to be nearly full. Unidentified emergent vegetation was observed growing sparsely in about 1 to 2 feet of standing water. Review of Google Earth aerial imagery suggests that the pond partially dries up but retains a small amount of water throughout the year. The pond is approximately 0.2 acre in size, of which approximately 0.001 acre is within the study area.

4.4 P2

Feature P2 is identified as a perennial pond in the in the NHD; however, it is not included in the NWI dataset. The pond is located near the northern portion of the study area and appears to be artificially created in uplands to support cattle grazing on the surrounding property. Like P1, P2

does not have an outlet or channel connecting it to S7. At the time of the May 2019 delineation, the pond appeared to be about half full. The edges of the pond are largely unvegetated and no emergent vegetation was observed growing within the water. Review of Google Earth aerial imagery suggests that the pond dries up annually. The pond is approximately 0.03 acre in size.

4.5 S17

Feature S17 is identified as an intermittent watercourse in both the NHD and NWI datasets that crosses Highway 14 near the lower reservoir. Additionally, the NWI identifies a palustrine shrub-scrub wetland immediately upslope of the highway. Field observations during the May 2019 delineation confirmed this feature is an intermittent stream channel; however, there is no shrub-scrub wetland present. The stream channel is about 24 inches wide and 1 to 3 inches deep, with substrate consisting of mud and fine gravels. Evidence of an OHWM included a defined bed and bank and sediment sorting. The channel begins above the highway and is conveyed beneath the highway through a metal culvert. Flowing water 1 to 3 inches deep was observed above the highway; however, no water was observed exiting the culvert at the outlet on the southeast side of the highway. Below the culvert outlet, the stream channel extends only about 20 feet where it resembles a grassy swale that lacks the OHWM indicators observed above the highway. These conditions suggest the culvert may be damaged and that most of the stream flow goes subsurface beneath the highway before reaching the culvert outlet. Vegetation along S17 consists of netleaf hackberry (*Celtis reticulata*), Himalayan blackberry (*Rubus armeniacus*), seep monkeyflower (*Mimulus guttatus*), bedstraw (*Galium* sp.), bulbous bluegrass, and cheatgrass.

4.6 S24

Feature S24 is not identified in either the NHD or NWI datasets, but appears to groundwater seep located along the excavated hillside above Highway 14 near the lower reservoir. Water flows down the hillside into a roadside drainage ditch and into a culvert that conveys the water to east side of the highway. Similar to S17, no flowing water was observed existing the culvert outlet. Vegetation within the seep consists primarily of Himalayan blackberry and black cottonwood (*Populus trichocarpa*) saplings.

4.7 W6

W6 is a palustrine, emergent wetland associated with a seep on a hillslope roadcut along Highway 14. Vegetation observed in wetland feature W6 included seep monkeyflower (*Mimulus guttatus*, OBL). Adjacent to the wetland feature in the riparian corridor surrounding the S17 channel vegetation included tree and shrub netleaf hackberry (*Celtis reticulata*, FAC) and Himalayan blackberry (*Rubus armeniacus*, FAC). Additional species observed in and adjacent to S17 and W6 included bedstraw (*Galium* sp., FACU-UPL), dock (*Rumex* sp., generally FACW), bulbous bluegrass (*Poa bulbosa*, FACU), cheatgrass (*Bromus tectorum*, UPL), milkweed (*Asclepias* sp., FAC-UPL), and blue wildrye (*Elymus glaucus*, FACU). Soil pits were not excavated in the W6 wetland due to flowing and standing water within the feature and plot. Additionally, the seep is located on an old roadbed consisting of compacted rock and gravel, which could not be excavated. Therefore hydric soil is assumed present. Hydrology in the wetland was observed as flowing and standing water. The wetland does not appear to have a surface connection to S17 located about 70 feet downslope.

ID	NWI	NHD	Clean Water Act Jurisdiction (2019 Field Confirmation)
S7	R5UBH	Perennial	Likely a jurisdictional waterbody. Ephemeral stream connects to Swale Creek, a perennial tributary of the Klickitat River, approximately 2.4 miles north of the survey area.
S8	R5UBH	Perennial	Likely a jurisdictional waterbody. Ephemeral stream connects to Swale Creek, a perennial tributary of the Klickitat River, approximately 2.4 miles north of the survey area.
P1	PUBHx	Perennial	Likely not jurisdictional. Pond is artificially created in uplands and appears to be isolated as it does not have an outlet or surface connection to feature S7.
P2	Not mapped	Perennial	Likely not jurisdictional. Pond is artificially created in uplands and appears to be isolated as it does not have an outlet or surface connection to feature S7.
S17	R4SBC & PSS1A	Intermittent	Likely not jurisdictional. Stream lacks a surface connection to the Columbia River as most of the stream flow goes subsurface near Highway 14.
S24	Not	Not	Likely not jurisdictional. Seep lacks a surface connection to the Columbia River as most
	mapped	mapped	of the flow goes subsurface hear Highway 14.
W6	Not	Not	Likely not jurisdictional. Wetland appears to be isolated and does not have a surface
	Mapped	mapped	connection to S17.

Table 4-7-1: Wetland and Water Features Confirmed in 2019 Delineation in the Proposed Project Boundary

5.0 CONCLUSIONS

Based on the observations described above from field investigations conducted in May 2019, ERM identified one wetland and six waterbodies existing within the study area.

Two of the six waterbodies within the study area, S7 and S8 are likely jurisdictional waters of the U.S. as they connect to perennial streams downstream of the project area and therefore are subject to regulation under Section 404 of the federal Clean Water Act. The remaining four waterbodies and one wetland are likely not jurisdictional waters of the U.S because they appear to be isolated and do not connect to the Columbia River.

6.0 **REFERENCES**

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of Interior, Fish and Wildlife Service, Washington, DC.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

- USACE (U.S. Army Corps of Engineers). 1987. USACE Wetland Delineation Manual. Technical Report Y -87 -1. U.S. Army Waterways Experiment Station, Vicksburg, Mississippi.
- _____. 2005. Ordinary High Water Mark Identification, Regulatory Guidance Letter 05-05. December 7, 2005.
- . 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Washington, DC: U.S. Army Engineer Research and Development Center, Environmental Laboratory, ERDC/EL TR-08028.
- USDA (U.S. Department of Agriculture). 2009. *Munsell Soil Color Chart*. U.S Dept. Agriculture —Soil Survey Manual, 2009 Edition, Munsell Soil Chart Brochure.
- _____. 2018. Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils (version 8.2, 2018; including revisions to versions 8.0 and 8.1).
- USDA/NRCS (U.S. Department of Agriculture National Resource Conservation Service). 2019. Soil Survey Geographic (SSURGO) database for Klickitat County Area, Washington. Accessed September 2019. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627
- USFWS (U.S. Fish and Wildlife Service). 2019. *National Wetland Inventory*. Accessed May 2019. https://www.fws.gov/wetlands/data/data-download.html.
- USGS (U.S. Geological Survey). 2019. *National Hydrography Data Set*. Accessed January 2019. https://water.usgs.gov/GIS/huc.html.

ATTACHMENT 1:

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Sto	City/County:G	oldendale / Klicl	kitat County	Sampling Da	ate: 5/14/19		
Applicant/Owner: Rye Development		Sta	ate:WA	Sampling Po	pint:DP-1		
Investigator(s): Justin Moffett, Carissa	a Shoemaker		Section, Towr	ship, Range:S18,	T03N, R17E		
Landform (hillslope, terrace, etc.): draw	/swale		Local relief (c	oncave, convex, no	one):concave		Slope (%):10
Subregion (LRR): B - Columbia/Snake	e River Platea	u Lat:45.	745335	Long:-1	20.730051		Datum:WGS84
Soil Map Unit Name: Lorena-Rockly of	Soil Map Unit Name: Lorena-Rockly complex, 30-65 percent slopes NWI classification:R5UBH						
Are climatic / hydrologic conditions on th	ne site typical fo	or this time of ye	ear?Yes 💽	No 🔿 🛛 (If	no, explain in R	emarks.)	
Are Vegetation Soil or H	ydrology	significantly	y disturbed?	Are "Normal C	ircumstances"	present? Ye	s 💿 🛛 No 🔿
Are Vegetation Soil or H	ydrology	naturally pr	oblematic?	(If needed, exp	olain any answe	rs in Remark	s.)
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			
Wetland Hydrology Present?	Yes 💽	No 🔘	within	a Wetland?	Yes 🔿	No 🖲	

Remarks:Plot located in swale exhibiting non-hydrophytic vegetation and non-hydric soils. No evidence of an ordinary high water mark observed.

VEGETATION

	Absolute	Dominant	Indicator	Dominance Test w	orkshee	t:		
Tree Stratum (Use scientific names.)		Species?	Status	Number of Dominan	t Species	s		
1.None				That Are OBL, FAC	W, or FA	C:	0	(A)
2.				Total Number of Do	minant			
3.	_			Species Across All S	Strata:		2	(B)
4.								
 Total Cove	r. %			- Percent of Dominan	t Species	S C:		(A/B)
Sapling/Shrub Stratum	1. 70				W, 011A	0.	0.0 %	(AVD)
1.Rosa sp.	2	Yes	FACU	Prevalence Index v	vorkshee	et:		
2.				Total % Cover of	of:	Mul	tiply by:	_
3.				OBL species		x 1 =	0	
4.		·		FACW species		x 2 =	0	
5.				FAC species	5	x 3 =	15	
Total Cover	r: 2, %			FACU species	37	x 4 =	148	
Herb Stratum				UPL species	27	x 5 =	135	
1.Poa bulbosa	30	Yes	FACU	Column Totals:	69	(A)	298	(B)
² .Lomatium nudicaule	5	No	UPL		0)	()		
³ .Achillea millefolium	3	No	FACU	Prevalence Inc	dex = B/	A =	4.32	
⁴ Lithophragma parviflorum	10	No	UPL	Hydrophytic Veget	ation Inc	dicators:		
5. <i>Poa sp.</i> *	5	No	FAC	Dominance Tes	st is >50%	6		
6.Bromus tectorum	2	No	UPL	Prevalence Inde	ex is ≤3.0) ¹		
7. Eriogonum compositum	10	No	UPL	Morphological A	Adaptatio	ns ¹ (Provi	ide support	ng
8. Taraxacum officinale	2	No	FACU		arks or o	n a separa		
Total Cover		·		- Problematic Hy	drophytic	c vegetation	on' (Explair	1)
Woody Vine Stratum	07 /0							
1.None				¹ Indicators of hydric	soil and	d wetland	hydrology	must
2.				be present.				
Total Cover	r: %			Hydrophytic				
% Bare Ground in Herb Stratum 20 % % Cover of Biotic Crust 20 % Vegetation Present? Yes () No ()								
Remarks: *Assuming the unidentified species is FAC to be conservative.								

SOIL

Profile Des	scription: (Describe to	o the de	pth needed to document the	e indicator	or confirm	m the absence of indicators.)			
Depth	Depth Matrix Redox Features								
(inches)	Color (moist)	%	Color (moist) %	Type ¹	Loc ²	Texture ³ Remarks			
0-8	10YR 3/3	100	NA			silt loam			
8-11	10YR 3/3	98	10YR 4/4 2	С	М	silt loam			
					·	·			
¹ Type: C=0	Concentration, D=Deple	etion, RN	I=Reduced Matrix. ² Locati	on: PL=Por	e Lining, F	RC=Root Channel, M=Matrix.			
[°] Soil Textur	res: Clay, Silty Clay, Sa	andy Cla	y, Loam, Sandy Clay Loam, S	Sandy Loan	n, Clay Loa	am, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.			
Hydric Soil	Indicators: (Applicable	e to all Li	Rs, unless otherwise noted.)			Indicators for Problematic Hydric Soils:			
Histoso	DI (A1)		Sandy Redox (S5)	、 、		1 cm Muck (A9) (LRR C)			
Histic E	=pipedon (A2)		Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)			
Васк в	HISTIC (A3)			rai (F1)		Reduced Vertic (F18)			
Hydrog	jen Sumde (A4)	、 、	Loamy Gleyed Mat	1X (FZ)		Chen (Fundain in Demonto)			
	ed Layers (A5) (LRR C)) - (EC)					
	IUCK (A9) (LRR D)	()	Redox Dark Surface	e (F6)					
	ed Below Dark Surface	(A11)							
	Dark Surface (A12)		Redox Depressions	5 (F8)					
Sandy	Mucky Mineral (S1)		Vernal Pools (F9)			Indicators of hydrophytic vegetation and			
Bestrictive						wetiand hydrology must be present.			
Turse	Layer (il present).								
Type.K(
Deptn (I	ncnes):11"					Hydric Soil Present? Yes () No (•			
Remarks:]	-3" round rock/cobb	ole throu	ighout profile						
	JGY								

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
Primary Indicators (any one indicator is sufficient)	Water Marks (B1) (Riverine)
Surface Water (A1) Salt Crust (B11)	Sediment Deposits (B2) (Riverine)
High Water Table (A2)	Drift Deposits (B3) (Riverine)
Saturation (A3)	Drainage Patterns (B10)
Water Marks (B1) (Nonriverine)	Dry-Season Water Table (C2)
Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Livin	ng Roots (C3) Thin Muck Surface (C7)
Drift Deposits (B3) (Nonriverine)	Crayfish Burrows (C8)
Surface Soil Cracks (B6)	Soils (C6) Saturation Visible on Aerial Imagery (C9)
Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks)	Shallow Aquitard (D3)
Water-Stained Leaves (B9)	FAC-Neutral Test (D5)
Field Observations:	
Surface Water Present? Yes No O Depth (inches): N/A	
Water Table Present? Yes No Depth (inches): >11"	
Saturation Present? Yes No Depth (inches): >11"	Wetland Hydrology Present? Yes No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspect	ions), if available:
Remarks: Algal matting present in swale.	
Soil dry and crumbly, low soil moisture.	

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Sto	City/County:G	oldendale / Klic	kitat County	Sampling D	ate:5/14/19			
Applicant/Owner: Rye Development	_	St	ate:WA	Sampling P	oint:DP-2			
Investigator(s): Justin Moffett, Cariss	a Shoemaker		Section, Towr	ship, Range: $\underline{S18}$,	T03N, R17E	-		
Landform (hillslope, terrace, etc.): draw	/swale		Local relief (c	oncave, convex, n	one):concave		Slope (%):10	
Subregion (LRR): B - Columbia/Snake	e River Platea	u Lat:45.	746126	Long:-1	20.729762		Datum:WGS84	
Soil Map Unit Name: Lorena-Rockly of	ioil Map Unit Name: Lorena-Rockly complex, 30-65 percent slopes NWI classification:R5UBH							
Are climatic / hydrologic conditions on the	ne site typical fo	or this time of ye	ear?Yes 💿	No 🔿 (If	no, explain in F	Remarks.)		
Are Vegetation Soil or H	ydrology	significantly	y disturbed?	Are "Normal C	ircumstances"	present? Ye	s 💿 🛛 No 🔿	
Are Vegetation Soil or H	ydrology	naturally pr	oblematic?	(If needed, exp	olain any answe	ers in Remark	s.)	
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				
Wetland Hydrology Present?	Yes 💽	No 💿	within	a Wetland?	Yes 🔿	No 🖲		

Remarks: Plot located in swale exhibiting non-hydrophytic vegetation and non-hydric soils. Ordinary high water mark beginning to form. Stream S7 begins immediately downslope of plot location.

VEGETATION

Absolute	Dominant	Indicator	Dominance Test w	vorkshee	t:		
% Cover	Species?	Status	Number of Domina	nt Specie	s		
			That Are OBL, FAC	W, or FA	C:	1	(A)
			Total Number of Do	ominant			
			Species Across All	Strata:		2	(B)
			- Demonst of Demines	at Casaia			
/er: %			That Are OBL. FAC	W. or FA	s C:	50.0 %	(A/B)
			,	,		50.0 %	()
			Prevalence Index	workshe	et:		
			Total % Cover	of:	Mu	Itiply by:	_
			OBL species		x 1 =	0	
			FACW species		x 2 =	0	
			FAC species	13	x 3 =	39	
er: %	-		FACU species	15	x 4 =	60	
			UPL species	7	x 5 =	35	
10	Yes	FACU	Column Totals:	35	(A)	134	(B)
5	No	UPL					
3	No	FAC	Prevalence In	dex = B/	A =	3.83	
2	No	UPL	Hydrophytic Vege	tation In	dicators:		
10	Yes	FAC	Dominance Te	st is >50%	6		
5	No	FACU	Prevalence Ind	lex is ≤3.0	\mathbf{D}^{1}		
			Morphological	Adaptatio	ns ¹ (Prov	vide support	ing
			data in Rem	harks or o	n a sepai	rate sheet)	
er: 35 %			- Problematic Hy	drophytic	c Vegetat	ion' (Explaii	ו)
JJ 70							
			¹ Indicators of hydri	c soil and	d wetland	l hydrology	must
			be present.				
er: %			Hydrophytic				
er of Biotic C	Crust 5	0 %	Vegetation Present?	Yes ()	No	\bullet	
FAC to be	conservat	ive.	•				
	Absolute % Cover // (Cover) // (C	Absolute Dominant % Cover Species?	Absolute Dominant Indicator % Cover Species? Status % Cover %	Absolute Dominant Indicator Dominance Test v % Cover Species? Status Number of Dominan That Are OBL, FAC	Absolute Dominant Indicator % Cover Species? Status Mumber of Dominant Specie Total Number of Dominant Specie Total Number of Dominant Specie Percent of Dominant Specie mer: % % Prevalence Index workshee Montpace FACW species FACW species FACW species FACW species 13 FACU species 7 Column Totals: 35 No FAC 10 Yes FAC Prevalence Index = B/ 10 Yes S No FAC Prevalence Index is \$3.0 Prevalence Index = B/ Dominance Test is >50% Prevalence Index is \$3.0 Prevalence Index is \$3.0 Morphological Adaptation data in Remarks or o Problematic Hydrophytic vegetation Present. Hydrophytic Yes (FAC to be conservative. Yes (Absolute Dominant Indicator % Cover Species? Species? Status Number of Dominant Species Total Number of Dominant Species rer: % % Percent of Dominant Species % Total Number of Dominant Species % Percent of Dominant Species % Total Number of Dominant Species % Percent of Dominant Species % Total Number of Dominant Species % Percent of Dominant Species % Total Number of Dominant Species % Percent of Dominant Species % Total % Cover of: Mu ØBL species x1 = FACW species x2 = FACU species 13 x3 = FACU Sono FAC 10 Yes FAC 10 Yes FAC 10 Yes FAC 10 Yes Prevalence Index is <3.01	Absolute Dominant Indicator % Cover Species? Species? Status Image:

SOIL

	scription: (Describe	to the de	pth needed to docu	ment the indicat		the absence of indi	cators.)
Depth	Matrix		Redo	x Features	4	2	
(inches)	Color (moist)	%	Color (moist)	%Туре	e^1 Loc ²	Texture	Remarks
0-3	10YR 3/3	100	NA			silt loam	
3-10	10YR 3/2	100	NA			silt loam	
		·					
		·					
1							
³ Soil Toxtur	Concentration, D=Dep	letion, RN	1=Reduced Matrix.	Location: PL=F	ore Lining, R	C=Root Channel, M=N	Natrix.
Soli Textur	Indicators: (Applicable)		Re unless otherwise	Loan, Sandy Lo	am, Clay Loai	Indicators for Brok	lamatia Hydria Saila
Histoso	(A1)		Sandy Red	x (S5)		1 cm Muck (A	9) (LRR C)
Histic E	Epipedon (A2)		Stripped M	atrix (S6)		2 cm Muck (A	10) (LRR B)
Black H	Histic (A3)		Loamy Mue	cky Mineral (F1)		Reduced Vert	ic (F18)
Hydrog	en Sulfide (A4)		Loamy Gle	yed Matrix (F2)		Red Parent M	aterial (TF2)
	ed Layers (A5) (LRR (3)		latrix (F3) k Surface (F6)		Other (Explain	i in Remarks)
	ed Below Dark Surface	e (A11)		ark Surface (F7)			
Thick D	Dark Surface (A12)	- ()	Redox Dep	ressions (F8)			
Sandy	Mucky Mineral (S1)		Vernal Poo	ls (F9)		⁴ Indicators of hydr	ophytic vegetation and
Sandy	Gleyed Matrix (S4)					wetland hydrolo	ogy must be present.
Restrictive	Layer (if present):						
Type:La	irge cobble						
Depth (ir	nches):10"					Hydric Soil Preser	nt? Yes () No (•)
Remarks:							
HYDROLO	DGY						
Wetland Hy	vdrology Indicators:						
-						Secondary In	dicators (2 or more required)
Primary Ind	licators (any one indic	ator is sul	ficient)			Secondary In	dicators (2 or more required) arks (B1) (Riverine)
Primary Ind	licators (any one indic e Water (A1)	ator is sut	ficient)	: (B11)		Secondary In	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine)
Primary Ind	licators (any one indic e Water (A1) /ater Table (A2)	ator is sul	ficient) Salt Crust X Biotic Cru	: (B11) st (B12)		Secondary In Water Ma Sedimen Drift Dep	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine)
Primary Ind Surface	icators (any one indic e Water (A1) /ater Table (A2) tion (A3)	ator is sul	ficient) Salt Crust X Biotic Cru Aquatic Ir	: (B11) st (B12) ivertebrates (B13)	Secondary In Water Ma Sedimen Drift Dep Drainage	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10)
Primary Ind Surface High W Saturat Water I	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver)	ator is sut i ne)	ficient) Salt Crust Biotic Cru Aquatic Ir Hydrogen	: (B11) st (B12) ivertebrates (B13 Sulfide Odor (C1)	Secondary In Water Ma Sedimen Drift Dep Drainage	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2)
Primary Ind Surface High W Saturat Water N Sedime	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (No r	ator is sut ine) nriverine	ficient) Salt Crust Biotic Cru Aquatic Ir Hydrogen) Oxidized	: (B11) st (B12) ivertebrates (B13 Sulfide Odor (C1 Rhizospheres alo)) ng Living Roo	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3)	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7)
Primary Ind Surface High W Saturat Water I Sedime Drift De	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nor eposits (B3) (Nonrive)	ator is sut ine) nriverine rine)	ficient) Salt Crust Salt Crust Siotic Cru Aquatic Ir Hydrogen Oxidized Presence	: (B11) st (B12) vertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron)) ng Living Roo (C4)	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8)
Primary Ind Surface High W Saturat Water I Sedime Drift De Surface	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Non eposits (B3) (Nonrive e Soil Cracks (B6)	ator is suf ine) nriverine rine)	ficient) Salt Crust Solution	: (B11) st (B12) ivertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reduction in P)) ng Living Roo (C4) lowed Soils ((Secondary In Water M: Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc Crayfish	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) in Visible on Aerial Imagery (C9)
Primary Ind Surface High W Saturat Vater I Sedime Drift De Surface	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Non eposits (B3) (Nonriver e Soil Cracks (B6) tion Visible on Aerial I	ator is sut ine) nriverine rine) magery (l	ficient) Salt Crust Biotic Cru Aquatic Ir Hydrogen Oxidized Presence Recent Irc 37) Other (Ex	: (B11) st (B12) overtebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reducetion in P plain in Remarks)) ng Living Roo (C4) lowed Soils (C	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc Crayfish C6) Saturatio Shallow	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) on Visible on Aerial Imagery (C9) Aquitard (D3)
Primary Ind Surface High W Saturat Water I Sedime Drift De Surface Inundat	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Non eposits (B3) (Nonriver e Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9)	ator is sut ine) nriverine rine) magery (l	ficient) Salt Crust Salt Crust Salt Crust Aquatic Ir Hydrogen Oxidized Presence Recent Irc Salt Crust Salt Cr	: (B11) st (B12) vertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reduction in P plain in Remarks)) ng Living Roo (C4) lowed Soils (C	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc Crayfish C6) Saturatio Shallow	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) in Visible on Aerial Imagery (C9) Aquitard (D3) utral Test (D5)
Primary Ind Surface High W Saturat Water N Sedime Drift De Surface Field Obse	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nor eposits (B3) (Nonriver e Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations:	ator is sut ine) nriverine rine) magery (l	ficient) Salt Crust Biotic Cru Aquatic Ir Aquatic Ir Hydrogen Oxidized Presence Recent Ir S7) Other (Ex	: (B11) st (B12) wertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reduction in P plain in Remarks) ng Living Roo (C4) lowed Soils (C	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc Crayfish C6) Saturation Shallow	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) in Visible on Aerial Imagery (C9) Aquitard (D3) utral Test (D5)
Primary Ind Surface High W Saturat Water I Sedime Drift De Surface Field Obse Surface Wa Water Table	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Non eposits (B3) (Nonriver e Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: ater Present? Y	ator is suf	ficient) Salt Crust Biotic Cru Aquatic Ir Hydrogen Oxidized Presence Recent Irc 37) Other (Ex No Depth (ir	: (B11) st (B12) ivertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reduction in P plain in Remarks aches): N/A) ng Living Roo (C4) lowed Soils (C	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc Crayfish C6) Saturatio Shallow A FAC-Neu	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) on Visible on Aerial Imagery (C9) Aquitard (D3) utral Test (D5)
Primary Ind Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S Field Obse Surface Wa Water Table	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Non eposits (B3) (Nonriver e Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: ater Present? Y e Present? Y	ator is sut ine) nriverine rine) magery (I es () es ()	ficient) Salt Crust S	: (B11) st (B12) ivertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reduction in P plain in Remarks inches): N/A inches): >10 inches): >10) ng Living Roo (C4) lowed Soils (C	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas ts (C3) Thin Muc Crayfish C6) Saturatio Shallow J FAC-Net	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) on Visible on Aerial Imagery (C9) Aquitard (D3) utral Test (D5)
Primary Ind Surface High W Saturat Water N Sedime Drift De Surface Inundal Water-S Field Obse Surface Wa Water Table Saturation F (includes ca	icators (any one indic e Water (A1) /ater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nor eposits (B3) (Nonriver e Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: ater Present? Y e Present? Y Present? Y apillary fringe)	ator is sut ine) nriverine rine) magery (I es () es () es ()	ficient) Salt Crust Biotic Cru Aquatic Ir Hydrogen Oxidized Presence Recent Irr 37) Other (Ex No Depth (ir No Depth (ir	: (B11) st (B12) ivertebrates (B13 Sulfide Odor (C1 Rhizospheres alo of Reduced Iron on Reduction in P plain in Remarks aches): N/A aches): >10 aches): >10) ng Living Roo (C4) lowed Soils (C	Secondary In Water Ma Sedimen Drift Dep Drainage Dry-Seas Thin Muc Crayfish C6) Saturatio Shallow FAC-Net	dicators (2 or more required) arks (B1) (Riverine) t Deposits (B2) (Riverine) osits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7) Burrows (C8) in Visible on Aerial Imagery (C9) Aquitard (D3) utral Test (D5)

Remarks: Beginning of channel, poorly defined bed and bank.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Project	City/County:G	oldendale / Klick	itat County	Sampling Date: 5/1	4/19	
Applicant/Owner: Rye Development	_	Stat	e:WA	Sampling Point:DI	» <u>-</u> 3	
Investigator(s): Justin Moffett, Carissa Shoemak	ker	Section, Towr	ship, Range: $S18$, 7	T03N, R17E		
Landform (hillslope, terrace, etc.): hillslope		Local relief (c	concave, convex, noi	ne):concave	Slope	e (%):7
Subregion (LRR):B - Columbia/Snake River Pla	ateau Lat:45.	.749407	Long:-12	0.731968	Datum	:WGS84
Soil Map Unit Name: Lorena silt loam, 10-15 pe	rcent slopes			NWI classific	ation:PUBHx	
Are climatic / hydrologic conditions on the site typic	al for this time of y	rear?Yes 💽	No 🔿 (If n	o, explain in R	emarks.)	
Are Vegetation Soil or Hydrology	significantl	y disturbed?	Are "Normal Cir	cumstances" p	oresent? Yes 💽	No 🔿
Are Vegetation Soil or Hydrology	naturally p	roblematic?	(If needed, expl	ain any answe	rs in Remarks.)	
SUMMARY OF FINDINGS - Attach site	map showing	g sampling	point locations	transects,	important feat	ures, etc.
Hydrophytic Vegetation Present? Yes 🔘	No 💿					
Hydric Soil Present? Yes 🔘	No 💿	Is the	Sampled Area			
Wetland Hydrology Present? Yes	No 🜘	within	a Wetland?	Yes	No 🔘	

Remarks: Plot located near edge of excavated stock pond.

VEGETATION

	Absolute	Dominant	Indicator	Dominance Test w	orkshee	t:		
Tree Stratum (Use scientific names.)	% Cover	Species?	Status	Number of Dominar	nt Specie	s		
1.None				That Are OBL, FAC	W, or FA	C:]	((A)
2.				Total Number of Do	minant			
3.				Species Across All	Strata:		2 ((B)
4.								
Total Cove	r. %			- Percent of Dominar	It Species	S C' 50		(A/R)
Sapling/Shrub Stratum					W, 011A	.u. 30	.0 % (,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
1.None				Prevalence Index	workshe	et:		
2.				Total % Cover	of:	Multip	y by:	
3.			·	OBL species		x 1 =	0	
4.				FACW species		x 2 =	0	
5				FAC species	20	x 3 =	60	
Total Cover				FACU species	40	x 4 =	160	
Herb Stratum	. ,0			UPL species	10	x 5 =	50	
1.Poa bulbosa	30	Yes	FACU	Column Totals:	10	(A)	270	(B)
2. Lomatium nudicaule	10	No	UPL		/0	(A)	270	(D)
3. A chillea millefolium	10	No	FACU	Prevalence In	dex = B/	A =	3.86	
4. Unidentified grass*	$\frac{10}{20}$	Yes	FAC	Hydrophytic Vege	tation Inc	dicators:		
5.				Dominance Tes	st is >50%	6		
6				Prevalence Ind	ex is ≤3.(D^1		
7				Morphological	Adaptatic	ns ¹ (Provide	supportir	าต
7. o				- data in Rem	arks or o	n a separate	sheet)	5
0				Problematic Hy	drophytic	Vegetation	¹ (Explain))
Woody Vine Stratum	70 %							
1 None				¹ Indicators of hydrid	c soil and	d wetland hy	/drology r	nust
2				be present.		-		
				Hydrophytic				
	. %			Vegetation				
% Bare Ground in Herb Stratum 30 % % Cover	of Biotic 0	Crust () %	Present?	Yes 🔿	No 🤆	Ð	
Remarks: *Assuming the unidentified species is FA	C to be c	onservativ	ve.	<u> </u>				

SOIL

Profile Des	cription: (Describe t	to the de	oth needed to docu	ment the	indicator o	or confirm	the absence of in	dicators.)
Depth	Matrix		Redo	x Features	S		3	
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	lype'	Loc ²	lexture ³	Remarks
0-12	10YR 3/3	100	NA				silt loam	
12-15	10YR 3/2	100	NA				silt loam	
¹ Type: C=C	Concentration, D=Depl	letion, RM	=Reduced Matrix.	² Locatior	: PL=Pore	Lining. R	 C=Root Channel. M	=Matrix.
³ Soil Textur	es: Clay, Silty Clay, S	andy Cla	y, Loam, Sandy Clay	Loam, Sa	andy Loam,	Clay Loa	m, Silty Clay Loam,	Silt Loam, Silt, Loamy Sand, Sand.
Hydric Soil	Indicators: (Applicabl	e to all LF	Rs, unless otherwise	e noted.)			Indicators for Pr	oblematic Hydric Soils:
Histoso	I (A1)		Sandy Redo	x (S5)			1 cm Muck	(A9) (LRR C)
Histic E	pipedon (A2) listic (A3)		Stripped Mi	atrix (S6) sky Minera	al (F1)			(A10) (LRR B) artic (E18)
Hydrog	en Sulfide (A4)		Loamy Gle	yed Matrix	(F2)		Red Parent	Material (TF2)
Stratifie	d Layers (A5) (LRR C	;)	Depleted N	latrix (F3)	. ,		Other (Expl	ain in Remarks)
1 cm M	uck (A9) (LRR D)		Redox Darl	< Surface	(F6)			
	ed Below Dark Surface	e (A11)	Depleted D	ark Surfac	ce (F7)			
	Mucky Mineral (S1)		Vernal Poo	ls (F9)	FO)		⁴ Indicators of hv	drophytic vegetation and
Sandy	Gleyed Matrix (S4)						wetland hydr	ology must be present.
Restrictive	Layer (if present):							
Type:No	one found							
Depth (ir	nches):						Hydric Soil Pres	ent? Yes No 💿
Remarks:								
HYDROLO	DGY							
Wetland Hy	drology Indicators:						Secondary	Indicators (2 or more required)
Primary Ind	icators (any one indica	ator is suf	ficient)				Water	Marks (B1) (Riverine)
Surface	e Water (A1)		Salt Crust	(B11)			Sedim	ent Deposits (B2) (Riverine)
High W	ater Table (A2)		Biotic Cru	st (B12)			Drift D	eposits (B3) (Riverine)
	ion (A3)			vertebrate	es (B13)			ge Patterns (B10)
	narks (B1) (Nonriveri	ne) vriverine)		Sullide O	uur (CT) ares along l	iving Roo	uts (C3)	uck Surface (CZ)
	eposits (B3) (Nonriver	ine)		of Reduce	ed Iron (C4)		sh Burrows (C8)
	e Soil Cracks (B6)		Recent Irc	n Reducti	ion in Plow	, ed Soils (0	C6) Satura	tion Visible on Aerial Imagery (C9)
Inundat	ion Visible on Aerial I	magery (E	37) 🗍 Other (Ex	plain in Re	emarks)		Shallov	w Aquitard (D3)
Water-	Stained Leaves (B9)						FAC-N	eutral Test (D5)
Field Obse	rvations:							
Surface Wa	ter Present? Ye	es 🔿	No Depth (in 	ches):	N/A			
Water Table	Present? Ye	es 🔿	No Depth (in	ches):	>15"			
Saturation F	Present? Ye	es 🔿	No Depth (in 	ches):	>15"	Wetla	and Hydrology Pre	sent? Yes 🔿 No 💿
Describe Re	ecorded Data (stream	gauge, m	onitoring well, aerial	photos, pr	evious insp	pections),	if available:	
Remarks:P]	ot located approxin	nately 2	feet above edge of	pond.				

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped S	storage Project		City/County:Go	Idendale / Klick	citat County	Sampling Date: 5/15/19
Applicant/Owner: Rye Development	t			Sta	ate:WA	Sampling Point:DP-4
Investigator(s): Justin Moffett, Cari	ssa Shoemaker		Section, Towns	hip, Range: <u>S19,</u>	T03N, R17E	
Landform (hillslope, terrace, etc.): roa	dcut terrace		Local relief (co	ncave, convex, no	one):convex	Slope (%):1
Subregion (LRR):B - Columbia/Sna	ke River Platea	u Lat:45.	728751	Long:-1	20.723742	Datum:WGS84
Soil Map Unit Name: Rock outcrop-	Rubble land-Ha	ploxerolls co	omplex, 30-90	percent slopes	NWI classific	cation:Upland
Are climatic / hydrologic conditions or	the site typical fo	r this time of y	ear?Yes 💿	No 🔿 (If	no, explain in R	lemarks.)
Are Vegetation Soil or	Hydrology	significantly	y disturbed?	Are "Normal C	ircumstances" p	oresent? Yes 💿 No 🔿
Are Vegetation Soil or	Hydrology	naturally pr	roblematic?	(If needed, exp	lain any answe	ers in Remarks.)
SUMMARY OF FINDINGS -	Attach site ma	ap showing	g sampling p	oint locations	s, transects	, important features, etc
Hydrophytic Vegetation Present?	Yes 💿	No 🔘				
Hydric Soil Present?	Yes 💿	No 🔘	Is the Sa	ampled Area		
Wetland Hydrology Present?	Yes 💽	No 🔘	within a	Wetland?	Yes 💿	No 🔿
Remarks:Wetland located in aba	ndoned road bed	d. Groundwa	ter flowing from	m excavated hil	lside associat	ed with abandoned road
manyidaa watland hudu	logy					

provides wetland hydrology.

VEGETATION

	Absolute	Dominant	Indicator	Dominance Test w	orkshee	t:		
Tree Stratum (Use scientific names.)	% Cover	Species?	Status	Number of Dominar	nt Specie	s		
1.None				That Are OBL, FAC	W, or FA	C: 1	((A)
2.				Total Number of Do	minant			
3.				Species Across All	Strata:	1	((B)
4.		·		-				. ,
Total Cove	r: 0%			- Percent of Dominar	nt Species	S C: 100	0.00	
Sapling/Shrub Stratum	1. 70			That Ale Obl, FAC	W, OFA	100	.0% (А/В)
1.None				Prevalence Index	workshe	et:		
2.		·		Total % Cover	of:	Multiply	v by:	
3.				OBL species	90	x 1 =	90	
4				FACW species		x 2 =	0	
5				FAC species	10	x 3 =	30	
Total Cover	r. 0/			FACU species	10	x 4 =	0	
Herb Stratum	. 70			LIPL species		x 5 =	0	
1.Mimulus guttatus	90	Yes	OBL		100		120	(P)
2. Rubus armoniacus		No	FAC		100	(A)	120	(D)
3.				Prevalence In	dex = B/	A =	1.20	
4.				Hydrophytic Vege	tation Ind	dicators:		
5				Dominance Te	st is >50%	6		
6				Prevalence Ind	ex is ≤3.0) ¹		
7				Morphological	Adaptatio	ons ¹ (Provide :	supportir	ng
2 2				- data in Rem	arks or o	n a separate	sheet)	0
0				Problematic Hy	drophytic	· Vegetation ¹	(Explain))
Woody Vine Stratum	100%							
1 None				¹ Indicators of hydrid	c soil and	d wetland hyd	lrology r	nust
2				be present.			0,	
Z				Hydrophytic				
Total Cover	. %			Vegetation				
% Bare Ground in Herb Stratum % Cover	r of Biotic (Crust	%	Present?	Yes 🖲	No 🔿		
Remarks:				1				

SOIL

Depth	Matrix	Redox Featur	es		— . 2	
(inches)	%	Color (moist) %	 			Remarks
¹ Type: C=C ³ Soil Texture	oncentration, D=Depletion, RI	M=Reduced Matrix. ² Locati ay, Loam, Sandy Clay Loam, S	on: PL=Pore	Lining, R0, Clay Loa	C=Root Channel, M=Mat m, Silty Clay Loam, Silt L	rix. .oam, Silt, Loamy Sand, Sand
Hydric Soil I Histosol Histic E Black Hi Hydroge Stratifier 1 cm Mu Deplete	ndicators: (Applicable to all L (A1) pipedon (A2) istic (A3) en Sulfide (A4) d Layers (A5) (LRR C) uck (A9) (LRR D) d Below Dark Surface (A11) ark Surface (A12)	RRs, unless otherwise noted.) Sandy Redox (S5) Stripped Matrix (S6 Loamy Mucky Mine Loamy Gleyed Matrix Depleted Matrix (F3 Redox Dark Surface Depleted Dark Surface Depleted Dark Surface Depleted Dark Surface) ral (F1) ix (F2) i) e (F6) ace (F7)		Indicators for Problem 1 cm Muck (A9) 2 cm Muck (A10) Reduced Vertic (Red Parent Mate Other (Explain in	natic Hydric Solls: (LRR C)) (LRR B) (F18) erial (TF2) I Remarks)
Sandy N Sandy O	Mucky Mineral (S1) Gleyed Matrix (S4)	Vernal Pools (F9)	(10)		⁴ Indicators of hydropł wetland hydrology	hytic vegetation and v must be present.
Restrictive Type: Depth (in Remarks: N hy	Layer (if present): ches): o soil pit dug due to prese ydrophytic vegetation and	nce of compacted rock road wetland hydrology.	lbed subst	rate. Hyd	Hydric Soil Present? ric soil is assumed pre	Yes No No cesent based on presence of
IYDROLO	GY					
Wetland Hy	drology Indicators:				Secondary Indic	ators (2 or more required)
Primary Indi	cators (any one indicator is su	fficient)			Water Mark	s (B1) (Riverine)
X Surface	Water (A1)	Salt Crust (B11)			Sediment D	eposits (B2) (Riverine)
High Wa	ater Table (A2)	Biotic Crust (B12)			Drift Deposi	its (B3) (Riverine)
X Saturati	on (A3)	Aquatic Invertebra	tes (B13)		Drainage Pa	atterns (B10)
Water N	/arks (B1) (Nonriverine)	Hydrogen Sulfide	Odor (C1)		Dry-Season	Water Table (C2)

(includes capillary fringe) Wetland Hydrology Present? Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

No 🔿

No 🔿

No 🔿

Remarks: Flowing water observed within wetland. Water originates from hillside seep located immediately upslope of wetland

Oxidized Rhizospheres along Living Roots (C3)

0"

0"

0"

Recent Iron Reduction in Plowed Soils (C6)

Presence of Reduced Iron (C4)

Other (Explain in Remarks)

Depth (inches):

Depth (inches):

Depth (inches):

Sediment Deposits (B2) (Nonriverine)

Inundation Visible on Aerial Imagery (B7)

Yes (

Yes (

Yes (

Drift Deposits (B3) (Nonriverine)

Surface Soil Cracks (B6)

Field Observations:

Surface Water Present?

Water Table Present?

Saturation Present?

Water-Stained Leaves (B9)

Thin Muck Surface (C7)

Saturation Visible on Aerial Imagery (C9)

Yes

No ()

Crayfish Burrows (C8)

Shallow Aquitard (D3)

FAC-Neutral Test (D5)

ATTACHMENT 2:

PHOTOGRAPH LOG



Photo 1: DP-1 Vegetation, Looking South



Photo 2: DP-1 Soil Pit

Goldendale Pump	ed Storage Project				
Goldendale, WA					
June	e 2019	ERM			
Wetland and Water Delineation Report	Page 1				



Photo 3: DP-2, Near Beginning of S7. Vegetation, Looking North



Photo 4: DP-2 Soil Pit

Goldendale Pumped Storage Project						
Goldeno	dale, WA	\bigcirc				
June	2019	ERM				
Wetland and Water Delineation Report	Page 2					



Photo 5: DP-3 (at P1) Vegetation, Looking East



Photo 6: DP-3 (at P1) Soil Pit





Photo 7: S17 Intermittent Stream, Looking West



Photo 8: W6 Wetland with Seep, Looking Southwest





Photo 9: S17 at Culvert Outlet Located below Highway 14, Looking West









Photo 11: S24, Looking Northeast



Photo 12: P2

Goldendale Pump Goldend June	ed Storage Project dale, WA 2019	ERM
Wetland and Water Delineation Report	Page 6	



```
Photo 13: S7, Looking North
```



Photo 14: S7 Width Measurement

Goldendale Pump	ed Storage Project				
Goldendale, WA					
June	2019	ERM			
Wetland and Water Delineation Report	Page 7				



Photo 15: S8, Looking North



Photo 16: S8, Looking South

