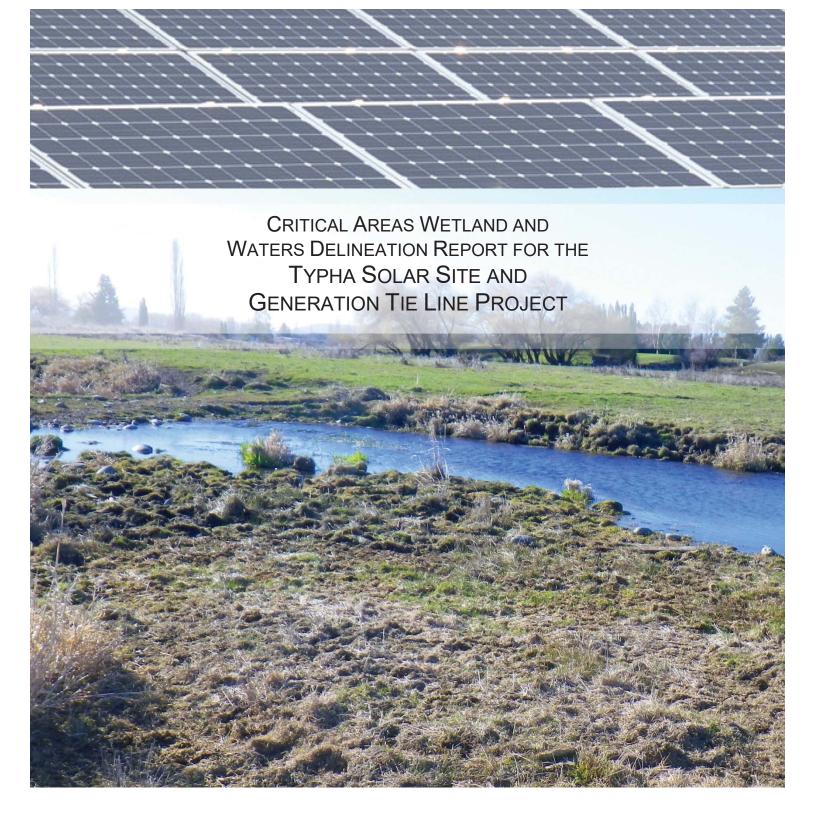
Appendix J: Typha Solar Project Site Reports and Permit Applications

J-1: Typha Solar Project Critical Areas Report J-2: Typha Solar Project Cultural Resources Report J-3: Typha Permit Applications J-4: Typha Solar Project Geotechnical Engineering Study J-5: Typha Solar Project Drainage Report

Appendix J-1: Typha Solar Project Critical Areas Report



July 10, 2017

SWCA ENVIRONMENTAL CONSULTANTS SEATTLE, WASHINGTON

CRITICAL AREAS WETLAND AND WATERS DELINEATION REPORT FOR THE TYPHA SOLAR SITE AND GENERATION TIE LINE PROJECT KITTITAS COUNTY, WASHINGTON

Section 30, Township 18 North, Range 18 East Parcel Numbers 712633, 752633, 802633, and 832633

Report Prepared for

TUUSSO Energy, LLC

By Evan Dulin

July 10, 2017

Project Number 38727.05

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1 INTRODUCTION

This report describes the methods and findings of wetland, stream, and other critical areas delineation for the proposed Typha Solar Site and Transmission Line Project (Typha Solar Project). The report was prepared by SWCA Environmental Consultants (SWCA), and is intended to address permitting requirements under Energy Facility Site Evaluation Council (EFSEC) Washington Administrative Code (WAC) 463-60-322, -332, and -333, and to show compliance of the proposed project with Kittitas County's Code for Critical Areas Ordinance (KCC Chapter 17A).

1.1 Background

TUUSSO Energy, LLC (TUUSSO) is proposing to construct a new photovoltaic solar facility installation on approximately 49.7 acres of private agricultural land, including the construction of a switchyard with a short (0.45-mile-long, 4.4-acre) generation tie line into an existing Puget Sound Energy (PSE) distribution transmission line, located northwest of Ellensburg, Kittitas County, Washington. The project is intended to provide up to 5 MW of solar energy to PSE for use within their service area.

1.2 Project Setting

The Typha Solar Project site primarily consists of fallow agricultural land located just west of the Yakima River and north of Thorp Highway, west of Ellensburg in unincorporated Kittitas County, Washington. The Typha Solar Project would be located approximately 1.1 miles east of the intersection of Thorp Highway and Cove Road, in Section 30 of Township 18 North, Range 18 East, Willamette Meridian (Figure 1). The generation tie line would originate from the southwestern project site boundary and follow existing power poles to cross south along an existing access road, crossing the Ellensburg Power (EP) Canal three times and passing through the Ellensburg Golf and Country Club, to connect to the existing PSE distribution transmission line along Thorp Highway. The Typha Solar Project site is approximately 54.1 acres and the generation tie line is approximately 4.4 acres, totaling 54.1 acres for the overall project. Topography of the site generally slopes to the east toward the Yakima River. Surface elevation within the solar site and generation tie line ranges from 1,570 to 1,614 feet above mean sea level, the lowest elevation being along the eastern site boundary closest to the Yakima River and the highest elevation being at the southern end of the generation tie line near Thorp Highway.

2 METHODS

2.1 Study Area

The Typha Solar Project site is approximately 54.1 acres and the generation tie line is approximately 4.4 acres, totaling 54.1 acres for the overall project. The generation tie line portion of the project is 80 feet wide centered on the existing power poles and new proposed line connecting the solar site to the existing poles (Figure 1). Wetlands and streams outside of the project site and generation tie line but that occur within 200 feet of these boundaries and had the potential to have buffers extend into the project were included in the study area. Wetlands and streams outside of the project site and within the study area were visually inspected but not formally delineated.

2.2 Review of Existing Information

Prior to conducting fieldwork, background materials were reviewed to determine the potential for wetlands, floodplains, habitats, and other critical areas and their buffers to occur within the study area. Materials referenced during the desktop study are listed below. The following checklist follows the KCC Critical Areas required checklist outlined in KCC Chapter 17A.03.035.

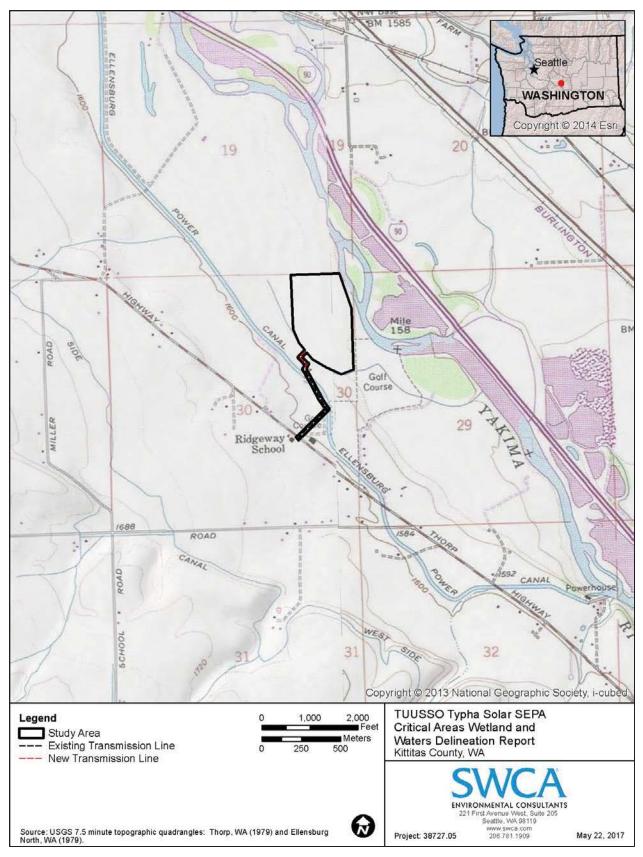


Figure 1. Project vicinity map.

Wetlands (KCC Chapter 17A.04)

- Historical Google Earth aerial photography (2000–2015).
- U.S. Department of Agriculture (USDA) historical imagery (USDA 1954).
- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps for Ellensburg North and Thorp, Washington, included in Figure 1.
- USFWS National Wetlands Inventory (NWI) data and USGS National Hydrography Dataset (NHD), included in Figure 2.
- Natural Resources Conversation Service (NRCS) Soil Survey of Kittitas County Area, Washington and NRCS Web Soil Survey map of the study area, included in Figure 3.

Frequently flooded areas (KCC Chapter 17A.05)

• Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 5300950438C (as cited by Kittitas County 2017), included in Figure 2.

Geologically hazardous areas (KCC Chapter 17A.06)

- Includes erosion, landslide, mine, and seismic hazard areas.
- Kittitas County COMPAS mapping tool.

Habitats (KCC Chapter 17A.07)

- Includes riparian habitats and streams and rivers.
- Washington State Department of Fish and Wildlife (WDFW) SalmonScape online mapper.
- WDFW Priority Habitats and Species (PHS) online mapper, included in Figure 3.

Aquifer recharge areas (KCC Chapter 17A.08)

• No critical aquifer recharge locations have been identified in Kittitas County.

Spatial data obtained during the review of existing information were incorporated into Typha Solar Project base maps (Figures 1–3).

2.3 Field Investigation

Following the desktop review of existing information, a team of two biologists conducted site visits on April 3, 4, and 12, 2017, to assess the study area for the presence of wetland and waterbody features and to record data relevant to the Washington State Department of Ecology's (Ecology's) most recently approved version of the *Washington State Wetland Rating System for Eastern Washington, 2014 Update* (Hruby 2014). Visual observations were recorded within 200 feet of the project site and generation tie line, and included wildlife and habitat data.

Precipitation data were obtained from the closest wetlands climate analysis (WETS) climate station, the Ellensburg National Weather Service (NWS) station (ELBW1), approximately 5.5 miles to the southeast of the project site in southern Ellensburg, Washington. Historical (1971–2000) average annual rainfall is listed as 8.96 inches. Table 1 shows the monthly precipitation at the Ellensburg NWS weather station for the 3 months prior to the April 3, 4, and 12, 2017, site visits. Table 2 shows the rainfall received 2 weeks prior to the site visits, and the water-year-to-date (WYTD) rainfall. Rainfall recorded 3 months prior to fieldwork was wetter than normal.

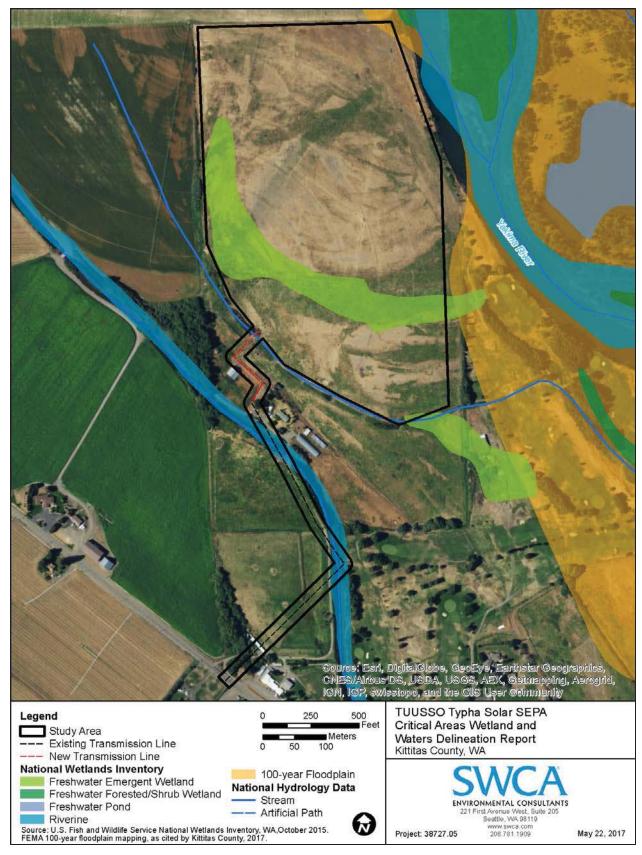


Figure 2. NWI, NHD, and floodplain mapping.

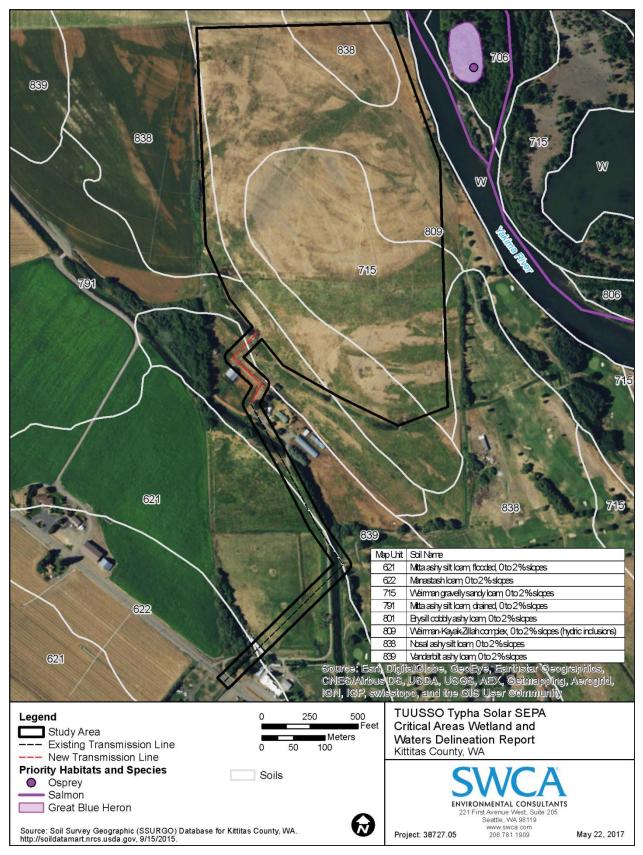


Figure 3. Soils and PHS mapping.

Month	Average	30% Chanc	e Will Have	Observed	Within Normal
wonth	Average	Less Than	More Than	Precipitation	Range?
March	0.76	0.36	0.93	1.49	Above
February	0.91	0.59	1.10	2.04	Above
January	1.19	0.65	1.45	1.54	Above

Table 1 Precipi	itation for 3 Mo	nths Prior to Site	Visits (in inches)

Source: NRCS 2017b.

Table 2. Precipitation 2 Weeks Prior to Site Visits (in inches)

Field Study	Precipitation 2 Weeks Prior	WYTD	Inches Above or Below Normal WYTD*	
April 2–March 20, 2017	0.79	8.93	2.80 above	
April 3–March 21, 2017	0.79	8.93	2.78 above	
April 11–March 29, 2017	0.61	9.38	3.08 above	

*Based on average precipitation from 1981 to 2010.

Source: NRCS 2017b.

2.3.1 Wetlands

The study area was investigated for wetlands in accordance with the current methodology of the U.S. Army Corps of Engineers' (USACE's) 2008 *Arid West Regional Supplement (Version 2)* and the *Wetlands Delineation Manual* (Environmental Laboratory 1987). A detailed description of the field methods used in this study is provided in Appendix A.

A Trimble Geo XT global positioning system (GPS) unit was used by the field team to assist in identifying the project site and generation tie line boundaries and to record site spatial data. This device is capable of submeter accuracy. The full extent of the study area was covered by the team of biologists. Photographs were collected and vegetation, soil, and hydrology characteristics were documented. The boundaries for wetlands located outside of the project site and generation tie line but within the study area were approximated using field observations and aerial imagery to determine the extent of on-site wetland buffers.

Geographic information system (GIS) software were used to analyze data and to produce the report figures (Figures 4 and 5). Per WAC 463-60-333 and KCC Chapter 17A, wetlands were rated using the *Washington State Wetland Rating System for Eastern Washington, 2014 Update*. Per KCC 17A.04.020, the resulting wetland ratings were used to determine the County-prescribed range of wetland buffers for each wetland. Table 3 lists Ecology's wetland rating criteria. Kittitas County's definition of a wetland is based on the Revised Code of Washington (RCW) 36.70A.030, which states:

(21) "Wetland" or "wetlands" means areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands.

=			
	-		2
 Category I wetlands: Category I wetlands: Represent a unique or rare wetlands: Represent a unique or rare wetlands: Represent a unique or rare wetland type; Represent a unique or rare wetland type; Represent a unique or rare wetlands and contain ecological attributes that are impossible to replace within a human fifetime; or provide a high level of functions. Specific wetlands that meet the Category II criteria include: Infetime; or provide a high level of functions. Specific wetlands that meet the Category II criteria include: Infetime; or provide a high level of functions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands that meet the Category II criteria include: Intertions. Specific wetlands sign wetlands with fast growing trees that are over 0.25 acre in size; and wetlands that perform many functions wetlands that perform many functions wetlands that perform many functions were well and the second shallow saling the wetlands with fast support state-listed threatened or endangered plants; and wetlands that perform many functions wetlands that perform the accore of 22 	ig at of	Category III wetlands: Wetlands that provide a moderate level of functions. Specific wetlands that meet the Category III criteria include: 1. wetlands scoring between 16 and 18 points, out of 27, on the wetland rating form.	Category IV wetlands: Wetlands that have the lowest levels of functions and are heavily disturbed. Specific wetlands that meet the Category IV criteria include: 1. wetlands scoring less than 16 points out of 27 on the wetland rating form.

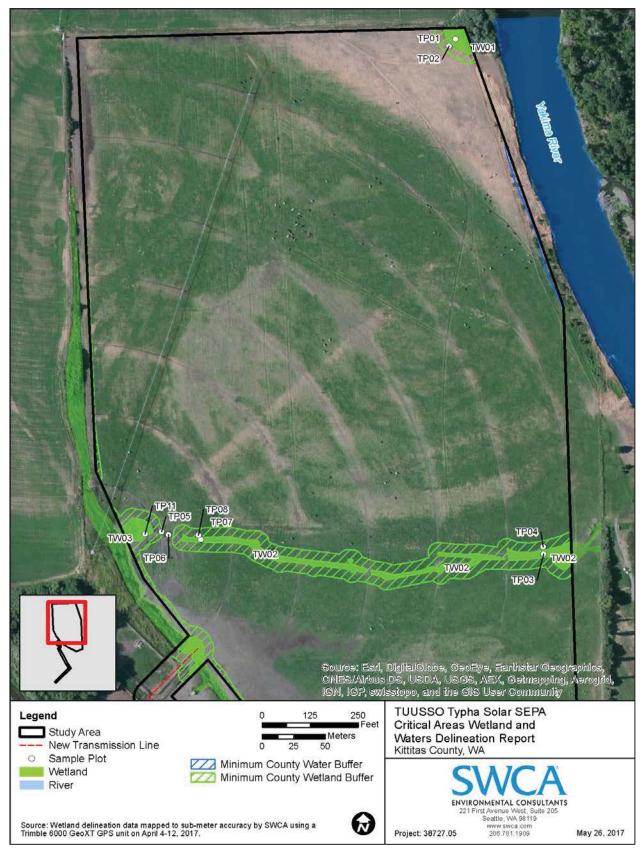


Figure 4. Wetland and waters delineation map, north portion.

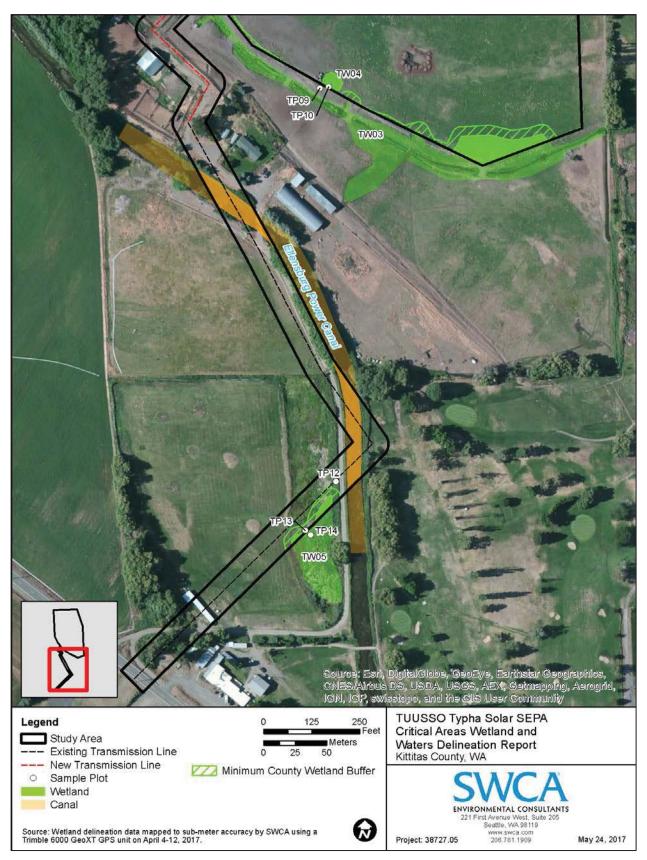


Figure 5. Wetland and waters delineation map, south portion.

A detailed analysis of wetland functions is not included in this report; however, a brief description of wetland functions is provided as part of the general description for each wetland.

2.3.2 Riparian Habitats

Biologists also investigated the Typha Solar Project study area for the presence of non-wetland waters and used a GPS device to delineate the ordinary high water marks (OHWMs) of streams per the definitions in WAC 173-22-030 (Figure 5). The OHWMs of streams and rivers outside of the project site and generation tie line but within the study area were approximated using field observations and aerial imagery to determine the extent of on-site stream buffers.

Streams identified in the study areas were classified according to the WAC stream typing system (WAC 222-16-030). Criteria for this typing system are described in Table 4. The stream types described in this report are based on the stream reaches within the study area; downstream reaches may be rated higher.

Stream Type	Definition ^a All waters, within their bankfull width, as inventoried as "shorelines of the state" under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including periodically inundated areas of their associated wetlands.					
S						
F	 All segments of natural waters that are not Type S waters, and that contain fish or fish habitat, including: waters diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility; waters diverted for use by a federal, state, or Tribal fish hatchery from the point of diversion for 1,500 feet or the entire tributary if the tributary is highly significant for protection of downstream water quality; waters that are within a federal, state, local, or private campground having more than 10 camping units; or riverine ponds, wall-based channels, and other channel features that are used by fish for off-channel habitat. 					
Np	All segments of natural waters within the bankfull width of defined channels that are perennial non–fish habitat streams. Perennial streams are flowing waters that do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow.					
Ns	All segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np waters. These are seasonal, non–fish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and the stream is not located downstream from any stream reach that is a Type Np water. Ns waters must be physically connected by an above-ground channel system to Type S, F, or Np waters.					

Table 4. Summary of the Water Typing System

^a Definitions are summarized from WAC 222-16-030. Kittitas County stream type definitions defer to WAC for guidance.

RESULTS AND DISCUSSION 3

The Typha Solar Project site consists of formerly irrigated and grazed pasture along the right bank (when facing downstream) of the Yakima River. The site is currently fallow and dominated by weeds and nonnative herbaceous species in upland areas, including tall false rye grass (Schedonorus arundinaceus), bluegrass (Poa spp.), remnant planted common timothy (Phleum pretense), garden yellow rocket (Barbarea vulgaris), hairy cat's-ear (Hypochaeris radicata), common dandelion (Taraxacum officinale), and white clover (*Trifolium repens*). In addition, the site has patches of noxious weeds, including Canadian thistle (*Cirsium arvense*), Scotch thistle (*Onopordum acanthium*), yellow nutsedge (*Cyperus* esculentus), and reed canary grass (Phalaris arundinacea). The generation tie line crosses areas of rural residential use, existing driveways and access roads, and a manicured gold course, including some areas with mature grand fir (Abies grandis), ponderosa pine (Pinus ponderosa), quaking aspen (Populus tremuloides), and crack willow (Salix X fragilis) trees, with Nootka rose (Rosa nutkana) shrubs along the EP Canal and nearby residences and other structures further south. Refer to Appendix B for a complete list of vegetation observed within the study area.

The proposed solar site is situated between the Yakima River and the Ellensburg Golf and Country Club to the east, active agricultural land to the north and west, and a wetland drainage and rural residence to the south. The generation tie line crosses over the EP Canal three times and over two ephemeral ditches that run along the existing access road and pass under the road through a culvert, until it ultimately terminates at Thorp Highway South to the south.

According to NRCS, the Typha Solar Project study area encompasses four different soil map units within the project site and three different soil map units with the generation tie line (Table 5). These soil map units range from somewhat poorly drained to well drained soils that occur on terraces, floodplains, valleys, and fans. The Weirman-Kayak-Zillah complex soil unit is on the National Hydric Soils list (NRCS 2015), which is a list of soils that can be indicative of saturated, flooded, or ponded areas that could meet the definition of a hydric soil.

Map Unit Symbol	Map Unit Name	Hydric	
621	Mitta ashy silt loam, flooded, 0%–2% slopes	No	
622	No		
715	Weirman gravelly sandy loam, 0%–2% slopes	No	
791	Mitta ashy silt loam, drained, 0%–2% slopes	No	
809	Weirman-Kayak-Zillah complex, 0%–2% slopes	Yes	
838	Nosal ashy silt loam, 0%–2% slopes	No	
839	Vanderbilt ashy loam, 0%–2% slopes	No	

Table F	Call Ma			the e	Cturdu /	A
Table 5.	2011 1019	ipping	within	lne	Sludy	Area

Source: NRCS 2015 and 2017b.

3.1 Wetlands

Five wetlands were delineated within the Typha Solar Project study area (three only on the solar site, one only on the generation tie line, and one on both). Wetlands were distinguished from adjoining uplands by the presence or absence of indicators for wetland hydrology, hydric soils, and hydrophytic vegetation. Wetland delineation data sheets are provided in Appendix C, photographs are provided in Appendix D, and wetland rating forms are provided in Appendix E.

Table 6 summarizes the size, rating, and classification of wetlands found within the study area. All delineated wetlands would fall under the jurisdiction of the USACE, Ecology, and Kittitas County. Figures 4 and 5 show the locations of the wetlands, streams, data plots, and their associated minimum protection buffers. The minimum wetland protection buffers were calculated per KCC guidance based on Ecology's Wetland Rating for each wetland. Detailed descriptions of each wetland are provided in the following sections.

Wetland Name	Delineated Area within the Project (Wetland Rating Unit Size) ^a (acres)	Wetland Rating ^b	Hydrogeomorphic Classification	Cowardin Classification [°]	Dominant Species Observed within Wetland
Solar Site		-		-	
TW01	0.07 (estimated 0.33)	11	Riverine	PEM/PSS	Narrow-leaf willow, Nootka rose, red osier dogwood, common panic grass, and hairy cat's-ear
TW02	0.38 (estimated 0.68)	II	Riverine	PEM	Baltic rush, tall false rye grass, common timothy, reed canary grass, and Fuller's teasel
TW03	0.35 (estimated 8.45)	II	Riverine	PEM/PSS	Reed canary grass, common duckweed, Rocky Mountain iris, and bluegrass
TW04	0.04 (0.05)	111	Depressional	PEM	Broad-leaf cat-tail, reed canary grass, and tall false rye grass
Generation 1	Γie Line				
TW03	0.07 (estimated 8.45)	Ш	Riverine	PEM/PSS	Reed canary grass, common duckweed, Rocky Mountain iris, and bluegrass
TW05	0.03 (estimated 0.47)	111	Riverine	PEM	Broad-leaf cat-tail, reed canary grass, and Baltic rush

Table 6. Wetland Size, Rating, and Classification for Wetlands within the Study Area

a Wetland rating unit size is the total area of wetland delineated or estimated based on aerial photograph interpretation and field reconnaissance. Area of delineated portions of the wetlands is based on SWCA survey data.

b Wetland ratings are based on Washington State Wetland Rating System for Eastern Washington - Revised (Hruby 2014).

c Cowardin et al. (1979).

3.1.1 Wetland TW01

Palustrine emergent/scrub-shrub Category II 0.07 acre within the project site, approximately 0.33 acre in total

Wetland TW01 is a riverine wetland located in the northeastern corner of the Typha Solar Project site, within the floodplain of the Yakima River (see Figure 5; and wetland rating Figures 1 through 4 in Appendix E). Delineation data were recorded at sample plots TP01 and TP02, provided on datasheets in Appendix C. The wetland extends off-site to the east to connect to the Yakima River, with its southwestern boundary defined by a subtle rise in topography and a change in the plant community. Wetland TW01 is located within the 100-year floodplain for the Yakima River (see Figure 2).

Wetland TW01 is composed of two Cowardin types, with palustrine emergent (PEM) wetland on the project side of the property boundary fence and palustrine scrub-shrub (PSS) wetland on the other side of the fence toward the Yakima River (Cowardin et al. 1979). Refer to Table A-1 in Appendix A for definitions of wetland indictor statuses listed in this section (i.e., FACU, FAC, FACW, and OBL). The PEM side is sparsely vegetated and consists of narrow-leaf willow (*Salix exigua*, FACW) saplings, common panic grass (*Panicum capillare*, FACU), and hairy cat's-ear (FACU). The off-site PSS portion of the wetland is dominated by narrow-leaf willow, red osier dogwood (*Cornus alba*, FACW), and Nootka rose (FACU).

Soils in Wetland TW01 are mapped as Weirman-Kayak-Zillah complex, with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The typical soil profile observed within 16 inches of the soil surface consists of very dark brown (10YR 2/2) silt loam with redoximorphic features starting at 7 inches (Munsell Color 2009). The soils in Wetland TW01 meet the hydric soil indicator for Redox Dark Surface (F6).

No primary indicators of hydrology within the wetland were observed. The only secondary indicator observed was saturation visible on aerial imagery. This wetland was determined to have problematic hydrology under the USACE's 2008 *Arid West Regional Supplement (Version 2)* and, therefore, the presence of positive hydric soil and wetland vegetation indicators, and relative landscape position within the 100-year floodplain, was relied upon for the wetland determination.

Wetland TW01 is rated as a Category II wetland in the Ecology rating system (see Table 3), with a moderately high score for water quality improvement (7/9 points) and moderate scores for hydrologic function (6/9) and habitat function (5/9 points). Wetland TW01 has moderately high potential to provide water quality improvements because of its position within the Yakima River floodplain, which is a 303(d) listed water, which has total maximum daily load (TMDL) limits, and has flooding problems within its watershed.

3.1.2 Wetland TW02

Palustrine emergent Category II 0.38 acre within the project site, approximately 0.68 acre in total

Wetland TW02 is a riverine wetland drainage that crosses the southern middle of the site from west to east, is fed from overbank flooding from Wetland TW03, and feeds into the Yakima River east of the Typha Solar Project site (see Figure 5; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots TP03, TP04, TP06, TP07, and TP08 and is provided on datasheets in Appendix C. This wetland has small areas of upland separating the wetland areas because of the slight berms along the tracks of the circular irrigator that passes through this wetland. The upland boundary of the wetland is defined by an obvious rise in elevation on either side of this wetland drainage.

Wetland TW02 is a PEM wetland habitat type (Cowardin et al. 1979). The wetland is dominated by Baltic rush (*Juncus balticus*, FACW), tall false rye grass (FACU), and remnant planted common timothy (FACU), with Nootka rose, narrow-leaf willow, Fuller's teasel (*Dipsacus fullonum*, FAC), and reed canary grass offsite to the east of the project site. The dominance of these species meets the wetland vegetation criteria. Wetland TW02 is partially located within a NWI-mapped palustrine emergent, persistent, seasonally flooded (PEM1C) wetland (see Figure 2).

Soils in Wetland TW02 are mapped as Weirman-Kayak-Zillah complex, with 0% to 2% slopes, and Weirman gravelly sandy loam, with 0% to 2% slops (NRCS 2017a) (see Figure 3). The soil profile observed within 16 inches of the soil surface in the eastern portion of the wetland consists of black (2.5Y 2.5/1) silt loam over a black silty clay loam with depletions of dark grayish brown (2.5Y 4/2) and redoximorphic features starting at 3 inches (Munsell Color 2009). The soil profile in the western portion of the wetland consists of black (10YR 2/1) silty clay loam with redoximorphic features starting at 7 inches, with a thin layer of sand at 10 inches. The soils in Wetland TW02 meet the hydric soil indicator for Redox Dark Surface (F6).

Primary indicators of hydrology within the wetland include saturation within the upper 12 inches and surface soil cracks. Secondary indicators of hydrology observed within the wetland include drainage patterns and saturation visible on aerial imagery. The presence of these indicators meets wetland hydrology criteria.

Wetland TW02 is rated as a Category II wetland in the Ecology rating system, with a moderately high score for hydrologic function (7/9 points) and moderate scores for habitat function (6/9 points) and water quality improvement (6/9 points). Wetland TW02 has moderately high potential to provide

hydrologic functions because of its potential to slow down water movement and help reduce flooding issues directly downstream in the Yakima River.

3.1.3 Wetland TW03

Palustrine emergent/scrub-shrub Category II 0.35 acre in the project site and 0.07 acre in the generation tie line, approximately 8.45 acres in total for the wetland unit

Wetland TW03 is a riverine wetland that surrounds a drainage that starts just outside of the western project site boundary and extends south and east along the southern study area boundary. This wetland is fed by runoff and irrigation from the agricultural fields to the north and west of the wetland and includes areas of open water as the drainage extends south and west, eventually feeding into the Yakima River east of the study area (see Figure 5; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots TP05 and TP11 and is provided on datasheets in Appendix C. The drainage passes through many culverts along its route east, but the culverts are partially obstructed, causing the water to flood over the higher elevation areas between the main drainage reaches; therefore, these areas are included in the wetland. The upland boundary of the wetland is defined by an obvious rise in elevation on either side of the overall drainage.

Wetland TW03 is mostly a PEM wetland habitat type with some PSS areas off-site to the east of the project site (Cowardin et al. 1979). The wetland is dominated by reed canary grass, common duckweed (*Lemna minor*, OBL), Rocky Mountain iris (*Iris missouriensis*, FACW), bluegrass (*Poa* spp., FAC), tall false rye grass, and yellow nutsedge (FACW), with some broad-leaf cat-tail (*Typha latifolia*, OBL), Fuller's teasel, and narrow-leaf willow in the eastern portion of the wetland. The dominance of these species meets the wetland vegetation criteria. Wetland TW03 is located within two different NWI-mapped PEM1C wetland polygons, one along the western project site boundary and one in the southeastern corner of the project site that extends off-site (see Figure 2).

Soils in Wetland TW03 are mapped as Nosal ashy silt loam with 0% to 2% slopes; Mitta ashy silt loam, drained with 0% to 2% slopes; Weirman-Kayak-Zillah complex with 0% to 2% slopes; and Weirman gravelly sandy loam with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The soil profile observed within 16 inches of the soil surface consists of black (2.5Y 2.5/1) silty clay loam with depletions of dark grayish brown (10YR 4/2) and redoximorphic features starting at 8 inches (Munsell Color 2009). The soils in Wetland TW03 meet the hydric soil indicator for Redox Dark Surface (F6).

Primary indicators of hydrology within this wetland include aquatic invertebrates. Secondary indicators of hydrology observed within the wetland include drift deposits (riverine) and drainage patterns. The presence of these indicators meets wetland hydrology criteria.

Wetland TW03 is rated as a Category II wetland in the Ecology rating system, with a high score for hydrologic function (8/9 points) and moderate scores for habitat function (6/9 points) and water quality improvement (6/9 points). Wetland TW03 has high potential to provide hydrologic functions because of its large wetland to channel width ratio and its potential to help reduce flooding issues directly downstream in the Yakima River.

Palustrine emergent Category III 0.04 acre within the project site, 0.05 acre in total

Wetland TW04 is a depressional wetland located at the southern project site boundary, approximately 25 feet north of TW03 (see Figure 5; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots TP09 and TP10 and is provided on datasheets in Appendix C. This wetland is fed by overland flow that is intercepted before entering TW03 and has seasonal ponding that provides frog habitat. Frog egg masses were observed in this wetland during the site visit. The upland boundary of the wetland is defined by an obvious rise in elevation in all directions.

Wetland TW04 is a PEM wetland habitat type (Cowardin et al. 1979). The wetland is dominated by broad-leaf cat-tail, reed canary grass, and tall false rye grass. The dominance of these species meets the wetland vegetation criteria.

Soils in Wetland TW04 are mapped as Weirman-Kayak-Zillah complex with 0% to 2% slopes, and Mitta ashy silt loam, drained with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The soil profile observed within 16 inches of the soil surface consists of black (10YR 2/1) silt loam with depletions of dark grayish brown (2.5Y 4/2) and medium to large rocks throughout (Munsell Color 2009). This wetland was determined to have problematic soils under the USACE's 2008 *Arid West Regional Supplement (Version 2)* and, therefore, the presence of positive wetland hydrology and wetland vegetation indicators, and the presence of rocks throughout the soil profile, which made detecting redoximorphic features difficult, was relied upon for the wetland determination.

Primary indicators of hydrology within the wetland include saturation and a high water table within the upper 12 inches and drift deposits (nonriverine). The presence of these indicators meets wetland hydrology criteria.

Wetland TW04 is rated as a Category III wetland in the Ecology rating system, with moderate scores for water quality improvement (6/9 points), hydrologic function (6/9 points), and habitat function (6/9 points). Wetland TW04 has moderate potential to provide water quality improvement and hydrologic function because of its lack of a surface water outlet, and it provides moderate habitat function because it provides amphibian egg laying habitat, as positively observed in the field.

3.1.5 Wetland TW05

Palustrine emergent Category III 0.03 acre within the project site, approximately 0.47 acre in total

Wetland TW05 is a riverine wetland fed by flooding from the EP Canal through a culvert under the access road along the eastern wetland boundary (see Figure 5; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots TP12, TP13, and TP14 and is provided on datasheets in Appendix C. This wetland is partially mowed along the western boundary where it overlaps with the Ellensburg Golf and Country Club driving range. The upland boundary of the wetland is defined by an obvious rise in elevation along the access road and a subtle elevation change and vegetation community change to the west.

Wetland TW05 is a PEM wetland habitat type (Cowardin et al. 1979). The wetland is dominated by broad-leaf cat-tail, reed canary grass, and Baltic rush, with a few crack willow (FAC) near the culvert. The dominance of these species meets the wetland vegetation criteria.

Soils in Wetland TW05 are mapped as Mitta ashy silt loam, flooded, with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The soil profile observed within 16 inches of the soil surface consists of black (2.5Y 2.5/1) mucky mineral soil over a black gleyed (N 2.5/0) layer within the upper 5 inches and very dark gray (2.5Y 3/1) silt loam with depletions of greyish brown (2.5Y 5/2) below 5 inches (Munsell Color 2009). The soils in Wetland TW05 meet the hydric soil indicator for Loamy Gleyed Matrix (F2).

Primary indicators of hydrology within the wetland include a water table at 12 inches and saturation to the soil surface. The presence of these indicators meets wetland hydrology criteria.

Wetland TW05 is rated as a Category III wetland in the Ecology rating system, with a moderately high score for hydrologic function (7/9 points), a moderately low score for water quality improvement (5/9 points), and a low score for habitat function (4/9 points). Wetland TW05 has moderately high potential to provide hydrologic functions because of its potential to store floodwaters and help reduce flooding issues directly downstream in the Yakima River, and it has a low score for habitat function because it does not provide adequate habitat structure and is isolated from habitat in the surrounding area.

3.2 Frequently Flooded Areas

FEMA floodplain mapping depicts the 100-year floodplain adjacent to the Yakima River, which extends onto the northeastern corner of the project site (see Figure 2). This area overlaps Wetland TW01 with a total area of 0.11 acre within the project site, and will likely be avoided during project design. Development within the 100-year floodplain will be avoided; therefore, no net loss of floodplain storage will be achieved.

3.3 Geologically Hazardous Areas

The Typha Solar Project site is not within any mapped geologically hazardous areas. No erosion/landslide geologic hazard areas, snow avalanche hazards, or mine hazard areas are mapped on any of the parcels that encompass the project site (Kittitas County 2017). The project will not require specialized engineering to ascertain that the property is suitable for development.

3.4 Habitats

Based on the criteria provided in KCC Chapter 17A.07, the Typha Solar Project study area includes riparian habitat and priority species habitat. The Typha Solar Project is not located on federal land or land owned or leased by the WDFW, and therefore is not considered big game winter range.

3.4.1 Riparian Habitat

One perennial canal (EP Canal) and two ephemeral ditches are located in the Typha Solar Project study area. In addition, the Yakima River is located within 200 feet of the project site. Based on the field observations, the EP Canal and the Yakima River are considered jurisdictional waters for the USACE, Ecology, and Kittitas County because they satisfy the definition of "waters of the United States" under the Clean Water Rule 40 CFR 230.3. The two ephemeral ditches ultimately feed into the EP Canal; one that runs along the south side of the access road and another that crosses under the road from north to south through a culvert, connecting to the first ditch. Because these ditches are hydrologically connected to the EP Canal, they will likely be considered jurisdictional. Table 7 summarizes the size, rating, and classification of the streams found in the study area (see Figures 4 and 5). Photographs of these features are provided in Appendix D.

Stream Name	Tributary to	Stream Type ^a	USACE Jurisdiction ^b	Average Width in Study Area (feet) ^c	Approximate Length in the Project (feet) ^c
Yakima River	Columbia River	S	RPW	158	0
EP Canal (TS01)	Yakima River	N/A	RPW	45	540
Unnamed Ephemeral Ditch 1	EP Canal	N/A	NRPW	4	115
Unnamed Ephemeral Ditch 2	EP Canal	N/A	NRPW	10	42

Table 7. Summary of Streams in the Study Area

^a S = shoreline of the state (WAC 222-16-030), N/A = not applicable, due to ditches and canals being excluded from the WAC typing system.

^b RPW = relatively permanent water; NPRW = non-relatively permanent water.

^c Average widths and approximate lengths were determined based on SWCA survey data and field observations.

3.4.1.1 Yakima River

The Yakima River is a perennial, fish bearing tributary of the Columbia River with a 6,150-square-mile drainage basin. The Yakima River is located approximately 35 feet outside of the project site, but is within 200 feet of the eastern project site boundary for approximately 1,150 feet. In the vicinity of the study area, the Yakima River is approximately 160 feet wide, with Wetland TW01 delineated within the 100-year floodplain. The project site is located near the cut bank, actively eroding, west side of the Yakima River, which may pose a long-term threat to the stability of the project site near the river. The thin riparian area between the project site and the Yakima River is dominated by herbaceous species, including stinging nettle (Urtica dioica), Fuller's teasel, Canadian thistle, and great mullein (Verbascum thapsus), with some areas of shrubs and saplings that included ponderosa pine, black hawthorn (Crataegus douglasii), narrow-leaf willow, red osier dogwood, and Nootka rose. According to WDFW mapping (WDFW 2017a, WDFW 2017b), coho (Oncorhynchus kisutch), Chinook (O. tshawytscha), steelhead (O. mykiss), cutthroat (O. clarki lewisi), and bull trout (Salvelinus confluentus) are present in the Yakima River in the vicinity of the project site. Based on the Washington Water Typing Criteria (WAC 222-16-030) and the Shoreline Management Act's list of streams and rivers constituting shorelines of the state for Kittitas County (WAC 173-18-230), this portion of the Yakima River is designated as a shoreline of the state (Type S).

3.4.1.2 Ellensburg Power Canal

The EP Canal is a perennial canal tributary to the Yakima River, located in the generation tie line, and is spanned three times by the existing line. Wetland TW05 receives floodwater from the EP Canal through a culvert under the access road that passes along the southwestern bank and crosses over the canal to the north. Within the study area, the EP Canal's OHWM is approximately 45 feet wide at each of the crossings. Vegetation on the riparian banks of this stream primarily consists of reed canary grass, stinging nettle, prickly lettuce (Lactuca serriola), Nootka rose, crack willow, narrow-leaf willow, black locust (Robinia pseudoacacia), quaking aspen, ponderosa pine, and grand fir.

Current WDFW mapping suggests that fish species do not occur in the EP Canal (WDFW 2017a, 2017b). This canal is highly manipulated by flow control measures to manage irrigation in the area; therefore, it is highly unlikely to support fish populations. Based on the Washington Water Typing Criteria (WAC 222-16-031) guidance, EP Canal does not fall into this typing system because it is a managed canal and not a stream.

3.4.2 Priority Habitats and Species

PHS fish species are designated in the portion of the Yakima River that is adjacent to the Typha Solar Project study area and include coho, rainbow trout (*O. mykiss*), summer steelhead, spring Chinook, bull trout (*Salvelinus malma*), and westslope cutthroat (WDFW 2017a). In addition, there is a great blue heron (*Ardea herodias*) rookery and osprey (*Pandion haliaetus*) occurrence point on the east bank of the Yakima River, opposite and within 300 feet of the project site (WDFW 2017a). Great blue heron were observed during site visits foraging in the project site. PHS mapping is depicted in Figure 3.

These PHS-mapped areas occur off-site and within the protection buffers of other wetland and water features; therefore, no additional designation will be required under KCC 17A.07.020.

3.5 Aquifer Recharge Areas

As described in KCC 17A.08.010, no critical aquifer recharge locations have been identified in Kittitas County. Additionally, the Typha Solar Project will not involve any hazardous materials or disposal of onsite sewage. No well-heads have been identified within the study area.

4 CONCLUSIONS AND RECOMMENDATIONS

EFSEC will provide permitting requirements for the Typha Solar Project, but this report evaluates and shows compliance with County requirements. A review of the Typha Solar Project study area determined that the following Kittitas County defined critical areas have the potential to be affected by the project:

- Wetlands
- Frequently Flooded Areas
- Habitats:
 - o Riparian Habitat

A summary of all wetlands, waters, and critical area buffers documented within the study area is provided in Table 8. The wetland and non-wetland waters identified in and adjacent to the study area will likely be determined jurisdictional by Ecology and the USACE. Although EFSEC will provide permitting requirements for the proposed project, to show compliance with County requirements, KCC guidance (Chapter 17A.07.010) defines a minimum 40-foot protection buffer for Type S waters, such as the Yakima River. However, up to a 200-foot protection buffer could be requested once Kittitas County has had the opportunity to review the results of this study and has had discussions with TUUSSO Energy (see Figures 4 and 5). KCC guidance does not define protection buffers for irrigation canals and ditches, such as The EP Canal and the delineated ephemeral ditches, because they do not qualify as streams. The minimum and maximum wetland protection buffers required by the KCC (Chapter 17A.04.020) are listed in Appendix F, and are provided for these wetlands in Table 8, but only the minimum protection buffers are depicted on Figures 4 and 5. Consultation with the County would be required to determine exact buffer distances.

Critical Area	Wetland Rating/Water Typing ^a	Kittitas County Minimum/Maximum Buffer Distances (feet) ^b	Total Size of Feature Within the Project (acres) ^c
Wetlands			
Wetland TW01	II	25 / 100	0.07
Wetland TW02	II	25 / 100	0.38
Wetland TW03	II	25 / 100	0.42
Wetland TW04	111	0 / 0 ^d	0.04
Wetland TW05	111	20 / 80	0.03
Frequently Flooded A	reas		
Yakima River flood zone	N/A	N/A	0.11
Riparian Habitat			
Yakima River	S	40 / 200	0.00
EP Canal (TS01)	N/A	None	0.44
Ditches	N/A	None	0.02

Table 8. Wetland and Waters Summary

^a II = Category II (Hruby 2014); III = Category III (Hruby 2014); S = shoreline of the state (WAC 22-16-030);

^b Only minimum buffer distances are depicted on maps;

^c Does not include buffer areas;

^d No Kittitas County buffer is defined because the wetland area is below the minimum size threshold for protection; however, building setbacks may be required based on zoning lot line setbacks, but would not exceed 25 feet.

Design plans are incomplete for the proposed Typha Solar Project; however, TUUSSO Energy will attempt to design the project to avoid, reduce, or eliminate impacts to wetlands, waters, and their buffers. Following the finalization of the design footprint, all removal-fill activities proposed within jurisdictional features would require a Joint Aquatic Resources Permit Application (JARPA) submitted for USACE and Ecology review.

There is no minimum threshold to implement mitigation sequencing for potential impacts to wetland and waters features. Where possible, the Typha Solar Project should demonstrate avoidance of jurisdictional features and then minimization of impacts. Avoidance and minimization could be achieved by making minor design alterations around delineated feature boundaries.

Where impact avoidance is not possible, mitigation measures should be implemented to minimize temporary construction disturbance and other permanent alterations to the features. Mitigation would include the implementation of construction best management practices. Where permanent alterations to wetland and waters features are unavoidable, wetland mitigation measures to achieve "no net loss" would be required. Desktop research shows that there are no approved mitigation banks or in-lieu fee programs in Kittitas County; therefore, any mitigation that would be required must be conducted as an Advance Permittee-Responsible Mitigation. Under KCC guidance (Chapter 17A.04.050), the mitigation ratio for a Category II wetland is 2:1, and the mitigation ratio for a Category III wetland is 1:1.

5 DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigators. This should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and is not a final determination.

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APPENDIX A: WETLAND DELINEATION METHODOLOGY

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The methods used to delineate wetlands within the study area conform to guidance in the *Washington State Wetland Identification and Delineation Manual* (Ecology 1997), the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008).

To be considered a wetland by the U.S. Army Corps of Engineers (USACE), an area must express hydrophytic vegetation, hydric soils, and wetland hydrology. SWCA Environmental Consultants (SWCA) staff documented site conditions for these parameters in areas representative of the study area and in areas most likely to exhibit wetland features. Staff collected additional data in associated uplands, as needed, to confirm wetland boundaries. Wetland boundaries, stream boundaries, and wetland data plot locations in the study area were recorded with a Trimble Geo XT global positioning system (GPS) unit. All delineated wetlands and streams were processed and projected onto existing base maps using ArcGIS software.

Vegetation

The dominant and sub-dominant plants were identified and recorded at each sample plot location. These plants were evaluated based on their wetland indicator status to determine if the vegetation was hydrophytic. SWCA biologists utilized the 50/20 rule per USACE recommendations to determine which plants were dominant at each sample plot. Under this guidance, absolute cover estimates were made for each species found rooted within the sample plot radius for each vegetative strata found in the habitat (tree, sapling/shrub, herb, and woody vine). Refer to the USACE regional supplement for exact applications of this method of determining dominance (USACE 2008).

Sample plot radii varied in size depending on site topography and habitat complexity. When documenting vegetation in smaller or oddly-shaped wetlands or habitat features, vegetation strata radii may be adjusted to more accurately depict vegetation rooted within the wetland or habitat feature being delineated.

Hydrophytic vegetation is defined as vegetation adapted to wetland conditions, such as inundation or prolonged saturation. To meet the hydrophytic vegetation criterion, more than 50% of the total dominant plants across all stratums must have a wetland indicator status of Facultative (FAC), Facultative Wetland (FACW), or Obligate (OBL). The wetland indicator status is assigned to plant species that have the potential to occur in wetlands by the USACE (Lichvar et al. 2016). Table A-1 lists the definitions for each wetland indicator status.

Wetland Indicator Status	Symbol	Definition
Obligate Wetland Plants	OBL	Plants that almost always (> 99% of the time) occur in wetlands, but which may rarely (< 1% of the time) occur in non-wetlands.
Facultative Wetland Plants	FACW	Plants that often (67 to 99% of the time) occurs in wetlands, but sometimes (1 to 33% of the time) occur in non-wetlands.
Facultative PlantsFACPlants with a similar likelihood (34 to 66% of the time) both wetlands and non-wetlands.		Plants with a similar likelihood (34 to 66% of the time) of occurring in both wetlands and non-wetlands.
Facultative Upland Plants	FACU	Plants that sometimes (1 to 33% of the time) occur in wetlands, but occur more often (67 to 99% of the time) in non-wetlands.
Upland Plants	UPL	Plants that rarely (< 1% of the time) occur in wetlands, and almost always (> 99% of the time) occur in non-wetlands.

Table A-1. Definitions for Each Wetland Plant Indicator Status

Source: Lichvar et al. (2016).

SWCA biologists identified plants found in the field to species whenever possible, when adequate vegetative or flowering characteristics were available. Scientific and common plant names were reported with the currently accepted nomenclature.

Soils

An area typically must contain hydric soils to be considered a wetland, except when problematic site conditions occur. Hydric soils typically form under an area that experiences durations of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper portion of the soil profile. Chemical and biological processes in saturated soil result in reduced oxygen concentrations and promote anaerobic metabolism in microorganisms. These prolonged anaerobic conditions often create mottling and other distinct patterns in the soil, which are used as indicators of hydric soils. The hue, value, and chroma and relative percentage of mottling are recorded in the field at each data plot location. Other important hydric soil indicators include organic matter accumulations in the surface horizon, reduced sulfur odors, and organic matter staining in the soil profile (Natural Resource Conservation Service [NRCS] 2017a).

SWCA staff examined soil profiles at each data plot location by excavating sample pits to a depth of 16 to 20 inches to observe the soil profile, colors, and textures. In some cases, a shallower soil pit was used due to shovel refusal from obstructions in the soil profile, such as gravel, bedrock, thick roots, or clay hardpan. Munsell color charts (Munsell Color 2009) were used to determine soil colors in the field.

Hydrology

SWCA staff investigated the entire project area for evidence of wetland hydrology. Where data plot locations were taken, additional notes were recorded to fully document the presence of primary and secondary wetland hydrology indicators at the sample location. According to the USACE, wetland hydrology criteria were considered to be satisfied if the soil was seasonally inundated or saturated to the surface for a consecutive number of days greater than or equal to 12.5% of the growing season. The growing season for the area was determined based on the period in which temperatures are above 28 degrees Fahrenheit 5 out of 10 years (Ecology 1997) using the long-term climatological data collected by the NRCS (2017). Using the wetlands climate analysis (WETS) table for the nearest station (Ellensburg, Washington), the growing season was approximated as typically between April 20 and October 10, or a total of 173 days (NRCS 17b).

However, often times multiple site visits to determine the duration of seasonal inundation or saturation are not possible. Therefore, field indicators are used in an attempt to determine an area's hydro-period through field observations. Wetland hydrology indicators are divided into two categories: primary and secondary indicators (USACE 2008). Primary indicators of hydrology include, but are not limited to, surface inundation and high water table and saturated soils within 12 inches of the soil surface. The presence of one primary indicator is sufficient to conclude that wetland hydrology is present. Secondary hydrology indicators are also recorded and may substitute in the case of a lack of any primary indicators if multiple secondary indicators are observed. Secondary indicators of hydrology include, but are not limited to, drainage patterns, crayfish burrows, and dry-season water table (USACE 2008). If no primary indicators, and fewer than two secondary indicators, are observed within the sample area, then it is likely that the area is not considered a wetland, unless problematic conditions exist on-site. Aerial and historic imagery are often reviewed before and after site visits to ensure all possible hydrology indicators are taken into account.

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APPENDIX B: VEGETATION LIST

Typha So	olar Site and Transmission I	_ine Project	
	Vegetation Table	-	
	April 3, 4, and 12, 2017		
Common Name	Scientific Name	Wetland	Native / Introduced
		Indicator	and Invasive / Noxious
		Status ¹	
Grand Fir	Abies grandis	FACU	native
Garden Yellow-Rocket	Barbarea vulgaris	FAC	non-native
Canadian Thistle	Cirsium arvense	FACU	invasive, noxious
Red Osier	Cornus alba	FACW	native
Black Hawthorn	Crataegus douglasii	FAC	native
Chufa (yellow nutsedge)	Cyperus esculentus	FACW	native, noxious
Fuller's Teasel	Dipsacus fullonum	FAC	invasive, noxious
Hairy Cat's-Ear	Hypochaeris radicata	FACU	non-native, noxious
Rocky Mountain Iris	Iris missouriensis	FACW	native
Baltic Rush	Juncus balticus	FACW	native
Prickly Lettuce	Lactuca serriola	FACU	non-native
Common Duckweed	Lemna minor	OBL	native
Spearmint	Mentha spicata	FACW	non-native
scotch thistle	Onopordum acanthium	NOL	noxious
Common Panic Grass	Panicum capillare	FACU	native
Reed Canary Grass	Phalaris arundinacea	FACW	invasive, noxious
Common Timothy	Phleum pratense	FACU	non-native
Ponderosa Pine	Pinus ponderosa	FACU	native
bluegrass	Poa species	FAC ?	-
Quaking Aspen	Populus tremuloides	FACU	native
Black Locust	Robinia pseudoacacia	FACU	non-native
Nootka Rose	Rosa nutkana	FACU	native
Curly Dock	Rumex crispus	FAC	non-native
Narrow-Leaf Willow	Salix exigua	FACW	native
crack willow	Salix X fragilis	FAC	non-native
Tall False Rye Grass	Schedonorus arundinaceus	FACU	non-native
Common Dandelion	Taraxacum officinale	FACU	non-native
False Mayweed	Tripleurospermum maritimum	FACU	non-native, noxious
White Clover	Trifolium repens	FACU	non-native
Broad-Leaf Cat-Tail	Typha latifolia	OBL	native
Stinging Nettle	Urtica dioica	FAC	native
Great Mullein	Verbascum thapsus	FACU	non-native

¹Wetland Indicator Status (WIS) from the NWPL AW Region - see below.

A question mark (?) preceded by a space indicates our default assumption that the plant is FAC.

Wetland Indicator Status (WIS) and taxonomy for the AW Region per the National Wetland Plant List 2016v3.3:(common names are capitalized)http://wetland-plants.usace.army.mil/Accessed January 10, 2017WIS for non-wetland plants and taxonomy from Reed 1988 and Reed et al.1993, and the USDA PLANTS database:(common names are not capitalized)http://plants.usda.gov/

Native per Hitchcock & Cronquist 1973 and http://plants.usda.gov/ Noxious per Washington State NWCB 2017

http://www.nwcb.wa.gov/_

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WETLAND INDICATOR STATUS - A	Arid West Region
OBL	Obligate Wetland – Almost always is a hydrophyte, rarely in uplands. Examples: broad-leaf cat-tail, yellow-skunk-cabbage
FACW	Facultative Wetland - Usually is a hydrophyte but occasionally found in uplands. Examples: Oregon ash, red osier
FAC	Facultative – Commonly occurs as either a hydrophyte or non-hydrophyte. Examples: red alder, salmon raspberry
FACU	Facultative Upland - Occasionally is a hydrophyte but usually occurs in uplands. Examples: big-leaf maple, Himalayan blackberry
UPL	Upland - Rarely is a hydrophyte, almost always in uplands. These plants have been removed from the NWPL WMVC Region.
NOL	Not Listed - Not on the list; assumed to be UPL.

APPENDIX C: WETLAND DATA SHEETS

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP01
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rang	je: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Floodplain			Local relief	(concave, convex, none): Concave Slope (%): 2
Subregion (LRR): B, Columbia/Snake River Pla	ateau	Lat: 47.028478		ng: -120.625543 Datum: NAD 1983
		to 2 percent slopes	; (809)	NWI classification: None
Are climatic / hydrologic conditions on the site t			Ye	
Are Vegetation,Soil	, or Hydrology	significantly of	disturbed? A	Are "Normal Circumstances" present? Yes X No
Are Vegetation,Soil	, or Hydrology	naturally prol	blematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach	site map sho	wing sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No		
Hydric Soil Present?	Yes X	No	Is the Samp	
Wetland Hydrology Present?	Yes X	No	within a We	
	eeks prior, 2.32"	above normal for C	YTD, 2.78" abc	ove normal for WYTD. *Wetter than normal.
Remarks: TWO1. Wetland is located within the 100-year f	icodulain of the \	Vakima River PEM	on-site and PS	is off cito
				10 011-51ce.
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' r</u>)	% Cover	Species?	<u>Status</u>	Number of Dominant Species
1				That Are OBL, FACW, or FAC:(A)
2.				-
3.				Total Number of Dominant
4.				Species Across All Strata: 5 (B)
	0%	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r	_)			Percent of Dominant Species
^{1.} Salix exigua	15%	Yes	FACW	That Are OBL, FACW, or FAC: <u>40%</u> (A/B)
2. Rosa nutkana	5%	Yes	FACU	Prevalence Index worksheet:
3. Cornus alba	5%	Yes	FACW	Total % Cover of: Multiply by:
4.		·		OBL species 0 x 1 = 0
5.		·		FACW species $20 \times 2 = 40$
	25%	= Total Cover		FAC species $0 \times 3 = 0$
Herb Stratum (Plot size: <u>5' r</u>)				FACU species $15 \times 4 = 60$
1. Panicum capillare	5%	Yes	FACU	UPL species $0 \times 5 = 0$
2. Hypochaeris radicata	<u>5%</u>	Yes	FACU	Column Totals: 35 (A) 100 (B)
3.		100	17.00	Prevalence Index = $B/A = \frac{2.86}{2.86}$
4.				Hydrophytic Vegetation Indicators:
5.		· · · · · · · · · · · · · · · · · · ·		1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7.				X 3 - Prevalence Index is $\leq 3.0^{1}$
8.				4 - Morphological Adaptations ¹ (Provide supporting
9		·		data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11				Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 10' r		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: <u>10' r</u> 1.)			be present.
2.		· · · · · · · · · · · · · · · · · · ·		Hydrophytic
	0%	= Total Cover		Vegetation Yes X No
% Bare Ground in Herb Stratum 90%				Present?
Remarks:				Entered by: KL/ED_QC by: TJD
The off-site PSS wetland portion is dominated b	oy Rosa nutkana	, Salix exigua, Corr	nus alba , and (

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Sampling Point: TP01

Depth	Matrix			T COUCK T	eatures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-7	10YR 2/2	100					SiL	
7-10+	10YR 2/2	97	7.5YR 3/3	3	С	M, PL	SiL	
Type: C=Cond	centration, D=Depletic	on, RM=Redu	uced Matrix CS=Cove	red or Coate	d Sand Grains.	² Location: F	PL=Pore Lining, M=M	atrix.
Hydric Soil Ind	licators: (Applicable	to all LRRs	, unless otherwise n	oted.)		Indicators for	or Problematic Hydri	ic Soils ³ :
Histosol (A	1)	_	Sandy Redox (S5)	_	1 cm muck (A9) (LRR C)	
Histic Epipe	edon (A2)	_	Stripped Matrix (S	6)	_	2 cm Muck (A10) (LRR B)	
Black Histic	c (A3)	_	Loamy Mucky Mir	neral (F1)	_	Reduced Ver	tic (F18)	
Hydrogen S	Sulfide (A4)	_	Loamy Gleyed Ma	atrix (F2)	_	Red Parent M	Material (TF2)	
Stratified La	ayers (A5) (LRR C)	_	Depleted Matrix (F	=3)	_	Other (Explai	in in Remarks)	
1 cm Muck	(A9) (LRR D)	2	X Redox Dark Surfa	ice (F6)				
Depleted B	elow Dark Surface (A	.11)	Depleted Dark Su	rface (F7)				
Thick Dark	Surface (A12)	-	Redox Depressior	ns (F8)	3	ndicators of hyd	drophytic vegetation a	ind
Sandy Muc	ky Mineral (S1)	-	Vernal Pools (F9)			wetland hydrol	ogy must be present,	
Sandy Gley	/ed Matrix (S4)					unless distrube	ed or problematic.	
Restrictive Lay	/er (if present):							
Restrictive Lay	/er (if present): None							
_	None				F	lydric Soil Pres	sent? Yes X	No
Type: Depth (inches	None): <u>N/A</u>	:= clay: =	$\log m $ or $\log m v$: co = c	oarse: f = fin		-		
Type: Depth (inches Remarks:	None): <u>N/A</u>		loam or loamy; co = c	oarse; f = fin		-		
Type: Depth (inches Remarks: Shovel refusal a	None S: N/A S = sand; Si = silt; C at 10" due to large roc		loam or loamy; co = c	oarse; f = fin		-		
Type: Depth (inches Remarks: Shovel refusal a	None N/A S = sand; Si = silt; C at 10" due to large roc SY		loam or loamy; co = c	oarse; f = fin		-		
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro	None S): N/A S = sand; Si = silt; C at 10" due to large roc SY blogy Indicators:	cks.		oarse; f = fin		; + = heavy (mo	re clay); - = light (less	s clay)
Type: Depth (inchess Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato	None None N/A S = sand; Si = silt; C at 10" due to large roo SY Diogy Indicators: Drs (minimum of one	cks.	eck all that apply)	oarse; f = fin		; + = heavy (mo	re clay); - = light (less ndicators (2 or more re	s clay)
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa	None N/A S = sand; Si = silt; C at 10" due to large roo SY Diogy Indicators: ors (minimum of one mater (A1)	cks.	eck all that apply) Salt Crust (B11)			; + = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri	equired)
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water	None N/A S = sand; Si = silt; C at 10" due to large roc SY blogy Indicators: ors (minimum of one ater (A1) r Table (A2)	cks.	eck all that apply) Salt Crust (B11) Biotic Crust (B12)			; + = heavy (mo	ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B	equired) verine) 32) (Riverine)
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation	None None N/A S = sand; Si = silt; C at 10" due to large roo SY Diogy Indicators: ors (minimum of one matter (A1) r Table (A2) (A3)	required; che	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra	ates (B13)		; + = heavy (mo	re clay); - = light (less adicators (2 or more re Water Marks (B1) (R i Sediment Deposits (B Drift Deposits (B3) (R	equired) equired) verine) 32) (Riverine) iverine)
Type: Depth (inchess Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation of Water Mark	None S): N/A S = sand; Si = silt; C at 10" due to large root SY blogy Indicators: ors (minimum of one) ater (A1) r Table (A2) (A3) xs (B1) (Nonriverine)	required; che	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide	ates (B13) Odor (C1)	e; vf = very fine	; + = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B	equired) verine) 32) (Riverine) iverine) 10)
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D	None None N/A S = sand; Si = silt; C at 10" due to large roc SY blogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (Ka) (Nonriverine) Deposits (B2) (Nonriv	required; che 	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl	ates (B13) Odor (C1) heres along l	e; vf = very fine	; + = heavy (mo	ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B ² Dry-Season Water Ta	equired) verine) 32) (Riverine) iverine) 10) able (C2)
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos	None None N/A S = sand; Si = silt; C at 10" due to large roo SY Diogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) ks (B1) (Nonriverine) Deposits (B2) (Nonriverine)	required; che 	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu	ates (B13) Odor (C1) heres along I iced Iron (C4	e; vf = very fine	; + = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B ² Dry-Season Water Ta Crayfish Burrows (C8	s clay) equired) verine) 32) (Riverine) iverine) 10) able (C2)
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Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation	None None None N/A S = sand; Si = silt; C at 10" due to large roo SY Dogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (A3) (Ks (B1) (Nonriverine) Deposits (B2) (Nonriverine) sits (B3) (Nonriverine)	required; che 	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu	ates (B13) Odor (C1) heres along I iced Iron (C4 ction in Tillec e (C7)	e; vf = very fine	; + = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on J	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery (C9)
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Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stair	None None N/A S = sand; Si = silt; C at 10" due to large roo SY Nogy Indicators: ors (minimum of one f ater (A1) r Table (A2) (A3) (Ks (B1) (Nonriverine) Deposits (B2) (Nonriverine) Deposits (B3) (Nonriverine) Sits (B3) (Nonriverine) None (B9) Visible on Aerial Imagened Leaves (B9) tions: Present? Yes	required; che	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu Thin Muck Surfac Other (Explain in I	ates (B13) Odor (C1) heres along I iced Iron (C4 ction in Tillec e (C7) Remarks)	e; vf = very fine	() () () () () () () () () ()	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B ² Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on a Shallow Aquitard (D3)	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery (C9))
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stain	None None None N/A S = sand; Si = silt; C at 10" due to large roo SY Dogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (Ka)	required; che 	Eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu Thin Muck Surface Other (Explain in I No X X De No X De	ates (B13) Odor (C1) heres along I iced Iron (C4 ction in Tillec e (C7) Remarks) epth (inches):	e; vf = very fine	$\frac{Secondary Ir}{X}$	re clay); - = light (less adicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on A Shallow Aquitard (D3) FAC-Neutral Test (D5	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery (C9))
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water Saturation of Water Mark Sediment D Drift Depos Surface So Inundation Water-Stair Field Observat Surface Water Water Table Pr	None None N/A S = sand; Si = silt; C at 10" due to large roo SY Dogy Indicators: Drs (minimum of one ater (A1) r Table (A2) (A3) (Ks (B1) (Nonriverine) Deposits (B2) (Nonriverine) Sits (B3) (Nonriverine) Deposits (B2) (Nonriverine) Sits (B3) (Nonriverine) Deposits (B3) (Nonriverine) Sits (B3) (Nonriverine) Deposits (B3) (Nonriverine) Sits (B3) (Nonriverine) Present? Yes sent? Yes	required; che 	Eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu Thin Muck Surface Other (Explain in I No X No X	ates (B13) Odor (C1) heres along L uced Iron (C4 ction in Tillec e (C7) Remarks) epth (inches):	e; vf = very fine	$\frac{Secondary Ir}{X}$	re clay); - = light (less adicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on J Shallow Aquitard (D3) FAC-Neutral Test (D5 Hydrology Present?	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery (C9)) ;)
Type: Depth (inches Remarks: Shovel refusal a HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stain Field Observat Surface Water Saturation Pres (includes capill	None None N/A S = sand; Si = silt; C at 10" due to large roo SY Nogy Indicators: Ors (minimum of one f ater (A1) r Table (A2) (A3) (Ks (B1) (Nonriverine) Deposits (B2) (Nonriverine) Deposits (B2) (Nonriverine) Sits (B3) (Nonriverine) Deposits (B3) (Nonriverine) Sits (B3) (Nonriverine) Nisible on Aerial Imagenetic Leaves (B9) tions: Present? Yes resent? Yes ary fringe)	required; che	Eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu Thin Muck Surface Other (Explain in I No X No X	ates (B13) Odor (C1) heres along I iced Iron (C4 ction in Tillec e (C7) Remarks) epth (inches): epth (inches):	e; vf = very fine Living Roots (C3) d Soils (C6) N/A >10 >10	(wetland	re clay); - = light (less adicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on J Shallow Aquitard (D3) FAC-Neutral Test (D5 Hydrology Present?	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery (C9)) ;)
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Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP02
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rang	je: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Plain			Local relief	(concave, convex, none): None Slope (%): 1
Subregion (LRR): B, Columbia/Snake River F	Plateau	Lat: 47.028432	Lon	ng: -120.625613 Datum: NAD 1983
Soil Map Unit Name: Weirman-Kayak	-Zillah complex, 0	to 2 percent slopes		NWI classification: None
Are climatic / hydrologic conditions on the site			Ye	No X* (If no, explain in Remarks)
Are Vegetation,Soil	, or Hydrology	significantly	disturbed? A	Are "Normal Circumstances" present? Yes X No
		naturally pro		If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach			point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes	No X		
Hydric Soil Present?	Yes	No X	Is the Samp	
Wetland Hydrology Present?	Yes	No X	within a We	
Precipitation prior to fieldwork: 0.79" two Remarks:	weeks prior, 2.32"	above normal for C	YTD, 2.78" abo	ove normal for WYTD. *Wetter than normal.
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: 0 (A)
2				
3.				Total Number of Dominant
4.				Species Across All Strata: 1 (B)
		= Total Cover		
Sapling/Shrub Stratum (Plot size: 10'	<u>r_</u>)			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2.				Prevalence Index worksheet:
3				Total % Cover of: Multiply by:
4.				OBL species 0 x 1 = 0
5				FACW species $0 \times 2 = 0$
Herb Stratum (Plot size: <u>5' r</u>)	0%	= Total Cover		FAC species $5 \times 3 = 15$
	0001		54.011	FACU species $23 \times 4 = 92$
Schedonorus arundinaceus	20%	Yes	FACU	UPL species $0 \times 5 = 0$ Column Totals: 28 (A) 107 (B)
2. Barbarea vulgaris	5%	No	FAC	Column Totals: <u>28</u> (A) <u>107</u> (B) Prevalence Index = $B/A = 3.82$
3. Panicum capillare	2%	No	FACU	Hydrophytic Vegetation Indicators:
Hypochaeris radicata S.	1%	No	FACU	1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7.				$3 - Prevalence Index is < 3.0^{1}$
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11.				Problematic Hydrophytic Vegetation ¹ (Explain)
	28%	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: <u>10'</u> 1.		- Total Cover		be present.
2.				Hydrophytic
	0%	= Total Cover		Vegetation Yes No X
% Bare Ground in Herb Stratum 72%)			Present?
Remarks:				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>
Sparsely vegetated.				

US Army Corps of Engineers SWCA Environmental Consultants

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicator Histosol (A1) Sandy Redox (S5) 1 cm mu Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Mu Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Par Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (E 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hy Sandy Gleyed Matrix (S4) unless dis Restrictive Layer (if present): Type: N/A Type: None My N/A Hydric Soil Hydric Soil Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy Large rocks (shovel refusal at 10") Seconda HYDROLOGY Wetland Hydrology Indicators: Mydrogen Sulfide Odor (C1) Seconda Surface Water (A1) Salt Crust (B11) Salt Crust (B12) Saturation (A3) Gauatic Invertebrates (B13) Seconda	Texture Remarks SiL
Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. ² Locatic Histosol (A1) Sandy Redox (S5) 1 cm much Histosol (A1) Sandy Redox (S5) 1 cm much Histosol (A1) Sandy Redox (S5) 1 cm much Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Par Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (E 1 cm Muck (A9) (LRR D) Redox Dark Surface (F7) Thick Dark Surface (A12) Redox Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators c Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hy Sandy Gleyed Matrix (S4) unless dis Retrictive Layer (If present): Type: N/A Type: None Hydric Soil Depth (inches): N/A Secondary Surface Water (A1) Salt Crust (B11) Secondary High Water Table (A2) Biotic Crust (B12) Secondary Surface Water (A1) Salt Crust (B1) Secondary High Water Table (A2) Biotic Crust (B	SiL
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Histosol (A1) Sandy Redox (S5) 1 cm mu Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Mu Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Par Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (E 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hy unless dis Sestrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") Seconda YDROLOGY Interverterates (B13) Aquatic Invertebrates (B13) Seconda Saturation (A3) Aquatic Invertebrates (B13) Seconda Seconda Surface Water (A1) Salt Crust (B11) Self Prosense along Living Roots (C3) Seconda Saturation (A3) Aquatic Invertebrates (B13) <td< td=""><td>rs for Problematic Hydric Soils³:</td></td<>	rs for Problematic Hydric Soils ³ :
Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Mu Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Par Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (E 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A12) Redox Depressions (F8) ³ Indicators of Sandy Mucky Mineral (S1) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hy Sandy Gleyed Matrix (S4) unless dis estrictive Layer (if present): Type: N/A Type: None Hydric Soil Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") VDROLOGY Saturation (A3) Aquatic Invertebrates (B13) Surface Water (A1) Salt Crust (B11) Seconda High Water Table (A2) Biotic Crust (B12) Saturation (A3) Water Marks (B1) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Dift Deposits (B3) (Nonriverine) Dift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface	ck (A9) (LRR C)
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Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Par Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (E 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of the start (S4) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hy unless dis Sandy Gleyed Matrix (S4) unless dis estrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") YDROLOGY Fettand Hydrology Indicators: rimary Indicators (minimum of one required; check all that apply) Secondar Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) OxidIzed Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) <	
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Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of wetland hy wetland hy unless dis Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hy unless dis estrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") IYDROLOGY ////////////////////////////////////	xplain in Remarks)
Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of wetland hy wetland hy wetland hy unless dis Sandy Gleyed Matrix (S4) wetland hy unless dis estrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") YDROLOGY Fettand Hydrology Indicators: rimary Indicators (minimum of one required; check all that apply) Seconda	
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Sandy Gleyed Matrix (S4) unless dis estrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") YPROLOGY YPROLOGY Seconda retland Hydrology Indicators: seconda rimary Indicators (minimum of one required; check all that apply) Seconda Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	
estrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") IYDROLOGY //etland Hydrology Indicators: rimary Indicators (minimum of one required; check all that apply) Seconda	drology must be present,
Type: None Depth (inches): N/A emarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") IVDROLOGY Vettand Hydrology Indicators: rimary Indicators (minimum of one required; check all that apply) Seconda Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	rubed or problematic.
Depth (inches): N/A Hydric Soil temarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy arge rocks (shovel refusal at 10") HYDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one required; check all that apply) Secondar	
Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy Arge rocks (shovel refusal at 10") HYDROLOGY Vetland Hydrology Indicators: Drimary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	
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HYDROLOGY Vetland Hydrology Indicators: Drimary Indicators (minimum of one required; check all that apply) Seconda Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	(more clay); - = light (less clay)
Vetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Seconda Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	
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Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	Sediment Deposits (B2) (Riverine)
Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	Drift Deposits (B3) (Riverine)
Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks)	Drainage Patterns (B10)
Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks) ield Observations: Imagery (B7)	Dry-Season Water Table (C2)
Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Other (Explain in Remarks) ield Observations:	Crayfish Burrows (C8)
Water-Stained Leaves (B9) Other (Explain in Remarks)	Saturation Visible on Aerial Imagery (C
ield Observations:	Shallow Aquitard (D3)
	FAC-Neutral Test (D5)
Surface Water Property Version No. No. No. No. No.	
Surface Water Present? Yes No X Depth (inches): N/A	
Saturation Present? Yes No X Depth (inches): >10	and Hydrology Present?
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	and Hydrology Present? YesNoX

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP03
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rang	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Depression	า			(concave, convex, none): Concave Slope (%): 1
Subregion (LRR): B, Columbia/Snake River F	lateau	Lat: 47.024787	 Lon	g: -120.624788 Datum: NAD 1983
3 (), <u>.</u>		2 percent slopes (_	NWI classification: None
Are climatic / hydrologic conditions on the site			Ye	
Are Vegetation ,Soil		•	disturbed? A	Are "Normal Circumstances" present? Yes X No
Are Vegetation ,Soil	, or Hydrology	naturally pro	blematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach	site map show	wing sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No		
Hydric Soil Present?	Yes X	No	Is the Samp	
Wetland Hydrology Present?	Yes X	No	within a We	tland? Yes X No
Remarks:	·			ove normal for WYTD. *Wetter than normal. ry 180' at bermed tracks for the irrigation system.
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC:(A)
2				
3.				Total Number of Dominant
4.				Species Across All Strata: 4 (B)
	0%	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10'	<u>()</u>			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
2				Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4				OBL species 0 x 1 = 0
5				FACW species <u>30</u> x 2 = <u>60</u>
	0%	= Total Cover		FAC species 20 x 3 = 60
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				FACU species 30 x 4 = 120
1. Juncus balticus	30%	Yes	FACW	UPL species $0 \times 5 = 0$
2. Schedonorus arundinaceus	15%	Yes	FACU	Column Totals: <u>80</u> (A) <u>240</u> (B)
3. Poa species	15%	Yes	FAC ?	Prevalence Index = $B/A = 3.00$
4. Phleum pratense	15%	Yes	FACU	Hydrophytic Vegetation Indicators:
5. Rumex crispus	3%	No	FAC	1 - Rapid Test for Hydrophytic Vegetation
6. Barbarea vulgaris	2%	No	FAC	2 - Dominance Test is >50%
7				X 3 - Prevalence Index is $\leq 3.0^{1}$
8				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11.				Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 10'		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present.
1.				Uudaashudia
2		- Total Course		Hydrophytic Vegetation Yes X No
% Bare Ground in Herb Stratum20%		= Total Cover		Vegetation Yes X No Present?
Remarks: <i>Phalaris arundinacea</i> is dominant further east				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>

US Army Corps of Engineers SWCA Environmental Consultants

OIL							nt: TP03
Profile Description: (Describ	e to the depth n	eeded to document	t the indicator o	r confirm the	absence of ir	ndicators.)	
Depth N	latrix		Redox Fea	itures			
(inches) Color (moist)) %	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-3 2.5Y 2.5/1	100					SiL	
3-13 2.5Y 2.5/1	68	2.5Y 4/2	30	D	М	SiCL	
		10YR 4/4	2	С	M, PL		
	- <u> </u>						
ype: C=Concentration, D=De	pletion, RM=Red	uced Matrix CS=Cov	vered or Coated S	Sand Grains.	² Location: F	PL=Pore Lining, M=M	atrix.
dric Soil Indicators: (Applic						or Problematic Hydri	2
Histosol (A1)		Sandy Redox (S			1 cm muck (/	-	
Histic Epipedon (A2)	-	Stripped Matrix (,			A10) (LRR B)	
Black Histic (A3)	-	Loamy Mucky Mi			Reduced Ver		
Hydrogen Sulfide (A4)	-	Loamy Gleyed N		_		Material (TF2)	
Stratified Layers (A5) (LRR	C)	Depleted Matrix			_	in in Remarks)	
1 cm Muck (A9) (LRR D)	·	X Redox Dark Surf		_			
Depleted Below Dark Surfac	-	Depleted Dark S					
Thick Dark Surface (A12)	-	Redox Depression		³ lı	ndicators of hyd	drophytic vegetation a	Ind
Sandy Mucky Mineral (S1)	-	Vernal Pools (F9			-	ogy must be present,	
Sandy Gleyed Matrix (S4)	-		,		-	ed or problematic.	
						a of problemade.	
estrictive Layer (if present):							
_							
Type: None							
_				н	ydric Soil Pres	sent? Yes X	No
Type: <u>None</u> Depth (inches): <u>N/A</u> emarks: S = sand; Si = s		loam or loamy; co =	coarse; f = fine;		-	sent? Yes X	
Type: <u>None</u> Depth (inches): <u>N/A</u> emarks: S = sand; Si = s		loam or loamy; co =	coarse; f = fine;		-		
Type: <u>None</u> Depth (inches): <u>N/A</u> emarks: S = sand; Si = s noval refusal at 13" due to larg		loam or loamy; co =	coarse; f = fine;		-		
Type: <u>None</u> Depth (inches): <u>N/A</u> emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY	e rocks.	loam or loamy; co =	coarse; f = fine;		-		
Type: None Depth (inches): N/A emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY Yetland Hydrology Indicators	e rocks.		coarse; f = fine;		+ = heavy (mo	re clay); - = light (less	s clay)
Type: <u>None</u> Depth (inches): <u>N/A</u> emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY etland Hydrology Indicators imary Indicators (minimum of	e rocks.	eck all that apply)			+ = heavy (mo <u>Secondary Ir</u>	re clay); - = light (less ndicators (2 or more re	s clay)
Type: None Depth (inches): N/A emarks: S = sand; Si = s oval refusal at 13" due to larg YDROLOGY etland Hydrology Indicators imary Indicators (minimum of _Surface Water (A1)	e rocks.	eck all that apply)			+ = heavy (mo <u>Secondary Ir</u>	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri	equired) verine)
Type: None Depth (inches): N/A emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY etland Hydrology Indicators imary Indicators (minimum of	e rocks.	eck all that apply) Salt Crust (B11) Biotic Crust (B12	2)		+ = heavy (mo	ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (E	equired) verine) 32) (Riverine)
Type: None Depth (inches): N/A emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY etland Hydrology Indicators imary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3)	e rocks.	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Invertebi	2) rates (B13)		+ = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R	equired) verine) 32) (Riverine) iverine)
Type: None Depth (inches): N/A emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY etland Hydrology Indicators imary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonrive	rine)	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Invertebr Hydrogen Sulfide	2) rates (B13) e Odor (C1)	vf = very fine;	+ = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B	equired) verine) 32) (Riverine) iverine) 10)
Type: None Depth (inches): N/A emarks: S = sand; Si = s noval refusal at 13" due to larg YDROLOGY etland Hydrology Indicators imary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No	rine)	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Inverteb Hydrogen Sulfide Oxidized Rhizosj	2) rates (B13) e Odor (C1) pheres along Liv	vf = very fine;	+ = heavy (mo	ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (E Drift Deposits (B3) (R Drainage Patterns (B ²)	equired) verine) 32) (Riverine) iverine) 10) able (C2)
Type: None Depth (inches): N/A emarks: S = sand; Si = s hoval refusal at 13" due to larg YDROLOGY Yetland Hydrology Indicators fimary Indicators (minimum of Surface Water (A1) High Water Table (A2) C Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No	rine)	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Inverteb Hydrogen Sulfide Oxidized Rhizos Presence of Red	2) rates (B13) e Odor (C1) pheres along Liv duced Iron (C4)	vf = very fine;	+ = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8	s clay) equired) verine) 32) (Riverine) iverine) 10) able (C2)
Type: None Depth (inches): N/A emarks: S = sand; Si = s hoval refusal at 13" due to larg PDROLOGY /etland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) X Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No Drift Deposits (B3) (Nonrive Surface Soil Cracks (B6)	rine) prine) prine) prine) 	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Inverteb Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Red	2) rates (B13) e Odor (C1) pheres along Liv duced Iron (C4) uction in Tilled S	vf = very fine;	+ = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery (0
Type: None Depth (inches): N/A emarks: S = sand; Si = s hoval refusal at 13" due to larg PDROLOGY Tetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No Drift Deposits (B3) (Nonrive Surface Soil Cracks (B6) Inundation Visible on Aerial	rine) ponriverine) erine) Imagery (B7)	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Inverteb Hydrogen Sulfide Oxidized Rhizos Presence of Red Recent Iron Red Thin Muck Surfa	2) rates (B13) e Odor (C1) pheres along Liv duced Iron (C4) uction in Tilled S ice (C7)	vf = very fine;	+ = heavy (mo	ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3)	equired) verine) 32) (Riverine) iverine) 10) 10) 10) Aerial Imagery ((
Type: None Depth (inches): N/A emarks: S = sand; Si = s hoval refusal at 13" due to larg YDROLOGY fetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No Drift Deposits (B3) (Nonrive Surface Soil Cracks (B6)	rine) ponriverine) erine) Imagery (B7)	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Inverteb Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Red	2) rates (B13) e Odor (C1) pheres along Liv duced Iron (C4) uction in Tilled S ice (C7)	vf = very fine;	+ = heavy (mo	re clay); - = light (less ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on	equired) verine) 32) (Riverine) iverine) 10) 10) 10) Aerial Imagery ((
Type: None Depth (inches): N/A emarks: S = sand; Si = s hoval refusal at 13" due to larg PDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No Drift Deposits (B3) (Nonrive Surface Soil Cracks (B6) Inundation Visible on Aerial Water-Stained Leaves (B9)	rine) ponriverine) erine) Imagery (B7)	eck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Inverteb Hydrogen Sulfide Oxidized Rhizos Presence of Red Recent Iron Red Thin Muck Surfa	2) rates (B13) e Odor (C1) pheres along Liv duced Iron (C4) uction in Tilled S ice (C7)	vf = very fine;	+ = heavy (mo	ndicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3)	equired) verine) 32) (Riverine) iverine) 10) 10) 10) Aerial Imagery ((
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Type: None Depth (inches): N/A emarks: S = sand; Si = s hoval refusal at 13" due to larg PDROLOGY Vetland Hydrology Indicators rimary Indicators (minimum of Surface Water (A1) High Water Table (A2) X Saturation (A3) Water Marks (B1) (Nonrive Sediment Deposits (B2) (No Drift Deposits (B3) (Nonrive Surface Soil Cracks (B6) Inundation Visible on Aerial Water-Stained Leaves (B9) ield Observations: Surface Water Present? Y Vater Table Present? Y Saturation Present? Y	rine) onriverine) rine) onriverine) erine) lmagery (B7) 'es 'es X 'es X 'es X m gauge, monitor	eck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebre Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Red Thin Muck Surfar Other (Explain in No D No D No D No D Ing well, aerial photo	2) rates (B13) e Odor (C1) pheres along Liv duced Iron (C4) uction in Tilled S ice (C7) n Remarks) Depth (inches): Depth (inches): Depth (inches):	vf = very fine; vf = very fine; ing Roots (C3 coils (C6) N/A 13 12 ections), if av	+ = heavy (mo	re clay); - = light (less adicators (2 or more re Water Marks (B1) (Ri Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B3) Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on 1 Shallow Aquitard (D3) FAC-Neutral Test (D5 Hydrology Present Yes X Entered by: <u>KL/ED</u>	equired) verine) 32) (Riverine) iverine) 10) able (C2)) Aerial Imagery ()) S)

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC			/ 14/4/4	State: WA Sampling Point: TP04
Investigator(s): Evan Dulin, Jamie Young		Section. T	ownship. Rang	je: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Plain		,		(concave, convex, none): Concave Slope (%): 2
Subregion (LRR): B, Columbia/Snake River	Plateau	Lat: 47.024839		ng: -120.624789 Datum: NAD 1983
		o 2 percent slopes (_	NWI classification: None
Are climatic / hydrologic conditions on the site				Provide State (If no, explain in Remarks)
Are Vegetation ,Soil	• ·	•		Are "Normal Circumstances" present? Yes X No
		naturally prot		If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach	n site <u>map sho</u> r	wing sampling	poi <u>nt locat</u>	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes	No X		
Hydric Soil Present?	Yes	No X	Is the Samp	oled Area
Wetland Hydrology Present?	Yes	No X	within a We	etland? Yes <u>No X</u>
Remarks:	weeks prior, 2.32"	above normal for C	YTD, 2.78" abo	ove normal for WYTD. *Wetter than normal.
VEGETATION			· ,	
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	Absolute	Dominant	Indicator	Dominance Test worksheet:
1. (Piot size. <u>30 i</u>)	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species
2.				That Are OBL, FACW, or FAC: 0 (A)
3.		, <u> </u>		
				Total Number of Dominant
4				Species Across All Strata: 2 (B)
		= Total Cover		
Sapling/Shrub Stratum (Plot size: 10	<u>r_)</u>			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2				Prevalence Index worksheet: Total % Cover of: Multiply by:
		, <u> </u>		
4.				OBL species $0 \times 1 = 0$
5				FACW species $0 \times 2 = 0$
	0%	= Total Cover		FAC species $0 \times 3 = 0$
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				FACU species <u>95</u> x 4 = <u>380</u>
1. Schedonorus arundinaceus	50%	Yes	FACU	UPL species <u>1</u> x 5 = <u>5</u>
2. Phleum pratense	45%	Yes	FACU	Column Totals: <u>96</u> (A) <u>385</u> (B)
3. Onopordum acanthium	1%	No	NOL	Prevalence Index = $B/A = \frac{4.01}{2}$
4				Hydrophytic Vegetation Indicators:
5				1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7.				3 - Prevalence Index is ≤3.0 ¹
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11.				Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 10		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present.
1.		·		
2	0%	= Total Cover		Hydrophytic Vegetation Yes No X
% Bare Ground in Herb Stratum 4%		= Total Cover		Present?
% Bare Ground in Herb Stratum4%) 			Entered by: KL/ED_QC by: TJD
Remarks.				

Sampling Point: TP04

Depth	Matr	ix		Redox Fe	atures			
(inches)	Color (moist)	%	Color (moist) %	Type ¹	Loc ²	Texture	Remarks
0-10	2.5Y 2.5/1	100					SiL	
10-14	2.5Y 2.5/1	74	2.5Y 4/2	25	D	М	SiCL	
			10YR 3/4	1	С	M, PL		
Type: C=Conce	entration, D=Deplet	ion, RM=Red	duced Matrix CS=	Covered or Coated	Sand Grains.	² Location: F	PL=Pore Lining, M=N	1atrix.
lydric Soil Indi	cators: (Applicab	e to all LRR	s, unless otherw	/ise noted.)		Indicators fo	or Problematic Hyd	ric Soils ³ :
Histosol (A1)		Sandy Redo	x (S5)	_	1 cm muck (A	A9) (LRR C)	
Histic Epipe	don (A2)		Stripped Ma	trix (S6)	_	2 cm Muck (A	A10) (LRR B)	
Black Histic	(A3)		Loamy Muck	ky Mineral (F1)	_	Reduced Ver	tic (F18)	
Hydrogen S	ulfide (A4)		Loamy Gley	ed Matrix (F2)	_	Red Parent M	laterial (TF2)	
Stratified La	yers (A5) (LRR C)		Depleted Ma	atrix (F3)	_	Other (Explai	n in Remarks)	
1 cm Muck	(A9) (LRR D)		Redox Dark	Surface (F6)	_			
Depleted Be	elow Dark Surface	(A11)	Depleted Da	rk Surface (F7)				
Thick Dark	Surface (A12)		Redox Depre	essions (F8)	3	Indicators of hyd	Irophytic vegetation	and
Sandy Muck	ky Mineral (S1)		Vernal Pools	s (F9)		wetland hydrold	ogy must be present	,
Sandy Gley	ed Matrix (S4)					unless distrube	d or problematic.	
Restrictive Lay	er (if present):							
-								
-	None				F	lydric Soil Pres	ent? Yes	No X
Type: Depth (inches)	None): <u>N/A</u>	C = clav: L =	loam or loamy: c	n = coarse: f = fine		-		
Type: Depth (inches) Remarks:	None): <u>N/A</u>	-	loam or loamy; c	co = coarse; f = fine		-	re clay); - = light (les	
Type: Depth (inches) Remarks:	None):N/A S = sand; Si = silt;	-	loam or loamy; c	co = coarse; f = fine		-		
Type: Depth (inches) Remarks: hick roots present	None N/A S = sand; Si = silt; ent in the 0-10" lay	-	loam or loamy; c	:o = coarse; f = fine		-		
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators:	er.				-		
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol	None N/A S = sand; Si = silt; ent in the 0-10" lay	er.				; + = heavy (mor	re clay); - = light (les dicators (2 or more l	s clay) required)
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one	er.)		; + = heavy (mor	re clay); - = light (les	s clay) required)
Type: Depth (inches) Remarks: Thick roots prese HYDROLOG Vetland Hydrol Primary Indicato	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1)	er.	neck all that apply	·) 311)		; + = heavy (mor <u>Secondary In</u> \	re clay); - = light (les dicators (2 or more l	s clay) required) iverine)
Type: Depth (inches) Remarks: Thick roots prese HYDROLOG Vetland Hydrol Primary Indicato Surface Wa	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2)	er.	neck all that apply Salt Crust (E Biotic Crust	·) 311)		; + = heavy (mor	re clay); - = light (les dicators (2 or more l Nater Marks (B1) (R	s clay) required) iverine) B2) (Riverine)
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2)	er.	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve) 311) (B12)		; + = heavy (mor	re clay); - = light (les dicators (2 or more (Nater Marks (B1) (R Sediment Deposits (s clay) required) iverine) B2) (Riverine) Riverine)
Type: Depth (inches) Remarks: Thick roots present TYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (a Water Mark	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3)	er. e required; ch	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve	7) 311) (B12) rtebrates (B13)	; vf = very fine	; + = heavy (mor	re clay); - = light (les dicators (2 or more I Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (F	s clay) required) iverine) B2) (Riverine) Riverine) 110)
Type: Depth (inches) Remarks: hick roots present TYDROLOG Primary Indicato Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D	None :: N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin	er. e required; ch e) iverine)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Si Oxidized Rh	r) 311) (B12) rtebrates (B13) ulfide Odor (C1)	; vf = very fine	; + = heavy (mor	re clay); - = light (les dicators (2 or more f Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (F Drainage Patterns (E	s clay) required) iverine) B2) (Riverine) Riverine) B10) able (C2)
Type: Depth (inches) Remarks: hick roots present HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonri	er. e required; ch e) iverine)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Su Oxidized Rh Presence of	r) 811) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li	ving Roots (C	; + = heavy (mor	re clay); - = light (les dicators (2 or more) Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (F Drainage Patterns (E Dry-Season Water T	s clay) required) iverine) B2) (Riverine) Riverine) s10) able (C2) 3)
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin ts (B3) (Nonriverin	er. e required; ch e) iverine) ie)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Su Oxidized Rh Presence of	r) B11) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled	ving Roots (C	; + = heavy (mor	re clay); - = light (les dicators (2 or more) Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (f Drainage Patterns (E Dry-Season Water T Crayfish Burrows (Ca	s clay) <u>required)</u> iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)
Type: Depth (inches) Remarks: hick roots present HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation (None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin ts (B3) (Nonriverin I Cracks (B6)	er. e required; ch e) iverine) ie)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Su Oxidized Rh Presence of Recent Iron Thin Muck S	r) B11) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled	ving Roots (C	; + = heavy (mor	re clay); - = light (les dicators (2 or more) Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (Ca Saturation Visible on	s clay) <u>required)</u> iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 3)
Type: Depth (inches) Remarks: hick roots present HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation (None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin ts (B3) (Nonriverin I Cracks (B6) /isible on Aerial Im ted Leaves (B9)	er. e required; ch e) iverine) ie)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Su Oxidized Rh Presence of Recent Iron Thin Muck S	r) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled	ving Roots (C	; + = heavy (mor	re clay); - = light (les dicators (2 or more f Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (F Drainage Patterns (E Dry-Season Water T Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) <u>required)</u> iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 3)
Type: Depth (inches) Remarks: hick roots press HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation \ Water-Stain	None None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin ts (B3) (Nonriverin I Cracks (B6) /isible on Aerial Im red Leaves (B9) ons:	er. e required; ch iverine) iverine) agery (B7)	eck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Su Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla	(B12) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled urface (C7) in in Remarks)	ving Roots (C	; + = heavy (mor	re clay); - = light (les dicators (2 or more f Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (F Drainage Patterns (E Dry-Season Water T Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) <u>required)</u> iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 3)
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation V Water-Stain	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin I Cracks (B6) /isible on Aerial Im red Leaves (B9) ons: Present? Yes	er. e required; ch iverine) ne) agery (B7)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Si Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla	2) 311) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled surface (C7) in in Remarks) Depth (inches):	ving Roots (C	- <u>Secondary In</u> - <u>Secondary</u>	re clay); - = light (les dicators (2 or more 1 Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C4 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D	s clay) required) iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 5)
Type: Depth (inches) Remarks: hick roots press HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation V Water-Stain Surface Water F Surface Water F	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin ts (B3) (Nonriverin l Cracks (B6) /isible on Aerial Im red Leaves (B9) ons: Present? Yes	er. e required; ch iverine) ive) agery (B7)	No X	2) 311) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled iurface (C7) in in Remarks) Depth (inches): Depth (inches):	ving Roots (C: Soils (C6) <u>N/A</u> >14	- <u>Secondary In</u> - <u>Secondary</u>	dicators (2 or more) Mater Marks (B1) (R Sediment Deposits (B Drainage Patterns (B Dry-Season Water T Crayfish Burrows (CA Saturation Visible on Shallow Aquitard (D SAC-Neutral Test (D Hydrology Present	s clay) required) iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 5) 7
Type: Depth (inches) Remarks: Thick roots present HYDROLOG Vetland Hydrol Primary Indicato Surface Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation V Water-Stain	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverir I Cracks (B6) /isible on Aerial Im ed Leaves (B9) ons: Present? Yes esent? Yes	er. e required; ch iverine) ne) agery (B7)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen Si Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla	2) 311) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled surface (C7) in in Remarks) Depth (inches):	ving Roots (C: Soils (C6)	- <u>Secondary In</u> - <u>Secondary</u>	re clay); - = light (les dicators (2 or more 1 Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C4 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D	s clay) required) iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 5)
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation V Water-Stain Field Observati Surface Water Field Surface Water Field Surface Water Field Saturation Pres (includes capilla	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin I Cracks (B6) /isible on Aerial Im ed Leaves (B9) ons: Present? Yes ent? Yes ent? Yes ary fringe) Yes	er. e required; ch iverine) iverine) agery (B7)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen St Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla No X No X No X	2) 311) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled iurface (C7) in in Remarks) Depth (inches): Depth (inches):	ving Roots (C3 Soils (C6) <u>N/A</u> >14 >14	; + = heavy (mot	dicators (2 or more) Mater Marks (B1) (R Sediment Deposits (B Drainage Patterns (B Dry-Season Water T Crayfish Burrows (CA Saturation Visible on Shallow Aquitard (D SAC-Neutral Test (D Hydrology Present	s clay) required) iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 5) 7
Type: Depth (inches) Remarks: hick roots prese HYDROLOG Vetland Hydrol Primary Indicato Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Surface Soi Inundation V Water-Stain Field Observati Surface Water Field Surface Water Field Saturation Pres (includes capilla	None N/A S = sand; Si = silt; ent in the 0-10" lay Y logy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverin eposits (B2) (Nonriverin I Cracks (B6) /isible on Aerial Im ed Leaves (B9) ons: Present? Yes ent? Yes ent? Yes ary fringe) Yes	er. e required; ch iverine) iverine) agery (B7)	neck all that apply Salt Crust (E Biotic Crust Aquatic Inve Hydrogen St Oxidized Rh Presence of Recent Iron Thin Muck S Other (Expla No X No X No X	2) (B11) (B12) rtebrates (B13) ulfide Odor (C1) izospheres along Li Reduced Iron (C4) Reduction in Tilled urface (C7) in in Remarks) Depth (inches): Depth (inches): Depth (inches):	ving Roots (C3 Soils (C6) <u>N/A</u> >14 >14	<u>Secondary In</u> <u>Secondary In</u> <u>Secondary</u>	dicators (2 or more) Mater Marks (B1) (R Sediment Deposits (B Drainage Patterns (B Dry-Season Water T Crayfish Burrows (CA Saturation Visible on Shallow Aquitard (D SAC-Neutral Test (D Hydrology Present	s clay) required) iverine) B2) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9) 5) ? No X

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP05
Investigator(s): Evan Dulin, Jamie Young	3	Section, T	ownship, Rang	je: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Terrace	, 			(concave, convex, none): Concave Slope (%): 1
Subregion (LRR): B, Columbia/Snake Rive	r Plateau	Lat: 47.025029	Lor	ng: -120.628765 Datum: NAD 1983
	t loam, 0 to 2 percen		_	NWI classification: PEMC
Are climatic / hydrologic conditions on the si			Ye	
	, or Hydrology	•	disturbed?	Are "Normal Circumstances" present? Yes X No
Are Vegetation ,Soil	, or Hydrology			If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attac	h site map show	wing sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes	No X		
Hydric Soil Present?	Yes	Νο Χ	Is the Samp	bled Area
Wetland Hydrology Present?	Yes X	No	within a We	etland? Yes No X
	o weeks prior, 2.32" a	above normal for C	YTD, 2.78" ab	ove normal for WYTD. *Wetter than normal.
Remarks: Sample plot taken in upland area between w	vetlands TW02 and T	W03. Water appea	ars to overflow	from TW03 into TW02.
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: 0 (A)
2.				
3.				Total Number of Dominant
4.				Species Across All Strata: 2 (B)
		= Total Cover		
Sapling/Shrub Stratum (Plot size: 10	<u>D'r_</u>)			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: 0% (A/B)
2.				Prevalence Index worksheet:
3.				Total % Cover of:Multiply by:
4.				OBL species 0 x 1 = 0
5.				FACW species $5 \times 2 = 10$
	0%	= Total Cover		FAC species $0 \times 3 = 0$
Herb Stratum (Plot size: <u>5' r</u>)				FACU species 90 x 4 = 360
1. Schedonorus arundinaceus	50%	Yes	FACU	UPL species $0 \times 5 = 0$
2. Phleum pratense	40%	Yes	FACU	Column Totals: 95 (A) 370 (B)
3. Phalaris arundinacea	5%	No	FACW	Prevalence Index = $B/A = 3.89$
4.				Hydrophytic Vegetation Indicators:
5.				1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7.				$3 - Prevalence Index is \leq 3.0^{1}$
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11		T-1-1-0		Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: <u>10</u>		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 10 1.	<u> </u>			be present.
2.				Hydrophytic
	0%	= Total Cover		Vegetation Yes No X
% Bare Ground in Herb Stratum 59				Present?
Remarks:				Entered by: KL/ED QC by: TJD

Depth	Matri	x		Redox Fe	atures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-7	2.5Y 2.5/1	100					SiL	
7	10YR 4/2	100					Sand	Very thin layer
7-12	2.5Y 2.5/1	100					SiL	
12-14	2.5Y 2.5/1	98	7.5YR 4/6	2	С	M	SiCL	
	ntration, D=Deplet				Sand Grains.		L=Pore Lining, M=I	
Hydric Soil Indie	cators: (Applicabl	e to all LRR	s, unless otherw	ise noted.)			r Problematic Hyd	ric Soils ³ :
Histosol (A1))		Sandy Redox	x (S5)	_	1 cm muck (A	(LRR C)	
Histic Epipeo	don (A2)		Stripped Mat	rix (S6)	_	2 cm Muck (A	(10) (LRR B)	
Black Histic	(A3)		Loamy Muck	y Mineral (F1)	_	Reduced Ver	tic (F18)	
Hydrogen Su			Loamy Gleye	ed Matrix (F2)	_	Red Parent M	laterial (TF2)	
Stratified Lay	yers (A5) (LRR C)		Depleted Ma	trix (F3)	_	Other (Explain	n in Remarks)	
1 cm Muck (Redox Dark	Surface (F6)				
Depleted Be	low Dark Surface (A11)	Depleted Da	rk Surface (F7)	2			
Thick Dark S	Surface (A12)		Redox Depre	essions (F8)	3	Indicators of hyd	rophytic vegetation	and
Sandy Muck	y Mineral (S1)		Vernal Pools	(F9)		wetland hydrold	ogy must be presen	t,
Sandy Gleye	ed Matrix (S4)					unless distrube	d or problematic.	
Restrictive Laye								
Type: <u>r</u> Depth (inches): Remarks: S	None N/A	•		o = coarse; f = fine		lydric Soil Pres ; + = heavy (mor	ent? Yes re clay); - = light (le	No X
Type: <u>r</u> Depth (inches): Remarks: S	None N/A S = sand; Si = silt; could be from histo	•		o = coarse; f = fine		•		
Type: <u>r</u> Depth (inches): Remarks: Sand layer at 7" (None N/A S = sand; Si = silt; could be from histo	•		o = coarse; f = fine		•		
Type: <u>1</u> Depth (inches): Remarks: S Sand layer at 7" (HYDROLOG Wetland Hydrolog	None N/A S = sand; Si = silt; could be from histo	ric 500-year	level flood event.			; + = heavy (mor		ss clay)
Type: <u>1</u> Depth (inches): Remarks: S Sand layer at 7" (HYDROLOG Wetland Hydrolog	None N/A S = sand; Si = silt; could be from histo Y ogy Indicators: rs (minimum of one	ric 500-year	level flood event.)		; + = heavy (mor <u>Secondary In</u>	re clay); - = light (le:	ss clay)
Type: <u>r</u> Depth (inches): Remarks: Sand layer at 7" HYDROLOG Wetland Hydrolo Primary Indicator	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: rs (minimum of one rer (A1)	ric 500-year	level flood event.) 11)		; + = heavy (mor <u>Secondary In</u>	re clay); - = light (le: dicators (2 or more	ss clay) required) Riverine)
Type: Depth (inches): Remarks: Sand layer at 7" (HYDROLOG Wetland Hydrolo Primary Indicator Surface Wat	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: rs (minimum of one rer (A1) Table (A2)	ric 500-year	level flood event. eck all that apply Salt Crust (B) 11) B12)		; + = heavy (mor <u>Secondary In</u> y	re clay); - = light (le dicators (2 or more Vater Marks (B1) (F	ss clay) required) Riverine) (B2) (Riverine)
Type: Depth (inches): Remarks: Sand layer at 7" (HYDROLOGY Wetland Hydrolo Primary Indicator Surface Wat High Water Saturation (A	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: rs (minimum of one rer (A1) Table (A2)	ric 500-year	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inve) 11) B12)		; + = heavy (mor <u>Secondary In</u> Secondary In S	re clay); - = light (le: dicators (2 or more Vater Marks (B1) (F Sediment Deposits	ss clay) required) Riverine) (B2) (Riverine) Riverine)
Type: Depth (inches): Remarks: Sand layer at 7" (HYDROLOG Wetland Hydrold Primary Indicator Surface Wat High Water Saturation (A Water Marks	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: rs (minimum of one er (A1) Table (A2) A3)	ric 500-year	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inven Hydrogen Su) 11) [B12) rtebrates (B13)	; vf = very fine	; + = heavy (mor <u>Secondary In</u> <u>Secondary In</u> <u>Secondary In</u> <u>X</u>	re clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (required) Riverine) (B2) (Riverine) Riverine) 310)
Type: Depth (inches): Remarks: Sand layer at 7" 0 HYDROLOGY Wetland Hydrold Primary Indicator Surface Wate High Water Saturation (A Water Marks Sediment De	None N/A S = sand; Si = silt; could be from history $Yrogy Indicators:rs (minimum of one er (A1) Table (A2) A3)s (B1) (Nonrivering)$	ric 500-year required; ch	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi) 11) B12) rtebrates (B13) Ilfide Odor (C1)	; vf = very fine	; + = heavy (mor <u>Secondary In</u> <u>Secondary I</u>	re clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (l	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2)
Type: Depth (inches): Remarks: Sand layer at 7" 0 HYDROLOGY Wetland Hydrold Primary Indicator Surface Wate High Water Saturation (A Water Marks Sediment De	None N/A S = sand; Si = silt; could be from history $Yrogy Indicators:rs (minimum of one)rer (A1)Table (A2)A3)s (B1) (Nonrivering eposits (B2) (Nonrivering eposits (B2)) (Nonrivering eposits (B3)) (Nonriverin$	ric 500-year required; ch	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of) 11) (B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li	; vf = very fine	; + = heavy (mor	re clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8)
Type: Depth (inches): Remarks: Sand layer at 7" (HYDROLOG Wetland Hydrold Primary Indicator Surface Wat High Water Saturation (A Water Marks Sediment De Drift Deposit Surface Soil	None N/A S = sand; Si = silt; could be from history $Yrogy Indicators:rs (minimum of one)rer (A1)Table (A2)A3)s (B1) (Nonrivering eposits (B2) (Nonrivering eposits (B2)) (Nonrivering eposits (B3)) (Nonriverin$	ric 500-year required; ch e) verine) e)	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduction in Tilled	; vf = very fine	; + = heavy (mor <u>Secondary In</u> <u>Secondary In</u> <u>Secondary In</u> <u>X</u> 3) <u>X</u> 5 <u>X</u> 5 <u>X</u> 5 <u>X</u> 5 <u>5</u> <u>5</u> <u>5</u> <u>5</u> <u>5</u> <u>5</u> <u>5</u>	re clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C	required) Riverine) (B2) (Riverine) Riverine) 310) Table (C2) 8) n Aerial Imagery (C9)
Type: Depth (inches): Remarks: Sand layer at 7" • HYDROLOGY Wetland Hydrolo Primary Indicator Surface Water High Water Saturation (A Water Marks Sediment De Drift Deposit Surface Soil Inundation V	None N/A S = sand; Si = silt; could be from history $Yrs (minimum of one)rer (A1)Table (A2)A3)s (B1) (Nonrivering)reposits (B2) (Nonrivering)s (B3) (Nonrivering)Cracks (B6)$	ric 500-year required; ch e) verine) e)	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Si) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduction in Tilled	; vf = very fine	; + = heavy (mor	dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C Saturation Visible o	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8) n Aerial Imagery (C9) 3)
Type: Depth (inches): Remarks: Sand layer at 7" • HYDROLOGY Wetland Hydrolo Primary Indicator Surface Water High Water Saturation (A Water Marks Sediment De Drift Deposit Surface Soil Inundation V	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: rs (minimum of one er (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonri s (B3) (Nonriverine Cracks (B6) 'isible on Aerial Ima ed Leaves (B9)	ric 500-year required; ch e) verine) e)	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Si) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduction in Tilled urface (C7)	; vf = very fine	; + = heavy (mor	e clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8) n Aerial Imagery (C9) 3)
Type: Depth (inches): Remarks: Sand layer at 7" HYDROLOG Wetland Hydrold Primary Indicator Surface Wate High Water Saturation (<i>A</i> Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Staine	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: rs (minimum of one rer (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonri s (B3) (Nonriverine Cracks (B6) fisible on Aerial Ima ed Leaves (B9) ons:	ric 500-year required; ch e) verine) e)	level flood event.) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduction in Tilled urface (C7)	; vf = very fine	; + = heavy (mor	e clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8) n Aerial Imagery (C9) 3)
Type: Depth (inches): Remarks: Sand layer at 7" • HYDROLOGY Wetland Hydrolo Primary Indicator Surface Wate High Water • Saturation (A Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Staine	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: s (minimum of one er (A1) Table (A2) A3) s (B1) (Nonriverine s (B3) (Nonriverine Cracks (B6) Tisible on Aerial Ima ed Leaves (B9) ons: Present? Yes	e) erequired; ch verine) e) agery (B7)	level flood event.) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduced Iron (C4) Reduction in Tilled urface (C7) in in Remarks)	ving Roots (C Soils (C6)	- <u>Secondary In</u> - <u>Secondary</u>	e clay); - = light (le dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8) n Aerial Imagery (C9) 3) 25)
Type: Depth (inches): Remarks: Sand layer at 7" (HYDROLOG Wetland Hydrolo Primary Indicator Surface Water - Saturation (A Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Staine Field Observatio	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: (minimum of one er (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonri s (B3) (Nonriverine Cracks (B6) 'isible on Aerial Ima ed Leaves (B9) ons: Present? Yes sent? Yes	e) verine) agery (B7)	level flood event. eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck So Other (Explain No X) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduction in Tilled urface (C7) in in Remarks) Depth (inches):	ving Roots (C: Soils (C6)	- <u>Secondary In</u> - <u>Secondary</u>	dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (I Dry-Season Water T Crayfish Burrows (C Saturation Visible on Shallow Aquitard (D FAC-Neutral Test (E	required) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8) n Aerial Imagery (C9) 3) 25)
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Type: Depth (inches): Remarks: Sand layer at 7" HYDROLOGY Wetland Hydrolog Primary Indicator Surface Water High Water Saturation (A Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Staine Field Observatio Surface Water F Water Table Pre Saturation Prese (includes capillar	None N/A S = sand; Si = silt; could be from histor Y ogy Indicators: (minimum of one er (A1) Table (A2) A3) (B1) (Nonriverine eposits (B2) (Nonri eposits (B2) (Nonri s (B3) (Nonriverine Cracks (B6) (sible on Aerial Ima ed Leaves (B9) Dns: Present? Yes esent? Yes ent? Yes ry fringe)	e) erequired; ch e) verine) e) agery (B7)	level flood event. eck all that apply Salt Crust (B Biotic Crust (C X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck St Other (Explain No X No X No X) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Li Reduced Iron (C4) Reduction in Tilled urface (C7) in in Remarks) Depth (inches): Depth (inches): Depth (inches):	ving Roots (C Soils (C6) <u>N/A</u> >14 >14	<u>Secondary In</u> <u>Secondary In</u> <u>Secondary</u>	dicators (2 or more Vater Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (F Drayfish Burrows (C Saturation Visible of Shallow Aquitard (D FAC-Neutral Test (E	required) ss clay) Riverine) (B2) (Riverine) Riverine) 310) Fable (C2) 8) n Aerial Imagery (C9) 3) 5) t? No

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP06
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rand	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Depressio	n			(concave, convex, none): Concave Slope (%): 0
Subregion (LRR): B, Columbia/Snake River F		Lat: 47.025004	_	g: -120.628694 Datum: NAD 1983
o () <u>·</u>		to 2 percent slopes	_	NWI classification: PEMC
Are climatic / hydrologic conditions on the site			Ye	
Are Vegetation ,Soil	• •	•		Are "Normal Circumstances" present? Yes X No
	, or Hydrology			If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach	site map sho	wing sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes	No X		
Hydric Soil Present?	Yes	No X	Is the Samp	oled Area
Wetland Hydrology Present?	Yes X	No	within a We	tland? Yes No X
Precipitation prior to fieldwork: 0.79" two	weeks prior, 2.32"	above normal for C	YTD, 2.78" abo	ove normal for WYTD. *Wetter than normal.
Remarks: Sample plot located in dry slight depression be	etween wetlands T	W02 and TW03.		
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: 2 (A)
2.				
3.				Total Number of Dominant
4.				Species Across All Strata: 4 (B)
	0%	= Total Cover		· ()
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10'</u>				Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
2.				Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4.				OBL species 0 x 1 = 0
5.				FACW species $35 \times 2 = 70$
J		- Tatal Causer		
Herb Stratum (Plot size: <u>5' r</u>)	0%	= Total Cover		FAC species20 $x 3 =$ 60FACU species40 $x 4 =$ 160
	050/	X	54.014/	
1. Juncus balticus	35%	Yes	FACW	
2. Schedonorus arundinaceus	20%	Yes	FACU	Column Totals: <u>95</u> (A) <u>290</u> (B)
3. Phleum pratense	20%	Yes	FACU	Prevalence Index = $B/A = 3.05$
4. Poa species	20%	Yes	FAC ?	Hydrophytic Vegetation Indicators:
5.				1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7				3 - Prevalence Index is ≤3.0 ¹
8				4 - Morphological Adaptations ¹ (Provide supporting
9				data in Remarks or on a separate sheet)
10				5 - Wetland Non-Vascular Plants ¹
11				Problematic Hydrophytic Vegetation ¹ (Explain)
		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 10'	<u>r</u>)			be present.
2.				Hydrophytic
۲	0%	= Total Cover		Vegetation Yes No X
% Bare Ground in Herb Stratum 5%	0 /0			Present?
Remarks:				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>

Depth	Mat	rix		Redox Fe	atures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-5	2.5Y 2.5/1	100					SiL	_
5	10YR 4/2	100					Sand	Very thin layer
5-11	2.5Y 2.5/1	100					SiCL	_
11-14	2.5Y 2.5/1	98	7.5YR 4/6	2	С	PL	SiCL	
Type: C=Conc	centration, D=Deple	tion, RM=Re	duced Matrix CS=Cov	ered or Coated	Sand Grains.	² Location:	PL=Pore Lining, M=	Matrix.
lydric Soil Ind	licators: (Applicat	le to all LRR	s, unless otherwise	noted.)		Indicators for	or Problematic Hyd	Iric Soils ³ :
Histosol (A	1)		Sandy Redox (S	5)		1 cm muck (A	A9) (LRR C)	
Histic Epipe	edon (A2)		Stripped Matrix (S6)		2 cm Muck (A10) (LRR B)	
Black Histic	c (A3)		Loamy Mucky Mi	ineral (F1)		Reduced Ver	rtic (F18)	
Hydrogen S	Sulfide (A4)		Loamy Gleyed M	latrix (F2)		Red Parent N	Material (TF2)	
Stratified La	ayers (A5) (LRR C)	Depleted Matrix	(F3)		Other (Expla	in in Remarks)	
1 cm Muck	(A9) (LRR D)		Redox Dark Surf	ace (F6)		_		
Depleted Be	elow Dark Surface	(A11)	Depleted Dark S	urface (F7)				
Thick Dark	Surface (A12)		Redox Depressio	ons (F8)	3	ndicators of hyd	drophytic vegetation	and
Sandy Mucl	ky Mineral (S1)		Vernal Pools (F9))		wetland hydrol	ogy must be presen	t,
Sandy Gley	yed Matrix (S4)					unless distrube	ed or problematic.	
Type: Depth (inches Remarks:	S = sand; Si = silt	•	= loam or loamy; co =	coarse; f = fine;		ydric Soil Pres + = heavy (mc		No X
Type: Depth (inches Remarks: Sand layer at 5"	None S: N/A S = sand; Si = silt " could be from hist	•	•	coarse; f = fine;		•		
Type: Depth (inches Remarks: Sand layer at 5"	None N/A S = sand; Si = silt could be from hist	•	•	coarse; f = fine;		•		
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro	None S): N/A S = sand; Si = silt " could be from hist SY blogy Indicators:	oric 500-year	level flood event.	coarse; f = fine;		+ = heavy (mc	ore clay); - = light (le	ss clay)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato	None None S = sand; Si = silt " could be from hist GY blogy Indicators: ors (minimum of or	oric 500-year	level flood event.			+ = heavy (mo	ore clay); - = light (le	ss clay)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Wa	None S): N/A S = sand; Si = silt " could be from hist SY Diogy Indicators: ors (minimum of or ater (A1)	oric 500-year	level flood event.			+ = heavy (mc <u>Secondary Ir</u>	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (I	ss clay) <u>required)</u> Riverine)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa High Water	None N/A S = sand; Si = silt could be from hist SY Sy Sy Sy Sy Sy Sy Sy Sy Sy Sy	oric 500-year	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12)	2)		+ = heavy (mo	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (I Sediment Deposits	ss clay) required) Riverine) (B2) (Riverine)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa Surface Wa High Water X Saturation (None None S = N/A S = sand; Si = silt could be from hist SY Diogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3)	e required; ch	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr	?) rates (B13)		+ = heavy (mc	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (ss clay) <u>required)</u> Riverine) (B2) (Riverine) Riverine)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water X Saturation (Water Mark	None S: N/A S = sand; Si = silt could be from hist SY Dlogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonrivering)	e required; cł	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12 Aquatic Invertebr Hydrogen Sulfide	2) rates (B13) e Odor (C1)	; vf = very fine;	+ = heavy (mo	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (ss clay) required) Riverine) (B2) (Riverine) Riverine) B10)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D	None None N/A S = sand; Si = silt could be from hist SY Dogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non	e required; ch e required; ch ne) riverine)	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizost	2) rates (B13) e Odor (C1) pheres along Li	; vf = very fine;	+ = heavy (mo	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi	None None N/A S = sand; Si = silt Could be from hist SY Diogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverin Deposits (B2) (Non sits (B3) (Nonriverin	e required; ch e required; ch ne) riverine)	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red	2) rates (B13) ∋ Odor (C1) pheres along Li luced Iron (C4)	ving Roots (C3	+ = heavy (mc	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi	None None None N/A S = sand; Si = silt could be from hist SY Dology Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non sits (B3) (Nonriveri bil Cracks (B6)	ne) riverine) ne)	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Red	2) rates (B13) e Odor (C1) oheres along Lir luced Iron (C4) uction in Tilled 3	ving Roots (C3	+ = heavy (mo	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water Crayfish Burrows (C Saturation Visible o	ss clay) ss clay) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (CS
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V	None None N/A S = sand; Si = silt Could be from hist SY Dogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non sits (B3) (Nonriveri oil Cracks (B6) Visible on Aerial In	ne) riverine) ne)	level flood event. <u>heck all that apply)</u> Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Thin Muck Surface	2) rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled S ce (C7)	ving Roots (C3	+ = heavy (mo	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible o Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (CS 3)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stair	None None None N/A S = sand; Si = silt could be from hist SY Dology Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non sits (B3) (Nonriveri oil Cracks (B6) Visible on Aerial In ned Leaves (B9)	ne) riverine) ne)	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Red	2) rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled S ce (C7)	ving Roots (C3	+ = heavy (mo	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water Crayfish Burrows (C Saturation Visible o	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (CS 3)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stair	None None None N/A S = sand; Si = silt could be from hist SY Dogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverin Deposits (B2) (Non sits (B3) (Nonriverin Difference (B2) Visible on Aerial In ned Leaves (B9) tions:	ne) ne) nagery (B7)	level flood event. heck all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Thin Muck Surfac Other (Explain in	2) rates (B13) e Odor (C1) pheres along Lin luced Iron (C4) uction in Tilled s ce (C7) Remarks)	ving Roots (C3	+ = heavy (mo	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible o Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (CS 3)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stair	None None None None N/A S = sand; Si = silt could be from hist SY Dology Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non sits (B3) (Nonriveri oil Cracks (B6) Visible on Aerial In ned Leaves (B9) tions: Present? Yes	ne) ne) nagery (B7)	Ievel flood event. neck all that apply)	2) rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled ce (C7) r Remarks)	ving Roots (C3 Soils (C6)	+ = heavy (mc	re clay); - = light (le ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible o Shallow Aquitard (D FAC-Neutral Test (I	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (CS 3) D5)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Vetland Hydro Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation Water-Stair Field Observati Surface Water Surface Water	None None N/A S = sand; Si = silt Could be from hist SY Dogy Indicators: ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverin Deposits (B2) (Non sits (B3) (Nonriveri bil Cracks (B6) Visible on Aerial In ned Leaves (B9) tions: Present? Yes	ne) ne) nagery (B7)	level flood event. neck all that apply)	2) rates (B13) e Odor (C1) oheres along Lir luced Iron (C4) uction in Tilled S ce (C7) Remarks) Depth (inches):	ving Roots (C3 Soils (C6)	+ = heavy (mc	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water Crayfish Burrows (C Saturation Visible o Shallow Aquitard (D FAC-Neutral Test (I Hydrology Presen	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) (8) n Aerial Imagery (CS 3) (25)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stair Field Observati Surface Water Surface Water Surface Water Water Table Pr Saturation Pres (includes capilla	None None None N/A S = sand; Si = silt could be from hist Nogy Indicators: Ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non sits (B3) (Nonriveri Di Cracks (B6) Visible on Aerial In ned Leaves (B9) tions: Present? Yes sent? Yes lary fringe)	ne) nagery (B7)	level flood event. neck all that apply)	2) rates (B13) e Odor (C1) pheres along Lin luced Iron (C4) uction in Tilled s ce (C7) Remarks) Pepth (inches): Pepth (inches):	ving Roots (C3 Soils (C6) <u>N/A</u> 13 12	+ = heavy (mo	re clay); - = light (le ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible o Shallow Aquitard (D FAC-Neutral Test (I	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9 3) D5)
Type: Depth (inches Remarks: Sand layer at 5" HYDROLOG Primary Indicato Surface Wa High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stair Field Observati Surface Water Surface Water Surface Water Water Table Pr Saturation Pres (includes capilla	None None None N/A S = sand; Si = silt could be from hist Nogy Indicators: Ors (minimum of or ater (A1) r Table (A2) (A3) ks (B1) (Nonriverir Deposits (B2) (Non sits (B3) (Nonriveri Di Cracks (B6) Visible on Aerial In ned Leaves (B9) tions: Present? Yes sent? Yes lary fringe)	riverine) nagery (B7)	level flood event. neck all that apply)	2) rates (B13) e Odor (C1) pheres along Lin luced Iron (C4) uction in Tilled s ce (C7) Remarks) Pepth (inches): Pepth (inches):	ving Roots (C3 Soils (C6) <u>N/A</u> 13 12	+ = heavy (mo	ndicators (2 or more Water Marks (B1) (I Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water Crayfish Burrows (C Saturation Visible o Shallow Aquitard (D FAC-Neutral Test (I Hydrology Presen	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) (8) n Aerial Imagery (C9 3) (25)

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: TP07 Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 30, T18N, R18E Investigator(s): Depression Local relief (concave, convex, none): Concave Slope (%): 0 O Subregion (LRR): B, Columbia/Snake River Plateau Lat: 47.024964 Long: -120.628357 Datum: NAD 1983 Soil Map Unit Name: Weirman-Kayak-Zillah complex, 0 to 2 percent slopes (809) NWI classification: None None Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X** (If no, explain in Remarks) Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No Are 'Yes X No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrology Present? Yes X No No Is the Sampled Area Within a Wetland? Yes X No No Precipitation prior to fieldwork: 0.79" two weeks prior, 2.32" above normal for CYTD, 2.78" above normal for WYTD. *Wetter than normal. Remarks: Tree Stratum (Plot size: 30' r) Absolute Dominant Indicator Number of Dominan
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0 Subregion (LRR): B, Columbia/Snake River Plateau Lat: 47.024964 Long: -120.628357 Datum: NAD 1983 Soil Map Unit Name: Weirman-Kayak-Zillah complex, 0 to 2 percent slopes (809) NWI classification: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X* (If no, explain in Remarks) Are Vegetation , Soil , or Hydrology
Subregion (LRR): B, Columbia/Snake River Plateau Lat: 47.024964 Long: -120.628357 Datum: NAD 1983 Soil Map Unit Name: Weirman-Kayak-Zillah complex, 0 to 2 percent slopes (809) NWI classification:: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X* (If no, explain in Remarks) Are Vegetation ,Soil , or Hydrology _significantly disturbed? Are "Normal Circumstances" present? Yes No SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No Is the Sampled Area within a Wetland? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Bydrology Present? Yes X No Is Precipitation prior to f
Subregion (LRR): B, Columbia/Snake River Plateau Lat: 47.024964 Long: -120.628357 Datum: NAD 1983 Soil Map Unit Name: Weirman-Kayak-Zillah complex, 0 to 2 percent slopes (809) NWI classification: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X* (If no, explain in Remarks) Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes No Is the Sampled Area within a Wetland? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area
Soil Map Unit Name: Weirman-Kayak-Zillah complex, 0 to 2 percent slopes (809) NWI classification: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X* (If no, explain in Remarks) Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes X No Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Bydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Is the Sampled Area Wetland Bydrology Present? Yes X
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X* (If no, explain in Remarks) Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No Are Vegetation ,Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes X No Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No Ves X No Precipitation prior to fieldwork: 0.79" two weeks prior, 2.32" above normal for CYTD, 2.78" above normal for WYTD. *Wetter than normal. Remarks: Two2. Wetland is fed by overflow from TW03. Problematic wetland vegetation, assumed wetland based on soils and hydrology. VEGETATION 1.
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes X No Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No within a Wetland? Yes X No Precipitation prior to fieldwork: 0.79" two weeks prior, 2.32" above normal for CYTD, 2.78" above normal for WYTD. *Wetter than normal. Remarks: TW02. Wetland is fed by overflow from TW03. Problematic wetland vegetation, assumed wetland based on soils and hydrology. VEGETATION Absolute Dominant Indicator Dominance Test worksheet: 1. Ye Status Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes X No Is the Sampled Area Hydrology Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No within a Wetland? Yes X No Precipitation prior to fieldwork: 0.79" two weeks prior, 2.32" above normal for CYTD, 2.78" above normal for WYTD. *Wetter than normal. Remarks: TW02. Wetland is fed by overflow from TW03. Problematic wetland vegetation, assumed wetland based on soils and hydrology. VEGETATION Tree Stratum (Plot size:30' r_) Absolute Dominant Indicator Dominant Species 1.
Hydrophytic Vegetation Present? Yes X No Is the Sampled Area Hydric Soil Present? Yes X No
Hydric Soil Present? Yes X No Is the Sampled Area Wetland Hydrology Present? Yes X No within a Wetland? Yes X No Precipitation prior to fieldwork: 0.79" two weeks prior, 2.32" above normal for CYTD, 2.78" above normal for WYTD. *Wetter than normal. Remarks: TW02. Wetland is fed by overflow from TW03. Problematic wetland vegetation, assumed wetland based on soils and hydrology. VEGETATION Absolute Dominant Indicator Dominance Test worksheet: Number of Dominant Species 1.
Wetland Hydrology Present? Yes X No within a Wetland? Yes X No Precipitation prior to fieldwork: 0.79" two weeks prior, 2.32" above normal for CYTD, 2.78" above normal for WYTD. *Wetter than normal. Remarks: TW02. Wetland is fed by overflow from TW03. Problematic wetland vegetation, assumed wetland based on soils and hydrology. VEGETATION Absolute Dominant Indicator Dominance Test worksheet: Number of Dominant Species 1.
Wetand Hydrology Hesent: Tes Tes <thtes< th=""> Tes <</thtes<>
Remarks: TW02. Wetland is fed by overflow from TW03. Problematic wetland vegetation, assumed wetland based on soils and hydrology. VEGETATION Absolute Dominant Indicator Dominance Test worksheet: Number of Dominant Species 1.
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VEGETATION Tree Stratum (Plot size: 30' r) Absolute Dominant Indicator Dominance Test worksheet: 1.
Absolute Dominant Indicator Dominance Test worksheet: Tree Stratum (Plot size: 30' r) % Cover Species? Status Number of Dominant Species 1.
Tree Stratum (Plot size: 30' r) % Cover Species? Status Number of Dominant Species 1.
1. That Are OBL, FACW, or FAC: 1 (A)
2.
3 Total Number of Dominant
4. Species Across All Strata: 2 (B)
0% = Total Cover
Sapling/Shrub Stratum (Plot size: 10' r) Percent of Dominant Species
1. That Are OBL, FACW, or FAC: 50% (A/B)
2. Prevalence Index worksheet:
3. Total % Cover of: Multiply by:
4 OBL species 0 x 1 = 0
5. FACW species 15 x 2 = 30
0% = Total Cover FAC species 25 x 3 = 75
Herb Stratum (Plot size: $5' r$) FACU species $40 \times 4 = 160$
1. Schedonorus arundinaceus 25% Yes FACU UPL species 0 x 5 = 0
2. Poa species 25% Yes FAC ? Column Totals: 80 (A) 265 (B)
Image: sector secto
4. Juncus balticus 15% No FACW Hydrophytic Vegetation Indicators:
5. 1 - Rapid Test for Hydrophytic Vegetation
6. 2 - Dominance Test is >50%
7. 3 - Prevalence Index is ≤3.0 ¹
8. 4 - Morphological Adaptations ¹ (Provide supporting
9. data in Remarks or on a separate sheet)
10. 5 - Wetland Non-Vascular Plants ¹
11. X Problematic Hydrophytic Vegetation ¹ (Explain)
$\frac{80\%}{100000000000000000000000000000000000$
Woody Vine Stratum (Plot size: 10' r) be present. 1.
2. Hydrophytic
0% = Total Cover Vegetation Yes X No
% Bare Ground in Herb Stratum 20% Present?
Remarks: Entered by: KL/ED_QC by: TJD

This site has been actively grazed which may have prevented the growth of wetland plants in the drier areas of the wetland.

Trome Description. (Des		needed to docume	nt the indicator of	r confirm	the absence of in	dicators)	
Danith						dicators.	
Depth	Matrix		Redox Fea	Type ¹	Loc ²	Tautuma	Demender
(inches) Color (m		Color (moist)	%	туре	LOC	Texture	Remarks
0-7 10YR				С		SiCL	<u></u>
7-10 10YR		7.5YR 4/6	7	U	M. PL	SiCL	Vary this lover
10 10YR				0		Sand SiCL	Very thin layer
10-15 10YR	2/1 93	7.5YR 4/6	7	С	M. PL	SICL	
		- <u> </u>	· ·		- <u> </u>		
Type: C=Concentration, D				Sand Grain		L=Pore Lining, M=N	
Hydric Soil Indicators: (Ap	pplicable to all LRF					r Problematic Hyd	ric Soils [°] :
Histosol (A1)		Sandy Redox (1 cm muck (A		
Histic Epipedon (A2)		Stripped Matrix			2 cm Muck (A		
Black Histic (A3)		Loamy Mucky			Reduced Ver		
Hydrogen Sulfide (A4)		Loamy Gleyed			Red Parent M		
Stratified Layers (A5) (I		Depleted Matri			Other (Explai	n in Remarks)	
1 cm Muck (A9) (LRR I		X Redox Dark Su	()				
Depleted Below Dark S	. ,	Depleted Dark	. ,		3		
Thick Dark Surface (A1		Redox Depress				rophytic vegetation	
Sandy Mucky Mineral (Vernal Pools (F	=9)		-	ogy must be present	,
Sandy Gleyed Matrix (S	54)				unless distrube	d or problematic.	
Depth (inches): N/	/A				Hydric Soil Pres	ent? Yes X	No
	Si = silt; C = clay; L =		= coarse; f = fine;	vf = very fi	-		
Remarks: S = sand; S Sand layer at 10" could be f	Si = silt; C = clay; L = from historic 500-yea		= coarse; f = fine;	vf = very fil	-		
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica	Si = silt; C = clay; L = from historic 500-yea	ar level flood event.	= coarse; f = fine;	vf = very fii	-		
Remarks: S = sand; S Sand layer at 10" could be f	Si = silt; C = clay; L = from historic 500-yea	ar level flood event.	= coarse; f = fine;	vf = very fil	ne; + = heavy (mo		ss clay)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica	Si = silt; C = clay; L = from historic 500-yea	ar level flood event.		vf = very fii	ne; + = heavy (mor	re clay); - = light (les	required)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur	Si = silt; C = clay; L = from historic 500-yea	ar level flood event. heck all that apply)	1)	vf = very fil	<u>Secondary In</u>	re clay); - = light (les dicators (2 or more	ss clay) required) tiverine)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1)	Si = silt; C = clay; L = from historic 500-yea	ar level flood event. heck all that apply) Salt Crust (B11	1) 12)	vf = very fi	ne; + = heavy (mor	re clay); - = light (les dicators (2 or more Nater Marks (B1) (R	required) Riverine) B2) (Riverine)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2)	Si = silt; C = clay; L = from historic 500-yea ntors: m of one required; c	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B	1) 12) bbrates (B13)	vf = very fi	<u>Secondary In</u>	re clay); - = light (les dicators (2 or more Vater Marks (B1) (R Sediment Deposits (required) Riverine) B2) (Riverine) Riverine)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3)	Si = silt; C = clay; L = from historic 500-yea itors: m of one required; c	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B Aquatic Inverte Hydrogen Sulfi	1) 12) bbrates (B13)		Secondary In	re clay); - = light (les dicators (2 or more Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I	ss clay) required) Riverine) B2) (Riverine) Riverine) B10)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor	Si = silt; C = clay; L = from historic 500-yea ntors: m of one required; c nriverine)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo	1) 12) ebrates (B13) de Odor (C1)		Secondary In	re clay); - = light (les dicators (2 or more Water Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (E	required) Riverine) B2) (Riverine) Riverine) 310) Sable (C2)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2)	Si = silt; C = clay; L = from historic 500-yea itors: m of one required; c nriverine) ?) (Nonriverine) nriverine)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re	1) 12) ebrates (B13) de Odor (C1) ospheres along Liv	ing Roots (<u>Secondary In</u> <u>Secondary In</u> <u>X</u> (C3)	re clay); - = light (les dicators (2 or more Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C	required) Riverine) B2) (Riverine) Riverine) 310) Sable (C2)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2) Drift Deposits (B3) (No	Si = silt; C = clay; L = from historic 500-yea itors: m of one required; c nriverine) ?) (Nonriverine) nriverine) 6)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re	1) 12) de Odor (C1) ospheres along Liv educed Iron (C4) eduction in Tilled S	ing Roots (Secondary In	re clay); - = light (les dicators (2 or more Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C	required) Riverine) B2) (Riverine) Riverine) 310) Jable (C2) 8) A Aerial Imagery (C9)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2 Drift Deposits (B3) (No X Surface Soil Cracks (B)	Si = silt; C = clay; L = from historic 500-yea ntors: m of one required; c nriverine) ?) (Nonriverine) nriverine) 6) eerial Imagery (B7)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re	1) 12) de Odor (C1) ospheres along Liv educed Iron (C4) eduction in Tilled S face (C7)	ing Roots (Secondary In Secondary In	re clay); - = light (les dicators (2 or more Water Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (E Dry-Season Water T Crayfish Burrows (Ca Saturation Visible or	required) Riverine) B2) (Riverine) Riverine) B10) Gable (C2) B) Aerial Imagery (C9) B)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2 Drift Deposits (B3) (No X Surface Soil Cracks (B4 Inundation Visible on A	Si = silt; C = clay; L = from historic 500-yea ntors: m of one required; c nriverine) ?) (Nonriverine) nriverine) 6) eerial Imagery (B7)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf	1) 12) de Odor (C1) ospheres along Liv educed Iron (C4) eduction in Tilled S face (C7)	ing Roots (Secondary In Secondary In	re clay); - = light (les dicators (2 or more Vater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (B Dry-Season Water T Crayfish Burrows (Ca Saturation Visible on Shallow Aquitard (D	required) Riverine) B2) (Riverine) Riverine) B10) Gable (C2) B) Aerial Imagery (C9) B)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2 Drift Deposits (B3) (No X Surface Soil Cracks (B4 Inundation Visible on A Water-Stained Leaves	Si = silt; C = clay; L = from historic 500-yea ntors: m of one required; c nriverine) ?) (Nonriverine) nriverine) 6) eerial Imagery (B7)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf Other (Explain	1) 12) de Odor (C1) ospheres along Liv educed Iron (C4) eduction in Tilled S face (C7)	ing Roots (Secondary In Secondary In	re clay); - = light (les dicators (2 or more Vater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (B Dry-Season Water T Crayfish Burrows (Ca Saturation Visible on Shallow Aquitard (D	required) Riverine) B2) (Riverine) Riverine) B10) Gable (C2) B) Aerial Imagery (C9) B)
Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2 Drift Deposits (B3) (No X Surface Soil Cracks (B4 Inundation Visible on A Water-Stained Leaves Field Observations:	Si = silt; C = clay; L = from historic 500-yea ntors: m of one required; c (Nonriverine) nriverine) 6) eerial Imagery (B7) (B9)	ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf Other (Explain	1) 12) brates (B13) de Odor (C1) ospheres along Liv educed Iron (C4) eduction in Tilled S face (C7) in Remarks)	ing Roots (Soils (C6)	Secondary In Secondary In V	re clay); - = light (les dicators (2 or more Vater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (B Dry-Season Water T Crayfish Burrows (Ca Saturation Visible on Shallow Aquitard (D	ss clay) required) Riverine) B2) (Riverine) Riverine) 310) able (C2) 8) Aerial Imagery (C9) 3) 5)
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Remarks: S = sand; S Sand layer at 10" could be f HYDROLOGY Wetland Hydrology Indica Primary Indicators (minimur Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Nor Sediment Deposits (B2 Drift Deposits (B3) (No X Surface Soil Cracks (B4 Inundation Visible on A Water-Stained Leaves Field Observations: Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Si = silt; C = clay; L = from historic 500-yea ators: m of one required; c (Nonriverine) (Nonriverine) nriverine) 6) kerial Imagery (B7) (B9) Yes Yes Yes Yes	Ar level flood event. heck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf Other (Explain No X No X No X	1) 12) brates (B13) de Odor (C1) bspheres along Liv educed Iron (C4) eduction in Tilled S face (C7) in Remarks) Depth (inches): Depth (inches):	ing Roots (Soils (C6) <u>N/A</u> >15 >15	Secondary In Secondary In Secondary In Secondary In Secondary In Secondary In Secondary In	dicators (2 or more Nater Marks (B1) (R Sediment Deposits (Drift Deposits (B3) (I Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C Saturation Visible or Shallow Aquitard (D SAC-Neutral Test (D	required) Riverine) B2) (Riverine) Riverine) B310) able (C2) B) Aerial Imagery (C9) B) 5) S)

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC			,	State: WA Sampling Point: TP08
Investigator(s): Evan Dulin, Jamie Young		Section. To	ownship, Rang	ge: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Terrace				(concave, convex, none): Convex Slope (%): 1
Subregion (LRR): B, Columbia/Snake River F	Plateau	Lat: 47.024995	-	ng: -120.628381 Datum: NAD 1983
3 (), <u>.</u>		to 2 percent slopes	-	NWI classification: PEMC
Are climatic / hydrologic conditions on the site			Ye	
Are Vegetation ,Soil	•••	•		Are "Normal Circumstances" present? Yes X No
		naturally prob		(If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach	site map sho	wing sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes	No X		
Hydric Soil Present?	Yes	No X	Is the Samp	oled Area
Wetland Hydrology Present?	Yes	No X	within a We	etland? Yes No X
Precipitation prior to fieldwork: 0.79" two Remarks:	weeks prior, 2.32"	above normal for C	YTD, 2.78" abo	ove normal for WYTD. *Wetter than normal.
VEGETATION			<u> </u>	
Tree Stratum (Plot size: 30' r)	Absolute	Dominant	Indicator	Dominance Test worksheet:
/	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC:(A)
2				
3.				Total Number of Dominant
4				Species Across All Strata: <u>3</u> (B)
	0%	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10'	<u>r_</u>)			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
2		<u> </u>		Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4.				OBL species x 1 =0
5.				FACW species 10 x 2 = 20
	0%	= Total Cover		FAC species 25 x 3 = 75
<u>Herb Stratum</u> (Plot size: <u>5' r</u>)		,		FACU species 66 x 4 = 264
1. Schedonorus arundinaceus	40%	Yes	FACU	UPL species 1 x 5 = 5
2. Poa species	25%	Yes	FAC ?	Column Totals: 102 (A) 364 (B)
3. Phleum pratense	25%	Yes	FACU	Prevalence Index = B/A = 3.57
4. Phalaris arundinacea	10%	No	FACW	Hydrophytic Vegetation Indicators:
5. Onopordum acanthium	1%	No	NOL	1 - Rapid Test for Hydrophytic Vegetation
6. Taraxacum officinale	1%	No	FACU	2 - Dominance Test is >50%
7.			17,000	$3 - Prevalence Index is \leq 3.0^{1}$
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
· · · · · · · · · · · · · · · · · · ·		·		
11				Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 10'		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 10' 1.	<u> </u>			be present.
2.				Hydrophytic
	0%	= Total Cover		Vegetation Yes No X
% Bare Ground in Herb Stratum 0%		•		Present?
Remarks:				Entered by: KL/ED QC by: TJD
i tomanto.				

(inches) Color (moist) % Type1 Loc2 Texture Remain 0-8 10YR 2/2 100 SiL SiL SiL SiCL S		Matrix		Redox Fea	atures			
0-8 10YR 2/2 100 SiL 8-12 10YR 2/1 100 SiCL 9-12 100 SiCL SiCL 9-13 10YR 2/1 100 SiCL 9-14 100 SiCL SiCL 9-15 10YR 2/1 100 SiCL 9-16 10YR 2/1 100 SiCL 9-16 10YR 2/2 100 SiCL 9-16 100 Sandy Redox (S5) 1 cm Muck (A9) (LRR C) 9-16 Stripfed Matrix (S6) 2 cm Muck (A10) (LRR B) 9-16 Black Histic (A3) Loamy Gueyed Matrix (F2) Red Parent Material (TF2) 9-16 Matrix (S4) Loamy Gueyed Matrix (F2) Red Parent Material (TF2) 9-10 Redox Depressions (F8) 3 ¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Sandy Mucky Mineral (S1) Vernal Pools ((inches) Color (moist) %	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. ¹ Location: PL=Pore Lining, M=Matrix. tydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histos Dipoted (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F7) Thick Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Startified Layer (If present): Type: No X Type: None Hydric Soil Present? Yes No X Retrictive Layer (If present): Tyle No X Type: None Hydric Soil Present? Yes No X Retrictive Andris (S1) (Explain and or				·			SiL	
tydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Suffide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and surface (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Type: None No X Depth (inches): N/A No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) X Xocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Secondary Indicators (2 or more required) Surface Water (A1) Salt	8-12 10YF	R 2/1 100		·			SiCL	
typeric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :								
hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ :								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histo: Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Suffide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Type: None No X Depth (inches): N/A No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Vertand Hydrology Indicators: HyDROLOGY Secondary Indicators (2 or more required) Secondary Indicators (2 or more required)								
tydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Suffide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and surface (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Type: None No X Depth (inches): N/A No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) X Xocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Secondary Indicators (2 or more required) Surface Water (A1) Salt								
tydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Suffide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and surface (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Type: None No X Depth (inches): N/A No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) X Xocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Secondary Indicators (2 or more required) Surface Water (A1) Salt								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosol (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histo: Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Suffide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Type: None No X Depth (inches): N/A No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Vertand Hydrology Indicators: HyDROLOGY Secondary Indicators (2 or more required) Secondary Indicators (2 or more required)								
Histosol (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Type: None Material (Treesont): No X Type: None No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) kocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Secondary Indicators (2 or more required) Mutch Mydrology Indicators: Sati Crust (B11) Water Marks (B1) (Riverine) Sur	Type: C=Concentration,	D=Depletion, RM=Re	educed Matrix CS=Co	vered or Coated	Sand Grains	. ² Location:	PL=Pore Lining, M=N	latrix.
Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Gleyed Matrix (S4) unless distrubed or problematic. testrictive Layer (if present): Type: Type: None Depth (inches): N/A Hydrology Indicators: No Xotoks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Hydrology Indicators: Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	lydric Soil Indicators: (A	Applicable to all LR	Rs, unless otherwise	e noted.)		Indicators f	or Problematic Hydr	ic Soils ³ :
Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, Sandy Gleyed Matrix (S4) unless distrubed or problematic. testrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil Present? Yes No X temarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) tooks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Yettand Hydrology Indicators (2 or more required) Muthare Table (A2) Biotic Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Histosol (A1)		Sandy Redox (S5)		1 cm muck ((A9) (LRR C)	
Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, Sandy Gleyed Matrix (S4) unless distrubed or problematic. Restrictive Layer (if present): Type: No Type: None Hydric Soil Present? Yes No Depth (inches): N/A Hydric Soil Present? Yes No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) No K Nocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) <td>Histic Epipedon (A2)</td> <td></td> <td>Stripped Matrix</td> <td>(S6)</td> <td></td> <td>2 cm Muck (</td> <td>A10) (LRR B)</td> <td></td>	Histic Epipedon (A2)		Stripped Matrix	(S6)		2 cm Muck (A10) (LRR B)	
Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Gleyed Matrix (S4) unless distrubed or problematic. Restrictive Layer (if present): Type: Type: None Depth (inches): N/A Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Reckard gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. HyDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B11) Mitgh Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Black Histic (A3)		Loamy Mucky M	Mineral (F1)		Reduced Ve	ertic (F18)	
1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, Sandy Gleyed Matrix (S4) Restrictive Layer (if present): Type: None Depth (inches): N/A Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Rocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Hydrogen Sulfide (A4)	Loamy Gleyed	Matrix (F2)	-	Red Parent	Material (TF2)	
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) sandy Gleyed Matrix (S4) unless distrubed or problematic. Restrictive Layer (if present): None Type: None Depth (inches): N/A Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Rocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Stratified Layers (A5)	(LRR C)	Depleted Matrix	(F3)	-	Other (Expla	ain in Remarks)	
Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Restrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil Present? Yes No X Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: YDROLOGY Vetland Hydrology Indicators: Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Secondary Indicators (2 or more required) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	1 cm Muck (A9) (LRR	2 D)	Redox Dark Su	rface (F6)	-			
Sandy Mucky Mineral (S1)	Depleted Below Dark	Surface (A11)	Depleted Dark	Surface (F7)				
Sandy Gleyed Matrix (S4) unless distrubed or problematic. testrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil Present? Yes No X temarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) No X temarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) to be the solution of the	Thick Dark Surface (A	(12)	Redox Depress	ions (F8)		³ Indicators of hy	drophytic vegetation a	and
Restrictive Layer (if present): Type: None Depth (inches): N/A Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Rocks and gravels (possibly fill material) from 3 to 8 inches. Shoval refusal at 12" due to large rocks. HYDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13)	Sandy Mucky Mineral	(S1)	Vernal Pools (F	9)		wetland hydro	logy must be present	
Type: None Depth (inches): N/A Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) HYDROLOGY Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquat		(0.1)				unless distrub	ed or problematic.	
Vetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Restrictive Layer (if pres Type: <u>None</u> Depth (inches):	ent): N/A	= loam or loamy; co =	= coarse; f = fine;		Hydric Soil Pre	sent? Yes	
Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Restrictive Layer (if pres Type: None Depth (inches): None Remarks: S = sand;	ent): //A Si = silt; C = clay; L	•		vf = very fin	Hydric Soil Pre e; + = heavy (mo	sent? Yes	
Surface Water (A1)Salt Crust (B11)Water Marks (B1) (Riverine)High Water Table (A2)Biotic Crust (B12)Sediment Deposits (B2) (Riverine)Saturation (A3)Aquatic Invertebrates (B13)Drift Deposits (B3) (Riverine)	Restrictive Layer (if pres Type: <u>None</u> Depth (inches): <u>N</u> Remarks: S = sand; Rocks and gravels (possib HYDROLOGY	ent): //A Si = silt; C = clay; L ly fill material) from 3	•		vf = very fin	Hydric Soil Pre e; + = heavy (mo	sent? Yes	
High Water Table (A2)Biotic Crust (B12)Sediment Deposits (B2) (Riverine)Saturation (A3)Aquatic Invertebrates (B13)Drift Deposits (B3) (Riverine)	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from 3	3 to 8 inches. Shoval		vf = very fin	Hydric Soil Pre e; + = heavy (mo	sent? Yes	
Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine)	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from 3	3 to 8 inches. Shoval		vf = very fin	Hydric Soil Pre e; + = heavy (mo ks.	sent? Yes	s clay)
	Restrictive Layer (if pressive of the second sec	ent): J/A Si = silt; C = clay; L oly fill material) from 3	3 to 8 inches. Shoval h	refusal at 12" due	vf = very fin	Hydric Soil Pre e; + = heavy (mo ks. <u>Secondary l</u>	sent? Yes ore clay); - = light (les ndicators (2 or more r	s clay) required)
Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10)	Sestrictive Layer (if pressive construction of the sector of the sect	ent): J/A Si = silt; C = clay; L oly fill material) from 3 cators: um of one required; c	3 to 8 inches. Shoval https://www.shoval.com/shoval)	vf = very fin	Hydric Soil Pre e; + = heavy (mo ks. <u>Secondary l</u>	sent? Yes ore clay); - = light (les ndicators (2 or more r Water Marks (B1) (R	s clay) required) iverine)
	Restrictive Layer (if pressing to the second secon	ent): J/A Si = silt; C = clay; L oly fill material) from 3 cators: um of one required; c	3 to 8 inches. Shoval (<u>check all that apply)</u> Salt Crust (B11Biotic Crust (B1	refusal at 12" due	vf = very fin	Hydric Soil Pre e; + = heavy (mo ks. <u>Secondary l</u>	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (l	s clay) required) iverine) 32) (Riverine)
Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Dry-Season Water Table (C2)	Restrictive Layer (if present the second	ent): N/A Si = silt; C = clay; L bly fill material) from S sators: um of one required; of)	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B1 Aquatic Invertel	refusal at 12" due))2) brates (B13)	vf = very fin	Hydric Soil Pre e; + = heavy (mo ks. <u>Secondary l</u>	sent? Yes pre clay); - = light (les <u>ndicators (2 or more r</u> Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F	s clay) required) iverine) 32) (Riverine) Riverine)
Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Crayfish Burrows (C8)	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from (sators: um of one required; c ponriverine)	3 to 8 inches. Shoval <u>check all that apply)</u> <u>Salt Crust (B11</u> <u>Biotic Crust (B11</u> <u>Aquatic Inverted</u> <u>Hydrogen Sulfic</u>	refusal at 12" due) l2) brates (B13) de Odor (C1)	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (mo ks. <u>Secondary I</u>	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B	s clay) required) iverine) 32) (Riverine) Riverine) 10)
Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Saturation Visible on Aerial Imagery	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from S sators: um of one required; c porriverine) (2) (Nonriverine)	3 to 8 inches. Shoval <u>check all that apply)</u> Salt Crust (B11 Biotic Crust (B1 Aquatic Inverted Hydrogen Sulfic Oxidized Rhizos	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T	s clay) <u>required)</u> iverine) 32) (Riverine) Riverine) 10) able (C2)
Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Shallow Aquitard (D3)	Restrictive Layer (if prestrype: None Type: None Depth (inches): N Remarks: S = sand; Rocks and gravels (possible HYDROLOGY Vetland Hydrology Indice Primary Indicators (minime Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (No Sediment Deposits (E Drift Deposits (B3) (No	ent): J/A Si = silt; C = clay; L bly fill material) from S sators: um of one required; c porriverine) S2) (Nonriverine) onriverine)	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B1 Aquatic Invertel Hydrogen Sulfic Oxidized Rhizos Presence of Re	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4)	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3)
Water-Stained Leaves (B9) Other (Explain in Remarks) FAC-Neutral Test (D5)	Restrictive Layer (if prestrype: None Type: None Depth (inches): N Remarks: S = sand; Rocks and gravels (possite HYDROLOGY Vetland Hydrology Indice Primary Indicators (minim Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (No Sediment Deposits (B3) (N Drift Deposits (B3) (N Surface Soil Cracks (I)	ent): J/A Si = silt; C = clay; L bly fill material) from 3 sators: um of one required; c ponriverine) s2) (Nonriverine) onriverine) B6)	3 to 8 inches. Shoval <u>check all that apply)</u> Salt Crust (B11 Biotic Crust (B11 Aquatic Inverted Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Rec	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from S sators: um of one required; c porriverine) i2) (Nonriverine) onriverine) B6) Aerial Imagery (B7)	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B1 Aquatic Invertel Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Red Thin Muck Surf	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7)	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from S sators: um of one required; c porriverine) i2) (Nonriverine) onriverine) B6) Aerial Imagery (B7)	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B1 Aquatic Invertel Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Red Thin Muck Surf	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7)	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
ield Observations:	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L bly fill material) from S sators: um of one required; c bnriverine) i2) (Nonriverine) onriverine) B6) Aerial Imagery (B7) s (B9)	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B1 Aquatic Invertel Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Red Thin Muck Surf Other (Explain i	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7) in Remarks)	vf = very fin e to large roo ving Roots (0 Soils (C6)	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
Field Observations:	Restrictive Layer (if prestry construction of the sector	ent): J/A Si = silt; C = clay; L bly fill material) from S sators: um of one required; c ponriverine) (Nonriverine) B6) Aerial Imagery (B7) s (B9) Yes	3 to 8 inches. Shoval <u>check all that apply)</u> Salt Crust (B11 Biotic Crust (B11 Aquatic Inverted Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Rec Thin Muck Surf Other (Explain i	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7) in Remarks) Depth (inches):	vf = very fin e to large roc ving Roots (C Soils (C6)	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9 5)
Field Observations: No X Depth (inches): N/A Surface Water Present? Yes No X Depth (inches): >12 Water Table Present? Yes No X Depth (inches): >12 Wetland Hydrology Present? Saturation Present? Yes No X Depth (inches): >12 Yes No X	Restrictive Layer (if prestrype: Type: None Depth (inches): None Remarks: S = sand; Rocks and gravels (possite HYDROLOGY Wetland Hydrology Indice Primary Indicators (minim Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) (Note Sediment Deposits (B3) (Note Surface Soil Cracks (Inundation Visible on Water-Stained Leavest Field Observations: Surface Water Present? Water Table Present?	ent): J/A Si = silt; C = clay; L bly fill material) from S sators: um of one required; c bnriverine) i2) (Nonriverine) backerial Imagery (B7) is (B9) Yes Yes Yes	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverted Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Red Thin Muck Surf Other (Explain in No X	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7) in Remarks) Depth (inches): Depth (inches):	ving Roots (C Soils (C6) N/A >12	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D Hydrology Present	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9 5) 5)
	Restrictive Layer (if present of pr	ent): J/A Si = silt; C = clay; L oly fill material) from S sators: um of one required; c porriverine) i2) (Nonriverine) onriverine) B6) Aerial Imagery (B7)	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B1 Aquatic Invertel Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Red Thin Muck Surf	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7)	vf = very fin e to large roc	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3	s clay) s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C
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Field Observations: No X Depth (inches): N/A Surface Water Present? Yes No X Depth (inches): >12 Wetland Hydrology Present? Water Table Present? Yes No X Depth (inches): >12 Wetland Hydrology Present?	Restrictive Layer (if prestrype: None Type: None Depth (inches): None Remarks: S = sand; Rocks and gravels (possite HYDROLOGY Vetland Hydrology Indice Primary Indicators (minim Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) (Not Sediment Deposits (B3) (Not) Surface Soil Cracks (I) Inundation Visible on Water-Stained Leavest Field Observations: Surface Water Present? Water Table Present?	ent): J/A Si = silt; C = clay; L bly fill material) from S sators: um of one required; c bnriverine) i2) (Nonriverine) backerial Imagery (B7) is (B9) Yes Yes Yes	3 to 8 inches. Shoval check all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverted Hydrogen Sulfic Oxidized Rhizos Presence of Re Recent Iron Red Thin Muck Surf Other (Explain in No X	refusal at 12" due) l2) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S ace (C7) in Remarks) Depth (inches): Depth (inches):	ving Roots (C Soils (C6) N/A >12	Hydric Soil Pre e; + = heavy (moks.	sent? Yes pre clay); - = light (les ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D Hydrology Present	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (CS 5) 7
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Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP09
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rang	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Terrace				(concave, convex, none): Convex Slope (%): 0
Subregion (LRR): B, Columbia/Snake River I	Plateau	Lat: 47.023402	_	g: -120.627208 Datum: NAD 1983
	am, drained, 0 to 2		_	NWI classification: None
Are climatic / hydrologic conditions on the site			Ye	
	, or Hydrology	significantly	disturbed?	Are "Normal Circumstances" present? Yes X No
	, or Hydrology	naturally prol	blematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach	site map show	ving sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No		
Hydric Soil Present?	Yes	No X	Is the Samp	oled Area
Wetland Hydrology Present?	Yes	No X	within a We	tland? Yes No X
Precipitation prior to fieldwork: 0.79" two Remarks: Sample plot located on berm between TW03 ;		above normal for C	YTD, 2.78" abo	ove normal for WYTD. *Wetter than normal.
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	% Cover	Species?	Status	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: 1 (A)
2.				
3.				Total Number of Dominant
4.				Species Across All Strata: 1 (B)
	0%	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10'				Percent of Dominant Species
1.	/			That Are OBL, FACW, or FAC: 100% (A/B)
2.				Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4.				
5.				
5		T (10		
Herb Stratum (Plot size: <u>5' r</u>)	0%	= Total Cover		FAC species $60 \times 3 = 180$
	222/		=	FACU species $38 \times 4 = 152$
1. Poa species	60%	Yes	FAC ?	UPL species $0 \times 5 = 0$
2. Schedonorus arundinaceus	15%	No	FACU	Column Totals: <u>100</u> (A) <u>336</u> (B)
3. Trifolium repens	10%	No	FACU	Prevalence Index = $B/A = \frac{3.36}{2}$
4. Phleum pratense	10%	No	FACU	Hydrophytic Vegetation Indicators:
5. Iris missouriensis	2%	No	FACW	1 - Rapid Test for Hydrophytic Vegetation
6. Taraxacum officinale	2%	No	FACU	X 2 - Dominance Test is >50%
7. Tripleurospermum maritimum	1%	No	FACU	3 - Prevalence Index is ≤3.0 ¹
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10				5 - Wetland Non-Vascular Plants ¹
11				Problematic Hydrophytic Vegetation ¹ (Explain)
		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 10'	<u>r</u>)			be present.
1				lludroulu die
2		- Total Course		Hydrophytic Vegetation Yes X No
		= Total Cover		
% Bare Ground in Herb Stratum 0%				Present?
Remarks:				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>

(inches) Color (moist) % Type ¹ Loc ² Texture Remarks 0-3 10YR 32 100	Depth	Matrix		Redox Fea	atures			
0-3 10YR 2/1 100 St. 3-13 10YR 3/2 100 Sal. Type: Cacation: PL=Pore Lining, M=Matrix. Histosi (A1) Sandy Redox (S5) 1 or mixel (M (Pl) (LRR C) Histosi (A1) Camy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfde (A4) Camy Gleyd Matrix (F2) Red Parent Material (F2) Startified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (M) (LRR D) Redox Dark Surface (F6) Pupting Mereia (S1) Depletice Matrix (S4) Vernal Poole (F9) wetland hydrology must be present. Sandy Mucky Mineral (S1) Vernal Poole (F9) Vertamatrix. Type: No X	(inches) Color (moist) %	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. ¹ Location: PL=Pore Lining, M=Matrix. Type: C=Concentration, D=Depletion, RM=Reduced Matrix (S6) 1 cm muck (A0) (LRR C) Histos (A1) Sandy Redox (S5) 1 cm muck (A0) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F16) Hydrogon Sulfido (A4) Loamy Glayed Matrix (F2) Red Parent Material (TF2) Strattled Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Dark Surface (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, Sandy Gleyed Matrix (S1) Vermal Pools (F9) Sandy Gleyed Matrix (S4) Umless distrubed or problematic. X Pepth (inches): No X Secondary Indicators (2 or more required) Sinface Water (A11) Salt C= clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13" layer. Shovel refusal at 13". Hydric Soil Present? Yes No X VB							SiL	
tydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histics (A1)	3-13 10YF	R 3/2 100					SaL	
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histos (A1) Sandy Redox (S5) 1 cm muck (A9) (LRR C) Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR D) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR D) Depleted Matrix (F2) Red Parent Material (TF2) I cm Muck (A9) (LRR D) Redox Dark Surface (F7) Thick Dark Surface (A12) Redox Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophylic vegetation and structure (F7) Sandy Gleyed Matrix (S4) unless distrubed or problematic. testrictive Layer (If present): Yes No X Type: None Matrix (S1) Vermal Pools (F9) Hydric Soil Present? Yes No X tringst indicators for problematic Hydrophylic vegetation and rolamy: co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (iess clay) Trientacts: Secondary Indicators (2 or more reguired) X Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Noriverine) Secondary Indicators (2 or m								
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hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils ³ : Histosci (A1)			_					
	Type: C=Concentration,	D=Depletion, RM=Re	educed Matrix CS=Co	overed or Coated	Sand Grains	s. ² Location:	PL=Pore Lining, M=M	latrix.
Histic Epipedon (A2) Stripped Matrix (S6) 2 cm Muck (A10) (LRR B) Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A12) Redox Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Micky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Sandy Gleyed Matrix (S4) unless distrubed or problematic. termarks: S = sand, S1 = silt, C = clay, L = loam or loamy, co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13" layer. Shovel refusal at 13". tYDROLOGY Vertand Hydrology Indicators: Water Marks (B1) (Norriverine) Biotic Crust (B12) Secondary Indicators (2 or more required) Sutrace Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Sutrace Water (A1) Salt Crust (B1) Drin Deposits (B2) (Riverine)	lydric Soil Indicators: (/	Applicable to all LRI	Rs, unless otherwis	e noted.)		Indicators f	or Problematic Hydi	ic Soils ³ :
Black Histic (A3) Loamy Mucky Mineral (F1) Reduced Vertic (F18) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Red Parent Material (TF2) Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Depressions (F6) Other (Explain in Remarks) 2 Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Gleyed Matrix (S4) unless distrubed or problematic. Exetrictive Layer (if present): Type: Type: None Matrix (S4) unless distrubed or problematic. Exetrictive Layer (if present): Type: No X Type: None Matrix (S4) Matrix (S4) WDROLOGY Vertiand Hydrology Indicators: No X Virtiand Hydrology Indicators: Satic Cust (B11) Water Marks (B1) (Riverine) Surface Water (A1) Satic Cust (B11) Satic Cust (B1) (Morriverine) Phydrogen Sulfide Odor (C1) Drainage Patterns (B10) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine) Saturation Presents (B1) Drift Deposits (B3) (Riverine) Surface Soil Cracks (B6) Re	Histosol (A1)		Sandy Redox (S5)		1 cm muck (A9) (LRR C)	
	Histic Epipedon (A2)		Stripped Matrix	: (S6)		2 cm Muck (A10) (LRR B)	
Stratified Layers (A5) (LRR C) Depleted Matrix (F3) Other (Explain in Remarks) 1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Bolew Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Mucky Mineral (S1) Vernal Pools (F9) Werland hydrology must be present, Sandy Mucky Mineral (S1) Vernal Pools (F9) Werland Hydrology must be present, Sandy Mucky Mineral (S1) Vernal Pools (F9) Werland Hydrology must be present, Type: None Depth (inches): N/A YPROLOGY Vertiand Hydrology Indicators: Trimary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B12) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B2) (Nonriverine) Hydrogen Suffide Odor (C1) Sediment Deposits (B2) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tille	Black Histic (A3)		Loamy Mucky I	Vineral (F1)		Reduced Ve	rtic (F18)	
1 cm Muck (A9) (LRR D) Redox Dark Surface (F6) Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Gleyed Matrix (S4) unless distrubed or problematic. Exetrictive Layer (ift present): Type: Type: None Depth (inches): N/A Yetmarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13" layer. Shovel refusal at 13". 4YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Nonriverine) Oxidized Rhizospheres along Living Roots (C3) Dirft Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Thih	Hydrogen Sulfide (A4)	Loamy Gleyed	Matrix (F2)		Red Parent	Material (TF2)	
Depleted Below Dark Surface (A11) Depleted Dark Surface (F7) Thick Dark Surface (A12) Redox Depressions (F8) Sandy Mucky Mineral (S1) Vernal Pools (F9) Sandy Gleyed Matrix (S4) unless distrubed or problematic. Redox Depressions (F8) Type: None Depth (inches): N/A Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13" layer. Shovel refusal at 13". Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) Hydrology Indicators: Primary Indicators (B2) (Riverine) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B2) (Riverine) Water Marks (B1) (Nonriverine) Presence of Reduced Iron (C4) Crayfish Burrows (C8) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9) Indicators: Water Table Present? Yes No X Water Sained Leaves (B9) Other (Explain in Remar	Stratified Layers (A5)	(LRR C)	Depleted Matrix	x (F3)		Other (Expla	in in Remarks)	
Thick Dark Surface (A12) Redox Depressions (F8) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless distrubed or problematic. Sandy Mucky Mineral (S1) Vernal Pools (F9) wetland hydrology must be present, unless distrubed or problematic. Sandy Gleyed Matrix (S4) unless distrubed or problematic. testrictive Layer (if present): N/A Type: Noe Depth (inches): N/A termarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13* layer. Shovel refusal at 13*. tyDROLOGY Vettand Hydrology Indicators: trimary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Water Marks (B1) (Riverine) Hydrology Indicators: Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine) Water Marks (B1) (Norriverine) Presence of Reduced Iron (C4) Crayfish Burrows (C8) Sufface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9) Orift Deposits (B2) (Nonriverine) Presence of Reduced Ir	1 cm Muck (A9) (LRF	2 D)	Redox Dark Su	ırface (F6)		-		
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Sandy Gleyed Matrix (S4) unless distrubed or problematic. testrictive Layer (if present): Type: None Depth (inches): N/A Hydric Soil Present? Yes No temarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13" layer. Shovel refusal at 13". HYDROLOGY Vettand Hydrology Indicators: trimary Indicators (minimum of one required; check all that apply) Surface Water (A1) Salt Crust (B11) High Water Table (A2) Biotic Crust (B12) Saturation (A3) Aquatic Invertebrates (B13) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) (Norriverine) Oxidized Rhizospheres along Living Roots (C3) Dirti Deposits (B2) (Norriverine) Oxidized Rhizospheres along Living Roots (C3) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Surface Soil Cracks (B9) Other (Explain in Remarks) FaC-Neutral Test (D5) FaC-Neutral Test (D5) ield Observations: No X Water Table Present? Yes No X No X <t< td=""><td>Thick Dark Surface (A</td><td>(12)</td><td>Redox Depress</td><td>sions (F8)</td><td></td><td>³Indicators of hy</td><td>drophytic vegetation</td><td>and</td></t<>	Thick Dark Surface (A	(12)	Redox Depress	sions (F8)		³ Indicators of hy	drophytic vegetation	and
Image: contract of the present of t	Sandy Mucky Mineral	(S1)	Vernal Pools (F	-9)		wetland hydro	logy must be present	,
Type: None Depth (inches): N/A Hydric Soil Present? Yes No X Atemarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay) arge rocks throughout 3-13" layer. Shovel refusal at 13". HYDROLOGY Vetland Hydrology Indicators: trimary. Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B1) Water Marks (B1) (Riverine) High Water Table (A2) Biotic Crust (B12) Sediment Deposits (B2) (Riverine) Saturation (A3) Aquatic Invertebrates (B13) Drift Deposits (B3) (Riverine) Water Marks (B1) (Nonriverine) Hydrogen Sulfide Odor (C1) Drainage Patterns (B10) Sediment Deposits (B2) (Nonriverine) Oxid/zed Rhizospheres along Living Roots (C3) Dry-Season Water Table (C2) Drift Deposits (B3) (Nonriverine) Presence of Reduced Iron (C4) Crayfish Burrows (C8) Surface Soil Cracks (B6) Recent Iron Reduction in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9 Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Shallow Aquitard (D3) Water-Stained Leaves (B9)	Sandy Gleyed Matrix	(S4)				unless distrub	ed or problematic.	
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Surface Water Present? Yes No X Depth (inches): N/A Water Table Present? Yes No X Depth (inches): >13 Wetland Hydrology Present? Saturation Present? Yes No X Depth (inches): >13 Yes No X	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minim Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) (No Sediment Deposits (B3) (No Surface Soil Cracks (<pre>J/A Si = silt; C = clay; L 13" layer. Shovel refu sators: um of one required; c) onriverine) s2) (Nonriverine) onriverine) B6)</pre>	sal at 13". <u>Sheck all that apply)</u> Salt Crust (B11 Biotic Crust (B11 Aquatic Inverter Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S	vf = very fin	c; + = heavy (mo	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C& Saturation Visible on	s clay) <u>required)</u> iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
Water Table Present? Yes No X Depth (inches): >13 Wetland Hydrology Present? Saturation Present? Yes No X Depth (inches): >13 Yes No X	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minim Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) (No Sediment Deposits (B Drift Deposits (B3) (N Surface Soil Cracks (Inundation Visible on	J/A Si = silt; C = clay; L 13" layer. Shovel refu sators: um of one required; c ponriverine) 2) (Nonriverine) 2) (Nonriverine) B6) Aerial Imagery (B7)	sel at 13". <u>Sheck all that apply)</u> Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S face (C7)	vf = very fin	c3)	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
Saturation Present? Yes No X Depth (inches): >13 Yes No X	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minim Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) (No Sediment Deposits (E Drift Deposits (B3) (N Surface Soil Cracks (Inundation Visible on Water-Stained Leave	J/A Si = silt; C = clay; L 13" layer. Shovel refu sators: um of one required; c ponriverine) 2) (Nonriverine) 2) (Nonriverine) B6) Aerial Imagery (B7)	sel at 13". <u>Sheck all that apply)</u> Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S face (C7)	vf = very fin	c3)	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minim Surface Water (A1) High Water Table (A2 Saturation (A3) Water Marks (B1) (No Sediment Deposits (B3) (N Surface Soil Cracks (Inundation Visible on Water-Stained Leave Field Observations:	<pre>J/A Si = silt; C = clay; L 13" layer. Shovel refu rators: um of one required; c bonriverine) 22) (Nonriverine) 23) (Nonriverine) 36) Aerial Imagery (B7) s (B9)</pre>	check all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf Other (Explain) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S face (C7) in Remarks)	vf = very fin	c3)	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9
(includes capillary fringe)	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minim	<pre>//A Si = silt; C = clay; L 13" layer. Shovel refu sators: um of one required; of porriverine) (2) (Nonriverine) (2) (Nonriverine) (3) (3) (4) (4) (5) (5) (5) (5) (5) (6) (5) (6) (6) (6) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7</pre>	sal at 13". <u>Sheck all that apply)</u> Salt Crust (B11 Biotic Crust (B11 Aquatic Inverte Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf Other (Explain) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S face (C7) in Remarks) Depth (inches):	vf = very fin ving Roots (0 Soils (C6) N/A	c; + = heavy (mo	ndicators (2 or more I Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9 5)
	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minimSurface Water (A1)High Water Table (A2Saturation (A3)Water Marks (B1) (NoSediment Deposits (B3) (NSurface Soil Cracks (Inundation Visible onWater-Stained Leave Field Observations: Surface Water Present? Water Table Present? Saturation Present?	J/A Si = silt; C = clay; L 13" layer. Shovel refu sators: um of one required; c porriverine) 12) (Nonriverine) 12) (Nonriverine) 13) 14) (Nonriverine) 15) 15) (B9) Yes Yes Yes	Sal at 13". Sheck all that apply) Salt Crust (B11 Biotic Crust (B11 Aquatic Inverter Hydrogen Sulfic Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Surf Other (Explain No X) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S face (C7) in Remarks) Depth (inches):	vf = very fin ving Roots (0 Soils (C6) <u>N/A</u> >13	c; + = heavy (mo	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9 5) 5)
	Type: None Depth (inches): Remarks: S = sand; arge rocks throughout 3- HYDROLOGY Vetland Hydrology Indic Primary Indicators (minimSurface Water (A1)High Water Table (A2Saturation (A3)Water Marks (B1) (NoSediment Deposits (B3) (NSurface Soil Cracks (Inundation Visible onWater-Stained Leave Field Observations: Surface Water Present? Water Table Present? Saturation Present?	J/A Si = silt; C = clay; L 13" layer. Shovel refu sators: um of one required; c um of one required; c un of one req	usal at 13". check all that apply)) 12) brates (B13) de Odor (C1) spheres along Liv educed Iron (C4) duction in Tilled S face (C7) in Remarks) Depth (inches): Depth (inches):	vf = very fin	c; + = heavy (mo	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (I Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water T Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D	s clay) required) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9 5) 5)

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP10
Investigator(s): Evan Dulin, Jamie Young		Section, To	ownship, Rang	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Depression			Local relief	(concave, convex, none): Convex Slope (%): 3
Subregion (LRR): B, Columbia/Snake River Pla	ateau L	at: 47.023411	Lon	g: -120.627114 Datum: NAD 1983
Soil Map Unit Name: Mitta ashy silt loa	m, drained, 0 to 2 pe	ercent slopes (79		NWI classification: None
Are climatic / hydrologic conditions on the site t	ypical for this time o	f year?	Ye	sNoX*(If no, explain in Remarks)
Are Vegetation,Soil	, or Hydrology			Are "Normal Circumstances" present? Yes X No
Are Vegetation,SoilX	, or Hydrology			If needed, explain any answers in Remarks.)
	· ·	<u> </u>	point locat	ions, transects, important features, etc.
Hydrophytic Vegetation Present?		No		
Hydric Soil Present?		No	Is the Samp	11 10
Wetland Hydrology Present?		No	within a We	
	eks prior, 2.32" abo	ove normal for C	YTD, 2.78" abo	ove normal for WYTD. *Wetter than normal.
Remarks: TW04. Depressional wetland intercepting overla	and runoff before TV	V03 Frog egg ma	asses observe	d
·····				-
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: 2 (A)
2.				
3.				Total Number of Dominant
4.				Species Across All Strata: <u>3</u> (B)
		Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r	_)			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
2.				Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4				OBL species <u>5</u> x 1 = <u>5</u>
5				FACW species 20 x 2 = 40
	<u> 0% </u> = T	Total Cover		FAC species 25 x 3 = 75
Herb Stratum (Plot size: <u>5' r</u>)				FACU species x 4 =100
1. Schedonorus arundinaceus	25%	Yes	FACU	UPL species x 5 =
2. <u>Poa species</u>	25%	Yes	FAC ?	Column Totals: <u>75</u> (A) <u>220</u> (B)
3. <u>Phalaris arundinacea</u>	20%	Yes	FACW	Prevalence Index = B/A = 2.93
4. <u>Typha latifolia</u>	5%	No	OBL	Hydrophytic Vegetation Indicators:
5				1 - Rapid Test for Hydrophytic Vegetation
6				X 2 - Dominance Test is >50%
7				3 - Prevalence Index is ≤3.0 ¹
8				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
^{11.}				Problematic Hydrophytic Vegetation ¹ (Explain)
Woody Vine Stratum (Plot size: 10' r		Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: <u>10' r</u>	_/			be present.
2.				Hydrophytic
		Total Cover		Vegetation Yes X No
% Bare Ground in Herb Stratum 5%				Present?
Remarks:				Entered by: KL/ED QC by: TJD
20% open water.				······································

US Army Corps of Engineers SWCA Environmental Consultants

Depth	Mat	rix		Redox Fe	atures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-11	10YR 2/1	98	2.5Y 4/2	2	D	М	SiL	
				·				
			_					
				·				
Type C=Conce	entration D=Deple	tion RM=Re	educed Matrix CS=Co	overed or Coated	Sand Grains	² Location	PL=Pore Lining, M=M	atrix
			Rs, unless otherwis				or Problematic Hydr	
Histosol (A1			Sandy Redox (,		1 cm muck (-	
Histic Epipe			Stripped Matrix	. ,		-	A10) (LRR B)	
Black Histic						-		
	()		Loamy Mucky			Reduced Ve		
Hydrogen S	aunide (A4) ayers (A5) (LRR C)		Loamy Gleyed	. ,	V	-	Material (TF2)	
)	Depleted Matri		<u>X</u>	Other (Expla	in in Remarks)	
	(A9) (LRR D)	()	Redox Dark Su					
	elow Dark Surface	(A11)	Depleted Dark		³ In	diastors of by	drophytic vegetation a	and
	Surface (A12)		Redox Depres					
	ky Mineral (S1)		Vernal Pools (I	-9)		-	ogy must be present,	
Sandy Gley	ed Matrix (S4)				L	Inless distrube	ed or problematic.	
Туре:	er (if present):				н	dric Soil Pro	sant? Vas X	No
Type: Depth (inches)	None): N/A	; C = clay; L	= loam or loamy; co	= coarse; f = fine;	-	dric Soil Pre		No
Type: Depth (inches) Remarks:	None): <u>N/A</u> S = sand; Si = silt	•	= loam or loamy; co be reducing the abili		vf = very fine;	+ = heavy (mo	ore clay); - = light (les	
Type: Depth (inches) Remarks: he large rocks	None N/A S = sand; Si = silt throughout the soi	•			vf = very fine;	+ = heavy (mo	ore clay); - = light (les	
Type: Depth (inches) emarks: he large rocks	None N/A S = sand; Si = silt throughout the soi Y	•			vf = very fine;	+ = heavy (mo	ore clay); - = light (les	
Type: Depth (inches) Remarks: The large rocks HYDROLOG Vetland Hydrol	None N/A S = sand; Si = silt throughout the soi Y logy Indicators:	l profile may	be reducing the abili		vf = very fine;	+ = heavy (mo epletions obse	ore clay); - = light (les: rved.	s clay)
Type: Depth (inches) Remarks: The large rocks HYDROLOG Vetland Hydrol Primary Indicato	None N/A S = sand; Si = silt throughout the soi Y logy Indicators: ors (minimum of on	l profile may	be reducing the abili	ty to locate redox	vf = very fine;	+ = heavy (mo epletions obse	ore clay); - = light (les	s clay)
Type: Depth (inches) Remarks: he large rocks IYDROLOG Vetland Hydrol	None N/A S = sand; Si = silt throughout the soi Y logy Indicators: ors (minimum of on	l profile may	be reducing the abili	ty to locate redox	vf = very fine;	+ = heavy (mo epletions obse - <u>Secondary I</u>	ore clay); - = light (les: rved.	s clay) equired)
Type: Depth (inches) Remarks: he large rocks IYDROLOG Vetland Hydrol Primary Indicato	None N/A S = sand; Si = silt throughout the soi Y logy Indicators: ors (minimum of on ter (A1)	l profile may	be reducing the abili	ty to locate redox	vf = very fine;	+ = heavy (mo epletions obse _ <u>Secondary Ir</u>	ore clay); - = light (less prved. ndicators (2 or more r	s clay) equired) iverine)
Type: Depth (inches) emarks: he large rocks IYDROLOG Vetland Hydrol rimary Indicato Surface Wa X High Water	None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rrs (minimum of on ter (A1) Table (A2)	l profile may	be reducing the abili	ty to locate redox	vf = very fine;	+ = heavy (mo epletions obse . <u>Secondary Ir</u>	ore clay); - = light (les prved. ndicators (2 or more r Water Marks (B1) (R i	equired) (verine) 32) (Riverine)
Type: Depth (inches) emarks: he large rocks IYDROLOG Vetland Hydrol rimary Indicato Surface Wa X High Water X Saturation (None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rrs (minimum of on ter (A1) Table (A2)	l profile may	be reducing the abilities the second	ty to locate redox 1) 12) ebrates (B13)	vf = very fine;	+ = heavy (mo epletions obse - <u>Secondary Ir</u>	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (E	s clay) equired) iverine) 32) (Riverine) iverine)
Type: Depth (inches) emarks: he large rocks HYDROLOG Vetland Hydrol rimary Indicato Surface Wa X High Water X Saturation (Water Mark	None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3)	l profile may	be reducing the abili <u>check all that apply</u> <u>Salt Crust (B1</u> Biotic Crust (B <u>Aquatic Inverte</u> <u>Hydrogen Sulf</u>	ty to locate redox 1) 12) ebrates (B13)	vf = very fine; ·	+ = heavy (mo epletions obse - <u>Secondary I</u>	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (R	equired) iverine) 32) (Riverine) Riverine) 10)
Type: Depth (inches) Remarks: The large rocks IYDROLOG Vetland Hydrol Primary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: ors (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverin	l profile may e required; c ne) riverine)	be reducing the abilition of the sector of t	ty to locate redox 1) 12) ebrates (B13) ide Odor (C1)	vf = very fine; ·	+ = heavy (mo epletions obse . <u>Secondary II</u>	ndicators (2 or more r Water Marks (B1) (R i Sediment Deposits (B Drift Deposits (B3) (R i Drainage Patterns (B	equired) (verine) 32) (Riverine) Riverine) 10) able (C2)
Type: Depth (inches) Remarks: The large rocks IYDROLOG Vetland Hydrol Primary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir reposits (B2) (Non	l profile may e required; c ne) riverine)	be reducing the abili check all that apply) Salt Crust (B1 Biotic Crust (B Aquatic Inverte Hydrogen Sulfi Oxidized Rhize Presence of Re	ty to locate redox 1) 12) ebrates (B13) ide Odor (C1) ospheres along Li	vf = very fine; - ; some small de	+ = heavy (mo epletions obse - <u>Secondary Ir</u>	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta	equired) (verine) 32) (Riverine) Riverine) 10) able (C2)
Type: Depth (inches) Remarks: The large rocks ATTOROLOG Vetland Hydrol Primary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: ors (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir eposits (B2) (Non ts (B3) (Nonriveri	l profile may e required; c ne) riverine) ne)	be reducing the abili check all that apply) Salt Crust (B1 Biotic Crust (B Aquatic Inverte Hydrogen Sulfi Oxidized Rhize Presence of Re	ty to locate redox 1) 12) bbrates (B13) ide Odor (C1) bspheres along Li educed Iron (C4) eduction in Tilled	vf = very fine; - ; some small de	+ = heavy (mo epletions obse - <u>Secondary II</u>	ore clay); - = light (less prved. Mater Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8	equired) (verine) 32) (Riverine) Niverine) 10) able (C2) () Aerial Imagery (C9)
Type: Depth (inches) emarks: he large rocks IYDROLOG Vetland Hydrol rimary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: ors (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir eposits (B2) (Non ts (B3) (Nonriveri I Cracks (B6)	l profile may e required; c ne) riverine) ne)	be reducing the abilition of the second seco	ty to locate redox 1) 12) bbrates (B13) ide Odor (C1) ospheres along Lir educed Iron (C4) eduction in Tilled S face (C7)	vf = very fine; - ; some small de	+ = heavy (mo epletions obse . <u>Secondary II</u>	ore clay); - = light (less rrved. Mater Marks (B1) (R i Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on	equired) (verine) 32) (Riverine) Riverine) 10) able (C2) () Aerial Imagery (C9)
Type: Depth (inches) Remarks: The large rocks ITDROLOG Vetland Hydrol Primary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir reposits (B2) (Non ts (B3) (Nonriveri l Cracks (B6) /isible on Aerial Im red Leaves (B9)	l profile may e required; c ne) riverine) ne)	be reducing the abilition of the sector of t	ty to locate redox 1) 12) bbrates (B13) ide Odor (C1) ospheres along Lir educed Iron (C4) eduction in Tilled S face (C7)	vf = very fine; - ; some small de	+ = heavy (mo epletions obse . <u>Secondary II</u>	ndicators (2 or more r water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3	equired) (verine) 32) (Riverine) Riverine) 10) able (C2) () Aerial Imagery (C9)
Type: Depth (inches) emarks: he large rocks TYDROLOG Vetland Hydrol rimary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stain	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir eposits (B2) (Non ts (B3) (Nonriveri l Cracks (B6) /isible on Aerial In ted Leaves (B9) ons:	l profile may ne required; c ne) riverine) nagery (B7)	be reducing the abilition of the sector of t	ty to locate redox 1) 12) bbrates (B13) ide Odor (C1) ospheres along Lir educed Iron (C4) eduction in Tilled S face (C7)	vf = very fine; - ; some small de	+ = heavy (mo epletions obse . <u>Secondary II</u>	ndicators (2 or more r water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3	equired) (verine) 32) (Riverine) Riverine) 10) able (C2) () Aerial Imagery (C9)
Type: Depth (inches) Remarks: The large rocks AYDROLOG Vetland Hydrol Primary Indicato Surface Wat X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stain	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverin reposits (B2) (Non- its (B3) (Nonriveri I Cracks (B6) Visible on Aerial Im- red Leaves (B9) ons: Present? Yes	l profile may le required; c ne) riverine) nagery (B7)	be reducing the abilition of the second seco	ty to locate redox 1) 12) brates (B13) ide Odor (C1) ospheres along Li educed Iron (C4) eduction in Tilled S face (C7) in Remarks) Depth (inches):	vf = very fine; - ; some small de	+ = heavy (mo epletions obse	pre clay); - = light (less srved. Mater Marks (B1) (R i Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D9	equired) iverine) 32) (Riverine) Riverine) 10) able (C2)) Aerial Imagery (C9)) 5)
Type: Depth (inches) Remarks: The large rocks TYDROLOG Vetland Hydrol Primary Indicato Surface Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stain Field Observati	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir reposits (B2) (Non ts (B3) (Nonriveri l Cracks (B6) /isible on Aerial Im red Leaves (B9) ons: Present? Yes	l profile may le required; c ne) riverine) nagery (B7) S X	be reducing the abilition in the second seco	ty to locate redox 1) 12) 20 20 20 20 20 20 20 20 20 20	vf = very fine; - ; some small de ving Roots (C3) Soils (C6)	+ = heavy (mo epletions obse	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D8	equired) iverine) 32) (Riverine) Riverine) 10) able (C2)) Aerial Imagery (C9)) 5)
Type: Depth (inches) Remarks: The large rocks ATDROLOG Vetland Hydrol Primary Indicato Surface Water X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stain Surface Water I Surface Water I Nater Table Pro	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir reposits (B2) (Non ts (B3) (Nonriveri I Cracks (B6) /isible on Aerial In ted Leaves (B9) ons: Present? Yes ent? Yes	l profile may le required; c ne) riverine) nagery (B7) S X	be reducing the abilition of the second seco	ty to locate redox 1) 12) brates (B13) ide Odor (C1) ospheres along Li educed Iron (C4) eduction in Tilled S face (C7) in Remarks) Depth (inches):	vf = very fine; - ; some small de ving Roots (C3) Soils (C6) <u>N/A</u> 9	+ = heavy (mo epletions obse	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D8	equired) iverine) 32) (Riverine) Noterine) 10) 10) able (C2)) Aerial Imagery (C9)) 5)
Type: Depth (inches) he large rocks TYDROLOG Vetland Hydrol rimary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stain ield Observati Surface Water I Surface Water I Surface Water I Saturation Pres includes capilla	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir eposits (B2) (Non ts (B3) (Nonriveri I Cracks (B6) Visible on Aerial Im red Leaves (B9) ons: Present? Yes ent? Yes ary fringe)	l profile may le required; c ne) riverine) nagery (B7) s X x X	be reducing the abilition in the second seco	ty to locate redox 1) 12) 20 brates (B13) 14e Odor (C1) 20 brates along Lifed 21 brates along Lifed 22 brates along Lifed 23 brates along Lifed 24 brates along Lifed 25 brates along Lifed 26 brates along Lifed 27 brates along Lifed 28 brates along Lifed 29 brates along Lifed 20 brat	vf = very fine; - ; some small de ving Roots (C3) Soils (C6) <u>N/A</u> 9 11	+ = heavy (mo epletions obse - <u>Secondary II</u>	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D8	equired) iverine) 32) (Riverine) Noterine) 10) 10) able (C2)) Aerial Imagery (C9)) 5)
Type: Depth (inches) emarks: he large rocks IYDROLOG /etland Hydrol rimary Indicato Surface Wa X High Water X Saturation (Water Mark Sediment D X Drift Deposi Surface Soi Inundation V Water-Stain ield Observati Surface Water I Vater Table Pro Saturation Pres includes capilla	None None N/A S = sand; Si = silt throughout the soi Y logy Indicators: rs (minimum of on ter (A1) Table (A2) A3) s (B1) (Nonriverir eposits (B2) (Non ts (B3) (Nonriveri I Cracks (B6) Visible on Aerial Im red Leaves (B9) ons: Present? Yes ent? Yes ary fringe)	l profile may le required; c ne) riverine) nagery (B7) s X x X	be reducing the abilition of the second seco	ty to locate redox 1) 12) 20 brates (B13) 14e Odor (C1) 20 brates along Lifed 21 brates along Lifed 22 brates along Lifed 23 brates along Lifed 24 brates along Lifed 25 brates along Lifed 26 brates along Lifed 27 brates along Lifed 28 brates along Lifed 29 brates along Lifed 20 brat	vf = very fine; - ; some small de ving Roots (C3) Soils (C6) <u>N/A</u> 9 11	+ = heavy (mo epletions obse - <u>Secondary II</u>	ndicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (R Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D8	equired) (verine) 32) (Riverine) tiverine) 10) able (C2) () Aerial Imagery (C9) () 5)

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/4/2017
Applicant/Owner: TUUSSO Energy, LLC			/ 144440	State: WA Sampling Point: TP11
Investigator(s): Evan Dulin, Jamie Young		Section T	ownship Rang	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Terrace				
· · · · · · · · · · · · · · · · · · ·	lataou	Lat: 17 025016	_	
Subregion (LRR): B, Columbia/Snake River P		Lat: <u>47.025016</u>	Lon	g: <u>-120.628938</u> Datum: NAD 1983
Soil Map Unit Name: Nosal ashy silt lo			Va	NWI classification: PEMC
Are climatic / hydrologic conditions on the site t	• •	•	Ye	esNoX* (If no, explain in Remarks) Are "Normal Circumstances" present? Yes X No
Are Vegetation,Soil Are Vegetation,Soil		naturally prol		If needed, explain any answers in Remarks.)
				tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No		
Hydric Soil Present?			Is the Samp	led Area
Wetland Hydrology Present?		No	within a We	11 10
		No		
Precipitation prior to fieldwork: 0.79" two w Remarks:	eeks prior, 2.32	above normal for C	YID, 2.78 abo	ove normal for WYTD. *Wetter than normal.
TW03. Sample plot located northeast of the op-	en ponded area v	where overflowing or	ccurs to feed T	W02.
	-			
VEGETATION				1
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC:(A)
2.				
3				Total Number of Dominant
4.	_			Species Across All Strata: 3 (B)
	0%	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10' r</u>)			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
2.				Prevalence Index worksheet:
3.	_			Total % Cover of: Multiply by:
4.	_			OBL species 0 x 1 = 0
5.	_			FACW species $20 \times 2 = 40$
	0%	= Total Cover		FAC species 30 x 3 = 90
Herb Stratum (Plot size: <u>5' r</u>)				FACU species 45 x 4 = 180
1. Schedonorus arundinaceus	45%	Yes	FACU	UPL species $0 \times 5 = 0$
2. Poa species	30%	Yes	FAC ?	Column Totals: 95 (A) 310 (B)
3. Phalaris arundinacea	20%	Yes	FACW	Prevalence Index = $B/A = 3.26$
4.	2078	165	TACW	Hydrophytic Vegetation Indicators:
5.				1 - Rapid Test for Hydrophytic Vegetation
6.				X 2 - Dominance Test is >50%
7				3 - Prevalence Index is $\leq 3.0^1$
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11				Problematic Hydrophytic Vegetation ¹ (Explain)
	95%	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
<u>Woody Vine Stratum</u> (Plot size: <u>10' r</u>)			be present.
2.				Hydrophytic
	0%	= Total Cover		Vegetation Yes X No
% Bare Ground in Herb Stratum 5%	070			Present?
Remarks:				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>

US Army Corps of Engineers SWCA Environmental Consultants

	Matrix	×		Redox Fe	atures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-8	2.5Y 2.5/1	100					SiCL	
8-13	2.5Y 2.5/1	93	10YR 4/2	5	D	М	SiCL	
			7.5YR 3/3	2	С	PL		
¹ Type: C=Conce	entration, D=Depleti	on, RM=Red	uced Matrix CS=	Covered or Coated	Sand Grains.	² Location: F	PL=Pore Lining, M=N	latrix.
Hydric Soil Indi	cators: (Applicable	e to all LRRs	s, unless otherw	ise noted.)		Indicators for	or Problematic Hydr	ic Soils ³ :
Histosol (A1)	-	Sandy Redox	x (S5)		1 cm muck (A	A9) (LRR C)	
Histic Epipe	don (A2)	-	Stripped Mat	rix (S6)		2 cm Muck (A	A10) (LRR B)	
Black Histic	(A3)	-	Loamy Muck	y Mineral (F1)		Reduced Ver	tic (F18)	
Hydrogen S	ulfide (A4)	-	Loamy Gleye	ed Matrix (F2)	_	Red Parent N	/laterial (TF2)	
Stratified La	yers (A5) (LRR C)		Depleted Ma	trix (F3)	_	Other (Explai	n in Remarks)	
1 cm Muck ((A9) (LRR D)		X Redox Dark	Surface (F6)				
Depleted Be	low Dark Surface (/	A11)	Depleted Da	rk Surface (F7)				
Thick Dark S	Surface (A12)	-	Redox Depre	essions (F8)	³ I	Indicators of hyd	drophytic vegetation a	and
Sandy Muck	y Mineral (S1)	-	Vernal Pools	(F9)		wetland hydrolo	ogy must be present,	
Sandy Gleye	ed Matrix (S4)					unless distrube	ed or problematic.	
Restrictive Lave	er (if present):							
Resulterve Laye								
-	None							
_	None				н	lydric Soil Pres	ent? Yes X	No
Type: Depth (inches)	None : N/A	C = clay; L =	loam or loamy; c	o = coarse; f = fine;		•		
Type: Depth (inches)	None : N/A	C = clay; L =	loam or loamy; c	o = coarse; f = fine;		•	eent? Yes X re clay); - = light (les	
Type: Depth (inches) Remarks:	None :N/A S = sand; Si = silt; (C = clay; L =	loam or loamy; c	o = coarse; f = fine;		•		
Type: Depth (inches) Remarks: HYDROLOG	None :N/A S = sand; Si = silt; (Y	C = clay; L =	loam or loamy; c	o = coarse; f = fine;		•		
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol	None N/A S = sand; Si = silt; (Y ogy Indicators:					; + = heavy (mo	re clay); - = light (les	s clay)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicato	None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one		eck all that apply)		; + = heavy (mo <u>Secondary In</u>	re clay); - = light (les dicators (2 or more r	s clay)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat	None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1)		eck all that apply Salt Crust (B) 11)		; + = heavy (mo <u>Secondary In</u>	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R	s clay) equired) iverine)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water	None : N/A S = sand; Si = silt; G Y ogy Indicators: rs (minimum of one ter (A1) Table (A2)		eck all that apply Salt Crust (B Biotic Crust () 11) B12)		; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B	s clay) equired) iverine) 32) (Riverine)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/	None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3)	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver) 11) [B12) rtebrates (B13)		; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F	s clay) equired) iverine) 32) (Riverine) Riverine)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (<i>i</i> Water Marks	None : N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su) 11) B12) rtebrates (B13) Ilfide Odor (C1)	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B	s clay) equired) iverine) 32) (Riverine) Riverine) 10)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/ Water Marks Sediment De	None None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta	s clay) equired) iverine) 32) (Riverine) Riverine) 10) able (C2)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/ Water Marks Sediment Do Drift Deposit	None None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine ts (B3) (Nonriverine	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of) 11) (B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4)	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8	s clay) <u>required)</u> iverine) 32) (Riverine) Riverine) 10) able (C2) 3)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/ Water Marks Sediment De Drift Deposit Surface Soil	None N/A S = sand; Si = silt; G Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) S (B1) (Nonriverine eposits (B2) (Nonriverine ts (B3) (Nonriverine Cracks (B6)	required; ch ;) verine) e)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on	equired) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/ Water Marks Sediment De Drift Deposit Surface Soil Inundation V	None None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine tis (B3) (Nonriverine Cracks (B6) //isible on Aerial Ima	required; ch ;) verine) e)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Su) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S urface (C7)	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) <u>equired)</u> iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9))
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/ Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Stain	None None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine ts (B3) (Nonriverine Cracks (B6) /isible on Aerial Ima ed Leaves (B9)	required; ch ;) verine) e)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Su) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on	s clay) <u>equired)</u> iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9))
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Wat High Water Saturation (/ Water Marks Sediment Do Drift Deposit Surface Soil Inundation V Water-Stain Field Observatio	None None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine ts (B3) (Nonriverine Cracks (B6) /isible on Aerial Ima ed Leaves (B9) ons:	required; ch) verine) e) agery (B7)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck St Other (Explai) 11) (B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks)	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C& Saturation Visible on Shallow Aquitard (D3	s clay) <u>equired)</u> iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9))
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Water Saturation (/ Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Stain Field Observatio	None None None None None None None None	required; ch , verine) e) agery (B7)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Si Other (Explai) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks) Depth (inches):	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C6 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D3	s clay) equired) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)) 5)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Water Saturation (/ Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Stain Field Observation Surface Water F Water Table Pre	None None None None None None NA None NA Non	required; ch verine) e) agery (B7)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck So Other (Explai) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Lin Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks) Depth (inches): Depth (inches):	vf = very fine ving Roots (C3 Soils (C6) <u>N/A</u> >13	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (CE Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D3 Hydrology Present	equired) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)) 5)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Water Saturation (/ Water Marks Sediment De Drift Deposit Surface Soil Inundation V Water-Stain Field Observatio Surface Water F Water Table Pres	None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine ts (B3) (Nonriverine Cracks (B6) /isible on Aerial Ima ed Leaves (B9) ons: Present? Yes esent? Yes ent? Yes	required; ch verine) e) agery (B7)	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Si Other (Explai) 11) B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks) Depth (inches):	vf = very fine	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B Drift Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C6 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D3	s clay) s clay) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)) 5)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Water Gaturation (/ Water Marks Sediment Do Drift Deposit Surface Soil Inundation V Water-Stain Field Observation Surface Water F Water Table Press (includes capilla	None None N/A None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriv ts (B3) (Nonriverine Cracks (B6) /isible on Aerial Ima ed Leaves (B9) ons: Present? Yes esent? Yes ent? Yes ent? Yes ry fringe)	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck St Other (Explai No X No X No X) 11) (B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks) Depth (inches): Depth (inches): Depth (inches):	vf = very fine ving Roots (C3 Soils (C6) <u>N/A</u> >13 >13	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (CE Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D3 Hydrology Present	equired) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)) 5)
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Water Gaturation (/ Water Marks Sediment Do Drift Deposit Surface Soil Inundation V Water-Stain Field Observation Surface Water F Water Table Press (includes capilla	None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine ts (B3) (Nonriverine Cracks (B6) /isible on Aerial Ima ed Leaves (B9) ons: Present? Yes esent? Yes ent? Yes	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck St Other (Explai No X No X No X) 11) (B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks) Depth (inches): Depth (inches): Depth (inches):	vf = very fine ving Roots (C3 Soils (C6) <u>N/A</u> >13 >13	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (C8 Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D9 Hydrology Present Yes X	s clay) equired) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)) 5) ? No
Type: Depth (inches) Remarks: HYDROLOG Wetland Hydrol Primary Indicator Surface Water Gaturation (/ Water Marks Sediment Do Drift Deposit Surface Soil Inundation V Water-Stain Field Observation Surface Water F Water Table Press (includes capilla	None None N/A None N/A S = sand; Si = silt; (Y ogy Indicators: rs (minimum of one ter (A1) Table (A2) A3) s (B1) (Nonriverine eposits (B2) (Nonriverine cracks (B6) /isible on Aerial Imate ed Leaves (B9) Ons: Present? Yes ent? Y	required; ch	eck all that apply Salt Crust (B Biotic Crust (X Aquatic Inver Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck St Other (Explai No X No X No X) 11) (B12) rtebrates (B13) Ilfide Odor (C1) zospheres along Liv Reduced Iron (C4) Reduction in Tilled S urface (C7) in in Remarks) Depth (inches): Depth (inches): Depth (inches):	vf = very fine ving Roots (C3 Soils (C6) <u>N/A</u> >13 >13	; + = heavy (mo	re clay); - = light (les dicators (2 or more r Water Marks (B1) (R Sediment Deposits (B3) (F Drainage Patterns (B Dry-Season Water Ta Crayfish Burrows (CE Saturation Visible on Shallow Aquitard (D3 FAC-Neutral Test (D3 Hydrology Present	s clay) equired) iverine) 32) (Riverine) Riverine) 10) able (C2) 3) Aerial Imagery (C9)) 5) ? No

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/12/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP12
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rang	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Terrace				(concave, convex, none): Convex Slope (%): 1
Subregion (LRR): B, Columbia/Snake River P	lateau	Lat: 47.020595	_	g: -120.627165 Datum: NAD 1983
0 ()		2 percent slopes (62	-	NWI classification: None
Are climatic / hydrologic conditions on the site			Ye	
	, or Hydrology	•		Are "Normal Circumstances" present? Yes X No
	, or Hydrology			If needed, explain any answers in Remarks.)
				tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No	1	
Hydric Soil Present?	Yes X	No	Is the Samp	oled Area
Vetland Hydrology Present?	Yes	No X	within a We	tland? Yes No X
	veeks prior, 2.62"	above normal for C		ove normal for WYTD. Wetter than normal.
Remarks: Sample plot located at the toe of slope for the a	·			
VEGETATION				
T O	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC:(A)
2				
3				Total Number of Dominant
4.	_			Species Across All Strata: 2 (B)
	0%	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>10' r</u>)			Percent of Dominant Species
1.				That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
2.				Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4.				OBL species 0 x 1 = 0
5.				FACW species $80 \times 2 = 160$
	0%	= Total Cover		FAC species $0 \times 3 = 0$
Herb Stratum (Plot size: <u>5' r</u>)				FACU species $20 \times 4 = 80$
1. Phalaris arundinacea	80%	Yes	FACW	UPL species $0 \times 5 = 0$
	20%	Yes	FACU	Column Totals: 100 (A) 240 (B)
 <u>Cirsium arvense</u> 3. 	2070	165	TACO	Prevalence Index = $B/A = \frac{2.40}{2.40}$
4.				Hydrophytic Vegetation Indicators:
5.				1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7				X 3 - Prevalence Index is $\leq 3.0^1$
8				4 - Morphological Adaptations ¹ (Provide supporting
9				data in Remarks or on a separate sheet)
10				5 - Wetland Non-Vascular Plants ¹
11				Problematic Hydrophytic Vegetation ¹ (Explain)
		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: <u>10' r</u>)			be present.
1				Uudranhutia
2		Tatalo		Hydrophytic
	0%	= Total Cover		Vegetation Yes <u>X</u> No
% Bare Ground in Herb Stratum 0%				Present?
Remarks:				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>

	Matrix	×		Redox F	eatures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-7	10YR 3/1	90					SiL	
	10YR 3/1	10					LS	mixed matrix
7-14	2.5Y 3/1	77	7.5YR 4/6	3	С	PL	SiL	
	10YR 4/2	20					LS	mixed matrix
¹ Type: C=Conc	centration, D=Depleti	on, RM=Red	luced Matrix CS=C	Covered or Coate	d Sand Grains.	² Location:	PL=Pore Lining, M=	Matrix.
Hydric Soil Ind	licators: (Applicable	e to all LRR	s, unless otherwi	ise noted.)		Indicators for	or Problematic Hyd	Iric Soils ³ :
Histosol (A	1)		Sandy Redox	: (S5)		1 cm muck (A9) (LRR C)	
Histic Epipe			Stripped Matr	. ,	_	2 cm Muck (A10) (LRR B)	
Black Histic	c (A3)		Loamy Mucky		_	Reduced Ve	rtic (F18)	
Hydrogen S	Sulfide (A4)		Loamy Gleye		_	Red Parent I	Material (TF2)	
	ayers (A5) (LRR C)		Depleted Mat		_		in in Remarks)	
1 cm Muck	(A9) (LRR D)		X Redox Dark S		_		,	
Depleted B	elow Dark Surface (/	•		k Surface (F7)				
Thick Dark	Surface (A12)	· ·	Redox Depres		3	Indicators of hy	drophytic vegetation	and
Sandy Muc	ky Mineral (S1)		Vernal Pools			wetland hydrol	ogy must be presen	t,
Sandy Gley	ved Matrix (S4)					unless distrube	ed or problematic.	
Bootrictivo Lov	/er (if present):							
Туре:	None							
-	s): <u>N/A</u>					lydric Soil Pre		
Type: Depth (inches Remarks:	s): <u>N/A</u> S = sand; Si = silt; (•			e; vf = very fine	; + = heavy (mo	sent? Yes X	
Type: Depth (inches Remarks:	s): <u>N/A</u>	•			e; vf = very fine	; + = heavy (mo		
Type: Depth (inches Remarks: Mixed matrix thr	s): N/A S = sand; Si = silt; (roughout loamy sand	•			e; vf = very fine	; + = heavy (mo		
Type: Depth (inches Remarks: Mixed matrix thr HYDROLOG	s): <u>N/A</u> S = sand; Si = silt; (roughout loamy sanc	•			e; vf = very fine	; + = heavy (mo		
Type: Depth (inches Remarks: Mixed matrix thr HYDROLOG Wetland Hydro	S): <u>N/A</u> S = sand; Si = silt; (roughout loamy sand SY blogy Indicators:	and silty loa	am from disturband	ce, likely during r	e; vf = very fine	; + = heavy (mo n.	ore clay); - = light (le	ss clay)
Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicate	s): <u>N/A</u> S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: brs (minimum of one	and silty loa	eck all that apply)	ce, likely during r	e; vf = very fine	; + = heavy (mo n. <u>Secondary Ir</u>	ore clay); - = light (le	ss clay)
Type: Depth (inches Remarks: Mixed matrix thr HYDROLOG Wetland Hydro Primary Indicato Surface Wa	S): <u>N/A</u> S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: brs (minimum of one ater (A1)	and silty loa	eck all that apply)	ce, likely during r	e; vf = very fine	; + = heavy (mo n. <u>Secondary Ir</u>	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (F	ss clay) <u>required)</u> Riverine)
Type: Depth (inches Remarks: Mixed matrix thr HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water	S): N/A S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: brs (minimum of one ater (A1) r Table (A2)	and silty loa	eck all that apply) Salt Crust (B1 Biotic Crust (B	ce, likely during ro	e; vf = very fine	; + = heavy (mo n. <u>Secondary Ir</u>	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits	ss clay) required) Riverine) (B2) (Riverine)
Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation	s): <u>N/A</u> S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3)	l and silty loa	eck all that apply) Salt Crust (B1 Biotic Crust (B Aquatic Invert	ce, likely during ro 11) B12) tebrates (B13)	e; vf = very fine	; + = heavy (mo n. <u>Secondary Ir</u>	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (ss clay) <u>required)</u> Riverine) (B2) (Riverine) Riverine)
Type: Depth (inchess Remarks: Mixed matrix the Mixed matrix the Mixed matrix the Mixed matrix the Surface Wa High Water Saturation of Water Mark	S): N/A S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: brs (minimum of one ater (A1) r Table (A2) (A3) (Ks (B1) (Nonriverine)	t and silty loa required; ch	eck all that apply) Salt Crust (B1 Biotic Crust (E Aquatic Invert Hydrogen Sul	ce, likely during ro 11) B12) tebrates (B13) Ifide Odor (C1)	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (ss clay) required) Riverine) (B2) (Riverine) Riverine) B10)
Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D	S): N/A S = sand; Si = silt; (roughout loamy sand C SY Diogy Indicators: Drs (minimum of one ater (A1) r Table (A2) (A3) Ks (B1) (Nonriverine Deposits (B2) (Nonri	I and silty loa required; ch	eck all that apply) Salt Crust (B1 Biotic Crust (B Aquatic Invert Hydrogen Sul Oxidized Rhiz	ce, likely during ro 11) B12) tebrates (B13) Ifide Odor (C1) zospheres along L	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2)
Type: Depth (inchess Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos	S): N/A S = sand; Si = silt; (roughout loamy sand) SY Ology Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (A3) (A3) (B1) (Nonriverine Deposits (B2) (Nonriverine other (B3))	I and silty loa required; ch	eck all that apply) Salt Crust (B1 Biotic Crust (B Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F	ce, likely during ro 11) B12) Ifide Odor (C1) zospheres along L Reduced Iron (C4	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (F Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C	ss clay) required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8)
Type: Depth (inchess Remarks: Mixed matrix the Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation of Water Mark Sediment D Drift Depos Surface So	S): N/A S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: brs (minimum of one ater (A1) r Table (A2) (A3) (A3) (A3) (A3) (Ss (B1) (Nonriverine bits (B3) (Nonriverine bits (B3) (Nonriverine bits (B6))	l and silty loa required; ch) verine) e)	eck all that apply) Salt Crust (B1 Biotic Crust (B1 Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R	ce, likely during ro 11) B12) Ifide Odor (C1) zospheres along L Reduced Iron (C4 Reduction in Tilled	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible o	ss clay) required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9)
Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation	N/A S = sand; Si = silt; Groughout loamy sand oroughout loamy sand SY ology Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (Ks (B1) (Nonriverine Deposits (B2) (Nonri sits (B3) (Nonriverine il Cracks (B6) Visible on Aerial Ima	l and silty loa required; ch) verine) e)	eck all that apply) Salt Crust (B1 Biotic Crust (B1 Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su	ce, likely during ro 11) B12) Ifide Odor (C1) zospheres along L Reduced Iron (C4 Reduction in Tilled urface (C7)	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9) 3)
Type: Depth (inchess Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation of Water Mark Sediment D Drift Depos Surface So Inundation Water-Stair	S): N/A S = sand; Si = silt; (roughout loamy sand SY blogy Indicators: brs (minimum of one ater (A1) r Table (A2) (A3) (A3) (A3) (Ks (B1) (Nonriverine beposits (B2) (Nonriverine bits (B3) (Nonriverine bits (B3) (Nonriverine bits (B6) Visible on Aerial Ima ned Leaves (B9)	l and silty loa required; ch) verine) e)	eck all that apply) Salt Crust (B1 Biotic Crust (B1 Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su	ce, likely during ro 11) B12) Ifide Odor (C1) zospheres along L Reduced Iron (C4 Reduction in Tilled	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible o	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9) 3)
Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stair Field Observat	S): N/A S = sand; Si = silt; (roughout loamy sand CY Dogy Indicators: Drs (minimum of one ater (A1) r Table (A2) (A3) (A3) (A3) (A3) (A3) (A3) (A3) (A3	l and silty loa required; ch) verine) e)	eck all that apply) Salt Crust (B1 Biotic Crust (B1 Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su	ce, likely during ro 11) B12) Ifide Odor (C1) zospheres along L Reduced Iron (C4 Reduction in Tilled urface (C7)	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9) 3)
Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stain	S): N/A S = sand; Si = silt; G roughout loamy sand SY blogy Indicators: brs (minimum of one ater (A1) r Table (A2) (A3) r Table (A2) (A3) r Table (B2) (Nonriverine bits (B3) (Nonriverine bits (B3) (Nonriverine bits (B3) (Nonriverine bits (B4) Visible on Aerial Ima ned Leaves (B9) tions: Present? Yes	l and silty loa required; ch) verine) e)	am from disturband eck all that apply) Salt Crust (B1 Biotic Crust (B Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Other (Explain No X	ce, likely during ro 11) B12) Ifide Odor (C1) zospheres along L Reduced Iron (C4 Reduction in Tilled urface (C7)	e; vf = very fine bad construction	; + = heavy (mo n. <u>Secondary Ir</u> 	ore clay); - = light (le ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9) 3)
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Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Wa High Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stain Field Observat Surface Water Saturation Pres (includes capill	N/A S = sand; Si = silt; Groughout loamy sand SY Slogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (Ka) (A3) (Ka) (B1) (Nonriverine Sits (B3) (Nonriverine il Cracks (B6) Visible on Aerial Ima ned Leaves (B9) tions: Present? Yes resent? Yes ary fringe)	and silty loa required; ch verine) e) agery (B7)	eck all that apply) Salt Crust (B1 Biotic Crust (B1 Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Other (Explain No X No X No X	ce, likely during re 11) B12) tebrates (B13) Ifide Odor (C1) cospheres along L Reduced Iron (C4 Reduction in Tilled urface (C7) n in Remarks) Depth (inches): Depth (inches):	e; vf = very fine bad construction d construction (C3) Soils (C6) N/A >14 >14 >14	3)	ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D FAC-Neutral Test (C	required) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) :8) n Aerial Imagery (C9) 3) 05)
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Type: Depth (inches Remarks: Mixed matrix the HYDROLOG Wetland Hydro Primary Indicato Surface Water Saturation Water Mark Sediment D Drift Depos Surface So Inundation Water-Stain Field Observat Surface Water Saturation Pres (includes capill	N/A S = sand; Si = silt; Groughout loamy sand SY Slogy Indicators: ors (minimum of one ater (A1) r Table (A2) (A3) (Ka) (A3) (Ka) (B1) (Nonriverine Sits (B3) (Nonriverine il Cracks (B6) Visible on Aerial Ima ned Leaves (B9) tions: Present? Yes resent? Yes ary fringe)	and silty loa required; ch verine) e) agery (B7)	eck all that apply) Salt Crust (B1 Biotic Crust (B1 Aquatic Invert Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Other (Explain No X No X No X	ce, likely during re 11) B12) tebrates (B13) Ifide Odor (C1) cospheres along L Reduced Iron (C4 Reduction in Tilled urface (C7) n in Remarks) Depth (inches): Depth (inches):	e; vf = very fine bad construction d construction (C3) Soils (C6) N/A >14 >14 >14	3)	ndicators (2 or more Water Marks (B1) (f Sediment Deposits Drift Deposits (B3) (Drainage Patterns (Dry-Season Water ⁻ Crayfish Burrows (C Saturation Visible of Shallow Aquitard (D FAC-Neutral Test (C	required) ss clay) Riverine) (B2) (Riverine) Riverine) B10) Fable (C2) (Riverine) B10) Fable (C2) (Riverine) B10) Fable (C2) (Riverine) B10) Fable (C2) (Riverine) B10) Fable (C2) (Riverine) (C9) (C9) (C9) (C9) (C9) (C9) (C9) (C9

Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/12/2017
Applicant/Owner: TUUSSO Energy, LLC				State: WA Sampling Point: TP13
Investigator(s): Evan Dulin, Jamie Young		Section, T	ownship, Rang	e: Section 30, T18N, R18E
Landform (hillslope, terrace, etc.): Terrace			Local relief	(concave, convex, none): Concave Slope (%): 0
Subregion (LRR): B, Columbia/Snake River Pla	teau	Lat: 47.020253	_ Lon	g: -120.627497 Datum: NAD 1983
Soil Map Unit Name: Mitta ashy silt Ioan			-	NWI classification: None
Are climatic / hydrologic conditions on the site ty			Ye	
	, or Hydrology	significantly	disturbed?	Are "Normal Circumstances" present? Yes X No
	, or Hydrology	naturally prol	olematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach s	ite map show	wing sampling	point locat	tions, transects, important features, etc.
Hydrophytic Vegetation Present?	Yes X	No		
Hydric Soil Present?	Yes	No X	Is the Samp	oled Area
Wetland Hydrology Present?	Yes X	No	within a We	tland? Yes No X
Precipitation prior to fieldwork: 0.61" two we Remarks: Determined not to be a wetland based on lack of		above normal for C	YTD, 3.08" abo	ove normal for WYTD. Wetter than normal.
VEGETATION				
	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' r</u>)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1				That Are OBL, FACW, or FAC:(A)
2				
3				Total Number of Dominant
4.				Species Across All Strata: 1 (B)
		= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>10' r</u>	_)			Percent of Dominant Species
1				That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2				Prevalence Index worksheet:
3.				Total % Cover of: Multiply by:
4.				OBL species 10 x 1 = 10
5.				FACW species 90 x 2 = 180
	0%	= Total Cover		FAC species 0 x 3 = 0
Herb Stratum (Plot size: <u>5' r</u>)				FACU species 0 x 4 = 0
1. Phalaris arundinacea	85%	Yes	FACW	UPL species $0 \times 5 = 0$
2. Typha latifolia	10%	No	OBL	Column Totals: 100 (A) 190 (B)
3. Juncus balticus	5%	No	FACW	Prevalence Index = $B/A = 1.90$
4.				Hydrophytic Vegetation Indicators:
5.				1 - Rapid Test for Hydrophytic Vegetation
6.				X 2 - Dominance Test is >50%
7.				3 - Prevalence Index is ≤3.0 ¹
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				5 - Wetland Non-Vascular Plants ¹
11.				Problematic Hydrophytic Vegetation ¹ (Explain)
	100%	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: <u>10' r</u>				be present.
 1				
2.				Hydrophytic
	0%	= Total Cover		Vegetation Yes X No
% Bare Ground in Herb Stratum 0%				Present?
Remarks:				Entered by: <u>KL/ED</u> QC by: <u>TJD</u>

Depth	Matrix		Redox Fe	atures			
(inches) (Color (moist) %	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-5	10YR 2/1 100						
5-14	2.5Y 3/1 100						
¹ Type: C=Concentra	ation, D=Depletion, RM=R	educed Matrix CS=Cove	ered or Coated	Sand Grains	² Location: P	L=Pore Lining, M=Ma	atrix.
	ors: (Applicable to all LR					r Problematic Hydrid	
Histosol (A1)		Sandy Redox (S5	5)		1 cm muck (A	9) (LRR C)	
Histic Epipedon	(A2)	Stripped Matrix (S	,	-	2 cm Muck (A		
Black Histic (A3		Loamy Mucky Mir		-	Reduced Vert		
Hydrogen Sulfic	,	Loamy Gleyed Ma		-	Red Parent M	()	
Stratified Layers		Depleted Matrix (-	Other (Explain		
1 cm Muck (A9)		Redox Dark Surfa		-		i in Romanio)	
	Dark Surface (A11)	Depleted Dark Su	· · /				
Thick Dark Surf		Redox Depressio			³ Indicators of hvd	rophytic vegetation ar	nd
Sandy Mucky M		Vernal Pools (F9)			-	gy must be present,	
Sandy Gleyed N)		-	d or problematic.	
Restrictive Layer (i Type: Nor							
Depth (inches):	N/A				Hydric Soil Pres	ent? Yes	No X
 Remarks: S =	sand: Si = silt: C = clav: L	= loam or loamy: co = c					
rtomanto. o	cana, or one, o oray, E		coarse t = tine	· vf = verv fin	e: + = heavy (mor	e clav): - = light (less	clay)
		found of foundy, oo	coarse; t = tine	; vf = very fin	e; + = heavy (mor	e clay); - = light (less	clay)
		ioan or ioaniy, oo	coarse; t = tine	; vf = very fin	e; + = heavy (mor	e clay); - = light (less	clay)
			coarse; f = fine	; vf = very fin	e; + = heavy (mor	e clay); - = light (less	clay)
Wetland Hydrology			coarse; t = tine	; vf = very fin			
Wetland Hydrology	/ Indicators: minimum of one required; of	check all that apply)	coarse; t = tine	; vf = very fin		e clay); - = light (less dicators (2 or more re	
Wetland Hydrology	minimum of one required; o		coarse; t = tine	; vf = very fin	<u>Secondary In</u>		quired)
Wetland Hydrology Primary Indicators (i	minimum of one required; ((A1)	check all that apply)		; vf = very fin	Secondary Inc V	licators (2 or more re	quired) verine)
Wetland Hydrology Primary Indicators (r Surface Water (minimum of one required; ((A1)	check all that apply))	; vf = very fin	<u>Secondary Ind</u> V	dicators (2 or more re Vater Marks (B1) (Riv	<u>quired)</u> verine) 2) (Riverine)
Wetland Hydrology Primary Indicators (in Surface Water (in Surface Water for the surface	minimum of one required; ((A1)	check all that apply) Salt Crust (B11) Biotic Crust (B12)) ates (B13)	; vf = very fin	<u>Secondary Ind</u> V V S	<u>dicators (2 or more re</u> Vater Marks (B1) (Riv iediment Deposits (B2	<u>quired)</u> verine) 2) (Riverine) verine)
Wetland Hydrology Primary Indicators (r Surface Water (r X High Water Tab X Saturation (A3) Water Marks (B	minimum of one required; ((A1) ole (A2)	check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra) ates (B13) : Odor (C1)		<u>Secondary In</u> V S C	dicators (2 or more re Vater Marks (B1) (Riv rediment Deposits (B3 prift Deposits (B3) (Ri	<u>quired)</u> verine) 2) (Riverine) verine) 0)
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Wetland Hydrology Primary Indicators (I Surface Water (I X High Water Tab X Saturation (A3) Water Marks (B Sediment Depo	minimum of one required; ((A1) ole (A2) (A) (Nonriverine) sits (B2) (Nonriverine) (33) (Nonriverine)	check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizosp) ates (B13) Odor (C1) oheres along L uced Iron (C4)	iving Roots (C	<u>Secondary Ind</u> V S C C3)C	dicators (2 or more re Vater Marks (B1) (Riv iediment Deposits (B3) Prift Deposits (B3) (Ri Prainage Patterns (B1 Pry-Season Water Tal	<u>quired)</u> verine) 2) (Riverine) verine) 0) ble (C2)
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Wetland Hydrology Primary Indicators (I Surface Water (I X High Water Tab X Saturation (A3) Water Marks (B Sediment Depo Drift Deposits (I Surface Soil Crassing	minimum of one required; ((A1) ole (A2) (1) (Nonriverine) sits (B2) (Nonriverine) 33) (Nonriverine) acks (B6) ole on Aerial Imagery (B7)	check all that apply) Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizosp Presence of Redu Recent Iron Redu) ates (B13) Odor (C1) oheres along L uced Iron (C4) uction in Tilled ce (C7)	iving Roots (C	<u>Secondary Ind</u> V C C C C C S	dicators (2 or more re Vater Marks (B1) (Riv Sediment Deposits (B3) Orift Deposits (B3) (Ri Orainage Patterns (B1 Ory-Season Water Tal Crayfish Burrows (C8) Staturation Visible on A	<u>quired)</u> verine) 2) (Riverine) verine) 0) ble (C2) Aerial Imagery (C9)
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Wetland Hydrology Primary Indicators (I Surface Water (I X High Water Tab X Saturation (A3) Water Marks (B Sediment Depo Drift Deposits (I Surface Soil Cra Inundation Visit Water-Stained I Field Observations Surface Water Pres	(A1) (A1) (A2) (I) (Nonriverine) sits (B2) (Nonriverine) 33) (Nonriverine) acks (B6) ole on Aerial Imagery (B7) Leaves (B9) :: sent? Yes	<u>check all that apply)</u> Salt Crust (B11) Biotic Crust (B12) Aquatic Invertebra Hydrogen Sulfide Oxidized Rhizosp Presence of Redu Recent Iron Redu Thin Muck Surfac Other (Explain in) ates (B13) Odor (C1) oheres along L uced Iron (C4) uction in Tilled ce (C7) Remarks) epth (inches):	iving Roots (C Soils (C6)	<u>Secondary Ind</u> V C C C C C S F	dicators (2 or more re Vater Marks (B1) (Riv rediment Deposits (B3) Prift Deposits (B3) (Ri Prainage Patterns (B1 Pry-Season Water Tal Crayfish Burrows (C8) raturation Visible on A challow Aquitard (D3) AC-Neutral Test (D5)	<u>quired)</u> verine) 2) (Riverine) verine) 0) ble (C2) Aerial Imagery (C9)
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Wetland Hydrology Primary Indicators (I Surface Water (I X High Water Tab X Saturation (A3) Water Marks (B Sediment Depo Drift Deposits (I Surface Soil Cra Inundation Visit Water-Stained I Field Observations Surface Water Pres	(A1) (A1) (A2) (A) (Nonriverine) sits (B2) (Nonriverine) 33) (Nonriverine) acks (B6) ble on Aerial Imagery (B7) Leaves (B9) :: sent? Yes A ? Yes X ? Yes X	check all that apply)) ates (B13) Odor (C1) oheres along L uced Iron (C4) uction in Tilled ce (C7) Remarks) epth (inches):	iving Roots (0 Soils (C6) <u>N/A</u> 12	<u>Secondary Ind</u> V C C C C C S F	dicators (2 or more re Vater Marks (B1) (Riv rediment Deposits (B3) Prift Deposits (B3) (Ri Prainage Patterns (B1 Pry-Season Water Tal Crayfish Burrows (C8) raturation Visible on A challow Aquitard (D3) AC-Neutral Test (D5)	<u>quired)</u> verine) 2) (Riverine) verine) 0) ble (C2) Aerial Imagery (C9)
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Wetland Hydrology Primary Indicators (in Surface Water (in Surface Water Table Sediment Depo X High Water Table Sediment Depo Drift Deposits (in Surface Soil Crassing Construction Visite Water-Stained In Surface Soil Crassing Construction Surface Water Pressing Surface Water Pressing Saturation Present Prese	(A1) (A1) (A2) (A2) (I) (Nonriverine) sits (B2) (Nonriverine) B3) (Nonriverine) acks (B6) ble on Aerial Imagery (B7) Leaves (B9) :: sent? Yes nt? Yes ? Yes ringe)	check all that apply)) ates (B13) c Odor (C1) oheres along L uced Iron (C4) uction in Tilled ce (C7) Remarks) epth (inches): epth (inches):	iving Roots (C Soils (C6) <u>N/A</u> 12 to surface	<u>Secondary Ind</u> V C C C C C C S F Wetland	dicators (2 or more re Vater Marks (B1) (Riv Sediment Deposits (B3) Orift Deposits (B3) (Ri Orainage Patterns (B1 Ory-Season Water Tal Crayfish Burrows (C8) Saturation Visible on <i>A</i> Shallow Aquitard (D3) AC-Neutral Test (D5) Hydrology Present?	<u>quired)</u> verine) 2) (Riverine) verine) 0) ble (C2) Aerial Imagery (C9) No

Applicativones: TUUSS0 Energy, LLC State: WA Sampling Point: TP14 Investigator(s): Evan Dulin, Jame Young Section, Township, Range: Section 30, 718N, R18E Sampling Point: TP14 Investigator(s): Evan Dulin, Jame Young Local relief (concave, conse): Concave Stope (%): 0 Jubresjon (LRR): B, CalumbalSmake River Piterau Lat: 47.020219 Long: 120.627443 Datum: NAD 1983 Ve deptation Soll or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No Ve deptation Soll or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrologic condition Fresent? Yes X No within a Methand? We "Normal Circumstances" present? Yes X No	Project/Site: Typha Solar Project		City/County:	- / Kittitas	Sampling Date: 4/12/2017
andform (linkings, termso, etc): Terrace Local relief (concess, convex, mms): Stope (%): 0 Bubregion (LRR): B, Columbia/Snake River Plateau Lat: 47.02019 Long: 120.62743 Datum: NAD 1883 Bubregion (LRR): B, Columbia/Snake River Plateau Lat: 47.02019 Long: 120.62743 Note: Datum: NAD 1883 We distantic / hydrologic conditions on the site byoal for this time of year? Yes No X: X: <td>Applicant/Owner: TUUSSO Energy, LLC</td> <td></td> <td></td> <td></td> <td></td>	Applicant/Owner: TUUSSO Energy, LLC				
andform (linkings, termso, etc): Terrace Local relief (concess, convex, mms): Stope (%): 0 Bubregion (LRR): B, Columbia/Snake River Plateau Lat: 47.02019 Long: 120.62743 Datum: NAD 1883 Bubregion (LRR): B, Columbia/Snake River Plateau Lat: 47.02019 Long: 120.62743 Note: Datum: NAD 1883 We distantic / hydrologic conditions on the site byoal for this time of year? Yes No X: X: <td></td> <td></td> <td>Section, T</td> <td>ownship, Rang</td> <td></td>			Section, T	ownship, Rang	
Subsequent (LRR): B. Columbia/Snake River Plateau Lat: 47.020219 Long: 120.627443 Datum: NADD 1883 Solid Mip Unit Name: Mitta anty alli taum, ficoded, 0 to 2 percent slopes (C21) NVVI classificator: Nome NVVI classificator: Nome Ver Vegetation Solid _or Hydrology significantly disturbed? Yes No					
Sold Map Luin Name Mitta ashy sill loam, flooded, 0 to 2 percent steps (621) NV		lateau	Lat: 47.020219	_	
Vec No Yes No No Vev Vegetation				-	·
vev Vegetation Soil or Hydrology ignificantly distured? Are "Normal Circurstances" present? Yes X No vev Vegetation Soil or Hydrology instrantly problemate? (if needed, explain any answers in Remarks.) SUMMARY OF FINDINGS – Attach site maps showing sampling point locations, transects, important features, etc. Hydrophylic Vegetation Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Is the Sampled Area within a Wetland? Yes X No Is the Sampled Area within a Wetland? Yes X No Yes X No Is the Sampled Area within a Wetland? Yes X No Yes X No Yes X No Yes X No Yes X Yes X Yes X No Yes X Yes	· · · · · · · · · · · · · · · · · · ·			,	
ver Vegetation			•		
Hydrophytic Vegetation Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Wetland Hydrophytic Vegetation prior to fieldwork: 0.61° two weeks prior, 2.62° above normal for CYTD, 3.08° above normal for WYTD. Wetter than normal. No					
Hydrophytic Vegetation Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Wetland Hydrophytic Vegetation prior to fieldwork: 0.61° two weeks prior, 2.62° above normal for CYTD, 3.08° above normal for WYTD. Wetter than normal. No	SUMMARY OF FINDINGS - Attach	site map sho	wing sampling	point locat	ions, transects, important features, etc.
Hydric Soil Present? Yes X No Is the Sampled Area within a Wetland? Yes X No Wetland Hydrology Present? 0.61* two weeks prior, 2.62* above normal for WYTD. Wetter than normal. No					
Wetland Hydrology Present? Yes X No within a Wetland? Yes X No Precipitation prior to fieldwork: 0.61° two weeks prior, 2.62° above normal for CYTD, 3.08° above normal for WYTD. Wetter than normal. W055. Wetland fed by overbank flooding of EP Canal via a culvert under the access road seperating the wetland from the canal. Indicator Dominance Test worksheet: WEGETATION Absolute Dominant Indicator Number of Dominant Species Teste Status Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A) .		Yes X	No	Is the Samp	led Area
Precipitation prior to fieldwork: 0.61" two weeks prior, 2.62" above normal for CYTD, 3.08" above normal for WYTD. Wetter than normal. Vertice that field by overbank flooding of EP Canal via a culvert under the access road seperating the wetland from the canal. VEGETATION Tree Stratum (Plot size: _30' r.) Absolute Dominant y Cover Section 2 Status Number of Dominant Species That Are OBL, FACW, or FAC: _2 (A) Total Number of Dominant Species That Are OBL, FACW, or FAC: _2 (A) Section 2 0% Section 2 0% Section 2 0% Total Number of Dominant Species That Are OBL, FACW, or FAC: _100% (A) Section 2 0% Section 2 0% Section 2 100% (A) Section 2 100 Section 2 100 Section 2 100% (A) Section 2 100% (A) Section 2 <td< td=""><td></td><td>Yes X</td><td>No</td><td>within a We</td><td>tland? Yes X No</td></td<>		Yes X	No	within a We	tland? Yes X No
Semarks: W05. Wetland fed by overbank flooding of EP Canal via a culvert under the access road seperating the wetland from the canal. / //////////////////////////////////		veeks prior, 2.62"	above normal for C	YTD, 3.08" abo	ove normal for WYTD. Wetter than normal.
VEGETATION Iree Stratum (Plot size:30'r) Absolute Dominant Indicator Status Number of Dominant Species Image: Stratum Image: Stratum Image: Stratum Total Number of Dominant Species 2 (A) Image: Stratum <	Remarks:				
Absolute Dominant Indicator <u>% Cover</u> <u>Species?</u> <u>Status</u> <u>% Cover</u> <u>Multiply br</u> <u>Cover</u> <u>10%</u> = Total Cover <u>Percent of Dominant Species</u> <u>10%</u> = Total Cover <u>Percent of Dominant Species</u> <u>10%</u> = Total Cover <u>Prevalence Index worksheet:</u> Total % Cover of: <u>Multiply br</u> <u>100%</u> = Total Cover <u>FACW species 50 x 1 = 50</u> <u>1000</u> <u>50%</u> <u>Yes</u> <u>FACW species 0 x 3 = 0</u> <u>1000 klairis arundinacea</u> <u>55%</u> <u>Yes</u> <u>FACW species 0 x 4 = 0</u> <u>1000 klairis arundinacea</u> <u>5%</u> <u>Yes</u> <u>FACW Species 0 x 4 = 0</u> <u>1000 klairis arundinacea</u> <u>5%</u> <u>Yes</u> <u>FACW Species 10 x 5 = 0</u> <u>11. arundinace 5%</u> <u>150</u> <u>Yes 50%</u> <u>1</u>	TW05. Wetland fed by overbank flooding of EF	P Canal via a culve	ert under the access	s road seperati	ng the wetland from the canal.
Absolute Dominant Indicator <u>% Cover</u> <u>Species?</u> <u>Status</u> <u>% Cover</u> <u>Multiply br</u> <u>Cover</u> <u>10%</u> = Total Cover <u>Percent of Dominant Species</u> <u>10%</u> = Total Cover <u>Percent of Dominant Species</u> <u>10%</u> = Total Cover <u>Prevalence Index worksheet:</u> Total % Cover of: <u>Multiply br</u> <u>100%</u> = Total Cover <u>FACW species 50 x 1 = 50</u> <u>1000</u> <u>50%</u> <u>Yes</u> <u>FACW species 0 x 3 = 0</u> <u>1000 klairis arundinacea</u> <u>55%</u> <u>Yes</u> <u>FACW species 0 x 4 = 0</u> <u>1000 klairis arundinacea</u> <u>5%</u> <u>Yes</u> <u>FACW Species 0 x 4 = 0</u> <u>1000 klairis arundinacea</u> <u>5%</u> <u>Yes</u> <u>FACW Species 10 x 5 = 0</u> <u>11. arundinace 5%</u> <u>150</u> <u>Yes 50%</u> <u>1</u>	VEGETATION				
Tree Stratum (Plot size: _ 30' r _) % Cover Species? Status Number of Dominant Species 1		Absolute	Dominant	Indicator	Dominance Test worksheet:
Image: second constraint of the second	Tree Stratum (Plot size: 30' r)				
A Interview Office Interview Off	1.	<u>/// 00/01</u>		otatus	
3.	2.				That Are OBL, FACW, of FAC. 2 (A)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	3.				Tabl New here of Damin and
0% = Total Cover 1 Typha latifolia 0% Yes 0% Yes 0% Yes 0% Yes 0% Yes 0% No FACW Prevalence Index = B/A = 0 100 (A) 10 100 (A) 10 X 2 Dominance Test is >50% 1 Rapid Test for Hydrophytic Vegetation Indicators: <t< td=""><td>4.</td><td></td><td></td><td></td><td></td></t<>	4.				
Sapling/Shrub Stratum (Plot size: 10'r) Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B) Prevalence Index worksheet: Total % Cover of: Mail Species 50 x 1 = 50 Sapling/Shrub Stratum 0% = Total Cover FACW species 50 x 2 = Prevalence Index worksheet: Total % Cover of: Multiply by: Mail Species 50 x 1 = 50 FACW species 0 x 3 = 0 FACU species 0 x 4 = 0 UPL species 0 x 5 = 0 Prevalence Index = B/A = 1.50 Hydrophytic Vegetation Indicators: 1.50 Mail Species 1.50 Mail Species 5% No FACW Prevalence Index = B/A = 1.50 Hydrophytic Vegetation Indicators: 1.50 Species 5% No FACW Prevalence Index is 3.0 ¹ Aurous balticus 5% Mail Species 50% Mail Species 50% Mail Species 50% Species 50% <td>···</td> <td></td> <td>T / 10</td> <td></td> <td>Species Across All Strata:(B)</td>	···		T / 10		Species Across All Strata:(B)
Image: Second of communication operators Image: Second of Communication operators Image: Second of Communication operators Image: Second operator of the second operators Image: Second operator operators Image: Second operators Image:	Sanling/Shruh Stratum (Plot size: 10')		= Total Cover		
A. Image: Action of the stratum Prevalence index worksheet: B. Image: Action of the stratum Prevalence index worksheet: B. Image: Action of the stratum Image: Action of the stratum Column of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum Image: Action of the stratum <t< td=""><td></td><td>)</td><td></td><td></td><td></td></t<>)			
3. Image: Constraint of the expension of the					
A.					
5.	3. 				
0% tratum $0%$ = Total Cover FAC species 0 x 3 = 0 x 4 = 1 1 $50%$ Phalaris arundinacea $50%$ Yes Yes 	4				
Herb Stratum(Plot size: $5'r$)FACU species $0 \times 4 = 0$ 1Typha latifolia50%YesOBL2Phalaris arundinacea45%YesFACW3.Juncus balticus5%NoFACW4.5%NoFACW4.11505.1Rapid Test for Hydrophytic Vegetation6.116.117.118.119.1100%10.1100%11.100%110.100%110.100%110.100%110.100%110.100%111.100%111.100%111.100%111.1111.1111.1111.1111.1111.1111.1111.1111.1111.1111.1111.1111.1111.1112.1113.114.1115.116.117.118.119.110.1 <td< td=""><td>5</td><td></td><td></td><td></td><td>FACW species <u>50</u> x 2 = <u>100</u></td></td<>	5				FACW species <u>50</u> x 2 = <u>100</u>
Typha latifolia 50% Yes OBL UPL species 0 x 5 = 0 2. Phalaris arundinacea 45% Yes FACW Column Totals: 100 (A) 150 (B) 3. Juncus balticus 5% No FACW Prevalence Index = B/A = 1.50 4.		0%	= Total Cover		
2. Phalaris arundinacea 45% Yes FACW Column Totals: 100 (A) 150 (B) 3. Juncus balticus 5% No FACW Prevalence Index = B/A = 1.50 4. Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 1 - Rapid Test for Hydrophytic Vegetation 5. 5. 6. 7. 8. 9. 10. 11. 100% = Total Cover Hydrophytic 11.	<u>Herb Stratum</u> (Plot size: <u>5' r</u>)				FACU species 0 x 4 = 0
3. Juncus balticus 5% No FACW Prevalence Index = B/A = 1.50 4. Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 5. X 2 - Dominance Test is >50% 7. X 2 - Dominance Test is >50% 8. X 2 - Dominance Test is >50% 9. X 2 - Dominance Test is >50% 10. X 2 - Dominance Index is ≤3.0 ¹ 11. Yervalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 10. Yervalence Index is ≤1. 5 - Wetland Non-Vascular Plants ¹ 11. Problematic Hydrophytic Vegetation ¹ (Explain) 11. 100% = Total Cover 11. Hydrophytic 12. Hydrophytic	1. Typha latifolia	50%	Yes	OBL	UPL species 0 x 5 = 0
Image: Street of the stream	2. Phalaris arundinacea	45%	Yes	FACW	Column Totals: <u>100</u> (A) <u>150</u> (B)
5. 1 - Rapid Test for Hydrophytic Vegetation 5. X 2 - Dominance Test is >50% 7. 3 - Prevalence Index is <3.01	3. Juncus balticus	5%	No	FACW	Prevalence Index = $B/A = 1.50$
S. X 2 - Dominance Test is >50% S. 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5. 5 - Wetland Non-Vascular Plants ¹ 10. 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) 11. Problematic Hydrophytic Vegetation ¹ (Explain) 100% = Total Cover Woody Vine Stratum (Plot size: 10' r) 1. Hydrophytic	4.				Hydrophytic Vegetation Indicators:
7. 3 - Prevalence Index is ≤3.0 ¹ 3. 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 9. 5 - Wetland Non-Vascular Plants ¹ 10. Problematic Hydrophytic Vegetation ¹ (Explain) 11. 100% Woody Vine Stratum (Plot size: 10' r)) 1. Hydrophytic 2. Hydrophytic	5.				1 - Rapid Test for Hydrophytic Vegetation
B. 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) B. 5 - Wetland Non-Vascular Plants ¹ IO. 5 - Wetland Non-Vascular Plants ¹ II. Problematic Hydrophytic Vegetation ¹ (Explain) Moody Vine Stratum 100% I. Image: Stratum	6.				X 2 - Dominance Test is >50%
D. data in Remarks or on a separate sheet) 10. 5 - Wetland Non-Vascular Plants ¹ 11. Problematic Hydrophytic Vegetation ¹ (Explain) 10. 100% 10. 100% 2. 100% Hydrophytic 100% 4. Hydrophytic 2. Hydrophytic	7.				3 - Prevalence Index is ≤3.0 ¹
D. data in Remarks or on a separate sheet) 10. 5 - Wetland Non-Vascular Plants ¹ 11. Problematic Hydrophytic Vegetation ¹ (Explain) 10. 100% 10. 100% 2. 100% Hydrophytic 100% 4. Hydrophytic 2. Hydrophytic	8.				4 - Morphological Adaptations ¹ (Provide supporting
10. 5 - Wetland Non-Vascular Plants ¹ 11. Problematic Hydrophytic Vegetation ¹ (Explain) 100% = Total Cover 100% = Total Cover 1 Indicators of hydric soil and wetland hydrology must be present. 1 Hydrophytic	9.				
11.	10.				
100% = Total Cover 1Indicators of hydric soil and wetland hydrology must be present. 1	11.				
Woody Vine Stratum (Plot size: 10' r) be present. I.		100%	- Total Cover		
Image: Section of the sectio	Woody Vine Stratum (Plot size: <u>10' r</u>				
2. Hydrophytic	1.				
0% - Total Covor	2.				Hydrophytic
		0%	= Total Cover		Vegetation Yes X No
% Bare Ground in Herb Stratum 0% Present?	% Bare Ground in Herb Stratum 0%				Present?
Remarks: Entered by: KL/ED_QC by: TJD	Remarks:				Entered by: KL/ED QC by: TJD

Depth	Matri	х		Redox Fe	eatures			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-3	2.5Y 2.5/1	100					Mucky Mineral	
3-5	N 2.5/0	100					Mucky Mineral	Gleyed
5-15	2.5Y 3/1	98	2.5Y 5/2	2	D	М	SiL	
¹ Type: C=Conc	entration, D=Deplet	ion, RM=Red	luced Matrix CS=Cov	vered or Coated	Sand Grains.	² Location: F	PL=Pore Lining, M=M	atrix.
Hydric Soil Ind	icators: (Applicabl	e to all LRR	s, unless otherwise	noted.)			or Problematic Hydr	•
Histosol (A ²	1)		Sandy Redox (S	5)		1 cm muck (/	A9) (LRR C)	
Histic Epipe	edon (A2)		Stripped Matrix	,	-	2 cm Muck (/	A10) (LRR B)	
Black Histic			Loamy Mucky M		-	Reduced Ver		
Hydrogen S			X Loamy Gleyed N		_		Material (TF2)	
	ayers (A5) (LRR C)		Depleted Matrix		-		in in Remarks)	
	(A9) (LRR D)		X Redox Dark Sur		_			
	elow Dark Surface (Depleted Dark S					
	Surface (A12)		Redox Depressi		3	Indicators of hyd	drophytic vegetation a	and
	ky Mineral (S1)		Vernal Pools (F			wetland hydrol	ogy must be present,	
	ed Matrix (S4)			- /		-	ed or problematic.	
Restrictive Lay	None				ŀ	lydric Soil Pres	sent? Yes X	No
Restrictive Lay	None): N/A	C = clay; L =	loam or loamy; co =	coarse; f = fine		Hydric Soil Pres	sent? Yes X	 No
Restrictive Lay Type: Depth (inches Remarks:	None): N/A			coarse; f = fine		•		
Restrictive Lay Type: Depth (inches Remarks: 3-5" Layer feels	None): N/A S = sand; Si = silt; mucky mineral. Thi			coarse; f = fine		•		
Restrictive Lay Type: Depth (inches Remarks: 3-5" Layer feels HYDROLOG	None): N/A S = sand; Si = silt; mucky mineral. Thi			coarse; f = fine		•		
Restrictive Lay Type: Depth (inches Remarks: 3-5" Layer feels HYDROLOG Wetland Hydro	None N/A S = sand; Si = silt; mucky mineral. Thi Y	ck roots in 0-	3" layer.	coarse; f = fine		;; + = heavy (mo	re clay); - = light (les	s clay)
Restrictive Lay Type: Depth (inches Remarks: 3-5" Layer feels HYDROLOG Wetland Hydro Primary Indicato	None N/A S = sand; Si = silt; mucky mineral. Thi Y logy Indicators: prs (minimum of one	ck roots in 0-	3" layer.			;; + = heavy (mo	re clay); - = light (less ndicators (2 or more r	s clay)
Restrictive Lay Type: Depth (inches Remarks: 3-5" Layer feels HYDROLOG Wetland Hydro Primary Indicato Surface Wa	None N/A S = sand; Si = silt; mucky mineral. Thi Y logy Indicators: ors (minimum of one tter (A1)	ck roots in 0-	3" layer. eck all that apply) Salt Crust (B11)			;; + = heavy (mo 	re clay); - = light (less ndicators (2 or more r Water Marks (B1) (R i	s clay) equired) iverine)
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APPENDIX D: WETLAND AND STREAM PHOTOGRAPHS



Photo A. View northeast of Wetland TW01.



Photo B. View east of the eastern portion of Wetland TW02 (TP03).



Photo C. View east of Wetland TW02 at eastern site boundary, extends off-site.



Photo D. View south of the western portion of Wetland TW02 (TP07).



Photo E. View east of Wetland TW03 at eastern site boundary, extends off-site.



Photo F. View east of Wetland TW03 at one of several culverts.



Photo G. View south of open water area in western portion of Wetland TW03 (TP11).



Photo H. View northwest of western portion of Wetland TW03.



Photo I. View north of off-site portion of Wetland TW03 to the west.



Photo J. View west of Wetland TW04.



Photo K. View south of Wetland TW04.



Photo L. View northwest of EP Canal at first crossing near the road crossing bridge.



Photo M. View southeast of EP Canal at second crossing.



Photo N. View northeast of the western wetland boundary for Wetland TW05.



Photo O. View west of culvert entering Wetland TW05 from EP Canal.



Photo P. View west of roadside ditch on the south side of the access road.



Photo Q. View northwest of ditch on the north side of the access road.



Photo R. View east of Great Blue Heron rookery on east side of the Yakima River.



Photo S. View down of frog egg masses in Wetland TW04.



Photo T. View down of dead vole (living voles were abundant throughout the site).

APPENDIX E: ECOLOGY RATING FORMS

Wetland name or number TW01

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): $\underline{TWO1}$ Date of site visit: $\underline{4/4/17}$ Rated by <u>N. Evan Dulin</u> Trained by Ecology? <u>Ves</u> No Date of training <u>3/29/17</u>-HGM Class used for rating <u>Riverine</u> Wetland has multiple HGM classes? <u>Y</u> N

NOTE: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map _______

OVERALL WETLAND CATEGORY _____ (based on functions ____ or special characteristics____)

1. Category of wetland based on FUNCTIONS

Category I – Total score = 22-27

Category II – Total score = 19-21

____Category III – Total score = 16-18

___Category IV – Total score = 9-15

FUNCTION	NAMES AND A DESCRIPTION OF A DESCRIPTION	nprov ter Qu	ing Jality	Ну	drol	ogic	1	Habita	at	
			Circle	the ap	prop	riate r	atings]
Site Potential	Н	(M)	L	н	M	L	Н	Μ	()	1
Landscape Potential	Н	M	L	Н	M	L	Н	M	L	
Value	Ð	Μ	L	H	Μ	L	(H)	Μ	L	ΤΟΤΑΙ
Score Based on Ratings		7			6			6		19

Score for each function based on three ratings (order of ratings is not important) 9 = H,H,H 8 = H,H,M 7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L

5 = M,M,L 4 = M,L,L 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY Circle the appropriate category		
Vernal Pools	II III		
Alkali	I		
Wetland of High Conservation Value	I		
Bog and Calcareous Fens	Ι		
Old Growth or Mature Forest – slow growing	Ι		
Aspen Forest	I		
Old Growth or Mature Forest – fast growing	II		
Floodplain forest	II		
None of the above			

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Maps and figures required to answer questions correctly for Eastern Washington Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	1.1
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	1
Hydroperiods	H 1.2, H 1.3	1
Ponded depressions - None	R 1.1	1
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	1
Map of the contributing basin	R 2.2, R 2.3, R 5.2	5
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	1
Width of wetland vs. width of stream (can be added to another figure)	R 4.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	3
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	4

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of area within 150 ft of the wetland (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

- 1. Does the entire unit **meet both** of the following criteria?
 - ____The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size _____At least 30% of the open water area is deeper than 10 ft (3 m)

NO – go to 2

YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

- 2. Does the entire wetland unit **meet all** of the following criteria?
 - <u>Final The wetland is on a slope (slope can be very gradual)</u>,

The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;

NO - go to 3

YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit meet all of the following criteria?

The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;

The overbank flooding occurs at least once every 10 years.

NO - go to 4

YES – The wetland class is **Riverine**

NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 5

YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

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NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating	
Slope + Riverine	Riverine	
Slope + Depressional	Depressional	
Slope + Lake Fringe	Lake Fringe	
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional	
Depressional + Lake Fringe	Depressional	
Riverine + Lake Fringe	Riverine	

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

N07 Wetland name or number_

RIVERINE WETLANDS Water Quality Functions - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:Depressions cover > $^{1}/_{3}$ area of wetlandDepressions cover > $^{1}/_{10}$ area of wetlandDepressions present but cover < $^{1}/_{10}$ area of wetlandPoints = 1No depressions presentpoints = 0	0
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; not Cowardin classes): \sim Forest or shrub > $^2/_3$ the area of the wetlandpoints = 10Forest or shrub $^1/_3 - ^2/_3$ area of the wetlandpoints = 5Ungrazed, herbaceous plants > $^2/_3$ area of wetlandpoints = 5Ungrazed herbaceous plants $^1/_3 - ^2/_3$ area of wetlandpoints = 2Forest, shrub, and ungrazed herbaceous < $^1/_3$ area of wetlandpoints = 0	10
Total for R 1 Add the points in the boxes above	10

Rating of Site Potential If score is: 12-16 = H _____6-11 = M ____0-5 = L

Record the rating on the first page

R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2	(No = 0)	0
R 2.2. Does the contributing basin include a UGA or incorporated area?	Yes = 1	(No = 0)	0
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests th within the last 5 years?	hat have been q (Yes = 1		1
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants	Ýes = 1	No = 0	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in q R 2.1-R 2.4? Source	A COMPANY A PARTY	No = 0\	0
Total for R 2 Add the point	nts in the boxe	s above	2

R 3.0. Is the water quality improvement provided by the site valuable to socie	ety?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary mi?	that drains to one within 1 (Yes = 1 $)$ No = 0	1
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens?	(Yes = 1 $)$ No = 0	1
R 3.3. Has the site been identified in a watershed or local plan as important for maint YES if there is a TMDL for the drainage in which wetland is found.	aining water quality? Answer (Yes = 2) No = 0	2
Total for R 3 Add t	he points in the boxes above	4

Rating of Value If score is: 2-4 = H ___1 = M ___0 = L

Record the rating on the first page

Wetland name or number_TW01

RIVERINE WETLANDS Hydrologic Functions - Indicators that site functions to reduce f	looding and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction stream or river channel (distance between banks). Calculate the ratio: (a width of stream between banks). If the ratio is more than 2 If the ratio is 1-2 ~ 90' /175' = >'½ If the ratio is ½-<1 If the ratio is ¼-< ½ If the ratio is ¼-< ½		4
 R 4.2. Characteristics of plants that slow down water velocities during floods: shrub. Choose the points appropriate for the best description (polygons height. These are NOT Cowardin classes). Forest or shrub for more than ²/₃ the area of the wetland ~ 60% Forest or shrub for >¹/₃ area OR emergent plants > ²/₃ area Forest or shrub for > ¹/₁₀ area OR emergent plants > ¹/₃ area Plants do not meet above criteria 	need to have > 90% cover at person points = 6 points = 4 points = 2 points = 0	6
Total for R 5	Add the points in the boxes above	10

R 5.0. Does the landscape have the potential to support the hydrolo	gic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	(Yes = 0)) No = 1	0
R 5.2. Does the up-gradient watershed include a UGA or incorporated area	? Yes = 1	(No = 0)	0
R 5.3. Is the up-gradient stream or river controlled by dams?	(Yes = 0	No = 1	0
Total for R 5	Add the points in the boxes above		0

R 6.0. Are the hydrologic functions provided by the site valuable to society?	ALL ALL
 R 6.1. Distance to the nearest areas downstream that have flooding problems? Choose the description that best fits the site. The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to 	0
human or natural resources points = 2 Surface flooding problems are in a basin farther down-gradient points = 1	L
Surface flooding problems are in a basin farther down-gradientpoints = 1No flooding problems anywhere downstreampoints = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2/No = 0	0
Total for R 6 Add the points in the boxes above	2

Rating of Value If score is: 2-4 = H ___1 = M ___0 = L

Record the rating on the first page

Wetland name or number____

101

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	(only 1 score per
H 1.0. Does the wetland have the potential to provide habitat for many species?	box)
H 1.1. Structure of the plant community: Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.	0
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
 H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac OR 10% of its area during the March to early June OR in August to the end of September? Answer YES for Lake Fringe wetlands. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? Answer yes only if H 1.3.1 is No. 	M.
1 1.4. <u>Richness of plant species</u> Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk) # of species	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points All three diagrams in this row are High = 3 points	Figure_

We	etland name or number_11101	
Γ	H 1.6. Special habitat features	
	Check the habitat features that are present in the wetland. The number of checks is the number of points. Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream.	
	 Cattails or bulrushes are present within the wetland. Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. Emergent or shrub vegetation in areas that are permanently inundated/ponded. Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity 	1
	Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)	
Ī	Total for H 1 Add the points in the boxes above	6

			10 m	
Rating of Site Potential If score	re is:15-18 = H	7-14 = M 📝	0-6 = L	Record the rating on the first page

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is:	
<i>Calculate:</i> % undisturbed habitat $\frac{19}{1.5} = \frac{23.5}{3.5}$ %	
$> \frac{1}{3}$ (33.3%) of 1 km Polygon points = 3	_
$ = \frac{1}{3} (33.3\%) \text{ of 1 km Polygon} $ points = 3 $ = \frac{20-33\%}{10-19\%} \text{ of 1 km Polygon} $ km for $= \frac{1}{3} \text{ bl} = \frac{1}{3} \text{ c} = -\frac{19\%}{10} $ points = 1 $ = \frac{1}{3} \text{ constant} = \frac{1}{3} $	<u>`</u> /
10-19% of 1km Polygon $Accessible = 157 ac = ~19\%$ points = 1	~
<10% of 1km Polygon 11 mid - intensity = 74 = ~9% points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around wetland.	
<i>Calculate:</i> % undisturbed habitat $\frac{19}{10}$ + [(% moderate and low intensity land uses)/2] $\frac{13}{13}$ = $\frac{32}{8}$ %	
Undisturbed habitat > 50% of Polygon Vidisturbed habitat 10 - 50% and in 1-3 patches Mid-intersity: 741+136/412 = 2.6% points = 3 points = 2	\cap
-Undisturbed habitat 10 - 50% and in 1-3 patches points = 2	~
Undisturbed habitat 10 - 50% and > 3 patches points = 1	
Undisturbed habitat < 10% of Polygon 2 particles points = 0	
H 2.3. Land use intensity in 1 km Polygon:	
445/412 = 55% points = (-2)	-7
Does not meet criterion above points = 0	4
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by	
irrigation practices, dams, or water control structures. Generally, this means outside boundaries of	0
reclamation areas, irrigation districts, or reservoirs Yes = 3 (No = 0)	
Total for H 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: _____4-9 = H ____1-3 = M ____<1 = L Record the rating on the first page

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose the highest score that applies to the wetland being rated	
Site meets ANY of the following criteria: points = 2	
It has 3 or more priority habitats within 100 m (see Appendix B)	
 It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) 	\cap
 It is mapped as a location for an individual WDFW species 	~ / .
 It is a Wetland of High Conservation Value as determined by the Department of Natural Resources 	0~
 It has been categorized as an important habitat site in a local or regional comprehensive plan, in a 	
Shoreline Master Plan, or in a watershed plan	
Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1	
Site does not meet any of the criteria above points = 0	

Rating of Value If score is: 1/2 = H ___1 = M ___0 = L

Record the rating on the first page

Appendix B: WDFW Priority Habitats in Eastern Washington

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here: <u>http://wdfw.wa.gov/conservation/phs/list/</u>]

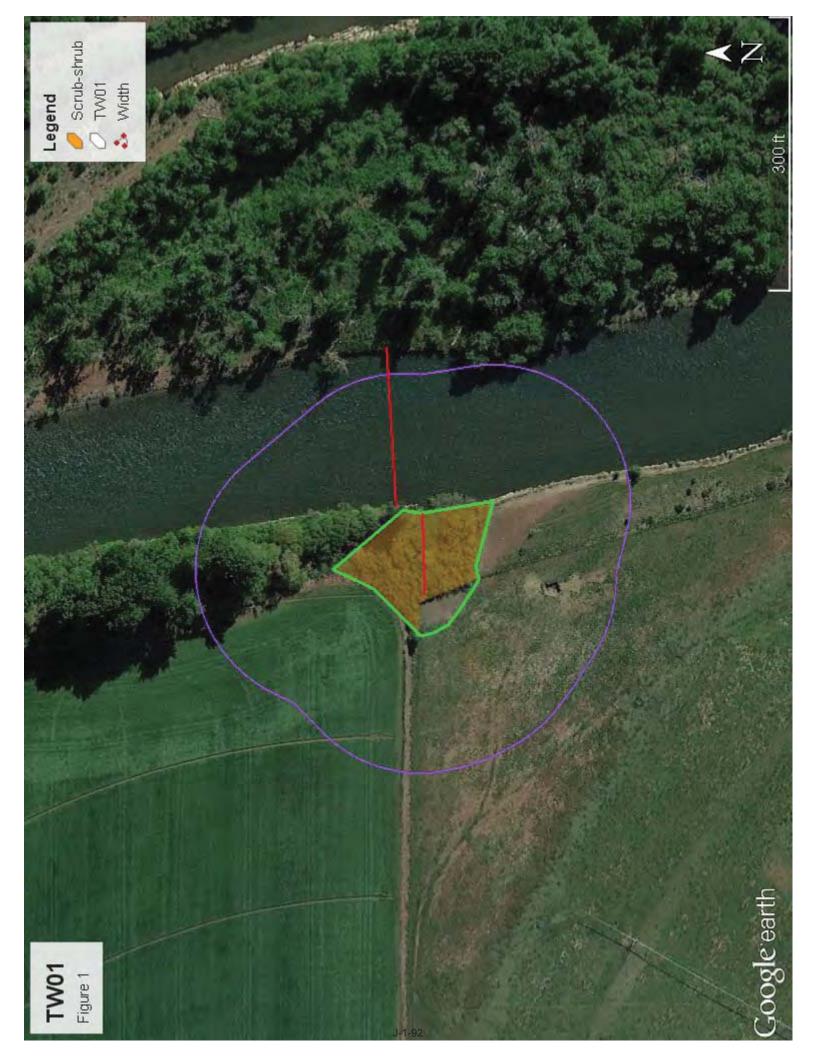
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: NOTE: This question is independent of the land use between the wetland and the priority habitat.

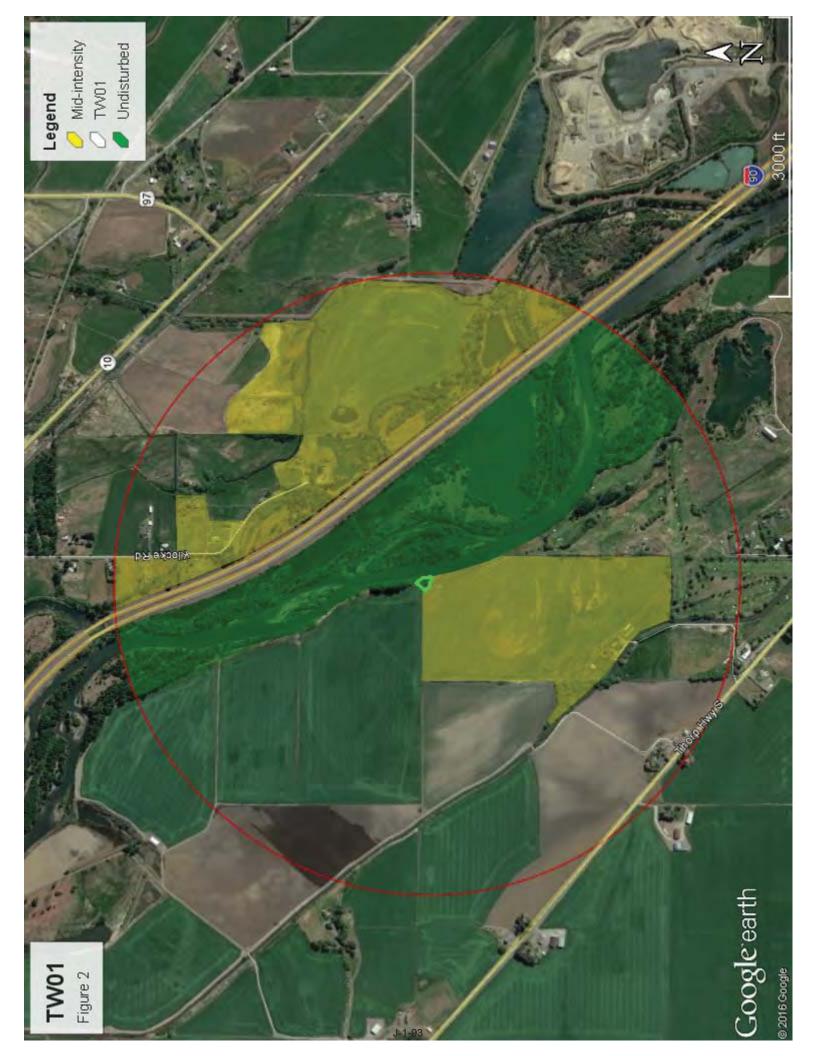
- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Old-growth/Mature forests: <u>Old-growth east of Cascade crest –</u> Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. <u>Mature forests –</u> Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.
- Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
 component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or
 other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- Shrub-steppe: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a
 conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Eastside Steppe: Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).
- Juniper Savannah: All juniper woodlands.

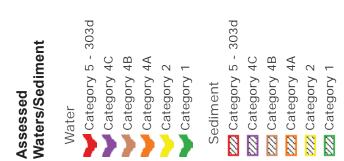
Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland Rating System for Eastern WA: 2014 Update Effective January 1, 2015 Appendix B





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Project Catalog by WRIA by County

Funding Opportunities Project Development Priority Lists

Related Information

TMDL Contacts

RELATED ECOLOGY PROGRAMS

Water Quality

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (<u>WRIA</u>). Please use links (where available) for more information on a project.

Yakima River basin project index:

www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html Counties

- <u>Kittitas</u>
- <u>Yakima</u>



Project Name	Pollutants	Status**	TMDL Lead
<u>Crystal Creek</u>	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	<u>Jane Creech</u> 509-454-7860
Selah Ditch	Fecal Coliform Temperature	EPA approved	<u>Greg Bohn</u> 509-454-4174
Teanaway River segments: Upper West Fork Teanaway River Upper Middle Fork Teanaway River Upper North Fork Teanaway River Stafford Creek Lower West Fork Teanaway River Lower Middle Fork Teanaway River Lower North Fork Teanaway River Mainstem Teanaway River	Temperature	EPA approved	<u>Jane Creech</u> 509-454-7860
Wilson/Cooke Creek Tributaries: Badger Creek Bull Ditch Caribou Creek Cherry Creek CID Canal Coleman Creek Cook Creek EWC Canal Johnson Drain KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 <u>Greg Bohn</u> 509-454-4174

TMDL Project Information for WRIA 39 | WA State Department of Ecology

Mercer Creek Naneum Creek Parke Creek Whiskey Creek Wilson Creek Wipple Wasteway			
Yakima River. Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	<u>Jane Creech</u> 509-454-7860
	Temperature	EPA approved Has an implementation plan	<u>Jane Creech</u> 509-454-7860
Yakima River	Toxics	Under development	<u>Jane Creech</u> 509-454-7860

** Status will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.

For more information about WRIA 39:

- <u>Waterbodies in WRIA 39</u> using the Water Quality Assessment Query Tool
- <u>Watershed Information for WRIA 39</u>

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

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Wetland name or number TW02

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): <u>Two 2</u>	Date of site visit: <u>4/4/1</u> 7					
Rated by N. Evan Dulin	Trained by Ecology? Ves No Date of training 2/29/17-					
HGM Class used for rating Riverine	Wetland has multiple HGM classes? Y					

NOTE: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map <u>(orgine barth</u>

OVERALL WETLAND CATEGORY _____ (based on functions _____ or special characteristics_____)

1. Category of wetland based on FUNCTIONS

____Category I – Total score = 22-27

Category II – Total score = 19-21

Category III – Total score = 16-18

Category IV – Total score = 9-15

FUNCTION	Improving Water Quali		A STATUTE THE STATUTE OF STATUTE	Hydrologic		H	Habitat			
		_	Circle	the ap	propr	iate	ratings]
Site Potential	Н	(M)	L	н	M)	L	Н	Μ	(L)]
Landscape Potential	Н	M	L	Н	(M)	L	Н	M	L	1
Value	н	M	L	H	Μ	L	H	М	L	TOTAL
Score Based on Ratings		6			7			6		19

Score for each function based on three ratings (order of ratings ìs not *important)* 9 = H, H, H8 = H, H, M7 = H, H, L7 = H, M, M6 = H, M, L6 = M, M, M5 = H, L, L5 = M, M, L4 = M, L, L

3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY Circle the appropriate category
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015 1

Maps and figures required to answer questions correctly for Eastern Washington Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	I
Hydroperiods	H 1.2, H 1.3	1
Ponded depressions	R 1.1	1
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	1
Map of the contributing basin	R 2.2, R 2.3, R 5.2	2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	1
Width of wetland vs. width of stream (can be added to another figure)	R 4.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	5

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of area within 150 ft of the wetland (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

- 1. Does the entire unit **meet both** of the following criteria?
 - _____The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size _____At least 30% of the open water area is deeper than 10 ft (3 m)

NO – go to 2

YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

- 2. Does the entire wetland unit **meet all** of the following criteria? <u>
 </u>The wetland is on a slope (*slope can be very gradual*),
 - The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
 - _____The water leaves the wetland **without being impounded**.
 - (NO go to 3)

YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

- 3. Does the entire wetland unit meet all of the following criteria?
 - The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;

NO - go to 4

YES – The wetland class is **Riverine**

NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 5

YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

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Wetland name or number Two

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

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RIVERINE WETLANDS Water Quality Functions - Indicators that the site functions to improve water	er quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?		
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments durin — Depressions cover $>^1/_3$ area of wetland Depressions cover $>^1/_{10}$ area of wetland Depressions present but cover $<^1/_{10}$ area of wetland No depressions present	ng a flooding event: points = 6 points = 3 points = 1 points = 0	6
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; not Cowar Forest or shrub $>^2/_3$ the area of the wetland Forest or shrub $^1/_3 - ^2/_3$ area of the wetland Ungrazed, herbaceous plants $>^2/_3$ area of wetland Ungrazed herbaceous plants $^1/_3 - ^2/_3$ area of wetland	rdin classes): points = 10 points = 5 points = 5 points = 2	0
- Forest, shrub, and ungrazed herbaceous $< 1/3$ area of wetland	points = 0	
 Forest, shrub, and ungrazed herbaceous < ¹/₃ area of wetland Total for R 1 Add the poin 	nts in the boxes above	6 the first pag
 Forest, shrub, and ungrazed herbaceous < ¹/₃ area of wetland Total for R 1 Add the poin Rating of Site Potential If score is: 12-16 = H6-11 = M0-5 = L 	nts in the boxes above Record the rating on	6 the first pag
— Forest, shrub, and ungrazed herbaceous < ¹ / ₃ area of wetland Total for R 1 Add the poin Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L R 2.0. Does the landscape have the potential to support the water quality function of a support the state of the state of the support the state of the state o	nts in the boxes above Record the rating on	the first pag
— Forest, shrub, and ungrazed herbaceous < ¹ / ₃ area of wetland Total for R 1 Add the poin Rating of Site Potential If score is:12-16 = H 6-11 = M 0-5 = L R 2.0. Does the landscape have the potential to support the water quality function of R 2.1. Is the wetland within an incorporated city or within its UGA?	nts in the boxes above Record the rating on of the site?	the first pag
— Forest, shrub, and ungrazed herbaceous < ¹ / ₃ area of wetland Total for R 1 Add the poin Rating of Site Potential If score is:12-16 = H 6-11 = M 0-5 = L R 2.0. Does the landscape have the potential to support the water quality function of R 2.1. Is the wetland within an incorporated city or within its UGA?	nts in the boxes above Record the rating on of the site? Yes = 2 No = 0 Yes = 1 No = 0	0
— Forest, shrub, and ungrazed herbaceous < ¹ / ₃ area of wetland Total for R 1 Add the point Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L R 2.0. Does the landscape have the potential to support the water quality function of R 2.1. Is the wetland within an incorporated city or within its UGA? R 2.2. Does the contributing basin include a UGA or incorporated area? R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests th	the boxes above Record the rating on of the site? Yes = 2 No = 0 Yes = 1 No = 0 at have been clearcut	0
 Forest, shrub, and ungrazed herbaceous < ¹/₃ area of wetland Total for R 1 Add the poin Rating of Site Potential If score is:12-16 = H6-11 = M0-5 = L R 2.0. Does the landscape have the potential to support the water quality function of R 2.1. Is the wetland within an incorporated city or within its UGA? R 2.2. Does the contributing basin include a UGA or incorporated area? R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests th within the last 5 years? 	the boxes above Record the rating on of the site? Yes = 2 No = 0 Yes = 1 No = 0 Not have been clearcut Yes = 1 No = 0 (Yes = 1 No = 0	0

R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary mi? Prairie to Yaking River within I sile	that drains to one within 1 (Yes = 1) No = 0	1
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 (No = 0)	0
R 3.3. Has the site been identified in a watershed or local plan as important for maint YES if there is a TMDL for the drainage in which wetland is found.	aining water quality? Answer Yes = 2 (No = 0)	0
Total for R 3 Add ti	ne points in the boxes above	1

Rating of Value If score is: 2-4 = H ___1 = M ___0 = L

Record the rating on the first page

Wetland name or number TWO2

RIVERINE WETLANDS Hydrologic Functions - Indicators that site functions to reduce flooding	and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction of the f stream or river channel (distance between banks). Calculate the ratio: (average v width of stream between banks). If the ratio is more than 2 If the ratio is 1-2 If the ratio is ½-<1 If the ratio is ½-<2 If the ratio is ½-<2 If the ratio is ½-<2 If the ratio is ½-<2	width of wetland)/(average points = 10 points = 8 points = 4 points = 2 points = 1	4
 R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large shrub. Choose the points appropriate for the best description (polygons need to height. These are NOT Cowardin classes). Forest or shrub for more than ²/₃ the area of the wetland APC 2.095 Soft Forest or shrub for >¹/₃ area OR emergent plants > ²/₃ area Forest or shrub for >¹/₁₀ area OR emergent plants > ¹/₃ area Plants do not meet above criteria 	have > 90% cover at person	4
Total for R 5 Add the	e points in the boxes above	8
Rating of Site Potential If score is: 12-16 = H 6-11 = M 0-5 = L	Record the rating o	n the first page
R 5.0. Does the landscape have the potential to support the hydrologic function	ns of the site?	42.12
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 [No = 1]	1

R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 [No = 1]	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 (No = 0)	0
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 (No = 1)	1
Total for R 5	Add the points in the boxes above	2
tating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on th	e first page

	. Record the rating on the first page
the hydrologic functions provided by the site valuable to	aciatu?

R 6.1. Distance to the nearest areas downstream that have flooding problems the site. The sub-basin immediately down-gradient of site has surface flooding p		2
human or natural resources Surface flooding problems are in a basin farther down-gradient No flooding problems anywhere downstream	<pre>points = 2 points = 1 points = 0</pre>	L
R 6.2. Has the site been identified as important for flood storage or flood conv plan?	eyance in a regional flood control Yes = 2 (No = 0)	0
Total for R 6	Add the points in the boxes above	2

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac. Aquatic bed Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover Scrub-shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each action of the wetland if wetland is < 2.5 ac. Aquatic bed Aquatic bed Check the Cowardin vegetation classes present and categories of emergent have > 30% cover Aquatic bed Aquatic	0
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
 H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac OR 10% of its area during the March to early June OR in August to the end of September? Answer YES for Lake Fringe wetlands. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? Answer yes only if H 1.3.1 is No. Yes = 3 No = 0 	0
Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk) # of species Scoring: > 9 species: points = 2 4-9 species: points = 1 - < 4 species: points = 0	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points All three diagrams in this row are High = 3 points	Figure_

W	retland name or number Two2	i.
•	H 1.6. Special habitat features Check the habitat features that are present in the wetland. The number of checks is the number of points. Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. Cattails or bulrushes are present within the wetland. Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. Emergent or shrub vegetation in areas that are permanently inundated/ponded. Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity Minvasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)	3
	Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ____15-18 = H ____7-14 = M $\sqrt{}$ 0-6 = L Record the rating on the first page

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is:Calculate:% undisturbed habitat 16 + [(% moderate and low intensity land uses)/2] $7 = 23$ %> $1/_3$ (33.3%) of 1 km PolygonFigure 158 ac 216%20-33% of 1 km PolygonI km polygon10-19% of 1 km PolygonI km polygon<10% of 1 km Polygon	2
H 2.2. Undisturbed habitat in 1 km Polygon around wetland.Calculate:% undisturbed habitat 16 + [(% moderate and low intensity land uses)/2] 14 = 36 %Undisturbed habitat > 50% of Polygonmid - intersityUndisturbed habitat 10 - 50% and in 1-3 patches 273 = 284 Undisturbed habitat 10 - 50% and > 3 patches 273 = 284 Undisturbed habitat 10 - 50% and > 3 patches 273 = 284 Undisturbed habitat 10 - 50% and > 3 patches 273 = 284 Undisturbed habitat 10 - 50% and > 3 patches 960 Undisturbed habitat < 10% of Polygon	2
H 2.3. Land use intensity in 1 km Polygon: $> 50\%$ of Polygon is high intensity land use Does not meet criterion above 52.9 -75% points = (-2) points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. <i>Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs</i> Yes = 3 (No = 0)	0
Total for H 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: 4-9 = H 1-3 = M < 1 = L Record the rating on the first page

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose the highest score that applies to the wetland being rated	
Site meets ANY of the following criteria: points = 2	
It has 3 or more priority habitats within 100 m (see Appendix B)	2
 It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) 	
 It is mapped as a location for an individual WDFW species 	~
 It is a Wetland of High Conservation Value as determined by the Department of Natural Resources 	
 It has been categorized as an important habitat site in a local or regional comprehensive plan, in a 	
Shoreline Master Plan, or in a watershed plan	
Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1	· ·
Site does not meet any of the criteria above points = 0	

Rating of Value If score is: 2 = H __1 = M __0 = L

Record the rating on the first page

Appendix B: WDFW Priority Habitats in Eastern Washington

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here: <u>http://wdfw.wa.gov/conservation/phs/list/</u>]

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: *NOTE:* This question is independent of the land use between the wetland and the priority habitat.

- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

 Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).

Old-growth/Mature forests: <u>Old-growth east of Cascade crest</u> – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. <u>Mature forests</u> – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

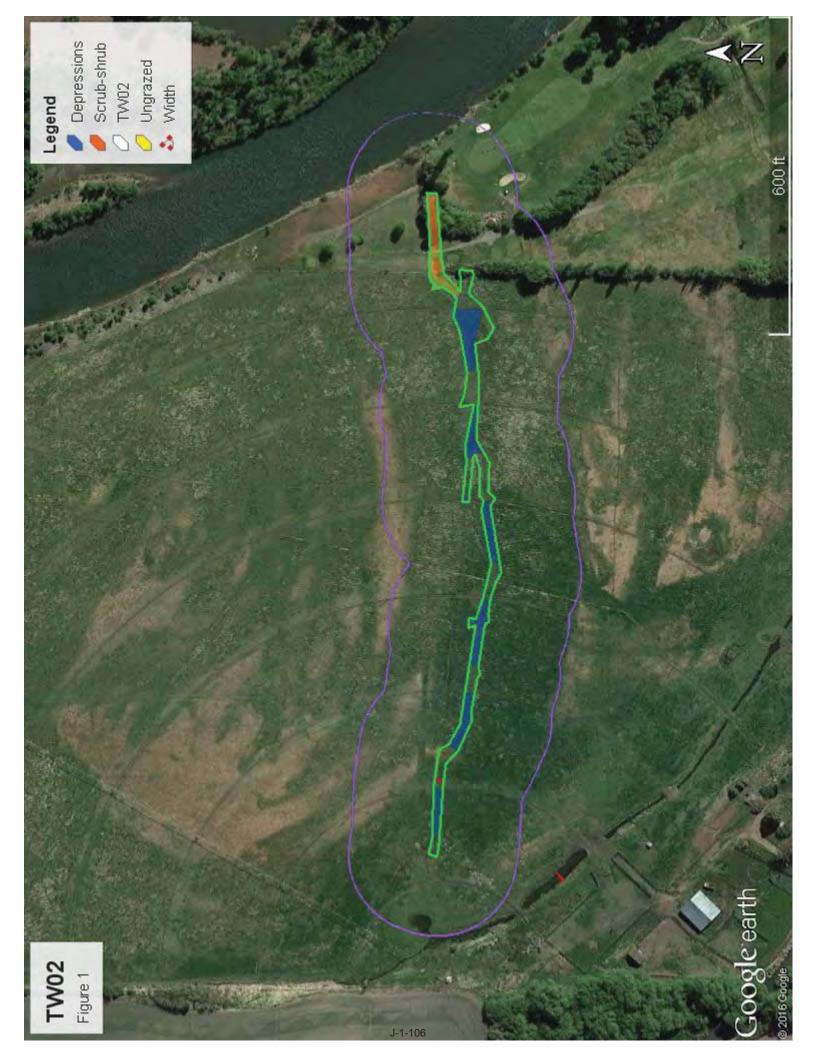
Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial
ecosystems which mutually influence each other.

 Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

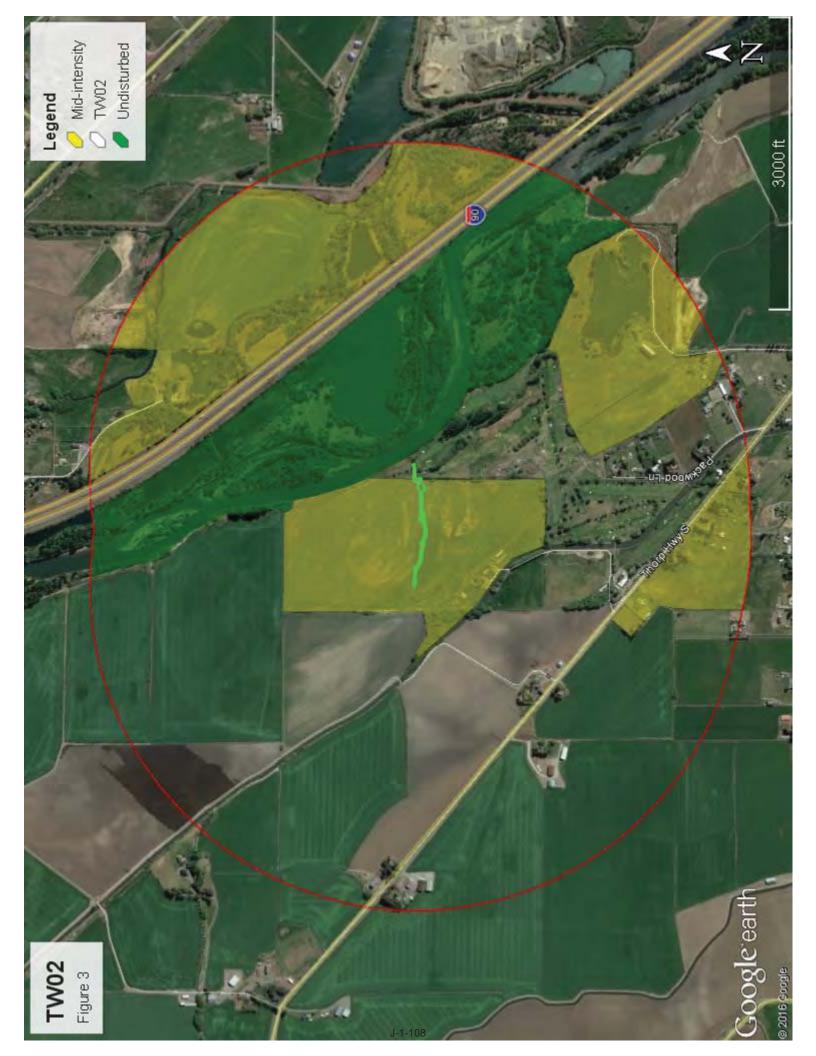
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- Shrub-steppe: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a
 conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Eastside Steppe: Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).
- Juniper Savannah: All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

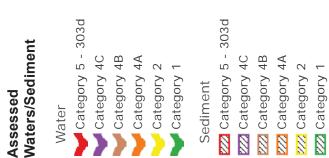
Wetland Rating System for Eastern WA: 2014 Update Effective January 1, 2015 Appendix B







TW02 - Figure 4







Miles 0.25 0.25

0.5

Image courtesy of USGS Earthstar Geographics SIO © 2017 Microsoft Corporation © 2010 NAVTEQ © AND



by County

Funding Opportunities Project Development Priority Lists

Related Information

TMDL Contacts

RELATED ECOLOGY PROGRAMS

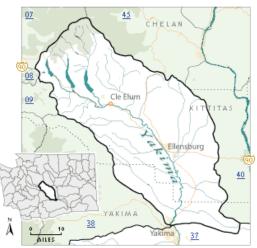
Water Quality

(where available) for more information on a project.

Yakima River basin project index:

www.ecy.wa.gov/programs/wg/tmdl/yakima_wg/index.html Counties

- <u>Kittitas</u>
- <u>Yakima</u>



Project Name	Pollutants	Status**	TMDL Lead
<u>Crystal Creek</u>	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	<u>Jane Creech</u> 509-454-7860
Selah Ditch	Fecal Coliform Temperature	EPA approved	<u>Greg Bohn</u> 509-454-4174
Teanaway River segments: Upper West Fork Teanaway River Upper Middle Fork Teanaway River Upper North Fork Teanaway River Stafford Creek Lower West Fork Teanaway River Lower Middle Fork Teanaway River Lower North Fork Teanaway River Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: Badger Creek Bull Ditch Caribou Creek Cherry Creek CID Canal Coleman Creek Cook Creek EWC Canal Johnson Drain KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 <u>Greg Bohn</u> 509-454-4174

J-1-110

TMDL Project Information for WRIA 39 | WA State Department of Ecology

Mercer Creek Naneum Creek Parke Creek Whiskey Creek Wilson Creek Wipple Wasteway			
Yakima River. Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	<u>Jane Creech</u> 509-454-7860
	Temperature	EPA approved Has an implementation plan	<u>Jane Creech</u> 509-454-7860
Yakima River	Toxics	Under development	<u>Jane Creech</u> 509-454-7860

** Status will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.

For more information about WRIA 39:

- <u>Waterbodies in WRIA 39</u> using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

<u>*</u> The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

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Wetland name or number TW03

RATING SUMMARY – Eastern Washington

 Name of wetland (or ID #):
 Two3
 Date of site visit:
 9/17/17

 Rated by <u>M. Evan Dulm</u>
 Trained by Ecology?
 Yes _____ No Date of training
 3/24/17

 HGM Class used for rating
 Riverine
 Wetland has multiple HGM classes?
 Y
 N

NOTE: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map __________

OVERALL WETLAND CATEGORY _____ (based on functions _____ or special characteristics____)

1. Category of wetland based on FUNCTIONS

Category I – Total score = 22-27

Category II – Total score = 19-21

Category III – Total score = 16-18

__Category IV – Total score = 9-15

FUNCTION		mprov ater Qu			drolo	ogic		Habita	it	
			Circle	the ap	opropr	riate r	rating	5		
Site Potential	Н	M	L	H	Μ	L	Н	M	L.	
Landscape Potential	Н	M	L	Н	(M)	L	Н	M	L	
Value	H	(M)	L	H	M	L	Н	M	L	TOTAL
Score Based on Ratings		6			Z	,		6		20

Score for each function based on three ratings (order of ratings is not important)
9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M.M.L

4 = M,L,L 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY Circle the appropriate category		
Vernal Pools	II III		
Alkali	I		
Wetland of High Conservation Value	I		
Bog and Calcareous Fens	I		
Old Growth or Mature Forest – slow growing	I		
Aspen Forest	I		
Old Growth or Mature Forest – fast growing	II		
Floodplain forest	II		
None of the above			

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015

Maps and figures required to answer questions correctly for Eastern Washington Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	1
Hydroperiods	H 1.2, H 1.3	1
Ponded depressions	R 1.1	1
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	1
Map of the contributing basin	R 2.2, R 2.3, R 5.2	2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	I
Width of wetland vs. width of stream (can be added to another figure)	R 4.1	7
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	S

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of area within 150 ft of the wetland (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit meet both of the following criteria?

603

____The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size _____At least 30% of the open water area is deeper than 10 ft (3 m)

NO – go to 2

YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

- 2. Does the entire wetland unit meet all of the following criteria?
 - _____The wetland is on a slope (*slope can be very gradual*),

____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks; ____The water leaves the wetland **without being impounded**.

NO - go to 3)

YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

- 3. Does the entire wetland unit meet all of the following criteria?
 - ____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
 - The overbank flooding occurs at least once every 10 years.

NO - go to 4

YES – The wetland class is **Riverine**

NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 5

YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015

RIVERINE WETLANDS Water Quality Functions - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:Depressions cover $>^1/_3$ area of wetlandDepressions cover $>^1/_{10}$ area of wetlandDepressions present but cover $<^1/_{10}$ area of wetlandNo depressions present	6
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; not Cowardin classes):Forest or shrub > $^{2}/_{3}$ the area of the wetlandpoints = 10Forest or shrub $^{1}/_{3} - ^{2}/_{3}$ area of the wetlandpoints = 5Ungrazed, herbaceous plants > $^{2}/_{3}$ area of wetlandpoints = 5Ungrazed herbaceous plants > $^{2}/_{3}$ area of wetlandpoints = 2Forest, shrub, and ungrazed herbaceous < $^{1}/_{3}$ area of wetlandpoints = 0	2
Total for R 1 Add the points in the boxes above	8

R 2.0. Does the landscape have the potential to support the water quality funct	tion of the site?	- 2003
R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	0
R 2.2. Does the contributing basin include a UGA or incorporated area?	Yes = 1 (No = 0)	0
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or fore within the last 5 years?	sts that have been clearcut Yes = 1 No = 0	1
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutan	ts [Yes = 1 No = 0	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed R 2.1-R 2.4? Source	d in questions Yes = $1 (No = 0)$	0
Total for R 2 Add the	e points in the boxes above	2
Rating of Landscape Potential If score is:3-6 = H1 or 2 = M0 = L	Record the rating on th	ne first page

R 3.0. Is the water quality improvement provided by the site valuable to society R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary th		
mi? Drails to Yakina Rivor within I nile	(Yes = 1)No = 0	1
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 (No = 0)	0
R 3.3. Has the site been identified in a watershed or local plan as important for maintain YES if there is a TMDL for the drainage in which wetland is found.	ing water quality? Answer Yes = 2 (No = 0)	Ô
Total for R 3 Add the	points in the boxes above	1
ating of Value If score is: 2-4 = H1 = M0 = L	Record the rating on t	he first

W03 Wetland name or number_

RIVERINE WETLANDS Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion		
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction stream or river channel (distance between banks). Calculate the ratio: (a width of stream between banks). If the ratio is more than 2 If the ratio is 1-2 If the ratio is ½-<1 If the ratio is ½-<1		10
 R 4.2. Characteristics of plants that slow down water velocities during floods: <i>shrub. Choose the points appropriate for the best description (polygons height. These are NOT Cowardin classes).</i> Forest or shrub for more than ²/₃ the area of the wetland Forest or shrub for >¹/₃ area OR emergent plants > ²/₃ area Forest or shrub for >¹/₁₀ area OR emergent plants > ¹/₃ area Plants do not meet above criteria 		2
Total for R 5	Add the points in the boxes above	12
ating of Site Potential If score is: V12-16 = H6-11 = M0-5 = L	Record the rating or	the first pag

R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 (No = 1)	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 (No = 0	0
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 (No = 1)	1
Total for R 5	Add the points in the boxes above	2

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? <i>Choose the description that best fits the site.</i>	
 The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources Surface flooding problems are in a basin farther down-gradient points = 1 No flooding problems anywhere downstream 	2
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 (No = 0)	0
Total for R 6 Add the points in the boxes above	2

Rating of Value If score is: 2-4 = H __1 = M __0 = L

Record the rating on the first page

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac. Aquatic bed Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover Scrub-shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) C checks: points = 3 C checks: points = 1 C checks: points = 0	M
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	1
 H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac OR 10% of its area during the March to early June OR in August to the end of September? Answer YES for Lake Fringe wetlands. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? Answer yes only if H 1.3.1 is No. Yes = 3 No = 0 	M
H 1.4. <u>Richness of plant species</u> Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk) # of species Scoring: > 9 species: points = 2	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points Low = 1 point Moderate = 2 points	Figure_
All three diagrams in this row are High = 3 points	0

H 1.6. Special habitat features	
Check the habitat features that are present in the wetland. The number of checks is the number of points. Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. Cattails or bulrushes are present within the wetland. Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. Emergent or shrub vegetation in areas that are permanently inundated/ponded. Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)	14
Total for H 1 Add the points in the boxes above	13
	1

Rating of Site Potential If score is: ____15-18 = H $\sqrt{7}$ -14 = M ____0-6 = L Record the rating on the first page

NO3

Wetland name or number

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is:Calculate:% undisturbed habitat 15 + [(% moderate and low intensity land uses)/2] 6.5 = 21.> $1/3$ (33.3%) of 1 km Polygon 136 = 15% 136 point- 20-33% of 1km Polygon 136 = 15% 136 point10-19% of 1km Polygon 136 = 15% 136 point<10% of 1km Polygon	$ \begin{array}{c} s = 3 \\ s = 2 \\ s = 1 \end{array} $
H 2.2. Undisturbed habitat in 1 km Polygon around wetland.	
<i>Calculate:</i> % undisturbed habitat $\frac{15}{15}$ + [(% moderate and low intensity land uses)/2] $\frac{23.5}{15}$ = $\frac{3.6}{15}$	<u>\$</u> %
Undisturbed habitat > 50% of Polygon goint	s=3
Undisturbed habitat > 50% of Polygon Undisturbed habitat 10 - 50% and in 1-3 patches 	s = 2
-Undisturbed habitat 10 - 50% and > 3 patches point	s = 1
Undisturbed habitat < 10% of Polygon Use Use Department point	is = 0
H 2.3. Land use intensity in 1 km Polygon:	_
> 50% of Polygon is high intensity land use 58% points =	(-2)
Does not meet criterion above point	s = 0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced	by
irrigation practices, dams, or water control structures. Generally, this means outside boundaries of	
reclamation areas, irrigation districts, or reservoirs Yes = 3 N	o = 0
Total for H 2 Add the points in the boxes a	bove

Rating of Landscape Potential If score is: 4-9 = H 1-3 = M < 1 = L Record the rating on the first page

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose the highest score that applies to the wetland being rated	
Site meets ANY of the following criteria: points = 2	
 It has 3 or more priority habitats within 100 m (see Appendix B) 	
— It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists)	^
 It is mapped as a location for an individual WDFW species 	1
 It is a Wetland of High Conservation Value as determined by the Department of Natural Resources 	- Andrews
 It has been categorized as an important habitat site in a local or regional comprehensive plan, in a 	
Shoreline Master Plan, or in a watershed plan	
Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1	
Site does not meet any of the criteria above points = 0	

Rating of Value If score is: 2 = H 1 = M 0 = L

1

Record the rating on the first page

Appendix B: WDFW Priority Habitats in Eastern Washington

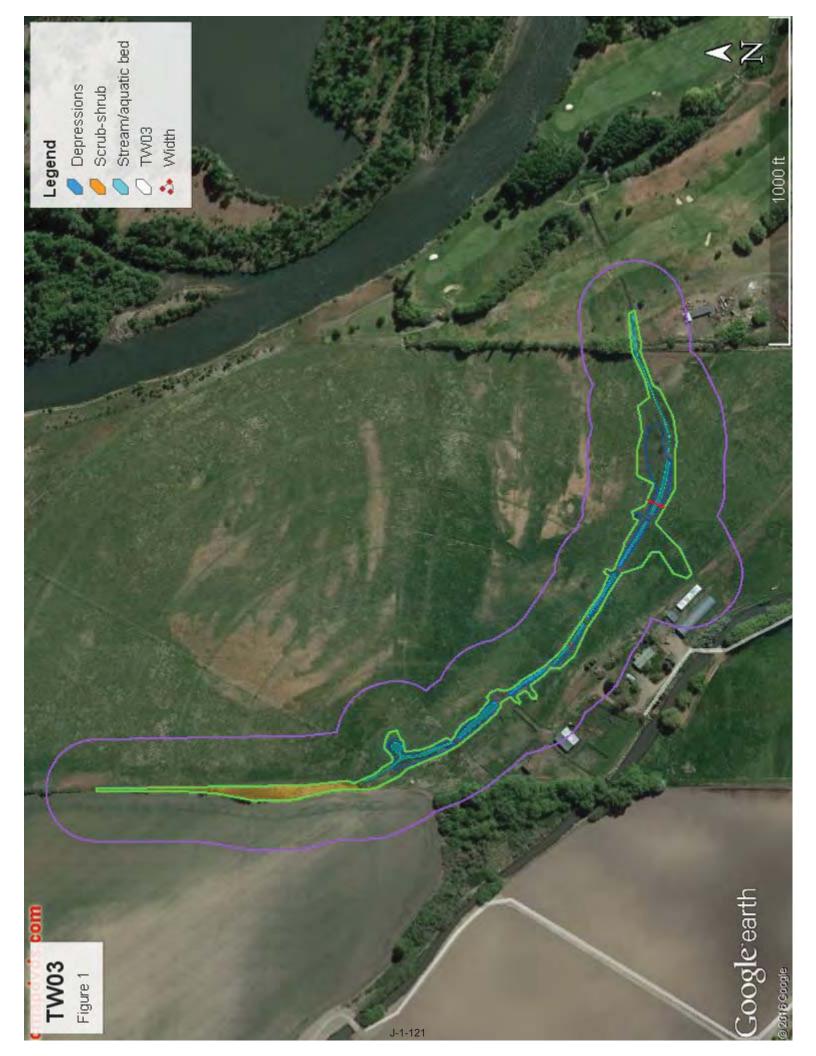
<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here: <u>http://wdfw.wa.gov/conservation/phs/list/</u>]

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: NOTE: This question is independent of the land use between the wetland and the priority habitat.

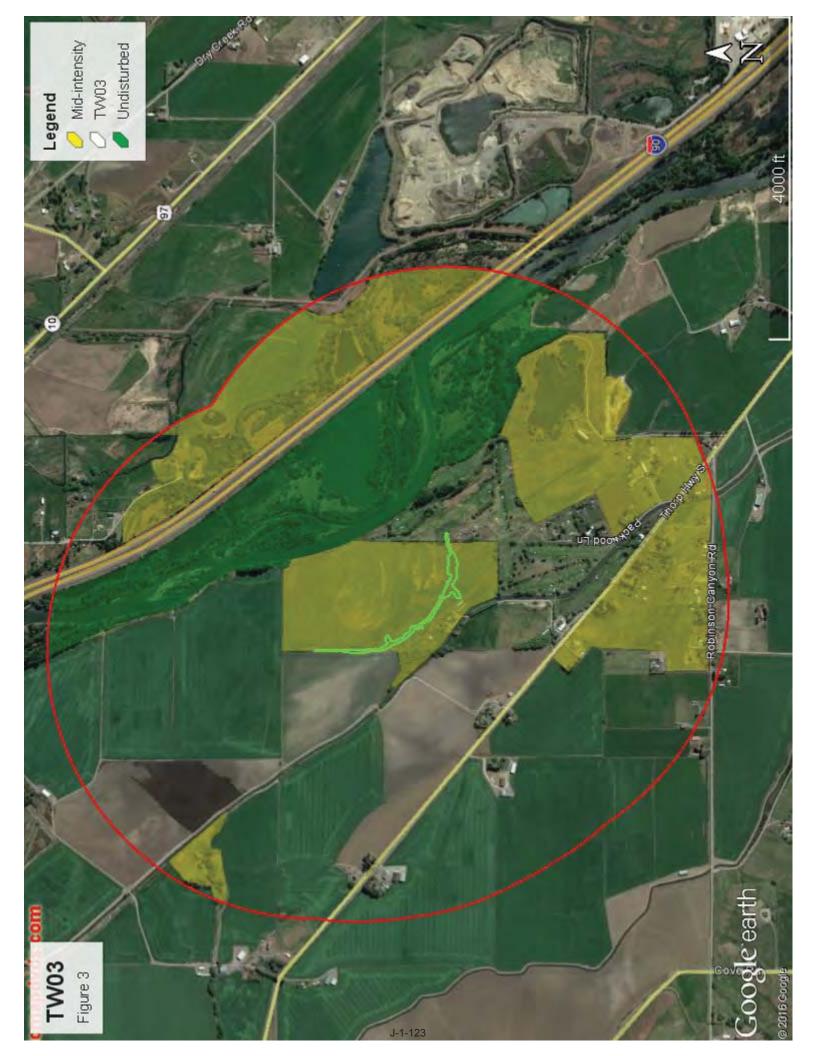
- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Old-growth/Mature forests: <u>Old-growth east of Cascade crest</u> Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. <u>Mature forests</u> Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.
- Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
 component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial
 ecosystems which mutually influence each other.
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- Shrub-steppe: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a
 conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Eastside Steppe: Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum spp.*).
- Juniper Savannah: All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

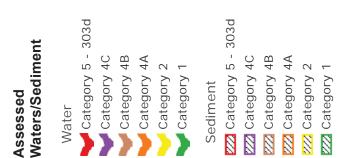
Wetland Rating System for Eastern WA: 2014 Update Effective January 1, 2015 Appendix B







TW03 - Figure 4







Miles ______ Miles ______ 0.125 0.25

0.5

Image courtesy of USGS Earthstar Geographics SIO © 2017 Microsoft Corporation © 2010 NAVTEQ © AND



by County

Funding Opportunities Project Development Priority Lists

Related Information

TMDL Contacts

RELATED ECOLOGY PROGRAMS

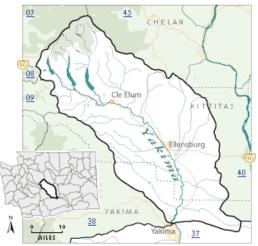
Water Quality

(where available) for more information on a project.

Yakima River basin project index:

www.ecy.wa.gov/programs/wg/tmdl/yakima_wg/index.html Counties

- <u>Kittitas</u>
- <u>Yakima</u>



Project Name	Pollutants	Status**	TMDL Lead
Crystal Creek	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	<u>Jane Creech</u> 509-454-7860
Selah Ditch	Fecal Coliform Temperature	EPA approved	<u>Greg Bohn</u> 509-454-4174
Teanaway River segments: Upper West Fork Teanaway River Upper Middle Fork Teanaway River Upper North Fork Teanaway River Stafford Creek Lower West Fork Teanaway River Lower Middle Fork Teanaway River Lower North Fork Teanaway River Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: Badger Creek Bull Ditch Caribou Creek Cherry Creek CID Canal Coleman Creek Cook Creek EWC Canal Johnson Drain KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 <u>Greg Bohn</u> 509-454-4174

TMDL Project Information for WRIA 39 | WA State Department of Ecology

Mercer Creek Naneum Creek Parke Creek Whiskey Creek Wilson Creek Wipple Wasteway			
Yakima River. Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	<u>Jane Creech</u> 509-454-7860
	Temperature	EPA approved Has an implementation plan	<u>Jane Creech</u> 509-454-7860
Yakima River	Toxics	Under development	<u>Jane Creech</u> 509-454-7860

** Status will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.

For more information about WRIA 39:

- <u>Waterbodies in WRIA 39</u> using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

<u>*</u> The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

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Wetland name or number Two4

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): <u>TWOY</u> Date of site visit: <u>4/4/17</u> Rated by <u>M. Evan Dhlh</u> Trained by Ecology? <u>Yes</u> No Date of training <u>3/24/17</u> HGM Class used for rating <u>Dephessional</u> Wetland has multiple HGM classes? <u>Y</u> N

NOTE: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map <u>Couple</u> Earth

OVERALL WETLAND CATEGORY _____ (based on functions _____ or special characteristics____)

1. Category of wetland based on FUNCTIONS

Category I – Total score = 22-27

Category II – Total score = 19-21

Category III – Total score = 16-18

Category IV – Total score = 9-15

FUNCTION	1 31 3 B 4 5 B	mprov ater Qu		Hy	drolo	ogic		Habita	at	
			Circle	the a	opropi	riate r	ating.	5		1
Site Potential	Н	M	L	H	Μ	L	Н	(M)	L	1
Landscape Potential	Н	\odot	L	Н	Μ	0	Н	M	L	1
Value	н	Ŵ	Ļ	H	M	L	Н	M	L	TOTAL
Score Based on Ratings		.6			6			6		18

Score for each function based on three ratings (order of ratings is not important) 9 = H,H,H 8 = H,H,M 7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L

5 = M,M,L 4 = M,L,L 3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY Circle the appropriate category
Vernal Pools	II III
Alkali	Ι
Wetland of High Conservation Value	I
Bog and Calcareous Fens	Ι
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	11
None of the above	

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015

Maps and figures required to answer questions correctly for Eastern Washington Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	1
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	1
Map of the contributing basin	D 5.3	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	5

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream (can be added to another figure)	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of area within 150 ft of the wetland (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?

The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size At least 30% of the open water area is deeper than 10 ft (3 m)

NO – go to 2

YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

- 2. Does the entire wetland unit meet all of the following criteria?
 - ____The wetland is on a slope (*slope can be very gradual*),
 - ____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;

_____The water leaves the wetland **without being impounded**.

NO - go to 3

YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

- 3. Does the entire wetland unit meet all of the following criteria?
 - _____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;

_The overbank flooding occurs at least once every 10 years. 🖘 ೂ

NO - go to 4/

YES – The wetland class is **Riverine**

NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 5

YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

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TWOY Wetland name or number

DEPRESSIONAL WETLANDS Water Quality Functions - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing, unconstricted, surface outlet points = 1	5
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions of soils) YES = 3 $(NO = 0)$	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for $>^2/_3$ of area Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to $<^1/_3$ of area Wetland has persistent, ungrazed vegetation $<^1/_{10}$ of area	1
D 1.4. Characteristics of seasonal ponding or inundation: This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded. Area seasonally ponded is >½ total area of wetland Area seasonally ponded is ½ -½ total area of wetland Area seasonally ponded is ½ total area of wetland Area seasonally ponded is <¼ total area of wetland	4
Total for D 1 Add the points in the boxes above	Ŧ

Rating of Site Potential If score is: ____12- 16 = H ____6- 11 = M ____0- 5 = L

D 2.0. Does the landscape have the potential to support the water quality function of the site? D 2.1. Does the wetland receive stormwater discharges? Yes = 1 (No = 0)0 D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0 D 2.3. Are there septic systems within 250 ft of the wetland? Vtry Possibly Yes = 1 No = 0 D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_ Yes = 1 (No = 0)Total for D 2 Add the points in the boxes above

Rating of Landscape Potential If score is: 3 or 4 = H / 1 or 2 = M 0 = L Record the rating on the first page

D 3.0. Is the water quality improvement provided by the site valuable to soc	iety?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or la	that is on the 303(d) list? Yes = $1(No = 0)$	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some eutrophic lakes, problems with nuisance and toxic algae]?	aquatic resource [303(d) list, (Yes = 1) No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for main if there is a TMDL for the drainage or basin in which the wetland is found)?	ntaining water quality (<i>answer YES</i> Yes = 2 (No = 0)	0
Total for D 3	Add the points in the boxes above	1

Rating of Value If score is: 2-4 = H V1 = M 0 = L

Record the rating on the first page

Wetland name or number

WOY

DEPRESSIONAL WETLANDS Hydrologic Functions - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
 D 4.1. <u>Characteristics of surface water outflows from the wetland</u>: Wetland has no surface water outlet Wetland has an intermittently flowing outlet Wetland has a highly constricted permanently flowing outlet Wetland has a permanently flowing unconstricted surface outlet (If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing") 	8
 D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry). Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding points = 6 The wetland is a headwater wetland Seasonal ponding: 1 ft - < 2 ft points = 4 Seasonal ponding: 6 in - < 1 ft points = 0 	6
Total for D 4 Add the points in the boxes above	14

D 5.0. Does the landscape have the potential to support the hydrologic f D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 (No = 0)	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that gener	ates runoff? Yes = 1 (No = 0)	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with in	ntensive human land uses? Yes = $1/No = 0$	0
Total for D 5	Add the points in the boxes above	0
ating of Landscape Potential If score is:3 = H1 or 2 = M0 = L	Record the rating on the	first p

0 6.1. The wetland is in a landscape that has flooding problems.		
Choose the description that best matches conditions around the wetland being rated. <i>Do not add points.</i> Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND		
Flooding occurs in sub-basin that is immediately down-gradient of wetlandpoints = 2Surface flooding problems are in a sub-basin farther down-gradientpoints = 1	-	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood.		
Explain why points = 0		
There are no problems with flooding downstream of the wetland points = 0		
0 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2(No = 0)	0	
Total for D 6 Add the points in the boxes above	1	

Rating of Value If score is: 2-4 = H __1 = M __0 = L

Wetland name or number_

These questions apply to wetlands of all HGM classes. IABITAT FUNCTIONS - Indicators that site functions to provide important habitat	(only 1 score per box)
1 1.0. Does the wetland have the potential to provide habitat for many species?	
I 1.1. Structure of the plant community: Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= % ac or >= 10% of the wetland if wetland is < 2.5 ac.	2
1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	.1
 H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac OR 10% of its area during the March to early June OR in August to the end of September? Answer YES for Lake Fringe wetlands. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? Answer yes only if H 1.3.1 is No. Yes = 3 No = 0 	LV.
1.4. <u>Richness of plant species</u> Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk) # of species	0
H 1.5. Interspersion of habitats	Figure_
Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high. None = 0 points All three diagrams in this row are High = 3 points	1

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H 1.6. Special habitat features	
Check the habitat features that are present in the wetland. The number of checks is the number of points.	
Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface	
ponding or in stream.	
Cattails or bulrushes are present within the wetland.	
Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge.	2
Emergent or shrub vegetation in areas that are permanently inundated/ponded.	5
Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree	· ·
slope) OR signs of recent beaver activity	
Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs,	
herbaceous, moss/ground cover)	
Total for H 1 Add the points in the boxes above	10
	V

Rating of Site Potential If score is: 15-18 = H $\sqrt{7-14} = M$ 0-6 = L Record the rating on the first page

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is:Calculate: % undisturbed habitat 17 + [(% moderate and low intensity land uses)/2] $9 = 76$ %> $1/_3$ (33.3%) of 1 km Polygonpoints = 3- 20-33% of 1 km Polygon 135 139 10-19% of 1 km Polygon 135 176 <10% of 1 km Polygon	2
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. Calculate: % undisturbed habitat 17 + [(% moderate and low intensity land uses)/2] Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches 212 - 27 Undisturbed habitat 10 - 50% and > 3 patches 212 - 27 Undisturbed habitat 10 - 50% and > 3 patches 763 - 763 Undisturbed habitat < 10% of Polygon	2
H 2.3. Land use intensity in 1 km Polygon: points = (-2) > 50% of Polygon is high intensity land use 56% Does not meet criterion above points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. <i>Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs</i> Yes = 3 (No = 0)	0
Total for H 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: 4-9 = H 1-3 = M < 1 = L Record the rating on the first page

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose the highest score that applies to the wetland being rated	
that applies to the wetland being rated	
Site meets ANY of the following criteria: points = 2	
 It has 3 or more priority habitats within 100 m (see Appendix B) 	
It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists)	
 It is mapped as a location for an individual WDFW species 	
— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources	
— It has been categorized as an important habitat site in a local or regional comprehensive plan, in a	
Shoreline Master Plan, or in a watershed plan	
Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1	
Site does not meet any of the criteria above points = 0	

Rating of Value If score is: 2 = H / 1 = M 0 = L

Record the rating on the first page

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015

TWOY

Wetland name or number

Appendix B: WDFW Priority Habitats in Eastern Washington

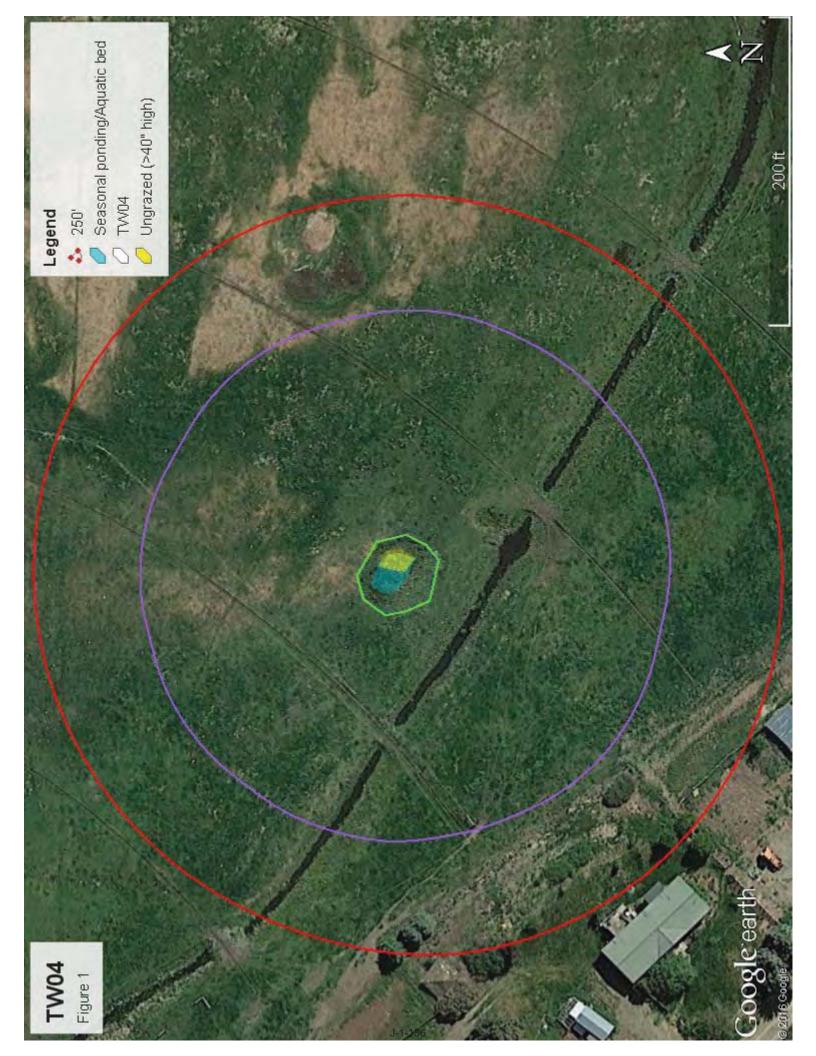
<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here: <u>http://wdfw.wa.gov/conservation/phs/list/</u>]

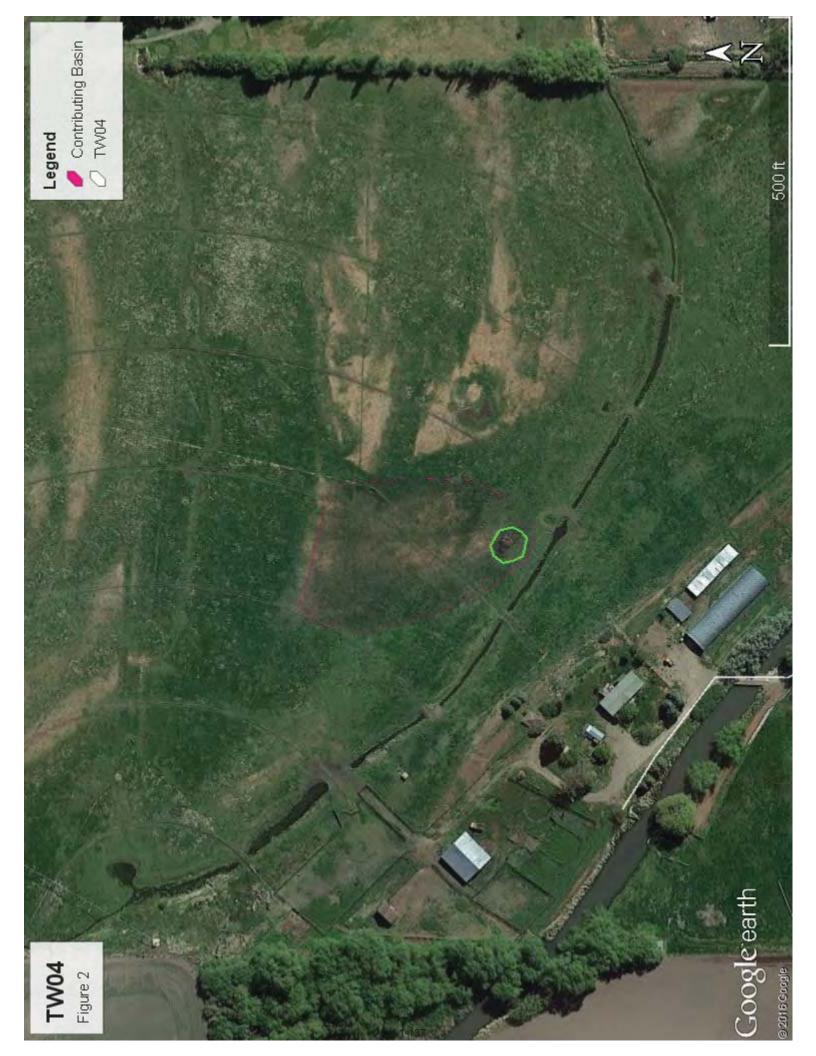
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: *NOTE:* This question is independent of the land use between the wetland and the priority habitat.

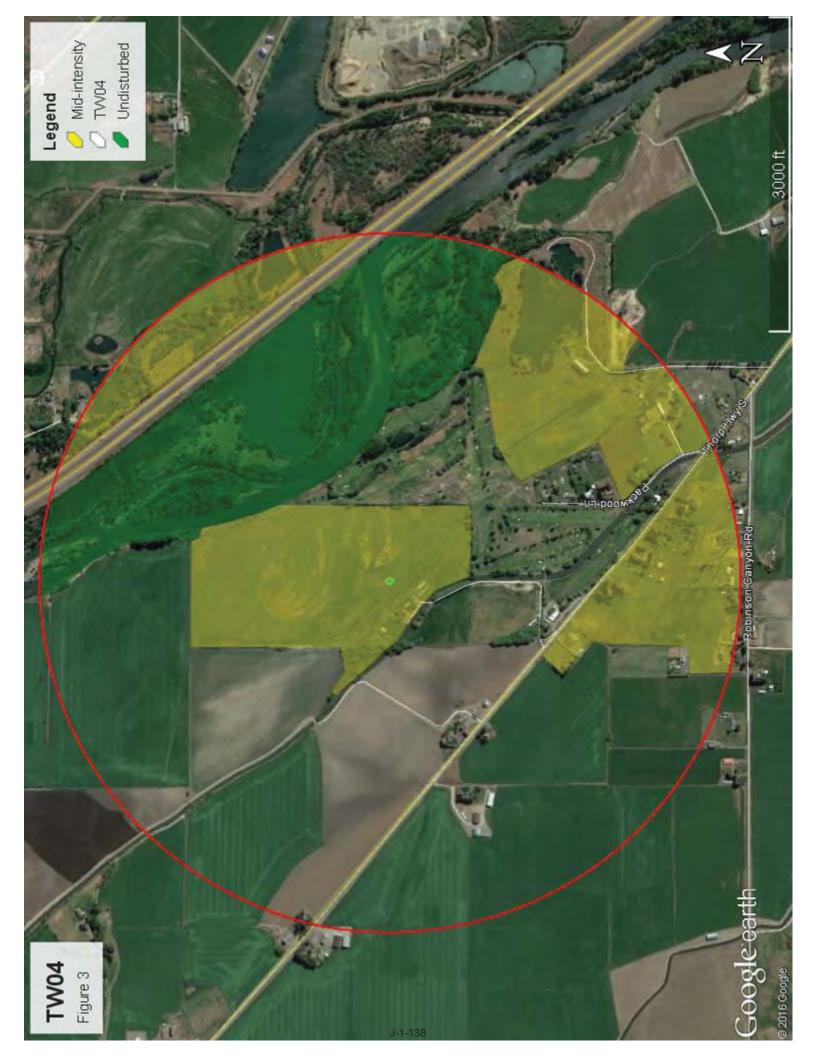
- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Old-growth/Mature forests: <u>Old-growth east of Cascade crest –</u> Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. <u>Mature forests –</u> Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.
- Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
 component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or
 other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- Shrub-steppe: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a
 conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Eastside Steppe: Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).
- Juniper Savannah: All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

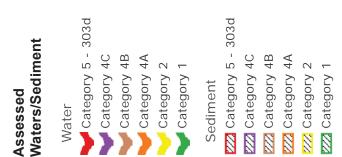
Wetland Rating System for Eastern WA: 2014 Update Effective January 1, 2015 Appendix B







TW04 - Figure 4







Miles 0.125 0.25

0.5

Image courtesy of USGS Earthstar Geographics SIO © 2017 Microsoft Corporation © 2010 NAVTEQ © AND

Funding Opportunities

Project Development

Related Information

RELATED ECOLOGY PROGRAMS Water Quality

Priority Lists

TMDL Contacts



Yakima River basin project index:

www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html Counties

- <u>Kittitas</u>
- <u>Yakima</u>



Project Name	Pollutants	Status**	TMDL Lead
<u>Crystal Creek</u>	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	<u>Jane Creech</u> 509-454-7860
<u>Selah Ditch</u>	Fecal Coliform Temperature	EPA approved	<u>Greg Bohn</u> 509-454-4174
Teanaway River segments: Upper West Fork Teanaway River Upper Middle Fork Teanaway River Upper North Fork Teanaway River Stafford Creek Lower West Fork Teanaway River Lower Middle Fork Teanaway River Lower North Fork Teanaway River Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: Badger Creek Bull Ditch Caribou Creek Cherry Creek CID Canal Coleman Creek Cook Creek EWC Canal Johnson Drain KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 <u>Greg Bohn</u> 509-454-4174

TMDL Project Information for WRIA 39 | WA State Department of Ecology

Mercer Creek Naneum Creek Parke Creek Whiskey Creek Wilson Creek Wipple Wasteway			
Yakima River, Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	<u>Jane Creech</u> 509-454-7860
	Temperature	EPA approved Has an implementation plan	<u>Jane Creech</u> 509-454-7860
Yakima River	Toxics	Under development	<u>Jane Creech</u> 509-454-7860

** Status will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.

For more information about WRIA 39:

- <u>Waterbodies in WRIA 39</u> using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

<u>*</u> The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

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Wetland name or number Twos

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): TWOS Date of site visit: 4/12/17 Rated by N. Evan Outlin Trained by Ecology? Yes No Date of training 3/24/17 HGM Class used for rating Riverine Wetland has multiple HGM classes? Y N

NOTE: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map ______Goog le Earth

OVERALL WETLAND CATEGORY <u>III</u> (based on functions <u>v</u> or special characteristics___)

1. Category of wetland based on FUNCTIONS

Category I – Total score = 22-27

____Category II – Total score = 19-21

____Category III – Total score = 16-18

Category IV – Total score = 9-15

FUNCTION	and the second second	mproving iter Quality	Contraction of the second	drolo	ogic		Habita	at	
		Circle	the ap	prop	riate ra	ating	5]
Site Potential	Н	M L	H	Μ	L	Н	Μ	Û	1
Landscape Potential	Н	M L	Н	Μ	Û	Н	Μ	(L)	
Value	Н	MÛ	H	Μ	Ľ	н	M	L	ΤΟΤΑΙ
Score Based on Ratings		5		7			4		16

Score for each function based on three ratings (order of ratings is not important)
9 = H,H,H
9 – п,п,п
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M . I . I

3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY Circle the appropriate category
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015 1

Maps and figures required to answer questions correctly for Eastern Washington Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	1
Hydroperiods	H 1.2, H 1.3	1
Ponded depressions	R 1.1	1
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	1
Map of the contributing basin	R 2.2, R 2.3, R 5.2	2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	1
Width of wetland vs. width of stream (can be added to another figure)	R 4.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	-3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	5

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of area within 150 ft of the wetland (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?

The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size At least 30% of the open water area is deeper than 10 ft (3 m)

NO – go to 2

YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit meet all of the following criteria?

_____The wetland is on a slope (*slope can be very gradual*),

_____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;

_____The water leaves the wetland **without being impounded**.

NO - go to 3

YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit meet all of the following criteria?

The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;

NO - go to 4

YES – The wetland class is **Riverine**

NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 5

YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland Rating System for Eastern WA: 2014 Update Rating Form – Effective January 1, 2015 3

Wetland name or number TWOS

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

RIVERINE WETLANDS Water Quality Functions - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:Depressions cover >1/3 area of wetlandpoints = 6Depressions cover > 1/10 area of wetland 0.15 or Depressions present but cover < 1/10 area of wetland 0.15 or No depressions presentpoints = 1points = 0	6
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; not Cowardin classes):Forest or shrub > $^2/_3$ the area of the wetlandPoints = 10Forest or shrub $^1/_3 - ^2/_3$ area of the wetlandOurgrazed, herbaceous plants > $^2/_3$ area of wetlandUngrazed, herbaceous plants > $^2/_3$ area of wetlandDungrazed herbaceous plants $^1/_3 - ^2/_3$ area of wetlandPoints = 5Points = 10Points = 5Ungrazed herbaceous plants $^1/_3 - ^2/_3$ area of wetlandPoints = 2Points = 0	5
Total for R 1 Add the points in the boxes above	11

R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 (No =	0 0
R 2.2. Does the contributing basin include a UGA or incorporated area?	Yes = 1 (No =	0) 0
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests within the last 5 years?	that have been clearcu Yes = 1 No =	it I
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants	(Yes = 1)No =	0 1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in R 2.1-R 2.4? Source	n questions Yes = 1 (No =	0) ()
Total for R 2 Add the p	oints in the boxes abov	/e 7

R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary the mi? Yaking $MHe_F > I$ mile	at drains to one within 1 Yes = 1 (No = 0)	0
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens?	Yes = 1 (No = 0)	0
R 3.3. Has the site been identified in a watershed or local plan as important for maintain YES if there is a TMDL for the drainage in which wetland is found.	ing water quality? Answer Yes = 2 (No = 0)	0
Total for R 3 Add the	points in the boxes above	0

Rating of Value If score is: 2-4 = H __1 = M __0 = L

Record the rating on the first page

Wetland name or number Two 5

RIVERINE WETLANDS Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion		
R 4.0. Does the site have the potential to reduce flooding and erosion?		per box)
R 4.1. Characteristics of the overbank storage the wetland provides: Estimate the average width of the wetland perpendicular to the direction of the stream or river channel (distance between banks). Calculate the ratio: (average width of stream between banks). If the ratio is more than 2 If the ratio is 1-2 If the ratio is ½-<1 If the ratio is ½-<2 If the ratio is 1-2 If the ratio is 1-2 If the ratio is 1-2 If the ratio is 1-		8
 R 4.2. Characteristics of plants that slow down water velocities during floods: Treat I shrub. Choose the points appropriate for the best description (polygons need height. These are NOT Cowardin classes). Forest or shrub for more than ²/₃ the area of the wetland Forest or shrub for >¹/₃ area OR emergent plants > ²/₃ area Forest or shrub for > ¹/₁₀ area OR emergent plants > ¹/₃ area Plants do not meet above criteria 		4
Plants do not meet above criteria	Donnes - O	
Total for R 5 Add	the points in the boxes above Record the rating on	12 the first pag
Total for R 5 Add ating of Site Potential If score is: 12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic funct	the points in the boxes above Record the rating on	
Total for R 5 Add ating of Site Potential If score is: $\sqrt{12-16} = H$	the points in the boxes above <i>Record the rating on</i> ions of the site?	
Total for R 5 Add ating of Site Potential If score is: 12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic funct R 5.1. Is the stream or river adjacent to the wetland downcut? R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	the points in the boxes above Record the rating on ions of the site? (Yes = 0) No = 1	
Total for R 5 Add ating of Site Potential If score is: 12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic funct R 5.1. Is the stream or river adjacent to the wetland downcut? R 5.2. Does the up-gradient watershed include a UGA or incorporated area? R 5.3. Is the up-gradient stream or river controlled by dams?	the points in the boxes above Record the rating on ions of the site? (Yes = 0) No = 1 Yes = 1 (No = 0)	
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Total for R 5 Add aating of Site Potential If score is: 12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic funct R 5.1. Is the stream or river adjacent to the wetland downcut? R 5.2. Does the up-gradient watershed include a UGA or incorporated area? R 5.3. Is the up-gradient stream or river controlled by dams?	the points in the boxes above Record the rating on ions of the site? (Yes = 0) No = 1 Yes = 1 (No = 0) (Yes = 0) No = 1 the points in the boxes above	the first page
Total for R 5 Add ating of Site Potential If score is:12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic funct R 5.1. Is the stream or river adjacent to the wetland downcut? R 5.2. Does the up-gradient watershed include a UGA or incorporated area? R 5.3. Is the up-gradient stream or river controlled by dams? Total for R 5 Add ating of Landscape Potential If score is:3 = H1 or 2 = M0 = L R 6.0. Are the hydrologic functions provided by the site valuable to society?	the points in the boxes above Record the rating on ions of the site? (Yes = 0) No = 1 Yes = 1 (No = 0) (Yes = 0) No = 1 the points in the boxes above Record the rating on ose the description that best fits	the first page
Total for R 5 Add ating of Site Potential If score is:12-16 = H6-11 = M0-5 = L R 5.0. Does the landscape have the potential to support the hydrologic funct R 5.1. Is the stream or river adjacent to the wetland downcut? R 5.2. Does the up-gradient watershed include a UGA or incorporated area? R 5.3. Is the up-gradient stream or river controlled by dams? Total for R 5 Add ating of Landscape Potential If score is:3 = H1 or 2 = M0 = L R 6.0. Are the hydrologic functions provided by the site valuable to society? R 6.1. Distance to the nearest areas downstream that have flooding problems? Choc the site. The sub-basin immediately down-gradient of site has surface flooding problems are in a basin farther down-gradient	the points in the boxes above Record the rating on ions of the site? (Yes = 0) No = 1 Yes = 1 (No = 0) (Yes = 0) No = 1 the points in the boxes above Record the rating on bese the description that best fits ms that result in damage to points = 2 points = 1 points = 0	the first page

Rating of Value If score is: 2-4 = H ___1 = M ___0 = L

Record the rating on the first page

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These questions apply to wetlands of all HGM classes.	(only 1 score per	
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	box)	
1 1.0. Does the wetland have the potential to provide habitat for many species?		
H 1.1. Structure of the plant community: Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.	1	
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0	
 H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac OR 10% of its area during the March to early June OR in August to the end of September? Answer YES for Lake Fringe wetlands. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? Answer yes only if H 1.3.1 is No. Yes = 3 No = 0 	0	Sejenda 127 me
H 1.4. <u>Richness of plant species</u> Count the number of plant species in the wetland that cover at least 10 ft ² . Different patches of the same species can be combined to meet the size threshold. You do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk) # of species	0	
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.	Figure	
None = 0 points All three diagrams in this row are High = 3 points		

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Wetland name or number Two G	
H 1.6. Special habitat features Check the habitat features that are present in the wetland. The number of checks is the number of points. Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. Cattails or bulrushes are present within the wetland. Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. Emergent or shrub vegetation in areas that are permanently inundated/ponded. Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity Invasive species cover less than 20% in each stratum of vegetation (canopy, sub-canopy, shrubs,	2
herbaceous, moss/ground cover)	
Total for H 1 Add the points in the boxes above	3

Rating of Site Potential If score is: 15-18 = H 7-14 = M 0-6 = L Record the rating on the first page

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: $Calculate:$ % undisturbed habitat > $1/_3$ (33.3%) of 1 km Polygon + [(% moderate and low intensity land uses)/2] =% 20-33% of 1 km Polygon 0 0 0 10-19% of 1 km Polygon 0 0 0 $-<10\%$ of 1 km Polygon 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. Image: Calculate: % undisturbed habitat 12 + [(% moderate and low intensity land uses)/2] Image: Calculate: % undisturbed habitat 12 + [(% moderate and low intensity land uses)/2] Image: Calculate: % undisturbed habitat 12 + [(% moderate and low intensity land uses)/2] Image: Calculate: % undisturbed habitat 12 + [(% moderate and low intensity land uses)/2] Image: Calculate: % undisturbed habitat 10 - 50% and in 1-3 patches Image: Calculate - 25% points = 3 points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches Image: Calculate - 25% points = 2 Image: Calculate - 25% points = 2 points = 2 Undisturbed habitat 10 - 50% and > 3 patches Image: Calculate - 25% points = 1 Image: Calculate - 25% points = 1 points = 1 Undisturbed habitat < 10% of Polygon	2
H 2.3. Land use intensity in 1 km Polygon: points = (-2) > 50% of Polygon is high intensity land use >> Does not meet criterion above points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. <i>Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs</i> Yes = 3 (No = 0)	0
Total for H 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: 4-9 = H -1-3 = M $\sqrt{-1} = L$ Record the rating on the first page

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose the highest score that applies to the wetland being rated	
Site meets ANY of the following criteria: points = 2	
 It has 3 or more priority habitats within 100 m (see Appendix B) 	Mart .
 It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) 	
 It is mapped as a location for an individual WDFW species 	1
 It is a Wetland of High Conservation Value as determined by the Department of Natural Resources 	No.
 It has been categorized as an important habitat site in a local or regional comprehensive plan, in a 	
Shoreline Master Plan, or in a watershed plan	
Site has 1 or 2 priority habitats within 100 m (see Appendix B) points = 1	
Site does not meet any of the criteria above points = 0	

Rating of Value If score is: 2 = H ___1 = M ___0 = L

Record the rating on the first page

Appendix B: WDFW Priority Habitats in Eastern Washington

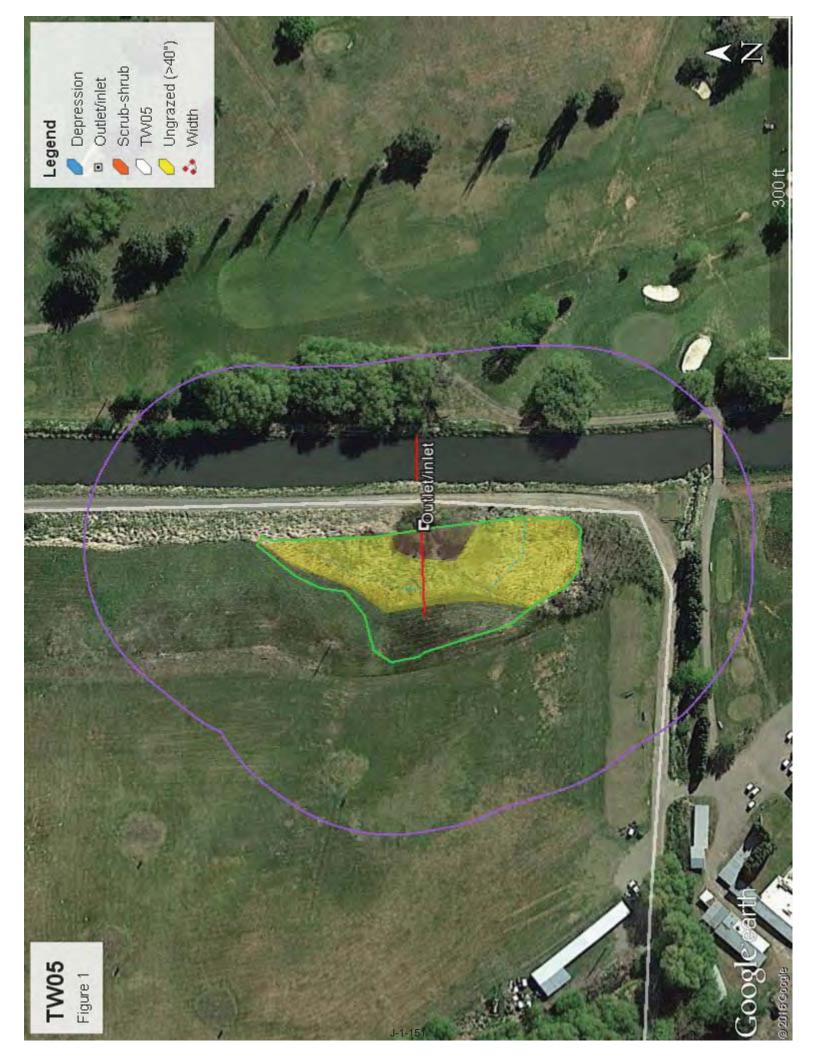
<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here: <u>http://wdfw.wa.gov/conservation/phs/list/</u>]

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: **NOTE:** This question is independent of the land use between the wetland and the priority habitat.

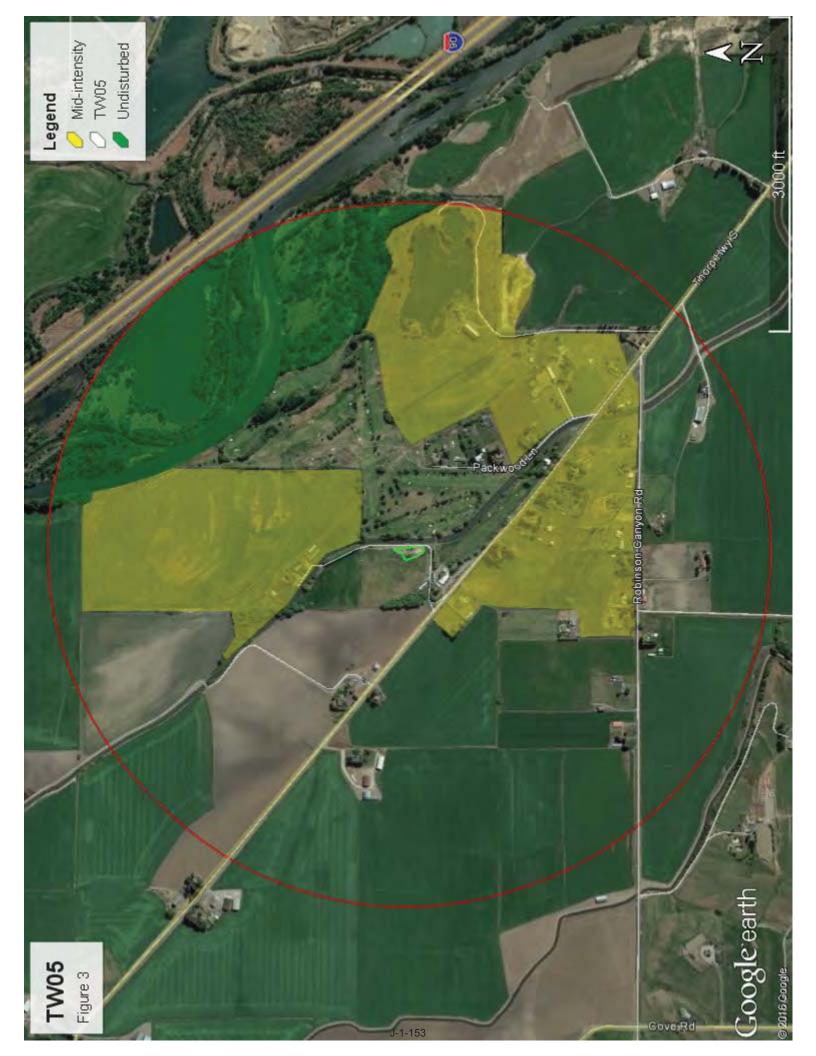
- Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report).
- Old-growth/Mature forests: <u>Old-growth east of Cascade crest</u> Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. <u>Mature forests</u> Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.
- Oregon White Oak: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak
 component is important (*full descriptions in WDFW PHS report p. 158 see web link above*).
- Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial
 ecosystems which mutually influence each other.
- Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or
 other geological formations and is large enough to contain a human.
- Cliffs: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus: Homogenous areas of rock rubble ranging in average size 0.5 6.5 ft (0.15 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- Shrub-steppe: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a
 conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- Eastside Steppe: Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).
- Juniper Savannah: All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland Rating System for Eastern WA: 2014 Update Effective January 1, 2015 Appendix B







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Yakima River basin project index:

www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html Counties

- <u>Kittitas</u>
- <u>Yakima</u>



Project Name	Pollutants	Status**	TMDL Lead
<u>Crystal Creek</u>	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	<u>Jane Creech</u> 509-454-7860
<u>Selah Ditch</u>	Fecal Coliform Temperature	EPA approved	<u>Greg Bohn</u> 509-454-4174
Teanaway River segments: Upper West Fork Teanaway River Upper Middle Fork Teanaway River Upper North Fork Teanaway River Stafford Creek Lower West Fork Teanaway River Lower Middle Fork Teanaway River Lower North Fork Teanaway River Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: Badger Creek Bull Ditch Caribou Creek Cherry Creek CID Canal Coleman Creek Cook Creek EWC Canal Johnson Drain KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	J <u>ane Creech</u> 509-454-7860 <u>Greg Bohn</u> 509-454-4174

RELATED ECOLOGY PROGRAMS

Funding Opportunities

Project Development

Related Information

Priority Lists

TMDL Contacts

Water Quality

J-1-155

http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/tmdl-wria39.html[4/24/2017 2:03:50 PM]

TMDL Project Information for WRIA 39 | WA State Department of Ecology

Mercer Creek Naneum Creek Parke Creek Whiskey Creek Wilson Creek Wipple Wasteway			
Yakima River, Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	<u>Jane Creech</u> 509-454-7860
	Temperature	EPA approved Has an implementation plan	<u>Jane Creech</u> 509-454-7860
Yakima River	Toxics	Under development	<u>Jane Creech</u> 509-454-7860

** Status will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.

For more information about WRIA 39:

- <u>Waterbodies in WRIA 39</u> using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

<u>*</u> The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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APPENDIX F: KITTITAS COUNTY WETLAND BUFFER GUIDANCE

Chapter 17A.04 CRITICAL AREAS DESIGNATION AND DEVELOPMENT STANDARDS

Sections

17A.04.010 Wetlands.
17A.04.015 No net loss of wetland areas.
17A.04.020 Buffer width requirements.
17A.04.025 Wetland buffer ranges.
17A.04.030 Wetland buffer averaging.
17A.04.035 Natural condition of wetland buffer.
17A.04.040 Allowed uses.
17A.04.045 Building setback lines from wetland buffers.
17A.04.050 Wetland replacement ratios.

17A.04.010 Wetlands.

Wetlands in Kittitas County are defined in <u>Section 17A.02.310</u> and classified in four categories: Category I (extreme high value), Category II (high value), Category III (average value), Category IV (less than average value). Critical area wetlands in Kittitas County are defined as Category I, Category II, Category III and Category IV wetlands as determined by the planning manager.

Category IV wetlands may be determined by the director to constitute a critical area based upon application of the criteria in this chapter. (Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).

17A.04.015 No net loss of wetland areas.

Kittitas County shall require, to the extent practical, and except for Category IV wetlands, a zero net loss of natural wetlands functions and values together with, if reasonably possible through voluntary agreements or government incentives, a gain of wetlands in the long term. (Ord. 94-22 (part), 1994).

17A.04.020 Buffer width requirements.

Wetland buffer requirements apply to all nonexempt activities on regulated wetlands. All wetland buffers shall be measured from the wetland boundary.

Categor	y Size of Wetland	Required Buffer
Ι	any size	50 - 200 feet
II	over 2,000 sq. ft.	25 - 100 feet
III	over 10,000 sq. ft.	20 - 80 feet
IV*	43,560 sq. ft. (1 acre)	Building setbacks will be determined by the zoning lot line setbacks, but shall not exceed 25 feet.

*Includes only nonirrigation induced or enhanced Category IV wetlands. Irrigation water does influence ground water table elevations in Kittitas County.

(Ord. 96-14 (part), 1996; Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).

17A.04.025 Wetland buffer ranges.

The wetland buffer ranges have been established to reflect the impact of certain intense land uses on wetland function and values. The director shall base the buffer size on the following criteria and shall establish the least restrictive width of buffer necessary to account for all of the following considerations:

- 1. The overall intensity of the proposed use;
- 2. The presence of threatened, endangered, or sensitive species;
- 3. The site's susceptibility to severe erosion;
- 4. The use of a buffer enhancement plan by the applicant which uses native vegetation or other measures which will enhance the functions and values of the wetland or buffer. (Ord. 94-22 (part), 1994).

17A.04.030 Wetland buffer averaging.

Wetland buffers may be modified by averaging buffer widths. Wetland buffer width averaging shall be allowed only where the applicant demonstrates that the following exists:

- 1. That averaging is necessary to avoid an extraordinary hardship to the applicant caused by circumstances peculiar to the property;
- 2. That the wetland contains variations in sensitivity due to existing physical characteristics;
- 3. That the proposed use would be located adjacent to areas where buffer width is reduced, and that such land uses are low in impact;
- 4. That width averaging will not adversely impact wetland function and values. (Ord. 9422 (part), 1994).

17A.04.035 Natural condition of wetland buffer.

Natural condition of wetland buffer. Wetland buffer areas shall be retained in their natural condition or may be improved to enhance buffer functions and values. Where buffer disturbance has occurred during construction, revegetation with native vegetation may be required. The Kittitas County noxious weed ordinance shall be adhered to. (Ord. 94-22 (part), 1994).

17A.04.040 Allowed uses.

In addition to exempt activities otherwise identified herein, the following activities are allowed to occur on wetland and wetland buffer areas: nonmotorized outdoor recreational activities including hunting and fishing; educational activities; existing and ongoing agricultural activities, silviculture and mining; and maintenance of existing facilities, structures, ditches, roads, bridges and other utility systems. Up to two acres of Class IV wetlands may be filled, drained or modified with no approval required from the planning manager. If more than two acres of Class IV wetlands are filled, drained or modified, approval of the planning manager is required. Such development activity shall provide mitigation in accordance with <u>Section 17A.04.050</u> for that portion of the wetland fill or modification that exceeds two acres. Category IV wetlands may be used for secondary stormwater management facilities having no reasonable alternative on-site location, provided there is no significant adverse impact to the functions and values of those wetlands. (Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).

17A.04.045 Building setback lines from wetland buffers.

A building setback line equal to the side yard setback requirement of the applicable zoning district is required from the edge of any wetland buffer. Minor intrusions into the area of the building setback may be allowed if the director determines that such intrusions will not negatively impact the wetland. The setbacks shall be shown on all site plans submitted with the application. (Ord. 94-22 (part), 1994).

17A.04.050 Wetland replacement ratios.

Wetland replacement ratios are expressed in gross area required for replacement. The actual replacement, enhancement or rehabilitation of wetlands shall be determined by the director and meet all applicable standards for such. Replacement areas shall be determined according to function, acreage, type, location, time factors, ability to be self sustaining and projected success. Wetland functions and values shall be calculated using the Kittitas County critical areas policy document and the professional judgment of the director.

Category of Wetland	Replacement Ratio
Ι	3:1
II	2:1
III	1.5:1
IV	1:1 for the portion of a wetland fill or modification

(Ord. 96-14 (part), 1996; Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).