## GOLDENDALE ENERGY STORAGE HYDROELECTRIC PROJECT

Federal Energy Regulatory Commission Project No. 14861

Klickitat County, Washington

# FINAL LICENSE APPLICATION Appendix B: Wetlands and Waters Delineation Report

#### For:

FFP Project 101, LLC



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#### **Acronyms and Abbreviations**

ERM ERM-West, Inc. FAC facultative plants

FACW facultative wetland plants HUC hydrologic unit code

NHD National Hydrography Database NWI National Wetlands Inventory

NRCS The Natural Resources Conservation Service

OBL obligate wetland plants
OHWM ordinary high water mark

UPL upland plants

USACE United States Army Corps of Engineers
USDA United States Department of Agriculture
USFWS United State Fish and Wildlife Service

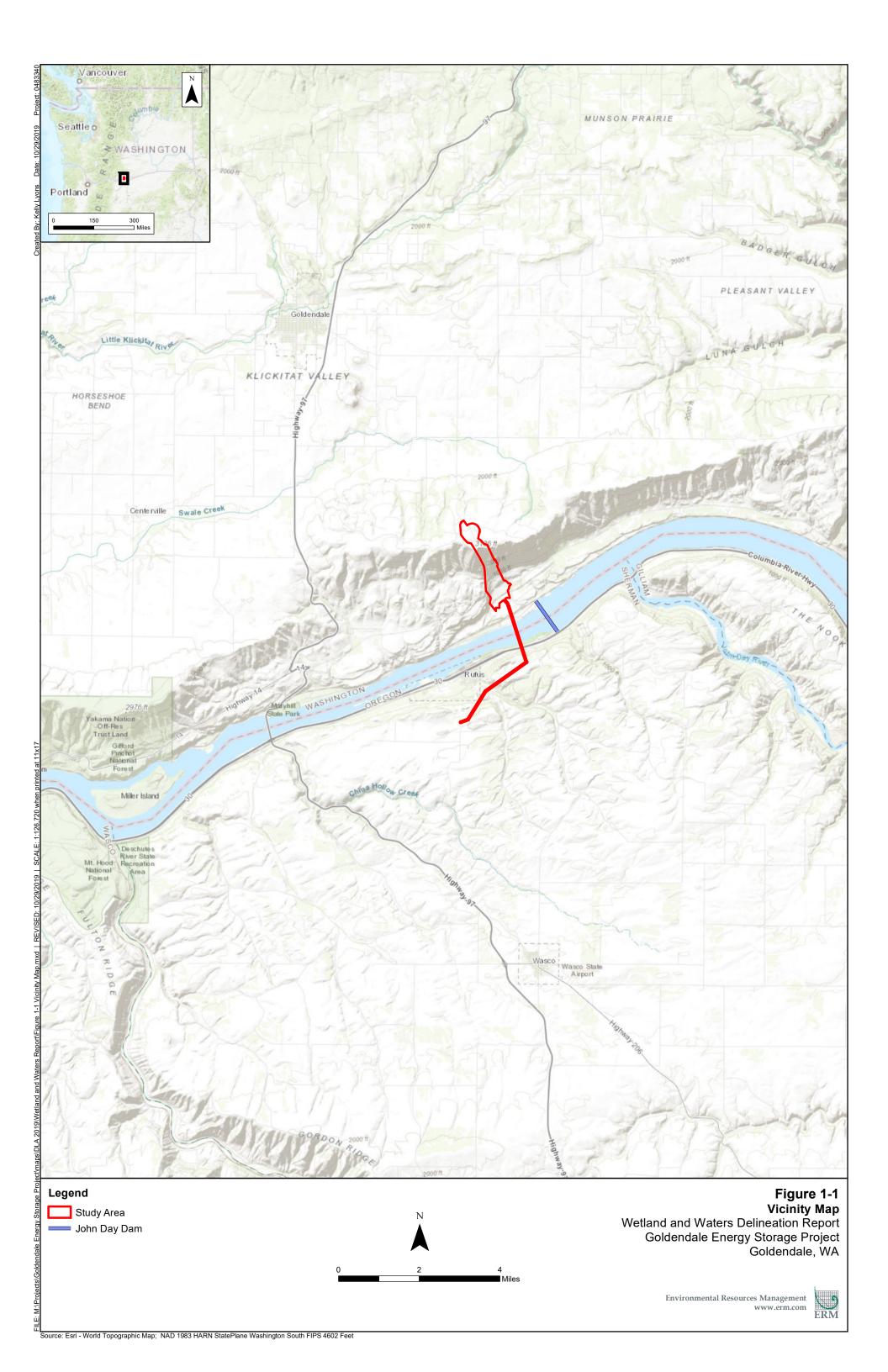
USGS United States Geological Survey

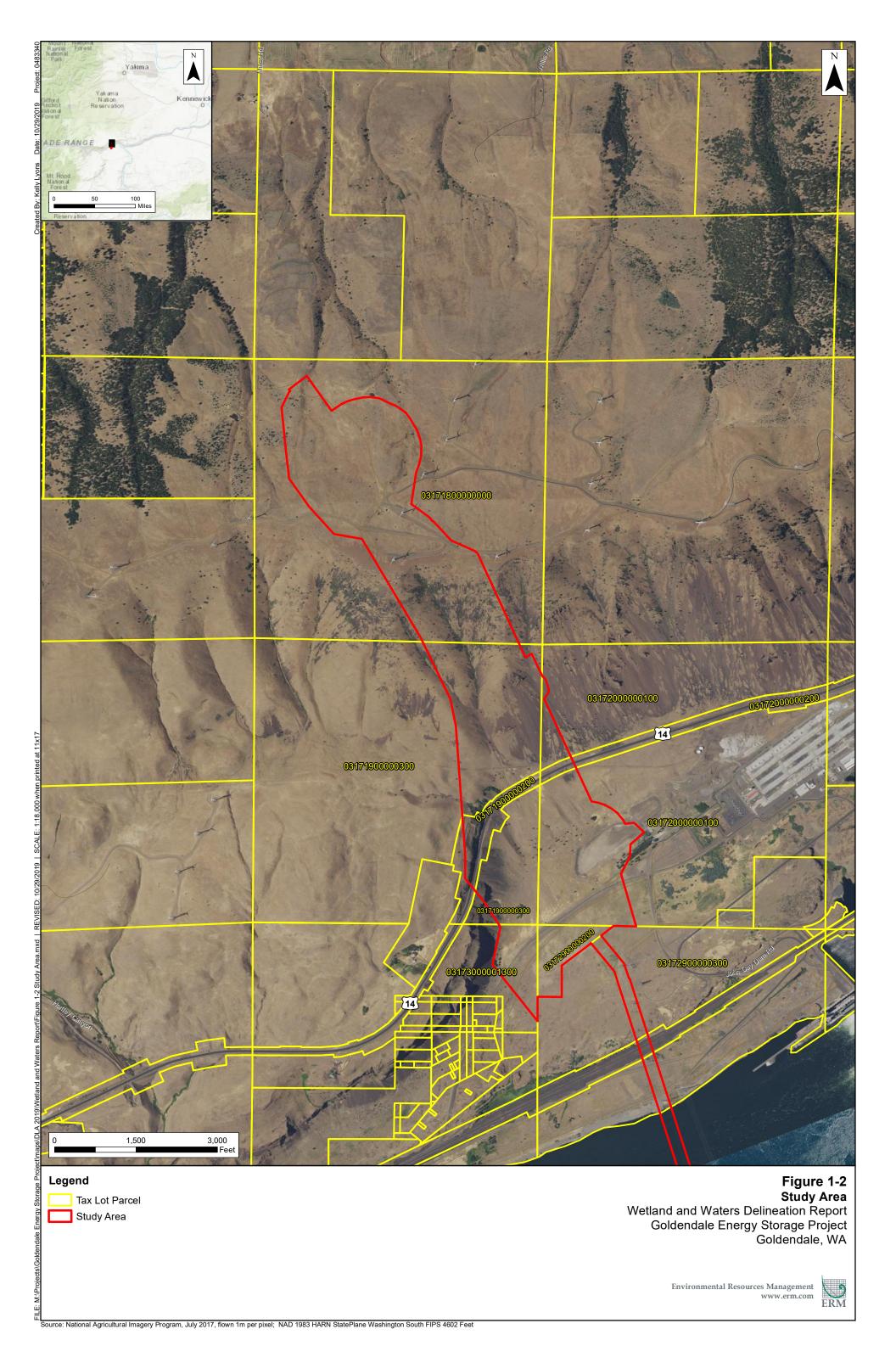
#### 1.0 INTRODUCTION

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.

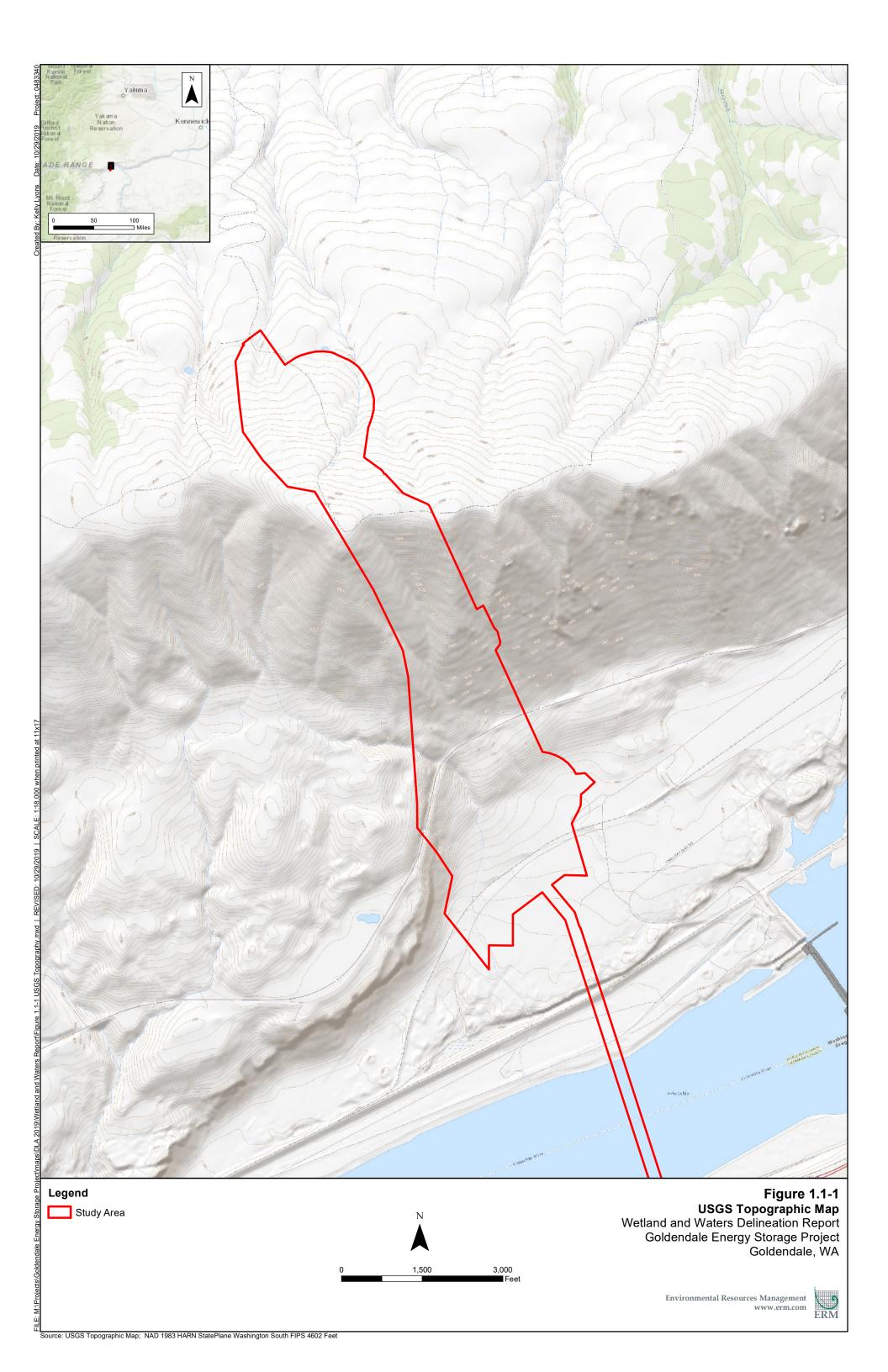
This report documents the presence and geographic extent of wetlands and waters, and describes how these features were distinguished from uplands. This delineation is subject to agency verification and approval.





#### 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.

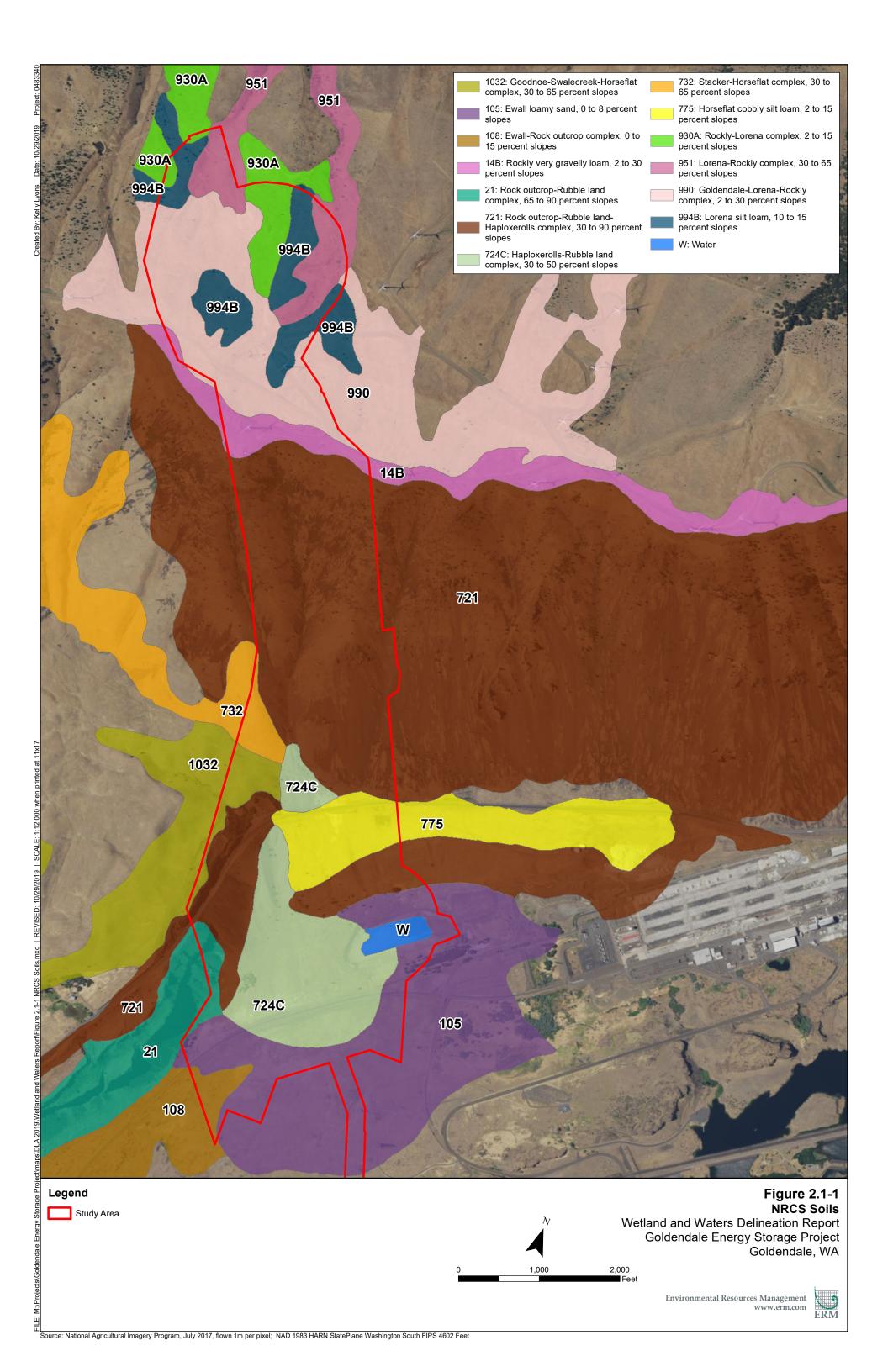
#### 2.1 Soil Survey Data

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.

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

Map Unit Symbol	Map Unit name	Drainage Class	Hydric Soil Rating
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

Source: USDA/NRCS 2019



### 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 5-foot 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.

Table 3.1-1: Plant Indicator Sta	atus Categories
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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.

<sup>\*</sup>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).

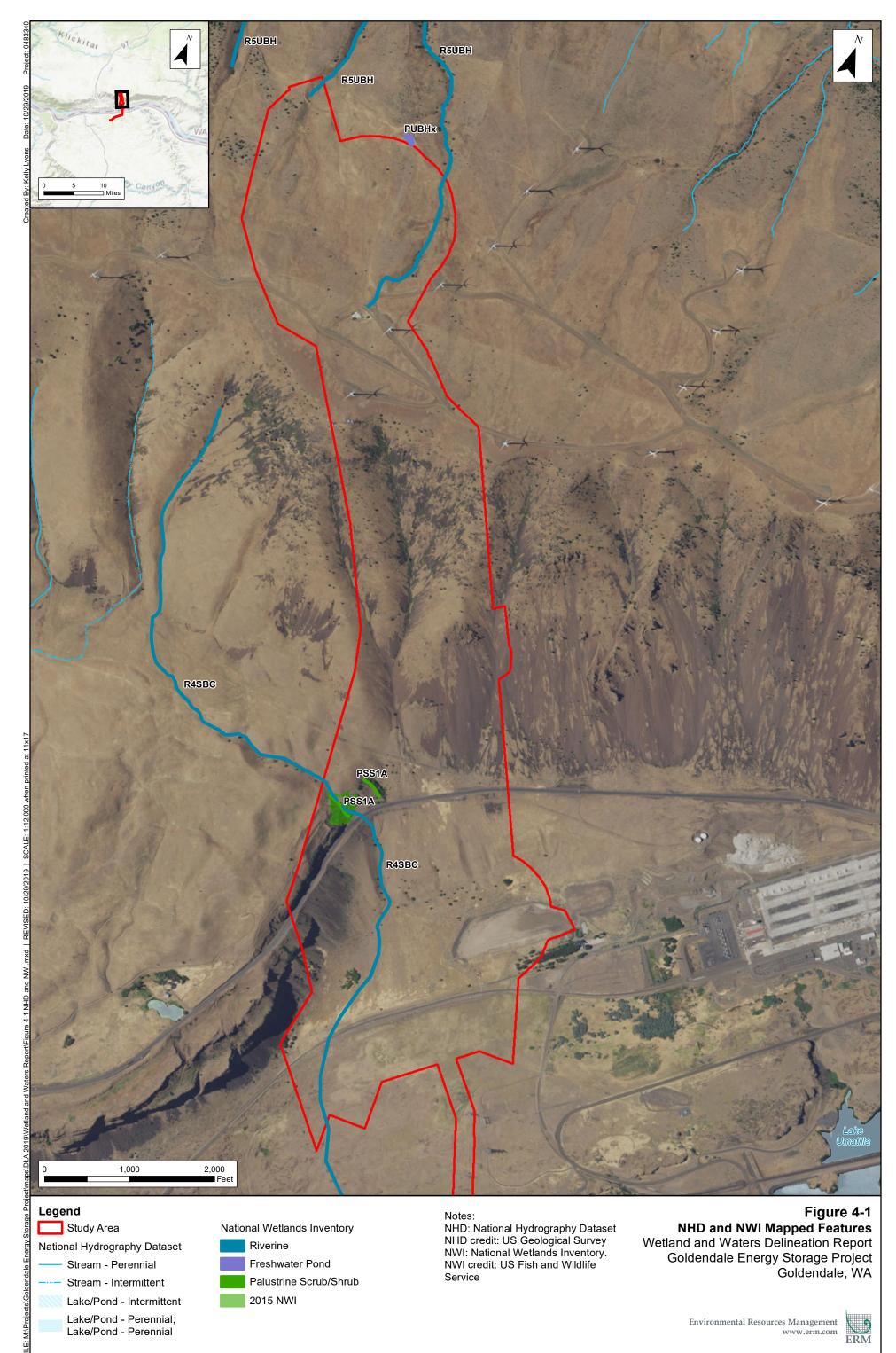
Assessment of hydrologic criteria was based on primary and secondary indicators. Primary indicators observed in the study area included observations of water marks and algal mat or crust. If the data point was situated above the level of seasonal inundation or saturation, the criteria were not met; conversely, 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.



#### 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.

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

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 mapped	Not mapped	Likely not jurisdictional. Seep lacks a surface connection to the Columbia River as most of the flow goes subsurface near Highway 14.
W6	Not Mapped	Not mapped	Likely not jurisdictional. Wetland appears to be isolated and does not have a surface connection to S17.

#### 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

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## ATTACHMENT 1: WETLAND DETERMINATION DATA FORMS

## WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Project		City/Count	ty:Goldenda	ale / Klickitat Cour	nty San	npling Date:	5/14/19	
Applicant/Owner: Rye Development				State:WA	 Sam	- npling Point:]	 DP-1	
Investigator(s): Justin Moffett, Carissa Shoemaker		Section, T	ownship, Ra	inge:S18, T03N, R	<u>17E</u>	-		
Landform (hillslope, terrace, etc.): draw/swale		Local relie	ef (concave,	convex, none):conc	ave	Slo	ope (%):1(	0
Subregion (LRR):B - Columbia/Snake River Plateau	Lat:45.7	745335		Long:-120.73005	1	——— Datı	um:WGS	84
Soil Map Unit Name: Lorena-Rockly complex, 30-65 per					ssification			
Are climatic / hydrologic conditions on the site typical for this			• No (					
	-	disturbed	~	"Normal Circumstand		,	) No	$\circ$
	, ,			eeded, explain any ar		_	, 140	$\cup$
		oblematic?	·			ŕ		
SUMMARY OF FINDINGS - Attach site map si	howing	samplir	ng point l	ocations, transe	ects, imp	oortant fe	atures,	etc.
Hydrophytic Vegetation Present? Yes No	•							
Hydric Soil Present? Yes No	•	ls t	he Sample	l Area				
			hin a Wetla			No 💿		
Remarks: Plot located in swale exhibiting non-hydrop	hytic ve	getation a	nd non-hyd	lric soils. No evide	ence of ar	n ordinary	high wat	er
mark observed.								
VEGETATION								
	Absolute	Dominant	Indicator	Dominance Test	workshee	.t-		
	% Cover	Species?		Number of Domina				
1.None				That Are OBL, FA			0	(A)
2.				Total Number of D	ominant			
3.				Species Across All			2	(B)
4.				Percent of Domina	nt Specie	s		
Total Cover:	%			That Are OBL, FAC		_	.0 %	(A/B)
Sapling/Shrub Stratum	2	Vac	EACH	Prevalence Index	worksho	ot·		
1.Rosa sp. 2.	2	Yes	FACU	Total % Cover		Multip	ılv hv	
3.			-	OBL species	01.	x 1 =	0	
4.				FACW species		x 2 =	0	
5.				FAC species	5	x 3 =	15	
Total Cover:	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	Dravalance I	ndev - Di	Λ -	4.00	
3. Achillea millefolium	3	No	FACU	Prevalence I			4.32	
4-Lithophragma parviflorum	10	No	UPL	Dominance Te				
5.Poa sp.*	5	No	FAC	Prevalence In				
6.Bromus tectorum	2	No	UPL	Morphological			supporti	na
7.Eriogonum compositum	10	No	UPL			n a separate		19
8. <u>Taraxacum officinale</u> Total Cover:	2	No	FACU	Problematic H	lydrophytic	C Vegetation	1 (Explain	)
Woody Vine Stratum	67 %							
1.None				<sup>1</sup> Indicators of hydr	ric soil and	d wetland hy	drology r	nust
2.				be present.				
Total Cover:	%			Hydrophytic				
% Bare Ground in Herb Stratum 20 % % Cover of	of Biotic C	Crust 2	0 %	Vegetation Present?	Yes (	No (	5)	
Remarks: *Assuming the unidentified species is FAC						- 0		
rissuming the undentified species is I AC	. 10 00 0	onser vall						

SOIL Sampling Point: DP-1

Profile Des	scription: (Describe Matrix	to the de	-	ument the ox Featur		or confir	m the absence of in	dicators.)
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture <sup>3</sup>	Remarks
0-8	10YR 3/3	100	NA				silt loam	
8-11	10YR 3/3	98	10YR 4/4					
0-11	- 101K 3/3		101 K 4/4		<u> </u>	- IVI	silt loam	
	_							
			· .				· <del></del> -	
	_			_				
1-		- <del></del>				-	: <del></del> :-	
	Concentration, D=Dep					-	RC=Root Channel, M	=Matrix. Silt Loam, Silt, Loamy Sand, Sand.
	Indicators: (Applicab			-		i, Clay Lu		oblematic Hydric Soils:
Histoso		ne to an L	Sandy Red	-				(A9) (LRR C)
	Epipedon (A2)		Stripped I	` '	)			(A10) (LRR B)
	Histic (A3)		Loamy M	•			Reduced Ve	, , ,
Hydrog	gen Sulfide (A4)		Loamy GI	-			Red Parent	Material (TF2)
	ed Layers (A5) (LRR (	C)	Depleted	Matrix (F3	5)		Other (Expla	ain in Remarks)
	Muck (A9) ( <b>LRR D</b> )		Redox Da		. ,			
	ed Below Dark Surfac	e (A11)	Depleted		. ,			
	Dark Surface (A12)		Redox De		(F8)		41	duanda, dia wasatatian and
	Mucky Mineral (S1) Gleyed Matrix (S4)		Vernal Po	ois (F9)				drophytic vegetation and ology must be present.
	Layer (if present):						Wettaria riyar	ology must be present.
	ock/cobble							
	nches):11"						Hydric Soil Pres	ent? Yes No (•)
	1-3" round rock/cob	. 1. 1					Hydric 30ii Fres	ent: les \ No \
i Kemarks.	1-5 TOUTHO TOCK/COU	odie uno	ugnout prome					
HYDROL	OGY							
Wetland H	ydrology Indicators:							Indicators (2 or more required)
Primary Inc	dicators (any one indic	ator is su	fficient)				Water	Marks (B1) (Riverine)
Surfac	e Water (A1)		Salt Cru	st (B11)			Sedime	ent Deposits (B2) (Riverine)
High W	Vater Table (A2)		⊠ Biotic Cr	ust (B12)			Drift De	eposits (B3) (Riverine)
Satura	tion (A3)		Aquatic	nvertebra	tes (B13)		Draina	ge Patterns (B10)
Water	Marks (B1) (Nonriver	rine)			Odor (C1)			eason Water Table (C2)
	ent Deposits (B2) (No		· <u></u>		neres along	-	` ' 🗀	luck Surface (C7)
	eposits (B3) (Nonrive	rine)			ced Iron (C	,		sh Burrows (C8)
🖳	e Soil Cracks (B6)				ction in Plov	wed Soils	· · ·	tion Visible on Aerial Imagery (C9)
	ition Visible on Aerial I	Imagery (	B7) Other (E	xplain in F	Remarks)			w Aquitard (D3)
	Stained Leaves (B9)						FAC-N	leutral Test (D5)
Field Obse	ervations:							
Surface Wa	ater Present? Y	′es 🔘	No   Depth (	inches):	N/A			
Water Tabl	e Present? Y	′es 🔘	No   Depth (	inches):	>11"			
Saturation		′es 🔘	No   Depth (	inches):	>11"	10/04	land Hudnalanu Daa	
	apillary fringe)	n dalide n	nonitoring well seris	l photos i	orevious in		land Hydrology Pre	sent? Yes   No
Describe K	ecorded Data (stream	ı gauge, I	normorning well, aella	ii pii0t05,	PIENIOUS III	ορευιίοι is)	, ii avaliabic.	
Damadaa								
1	Algal matting presen							
S	oil dry and crumbly	y, Iow so	11 moisture.					
US Army Cor	ps of Engineers							

## WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Project		City/Cour	nty:Goldend	ale / Klickitat Cour	nty San	npling Date:	5/14/19	
Applicant/Owner: Rye Development				State:WA	San	npling Point:	DP-2	
Investigator(s):Justin Moffett, Carissa Shoemaker		Section,	Township, Ra	ange:S18, T03N, R1	17E	-		
Landform (hillslope, terrace, etc.): draw/swale		Local rel	ief (concave,	convex, none):conca	ave	Slo	ope (%):1(	0
Subregion (LRR):B - Columbia/Snake River Plateau	Lat:45.	746126		Long:-120.72976	2	 Dat	um:WGS	84
Soil Map Unit Name: Lorena-Rockly complex, 30-65 pe	ercent slo	pes		NWI cla	ssification	:R5UBH		
Are climatic / hydrologic conditions on the site typical for thi			<ul><li>No (</li></ul>	(If no, explain	in Rema	rks.)		
	significantly			"Normal Circumstanc	es" prese	nt? Yes	) No	$\circ$
	naturally pr			eeded, explain any ar				
SUMMARY OF FINDINGS - Attach site map							eatures.	etc.
			31					
	lo 💿	le	the Sample	d Aroa				
	lo 🔘		the Sample thin a Wetla			No (•)		
Remarks:Plot located in swale exhibiting non-hydro							eginning	to
form. Stream S7 begins immediately down				<u> </u>	111811 1110		· B	
VEGETATION								
Tree Stratum (Use scientific names.)	Absolute % Cover	Dominar Species	nt Indicator ? Status	Dominance Test				
1.None	70 00101	Ороско	. Otatao	Number of Domina That Are OBL, FAC			1	(A)
2.				_				(* ')
3.	_			<ul> <li>Total Number of Description</li> <li>Species Across All</li> </ul>			2.	(B)
4.			_				_	,
Total Cove	er: %			<ul> <li>Percent of Domina</li> <li>That Are OBL, FAC</li> </ul>		_	0.0 %	(A/B)
Sapling/Shrub Stratum							7.0 70	()
1.None	_			Prevalence Index			day bayı	
2. 3.	_			OBL species	OI.	Multip x 1 =	0 Diy by.	
4.	_			FACW species		x 2 =	0	
5.	_			FAC species	13	x 3 =	39	
Total Cove	r: %		_	FACU species	15	x 4 =	60	
Herb Stratum	, ,			UPL species	7	x 5 =	35	
1.Poa bulbosa	10	Yes	FACU	Column Totals:	35	(A)	134	(B)
<sup>2</sup> ·Lomatium nudicaule	5	No	UPL	- Barratan a di			2.02	
3.Gallium sp.*	3	No	FAC	Prevalence In			3.83	
4 Lithophragma parviflorum	_ 2	No	UPL	Hydrophytic Vege  Dominance Te				
5.Poa sp.*		Yes	FAC	Prevalence Inc				
6.Eriogonum compositum	5	No	FACU	Morphological			- supporti	าต
7. 8.	_		_			n a separat		19
Total Cove	r. 0.7		_	Problematic H	ydrophyti	c Vegetation	<sup>1</sup> (Explain	)
Woody Vine Stratum	r: 35 %							
1.None				<sup>1</sup> Indicators of hydr	ic soil an	d wetland h	ydrology r	nust
2				be present.				
Total Cove	r: %			Hydrophytic Vegetation				
% Bare Ground in Herb Stratum 15 % % Cove	r of Biotic C	Crust :	50 %	Present?	Yes (	No (	•	
Remarks: *Assuming the unidentified species are F	FAC to be	conserva	ntive.					
and a species were	_ 13 0 <b>0</b>		. <del></del>					

SOIL Sampling Point: DP-2

Profile Des	cription: (Describe	to the dep	th neede	d to docu	ment the	indicator	or confirr	m the abs	ence of in	dicators.)	
Depth	Matrix				x Feature				2		
(inches)	Color (moist)	%	Color	(moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Textu	re <sup>3</sup>	Rem	arks
0-3	10YR 3/3	100	NA					silt loam			
3-10	10YR 3/2	100	NA					silt loam			
	101110/2										
1	Concentration, D=Dep					n: PL=Pore	-				
<sup>3</sup> Soil Textur	es: Clay, Silty Clay, S	Sandy Clay	, Loam, S	Sandy Clay	Loam, S	andy Loam	, Clay Loa		-		-
Hydric Soil	Indicators: (Applicab	le to all LR	Rs, unless	s otherwise	e noted.)			Indica	tors for Pr	oblematic Hydric S	oils:
Histoso	• •			Sandy Redo	. ,					(A9) ( <b>LRR C</b> )	
	Epipedon (A2)			Stripped M	, ,					(A10) ( <b>LRR B</b> )	
	Histic (A3)			oamy Muc	-				Reduced Ve		
	en Sulfide (A4)			oamy Gle		, ,				Material (TF2)	
	ed Layers (A5) (LRR (	(د		Depleted M Redox Darl	, ,				itner (Expia	ain in Remarks)	
	luck (A9) ( <b>LRR D</b> ) ed Below Dark Surfac	o (A11)		Depleted D		` '					
	Park Surface (A12)	c (ATT)		Redox Dep							
	Mucky Mineral (S1)		1 1	/ernal Poo		(10)		<sup>4</sup> Indic	ators of hy	drophytic vegetatio	n and
	Gleyed Matrix (S4)				()				-	ology must be pres	
	Layer (if present):										
	rge cobble										
	nches):10"							Hydric	Soil Pres	ent? Yes	No 📵
Remarks:	10103).10							Hydric		ent: res	140 (4)
ixemarks.											
HYDROLO	OGY										
									Cocondon	Indicators (2 or ma	ura raquirad\
1	ydrology Indicators:							-		Indicators (2 or mo	
	icators (any one indic	ator is suff	icient)					[		Marks (B1) ( <b>Riveri</b>	•
	e Water (A1)			Salt Crust						ent Deposits (B2) (	,
High W	ater Table (A2)		×	Biotic Cru				[		eposits (B3) (River	ine)
	tion (A3)			Aquatic In						ge Patterns (B10)	
	Marks (B1) ( <b>Nonriver</b> i	,		Hydrogen		, ,		[		ason Water Table	(C2)
	ent Deposits (B2) (No			Oxidized I	Rhizosph	eres along	Living Ro	ots (C3)	Thin M	uck Surface (C7)	
Drift De	eposits (B3) (Nonrive	rine)		Presence	of Reduc	ed Iron (C4	1)	[	Crayfis	h Burrows (C8)	
Surface	e Soil Cracks (B6)			Recent Iro	n Reduc	tion in Plow	ed Soils (	(C6)	Satura	tion Visible on Aeri	al Imagery (C9)
Inunda	tion Visible on Aerial I	magery (B	7)	Other (Ex	plain in R	emarks)		[		w Aquitard (D3)	
Water-	Stained Leaves (B9)								FAC-N	eutral Test (D5)	
Field Obse	rvations:										
Surface Wa	iter Present? Y	es 🔘	No 💿	Depth (in	ches):	N/A					
Water Table	e Present? Y	es 🔘	No 💿	Depth (in	ches):	>10"					
Saturation F		_	No (	Depth (in	ches):	>10"					
(includes ca	apillary fringe)	_						-		sent? Yes 💿	No 🔘
Describe Re	ecorded Data (stream	gauge, m	onitoring v	vell, aerial	photos, p	revious ins	pections),	, if availab	le:		
Remarks:B	eginning of channe	l, poorly	defined l	ed and b	ank.						
	8 8	, 1									
US Army Corr	os of Engineers										

## WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Project		City/Count	y:Goldenda	le / Klickitat Cou	nty San	npling Date:5	/14/19	
Applicant/Owner: Rye Development				State:WA	San	npling Point:[	)P-3	
Investigator(s): Justin Moffett, Carissa Shoemaker		Section, T	ownship, Ra	nge:S18, T03N, R	17E	_		
Landform (hillslope, terrace, etc.): hillslope		Local relie	ef (concave,	convex, none):conc	ave	Slo	pe (%):7	
Subregion (LRR):B - Columbia/Snake River Plateau	Lat:45.7	49407		Long:-120.73196	8	 Datu	m:WGS	84
Soil Map Unit Name: Lorena silt loam, 10-15 percent slop	es —			NWI cla	ssification	:PUBHx		
Are climatic / hydrologic conditions on the site typical for this til		ar? Yes	No (	(If no, explair	ı in Remar	rks.)		
	-	disturbed?	~	'Normal Circumstand	es" prese	nt? Yes	No	$\circ$
		oblematic?		eded, explain any a				
SUMMARY OF FINDINGS - Attach site map she							atures,	etc.
Hydrophytic Vegetation Present? Yes No	•							
Hydric Soil Present? Yes No	-	ls t	he Sampled	Area				
Wetland Hydrology Present? Yes No	•	wit	hin a Wetlar	nd? Yes	$\circ$	No 💿		
Remarks:Plot located near edge of excavated stock por	nd.	•						
VEGETATION								
	haaluta	Dominant	Indicator	Deminance Test	aultabaa	.4.		
	bsolute Cover	Species?	Status	Number of Domina				
1. <i>None</i>				That Are OBL, FA			(	(A)
2.				Total Number of D	ominant			
3.				Species Across Al		2	(	(B)
4				Percent of Domina	ant Specie	s		
Total Cover: Sapling/Shrub Stratum	%			That Are OBL, FA		_	.0 %	(A/B)
1.None				Prevalence Index	workshe	et:		
2.				Total % Cove		Multipl	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	20	<b>3</b> 7		UPL species	10	x 5 =	50	
1.Poa bulbosa		Yes	FACU	Column Totals:	70	(A)	270	(B)
2-Lomatium nudicaule 3-Achillea millefolium		No No	UPL	Prevalence I	ndex = B/	/A =	3.86	
4-Unidentified grass*	10 20	Yes	FACU FAC	Hydrophytic Veg	etation In	dicators:		
5.		103		Dominance Te	est is >509	%		
6.				Prevalence In	dex is ≤3.	01		
7.				Morphological				ng
8.				Problematic H		on a separate	,	,
Total Cover:	70 %			Floblematic	iyaropriyii	vegetation	(Explain)	,
Woody Vine Stratum  1.None				<sup>1</sup> Indicators of hydi	ric soil and	d wetland hy	drology r	nust
2.				be present.		a	a. o. o. g y	
Total Cover:	%			Hydrophytic				
		`must (	<b>1</b> 0/	Vegetation	V (	No G		
			) % 	Present?	Yes (	No (	<i>y</i>	
Remarks: *Assuming the unidentified species is FAC	to be co	onservativ	e.					

SOIL Sampling Point: DP-3

Depth	. Natrix			ox Features			,
(inches)	Color (moist)	%	Color (moist)	% Type <sup>1</sup>	Loc <sup>2</sup>	Texture <sup>3</sup>	Remarks
0-12	10YR 3/3	100	NA			silt loam	
12-15	10YR 3/2		NA			silt loam	
12-13	101 K 3/2		INA		-	SIII IOAIII	
	-						
4							
	Concentration, D=Dep			<sup>2</sup> Location: PL=Pore	-		
					i, Clay Loa		n, Silt Loam, Silt, Loamy Sand, Sand.
Hydric Soil I	Indicators: (Applicab	le to all LR		•			Problematic Hydric Soils:
	Epipedon (A2)		Sandy Red	юх (S5) Matrix (S6)			( (A9) ( <b>LRR C</b> ) ( (A10) ( <b>LRR B</b> )
	Histic (A3)			ucky Mineral (F1)			Vertic (F18)
	en Sulfide (A4)			eyed Matrix (F2)			nt Material (TF2)
	ed Layers (A5) (LRR (	C)		Matrix (F3)			plain in Remarks)
	luck (A9) (LRR D)	,	Redox Da	rk Surface (F6)			·
Deplete	ed Below Dark Surfac	e (A11)	Depleted	Dark Surface (F7)			
	Oark Surface (A12)			pressions (F8)			
	Mucky Mineral (S1)		Vernal Po	ols (F9)			ydrophytic vegetation and
	Gleyed Matrix (S4)					wetland hyd	drology must be present.
	Layer (if present):						
	one found						
Depth (ir	nches):					Hydric Soil Pre	esent? Yes No   No
Remarks:							
HYDROLO	OGY						
						Secondar	v Indicators (2 or more required)
Wetland Hy	ydrology Indicators:		icient)				y Indicators (2 or more required)
Wetland Hy Primary Indi	ydrology Indicators: icators (any one indic		,	pt (P11)		Wate	r Marks (B1) ( <b>Riverine</b> )
Wetland Hy Primary Indi Surface	ydrology Indicators: icators (any one indic e Water (A1)		Salt Cru			Wate	r Marks (B1) ( <b>Riverine</b> ) ment Deposits (B2) ( <b>Riverine</b> )
Wetland Hy Primary Indi Surface High W	ydrology Indicators: icators (any one indic e Water (A1) /ater Table (A2)		Salt Cru Biotic Cr	rust (B12)		Wate	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine)
Wetland Hy Primary Indi Surface High W Saturati	ydrology Indicators: icators (any one indic e Water (A1) /ater Table (A2) tion (A3)	ator is suffi	Salt Cru Biotic Cr Aquatic	ust (B12) Invertebrates (B13)		Wate Sedir Drift	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) age Patterns (B10)
Wetland Hy Primary Indi Surface High W Saturat Water N	ydrology Indicators: icators (any one indic e Water (A1) /ater Table (A2) ition (A3) Marks (B1) (Nonriver	ator is suffi	Salt Cru Biotic Cr Aquatic Hydroge	ust (B12) Invertebrates (B13) n Sulfide Odor (C1)	Living Ro	Wate Sedir Drift Drain Dry-S	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2)
Wetland Hy Primary Indi Surface High W Saturat Water M Sedime	ydrology Indicators: icators (any one indice water (A1) /ater Table (A2) icion (A3) Marks (B1) (Nonriver ent Deposits (B2) (No	eator is suffi	Salt Cru Biotic Cr Aquatic Hydroge Oxidized	ust (B12) Invertebrates (B13) n Sulfide Odor (C1) I Rhizospheres along	-		r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2) Muck Surface (C7)
Wetland Hy Primary Indi Surface High W Saturat Water M Sedime Drift De	ydrology Indicators: icators (any one indicated water (A1) fater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Noneposits (B3))	eator is suffi	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presence	ust (B12) Invertebrates (B13) n Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4	4)		r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2) Muck Surface (C7) fish Burrows (C8)
Wetland Hy Primary Indi Surface High W Saturat Water M Sedime Drift De Surface	ydrology Indicators: icators (any one indicate Water (A1) //ater Table (A2) //ater Table (A3) //ater T	ine) nriverine) rine)	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc	ust (B12) Invertebrates (B13) n Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov	4)	Wate   Wate   Sedir   Sedir   Drift   Drain   Dry-Stots (C3)   Thin   Crayl   C6)   Satur	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) mage Patterns (B10) Geason Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9)
Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat	ydrology Indicators: icators (any one indicated water (A1) yater Table (A2) tion (A3) Marks (B1) (Nonriverent Deposits (B2) (Nonriverent Deposits (B3) (Nonriverent Deposits (B6)) tion Visible on Aerial I	ine) nriverine) rine)	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc	ust (B12) Invertebrates (B13) n Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4	4)	Wate   Wate   Sedir   Drain   Dry-Stots (C3)   Thin   Crayl   C6)   Satur   Shall	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3)
Wetland Hy Primary Indi Surface High W Saturat Water M Sedime Drift De Surface Inundat Water-S	ydrology Indicators: icators (any one indice Water (A1) Vater Table (A2) icion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nonriver es Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9)	ine) nriverine) rine)	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc	ust (B12) Invertebrates (B13) n Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov	4)	Wate   Wate   Sedir   Drain   Dry-Stots (C3)   Thin   Crayl   C6)   Satur   Shall	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) mage Patterns (B10) Geason Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9)
Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S	ydrology Indicators: icators (any one indice water (A1) /ater Table (A2) icion (A3) Marks (B1) (Nonriver ent Deposits (B2) (No eposits (B3) (Nonrive e Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations:	ine) nriverine) rine) Imagery (B	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Ploy xplain in Remarks)	4)	Wate   Wate   Sedir   Drain   Dry-Stots (C3)   Thin   Crayl   C6)   Satur   Shall	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3)
Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S Field Obset	ydrology Indicators: icators (any one indicators (any one indicators) water (A1) yater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nonriver ent Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: yater Present?	ine) nriverine) rine) Imagery (B	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov xplain in Remarks) inches): N/A	4)	Wate   Wate   Sedir   Drain   Dry-Stots (C3)   Thin   Crayl   C6)   Satur   Shall	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3)
Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S Field Obser Surface Wa Water Table	ydrology Indicators: icators (any one indicators (any one indicators) water (A1) vater Table (A2) tion (A3) Marks (B1) (Nonriver) ent Deposits (B2) (Nonriver) es Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: ter Present?  Year Present?  Year Present?  Year Present?  Year Present?	ine) nriverine) rine) Imagery (B'	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov xplain in Remarks) Inches): N/A inches): N/A	4)	Wate   Wate   Sedir   Drain   Dry-Stots (C3)   Thin   Crayl   C6)   Satur   Shall	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) lage Patterns (B10) Season Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3)
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Wetland Hy Primary Indi Surface High W Saturati Water N Sedime Drift De Surface Inundat Water-S Field Obset Surface Wa Water Table Saturation F (includes ca	ydrology Indicators: icators (any one indicators (any one indicators) water (A1) yater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nonriver ent Deposits (B3) (Nonriver ent Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: ter Present? Present? pright in the property of the present? present? pright in the property of the present? present? present?	ine) nriverine) rine) Imagery (B'	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov xplain in Remarks)  inches):    N/A     inches   15"   inches   >15"	4) wed Soils (	Wate   Wate   Sedir   Sedir   Drift   Drain   Dry-Stots (C3)   Thin   Crayl   Satur   Shall   FAC-	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) mage Patterns (B10) Geason Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3) Neutral Test (D5)
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Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S Field Obser Surface Wa Water Table Saturation F (includes ca	ydrology Indicators: icators (any one indicators (any one indicators) water (A1) yater Table (A2) tion (A3) Marks (B1) (Nonriver ent Deposits (B2) (Nonriver ent Deposits (B3) (Nonriver ent Soil Cracks (B6) tion Visible on Aerial I Stained Leaves (B9) rvations: ter Present? Present? pright in the property of the present? present? pright in the property of the present? present? present?	ine) nriverine) Imagery (B	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov xplain in Remarks) Inches):    N/A	4) wed Soils (	Wate   Wate   Sedir   Sedir   Drift   Drain   Dry-Stots (C3)   Thin   Crayl   Satur   Shall   FAC-	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) mage Patterns (B10) Geason Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3) Neutral Test (D5)
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Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S Field Obser Surface Wa Water Table Saturation F (includes ca	ydrology Indicators: icators (any one indicated water (A1)  /ater Table (A2) icion (A3)  Marks (B1) (Nonriver ent Deposits (B2) (Nonriver ent Deposits (B3) (Nonriver end Carolina (B6) ition Visible on Aerial In Stained Leaves (B9)  rvations: ater Present?  Present?  Present?  Yelliary fringe) ecorded Data (stream	ine) nriverine) Imagery (B	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov xplain in Remarks) Inches):    N/A	4) wed Soils (	Wate   Wate   Sedir   Sedir   Drift   Drain   Dry-Stots (C3)   Thin   Crayl   Satur   Shall   FAC-	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) mage Patterns (B10) Geason Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3) Neutral Test (D5)
Wetland Hy Primary Indi Surface High W Saturat Water N Sedime Drift De Surface Inundat Water-S Field Obser Surface Wa Water Table Saturation F (includes ca	ydrology Indicators: icators (any one indicated water (A1)  /ater Table (A2) icion (A3)  Marks (B1) (Nonriver ent Deposits (B2) (Nonriver ent Deposits (B3) (Nonriver end Carolina (B6) ition Visible on Aerial In Stained Leaves (B9)  rvations: ater Present?  Present?  Present?  Yelliary fringe) ecorded Data (stream	ine) nriverine) Imagery (B	Salt Cru Biotic Cr Aquatic Hydroge Oxidized Presenc Recent I Other (E	ust (B12) Invertebrates (B13) In Sulfide Odor (C1) I Rhizospheres along e of Reduced Iron (C4) ron Reduction in Plov xplain in Remarks) Inches):    N/A	4) wed Soils (	Wate   Wate   Sedir   Sedir   Drift   Drain   Dry-Stots (C3)   Thin   Crayl   Satur   Shall   FAC-	r Marks (B1) (Riverine) ment Deposits (B2) (Riverine) Deposits (B3) (Riverine) mage Patterns (B10) Geason Water Table (C2) Muck Surface (C7) fish Burrows (C8) ration Visible on Aerial Imagery (C9) ow Aquitard (D3) Neutral Test (D5)

## WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Pro	oject		City/Co	ounty:Goldend	ale / Klickitat Count	y Sam	pling Date:	5/15/19	
Applicant/Owner: Rye Development					State:WA	Sam	pling Point:	OP-4	
Investigator(s): Justin Moffett, Carissa Shoem	aker		Sectio	n, Township, Ra	ange:S19, T03N, R17	 E	_		
Landform (hillslope, terrace, etc.): roadcut terrac	ee		Local	relief (concave,	convex, none): convex	:	Slo	pe (%):1	
Subregion (LRR):B - Columbia/Snake River F		Lat:45.7	728751 Long:-120.723742 Datum:WGS						84
Soil Map Unit Name: Rock outcrop-Rubble lar					_	ification			
Are climatic / hydrologic conditions on the site typ									
Are Vegetation Soil or Hydrology		nificantly			"Normal Circumstances		,	No (	
								) 140 (	$\cup$
Are Vegetation Soil or Hydrology		turally pro		,	eeded, explain any ans		,		
SUMMARY OF FINDINGS - Attach sit	te map sh	nowing	samı	pling point l	ocations, transec	ts, imp	ortant fe	atures,	etc.
Hydrophytic Vegetation Present? Yes (	<ul><li>No</li></ul>								
Hydric Soil Present? Yes (		1		Is the Sample	d Area				
Wetland Hydrology Present? Yes (	No			within a Wetla		•)	No 🔘		
Remarks: Wetland located in abandoned roa	ad bed. Gro	oundwat	er flov	wing from exc	avated hillside assoc	iated w	ith abando	ned road	
provides wetland hydrology.									
VEGETATION									
Tree Stratum (Use scientific names.)		bsolute 6 Cover	Domir Speci	nant Indicator ies? Status	Dominance Test wo				
1.None	<u> </u>				Number of Dominan That Are OBL, FACV			l (	(A)
2.					-	•			/
3.					Total Number of Dor Species Across All S		1	l (	(B)
4.					-			`	,
		%			<ul> <li>Percent of Dominant</li> <li>That Are OBL, FACV</li> </ul>		_	0.0%	(A/B)
Sapling/Shrub Stratum								9.0 %	,
1.None					Prevalence Index w Total % Cover of			ly by:	
2					OBL species	90	$\frac{\text{Multip}}{\text{x 1 =}}$	90	
3.				<del></del>	FACW species	90	x 2 =	0	
4 5.					FAC species	10	x 3 =	30	
	otal Cover:	%			FACU species	10	x 4 =	0	
Herb Stratum	010	70			UPL species		x 5 =	0	
1-Mimulus guttatus		90	Yes	OBL	Column Totals:	100	(A)	120	(B)
2.Rubus armeniacus		10	No	FAC			` '		, ,
3.					Prevalence Inc			1.20	
4					Hydrophytic Vegeta				
5.					<ul><li>Dominance Tes</li><li>Prevalence Inde</li></ul>				
6.					Prevalence Inde			sunnortir	20
7.					data in Rema				ig
8.	atal Cayari				Problematic Hyd	drophytic	Vegetation	1 (Explain)	)
Woody Vine Stratum	otal Cover:	100%							
1.None					<sup>1</sup> Indicators of hydric	soil and	I wetland hy	/drology n	nust
2.					be present.				
Т	otal Cover:	%			Hydrophytic				
% Bare Ground in Herb Stratum 0 %	% Cover o	of Biotic C	Crust	0 %	Vegetation Present?	Yes 💿	No (	)	
Remarks:									

SOIL Sampling Point: <u>DP-4</u>

	Matrix		Redo	k Features	;					
Depth (inches)	Color (moist)	% Co	lor (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Textur	re <sup>3</sup>	Remark	S
			, ,							
		· ———								
		·								
		· — — —								
	· <del></del>	· ———								
<sup>1</sup> Type: C=C	Concentration, D=Dep	letion, RM=Redu	iced Matrix.	<sup>2</sup> Location	: PL=Pore	e Lining, R	C=Root C	hannel, M=I	Matrix.	
<sup>3</sup> Soil Texture	es: Clay, Silty Clay, S	Sandy Clay, Loar	n, Sandy Clay	Loam, Sa	ndy Loam	i, Clay Loa	m, Silty C	lay Loam, S	ilt Loam, Silt, Loamy	Sand, Sand.
Hydric Soil I	Indicators: (Applicable	le to all LRRs, un	less otherwise	noted.)			Indica	tors for Prol	blematic Hydric Soils	4 5:
Histoso	l (A1)		Sandy Redo	x (S5)			<b>1</b>	cm Muck (A	(49) ( <b>LRR C</b> )	
Histic E	pipedon (A2)		Stripped Ma	atrix (S6)			<u> </u>	cm Muck (A	(10) ( <b>LRR B</b> )	
Black H	listic (A3)		Loamy Muc	ky Minera	l (F1)		∏ R	educed Ver	tic (F18)	
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		R	ed Parent M	Naterial (TF2)	
	ed Layers (A5) (LRR (	<b>&gt;</b> )	Depleted M				Πo	ther (Explain	n in Remarks)	
1 cm M	uck (A9) ( <b>LRR D</b> )		Redox Dark	Surface (	F6)					
Deplete	ed Below Dark Surface	e (A11)	Depleted Da	ark Surfac	e (F7)					
Thick D	ark Surface (A12)		Redox Depi	ressions (I	<del>-</del> 8)					
Sandy I	Mucky Mineral (S1)		Vernal Pool	s (F9)			<sup>4</sup> Indica	ators of hydr	rophytic vegetation a	nd
Sandy (	Gleyed Matrix (S4)		_				we	tland hydrol	ogy must be present	
Restrictive	Layer (if present):									
Type:										
Depth (in	iches).						Hydric	Soil Prese	nt? Yes	No 🔘
	To soil pit dug due t	to presence of	aomnostad re	alr roadh	ad subst	roto Und	1 -		_	_
	ydrophytic vegetati				cu subst	raic. Hyu	inc son is	s assumed	present based on p	oresence of
11	ydrophytic vegetati	ion and wettan	u nyurology.							
HYDROLO	OGY									
									- did (O	na susina d
Wetland Hy	drology Indicators:						S		ndicators (2 or more	
Wetland Hy		ator is sufficient)					<u>s</u>		ndicators (2 or more larks (B1) ( <b>Riverine</b> )	
Wetland Hy Primary Indi	drology Indicators:	ator is sufficient)	Salt Crust				<u></u>	Water M	`	
Wetland Hy Primary Indi X Surface	vdrology Indicators: icators (any one indicators)	ator is sufficient)	Salt Crust Biotic Crus	(B11)				Water M Sedimer	larks (B1) (Riverine)	erine)
Wetland Hy Primary Indi Surface High W	rdrology Indicators: icators (any one indicators) water (A1) ater Table (A2)	ator is sufficient)	Biotic Crus	(B11) st (B12)	s (B13)			Water M Sedimer Drift Dep	larks (B1) ( <b>Riverine</b> ) nt Deposits (B2) ( <b>Riv</b> posits (B3) ( <b>Riverine</b>	erine)
Primary Indi  Surface  High W  Saturati	rdrology Indicators: icators (any one indicate Water (A1) ater Table (A2) ion (A3)		Biotic Crus Aquatic In	(B11) st (B12) vertebrate				Water M Sedimer Drift Dep Drainage	larks (B1) (Riverine) nt Deposits (B2) (Riverine) posits (B3) (Riverine e Patterns (B10)	erine)
Wetland Hy Primary Indi  Surface High W. Saturati Water M	rdrology Indicators: icators (any one indicate Water (A1) ater Table (A2) ion (A3) Marks (B1) (Nonriveri	ine)	Biotic Crus Aquatic In	(B11) st (B12) vertebrate Sulfide Od	dor (C1)	Living Roc		Water M Sedimer Drift Dep Drainage Dry-Sea	larks (B1) (Riverine) ant Deposits (B2) (Riverine) cosits (B3) (Riverine) e Patterns (B10) son Water Table (C2)	erine)
Wetland Hy Primary Indi  X Surface High W X Saturati Water M Sedime	rdrology Indicators: icators (any one indicators) water (A1) later Table (A2) ion (A3) Marks (B1) (Nonriveriant Deposits (B2) (Non	ine) nriverine)	Biotic Crus Aquatic In Hydrogen Oxidized F	(B11) st (B12) vertebrate Sulfide Od Rhizosphe	dor (C1) res along	_		Water M Sedimer Drift Dep Drainage Dry-Sea Thin Mu	larks (B1) (Riverine) at Deposits (B2) (Riverine) cosits (B3) (Riverine) e Patterns (B10) son Water Table (C2) ck Surface (C7)	erine)
Wetland Hy Primary Indi  Surface High W. Saturati Water M Sedime Drift De	rdrology Indicators: icators (any one indicators) water (A1) ater Table (A2) ion (A3) Marks (B1) (Nonrivering Deposits (B2) (Nonrivering Deposits (B3) (Nonr	ine) nriverine)	Biotic Crus Aquatic In Hydrogen Oxidized F	(B11) st (B12) vertebrate Sulfide Oc Rhizosphe of Reduce	dor (C1) res along d Iron (C4	4)		Water M Sedimer Drift Dep Drainage Dry-Sea Thin Mu Crayfish	larks (B1) (Riverine) at Deposits (B2) (Riverine) cosits (B3) (Riverine) e Patterns (B10) son Water Table (C2 ck Surface (C7) Burrows (C8)	erine)
Wetland Hy Primary Indi  Surface High W. Saturati Water M Sedime Drift De Surface	rdrology Indicators: icators (any one indicate Water (A1) ater Table (A2) ion (A3) Marks (B1) (Nonriverient Deposits (B2) (Nonriveries Exposits (B3) (Nonriveries Exposits (B6)	ine) nriverine) rine)	Biotic Crus Aquatic In Hydrogen Oxidized F Presence Recent Iro	(B11) st (B12) vertebrate Sulfide Oo Rhizosphe of Reduce n Reduction	dor (C1) res along d Iron (C4 on in Plov	4)		Water M Sedimer Drift Dep Drainage Dry-Sea Thin Mu Crayfish Saturatio	larks (B1) (Riverine) at Deposits (B2) (Riverine) be Patterns (B10) son Water Table (C2 ck Surface (C7) Burrows (C8) on Visible on Aerial II	erine)
Wetland Hy Primary Indi  Surface High W. Saturati Water M. Sedime Drift De Surface Inundat	rdrology Indicators: icators (any one indicated water (A1) ater Table (A2) ion (A3) Marks (B1) (Nonriverient Deposits (B2) (Nonriveries Soil Cracks (B6) ion Visible on Aerial I	ine) nriverine) rine)	Biotic Crus Aquatic In Hydrogen Oxidized F	(B11) st (B12) vertebrate Sulfide Oo Rhizosphe of Reduce n Reduction	dor (C1) res along d Iron (C4 on in Plov	4)		Water M Sedimer Drift Dep Drainage Dry-Sea Thin Mu Crayfish Saturatio Shallow	larks (B1) (Riverine) Int Deposits (B2) (Riverine) Int Deposits (B3) (Riverine) Int Deposits (B3) (Riverine) Int Deposits (B10) (Riverine) Int Deposit (B10) (Ri	erine)
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## ATTACHMENT 2: PHOTO LOG



Photo 1: DP-1 Vegetation, Looking South



Photo 2: DP-1 Soil Pit





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



Photo 4: DP-2 Soil Pit





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 10: S24, Looking Southwest





Photo 11: S24, Looking Northeast



Photo 12: P2





Photo 13: S7, Looking North



**Photo 14: S7 Width Measurement** 





Photo 15: S8, Looking North



Photo 16: S8, Looking South

