Cleanup Action Plan

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington
Cleanup Site ID 15545

Prepared for:

Forterra Roslyn LLC

August 11, 2025
Project No. M1122.05.006

Prepared by:

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MAUL FOSTER ALONGI

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The material and data in this report were prepared under the supervision and direction of the undersigned.

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Abbreviations

ABCA	analysis of brownfield cleanup alternatives
bgs	below ground surface
BMP	best management practice
CAP	cleanup action plan
COC	chemical of concern
Commerce	Washington State Department of Commerce
CSM	conceptual site model
CUL	cleanup level
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ESA	environmental site assessment
Forterra	Forterra Roslyn LLC
JARPA	joint aquatic resource permit application
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligrams per kilogram
mg/L	miligrams per liter
MTCA	Model Toxics Control Act
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
POC	point of compliance
the Property	Roslyn No. 4 Mine, 205 E Dakota Avenue, Roslyn, Washington
SMP	soil management plan
TCLP	toxicity characteristic leaching procedure
TEE	terrestrial ecological evaluation
TPH	total petroleum hydrocarbon
ug/L	micrograms per liter
USACE	U.S. Army Corps of Engineers
WAC	Washington Administrative Code
WPP	wetland protection plan
XRF	X-ray fluorescence

1 Introduction

On behalf of Forterra Roslyn LLC (Forterra), Maul Foster & Alongi, Inc. (MFA), has prepared this cleanup action plan (CAP) for the remedial action at the Roslyn No. 4 Mine, located at 205 E Dakota Avenue in Roslyn, Washington (the Property; see Figure 1-1). The Property is currently vacant but was formerly used for a variety of operations, including a coal mine (referred to as the No. 4 Mine). Forterra is the owner of the Property. The Property is listed with the Washington State Department of Ecology (Ecology) under facility site ID 66921 and cleanup site ID 15545.

1.1 Regulatory Framework and Purpose

The Property is currently enrolled in Ecology's Voluntary Cleanup Program. Forterra received a grant from the Washington State Department of Commerce (Commerce) (Capital Agreement contract No. 24-62310-001), with an effective date of June 3, 2024. The grant supports Forterra's environmental site assessment, analysis of cleanup alternatives, and site planning for redeveloping the Property with attainable housing for community benefit.

This CAP, which includes a soil management plan (SMP) and a wetland protection plan (WPP) as appendices A and B, has been prepared in accordance with the Capital Agreement with Forterra through Commerce for Roslyn No. 4 Mine Cleanup Project. The purpose of this CAP is to identify the proposed cleanup action for the Property and describe the rationale for the selected cleanup action. In addition, This CAP generally follows the requirements of Washington Administrative Code (WAC) 173-340-400 and 173-340-380.

The cleanup action is intended to mitigate exposure risk for residents, visitors, workers, and ecological receptors at the Property from metals and petroleum-contaminated soil and arsenic-contaminated groundwater. The SMP includes consideration of coal and describes the handling and disposal requirements for soil on the Property. The WPP describes guidelines for protecting wetlands on the Property during cleanup actions.

A draft version of this cleanup action plan was provided to Ecology. In an opinion letter dated July 31, 2025, Ecology indicated that no further remedial action will likely be necessary to clean up contamination at the Property if the remedial action is completed as proposed, with the addition of institutional control requirements (e.g., an environmental covenant if soil contamination remains beneath a soil cap following the cleanup action) (Ecology 2025a). Ecology did not have any comments on the draft cleanup action plan (Ecology 2025b).

1.2 Report Organization

This document is organized as follows:

- Section 2 discusses background information, including the Property history, previous investigations, and the physical setting.
- Section 3 describes the conceptual site model (CSM) for the Property.

- **Section 4** discusses the cleanup requirements and applicable regulations
- **Section 5** describes the cleanup action alternatives considered and the evaluation of the proposed cleanup options
- **Section 6** describes the selected remedy.

2 Background and Physical Setting

The background and physical setting information summarized below for the Property has been obtained from a Phase I environmental site assessment (ESA) conducted in 2020 (MFA 2020) and from several environmental assessments completed by Hart Crowser, Inc. (HC), Icicle Creek Engineers, Inc. (ICE), and MFA between 2004 and 2025 (HC 2004, 2006, 2007; ICE 2020; MFA 2023a; MFA 2025).

2.1 Property Description

The Property is located in section 17 of township 20 north and range 15 east of the Willamette Meridian. The Property consists of one 30.4-acre parcel (Kittitas County parcel 456234) and is situated in the southeast portion of the City of Roslyn (see Figures 1-1 and 2-1). The Property is currently vacant and is covered with low lying vegetation, trees, and open grass. Dirt and gravel roads are present throughout the Property. Remnant foundations of former structures, including a foundation used for auto maintenance, a former pump house, an unidentified brick structure, and slag pile are present on the Property.

2.2 Property History

An underground coal mine, the No. 4 Mine, was active at the Property from the 1880s until about 1909. Historical structures on the Property included a powerhouse, wash house, two barns, two warehouses, a foundry, the tipple and entrance shaft for the No. 4 Mine, the tipple for the No. 6 and No. 8 Mines, and several small buildings. The powerhouse and foundry were fueled by coal and coke. Although the mine was no longer active after 1909, the foundry remained operational through the mid-1970s to service the remaining mines in Roslyn that operated through the mid-1960s. Electrical transformers were formerly located east of the powerhouse between the 1960s and 1980s, until a new power substation was constructed off-property in the town of Roslyn. All remaining structures on the Property were removed in the 1980s.

2.3 Physical Setting

The Property is generally flat with a slight increase in slope to the north. A tailings pile represents a topographic high on the southeast portion of the Property. The Property is bordered by forested land and the Coal Mines Trail, a recreational walking and biking trail, to the northeast. Residential and commercial properties border the Property to the north and the southwest. Crystal Creek, located adjacent to the east and south of the Property, generally flows south in the vicinity. Tributaries of

Crystal Creek, Stream A and Stream B are present on the western and southwestern portion of the Property. Wetlands A through I are located throughout the Property (see Attachment A to Appendix B).

2.4 Geology and Hydrogeology

According to the 2000 U.S. Geological Survey Geologic Map of the Snoqualmie Pass Quadrangle, Washington, the Property is predominantly underlain by unconsolidated deposits consisting of dense, glacially overridden material of alternating till (very dense sand and gravel), outwash (dense sand and gravel), and lacustrine (hard silt and sand) deposits (Tabor 2000).

Based on investigation activities conducted by MFA at the Property in 2023 and 2024, soil encountered during explorations were predominantly sandy silt and silty sand, with varying amounts of gravel up to 19.5 feet below ground surface (bgs). Coal was noted to be present in some sampling locations to approximately 3 feet bgs.

Groundwater was encountered in temporary reconnaissance wells at depths varying between 2.70 to 3.40 feet bgs at the Property in April 2023. During supplemental investigation activities conducted at the Property in September 2024, depth to groundwater in newly installed permanent monitoring wells ranged from approximately 5.5 feet bgs in MW-01 and 12.1 feet bgs in MW-03. During additional groundwater monitoring in April 2025, depth to groundwater ranged from approximately 1.1 feet bgs in MW-01 and 7.7 feet bgs in MW-03. In general, the depth to groundwater in April 2025 was approximately 4 feet shallower than September 2024 (MFA 2025). Groundwater was determined to flow south-southwest on the Property in September 2024 and April 2025 (see Figure 2-2 and Figure 2-3).

2.5 Previous Environmental Investigation

Multiple environmental assessments have been completed at the Property, including the following:

- Phase I and Phase II ESAs completed in 2004, 2006, and 2007 by HC (2004, 2006, 2007).
- Follow-up investigation in 2020 by ICE (2020).
- Phase I ESA completed in 2020 by MFA (2020).
- Data gaps investigation completed in 2023 by MFA (2023a).
- Supplemental investigation completed in 2024 and 2025 by MFA (2025)

An overview of the Property's history and environmental conditions based on prior assessment activities is provided in a site conditions memorandum prepared by MFA (2022). Soil and groundwater sample locations and exceedances from previous investigations are provided in Figure 2-4 and 2-5. The analytical results from all of these investigations indicate that the extent of contamination was generally delineated for all features of interest, with the exception of an area near the former foundry and near the former transformers. Pre-construction sampling will be done to determine extent of contamination in that location during the cleanup action. Arsenic in groundwater exceeded the Model Toxics Control Act (MTCA) Method A cleanup level (CUL) at MW-02. A summary of the investigations is provided below:

2004 HC Environmental Assessment. HC completed a Phase I and limited Phase II ESA that included soil sampling and analysis (HC 2004). HC evaluated historic uses of the Property and identified four areas of potential concern: Former foundry area and associated slag pile, building foundation area used for vehicle maintenance, power transformers, and mine tailings pile and surface mine rock fill on the Property. Phase II sampling included advancing nine hand auger borings and surface soil grab sampling of the slag and tailings piles and laboratory analysis of select soil samples for potential contaminants associated with historical use at the Property. Concentrations of diesel- and heavy-oil-range total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and mercury were not detected in any of the soil samples submitted. One soil sample (HB-1), collected near the bottom of the foundation used for vehicle maintenance, had a concentration of cadmium (2.7 milligrams per kilogram [mg/kg]) that marginally exceeded the MTCA Method A CUL (2 mg/kg). Soil sample HB-3, collected near the former foundry, had a concentration of lead (620 mg/kg) that exceeded the MTCA Method A CUL (250 mg/kg). A review of the hand auger logs showed that only one sample, HB-8-S1, was described as containing coal fragments.

2006 HC Environmental Assessment. HC completed an additional environmental assessment at the Property that included completion of 14 test pits advanced in and near the four areas previously identified as areas of potential concern. Select soil samples were submitted for laboratory analysis of for potential contaminants associated with historical use at the Property. Gasoline-range TPH, diesel range TPH, PCBs, and volatile organic compounds were not detected in any of the soil samples. Heavy oil-range TPH was detected at 2,100 mg/kg (MTCA Method A CUL 2,000 mg/kg) in a sample, TP-13, from near the former powerhouse. PAHs were detected in one soil sample (TP-12; described as moist, dark gray sand with brick and coal fragments) near the power transformer area at concentrations below their respective MTCA CULs. MTCA Method A CULs in soil for arsenic, cadmium, mercury, and lead were exceeded in five locations. A review of the test pit logs showed that soil containing coal fragments was encountered in four test pits from the surface to depths ranging from 2 to 10 feet below ground surface (bgs).

2007 HC Environmental Assessment. HC performed additional assessment to evaluate the former foundry area and associated slag pile, building foundation area used for vehicle maintenance, former area of power transformers and the powerhouse, and wetland area (labeled on figures in this document as vegetated area). HC collected near surface soil samples in these areas, advanced four direct push borings to eight feet bgs, and installed four mini-wells in the wetland area. Selected soil, sediment, and groundwater samples were analyzed for diesel- and heavy-oil-range TPH and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc). TPH was below MTCA CULs in all soil samples, while cadmium, arsenic, and mercury exceeded MTCA CULs. The mini wells targeted seasonal perched groundwater and three of the perched groundwater samples had concentrations of total metals, particularly lead, chromium, or arsenic, that exceeded MTCA Method A CULs. However, field notes from HC indicate the turbidity of these samples was elevated (350 to 400 Nephelometric Turbidity Units) and sediment in the samples likely contributed to the CUL exceedances for metals. A review of the boring and mini well logs showed that coal containing coal fragments was encountered in two borings from the surface to depths ranging from 3.5 to 4 feet bgs.

2020 ICE Investigation. ICE conducted additional soil sampling in the vicinity of the mine tailings pile and slag pile in 2020. Concentrations of diesel- and heavy-oil-range TPH and metals in the vicinity of the mine tailings pile were below MTCA CULs. Concentrations of cadmium and arsenic in the vicinity of the slag pile were above their respective screening levels, while lead, chromium, copper, nickel, mercury, and zinc concentrations were below their respective MTCA CULs (ICE 2020).

2023 MFA Data Gaps Investigation. MFA conducted a data gaps investigation at the Property in April 2023 to characterize potential environmental impacts based on identified features of interest associated with historical operations and areas of contamination identified during previous sampling activities (MFA 2023a). A total of 22 direct-push borings were advanced across the Property for collection of soil and groundwater, which were analyzed for a combination of metals and diesel- and oil-range petroleum.

The lateral extent of metals in soil was delineated for the vegetated area; however, the extent of metals was not delineated for the remaining features of interest (i.e., the vehicle maintenance area, former foundry, slag pile, former powerhouse, and former transformers). In addition, elevated total and dissolved metals were observed in a reconnaissance groundwater sample. However, the turbidity of the sample was highly elevated, and metals concentrations in the groundwater sample were not anticipated to be representative of groundwater conditions at the Property. MFA recommended additional soil investigation to delineate the lateral extent of metals impacts and later installation of monitoring wells to collect representative groundwater samples and refine the CSM (MFA 2023a). A review of the boring logs showed that soil containing coal fragments was encountered in seven borings from the surface or near surface to depths ranging between 0.5 to 3.5 feet bgs.

2024 MFA Supplemental Investigation. MFA conducted a supplemental investigation at the Property in September 2024 to delineate the nature and extent of contamination at the features of interest (MFA 2025). A total of 32 direct-push borings were advanced to a depth of 2.0 feet bgs for collection of discrete soil samples. In addition, three permanent monitoring wells (MW-01 to MW-03) were installed to a maximum depth of 20 feet bgs on the Property. Soil and groundwater samples were analyzed for a combination of metals. Additionally, a site-specific terrestrial ecological evaluation (TEE) was conducted at the Property that yielded site-specific CULs for lead and zinc.

All total lead concentrations in samples from FO-DP-5, FO-DP-6, and FO-DP-8 at the former foundry area exceed the toxicity characteristic leaching procedure (TCLP) rule of 20 concentration (100 mg/kg). At least one sample from each boring that exceeded the rule of 20 was analyzed for lead by the TCLP method for informational purposes to assess whether the material could be classified as a federal characteristic hazardous waste if transported for disposal off-site. The U.S. Environmental Protection Agency (EPA) TCLP regulatory criteria is 5 milligrams per liter (mg/L). In FO-DP-5, lead was detected in the TCLP extract at 4.4 mg/L and 9.7 mg/L, from 0.5 feet bgs and 1.5 feet bgs, respectively. Lead was not detected in the TCLP extract for FO-DP-6 and was detected at 1.3 mg/L at 1.1 feet bgs in FO-DP-8. One soil sample near the former foundry exceeded the TCLP rule of 20 for lead, but lead was not detected in the TCLP extract.

A review of the boring logs showed that soil containing coal fragments was encountered in two of the three monitoring well borings from the surface to depths ranging between approximately 8 and 12 feet bgs. Soil with coal fragments was also identified in most of the shallow direct push borings to approximately 2 feet bgs.

Summary of Coal Presence at the Property: As indicated above, coal has been observed in soil on the Property in varying amounts during previous investigations. Ecology and EPA do not have specific guidance for handling or disposal requirements for raw (unburned coal). Disposal and handing requirements for coal post-combustion or use (coal tar, fly ash, coal ash, or coal combustion residuals) are available, but not relevant to the raw coal associated with the Property. While PAHs have been shown to be present in coal materials at other sites, only one soil sample at the Property

had detections of PAHs, which did not exceed MTCA CULs (HC 2004). The PAHs detected in this location are indicative of the burning of materials including plastics. Of the PAH compounds detected in the sample, Phenanthrene, Fluoranthene, and Pyrene are commonly used in plastics and dyes while Benzo(a)Anthracene and Chrysene are associated with incomplete combustions of fossil fuel, wood, coal tar, or creosote.

3 Conceptual Site Model

The CSM is based on information collected during previous investigations (HC 2004, 2006, 2007; ICE 2020; MFA 2023a, 2025), and MFA's understanding of the proposed future use of the Property (see Figure 3-1; MFA 2020, 2022).

3.1 Chemicals of Concern

Soil. Total arsenic, cadmium, lead, mercury, and oil-range petroleum concentrations in soil exceed MTCA Method A CULs in soil for protection of human health. Total lead and zinc exceed screening values developed in the site-specific TEE for protection of ecological receptors at the Property. Arsenic, cadmium, lead, mercury, zinc, and oil-range petroleum are considered chemicals of concern (COCs) for soil. Other chemicals detected at the site do not exceed applicable screening criteria and are therefore not carried forward as COCs.

Groundwater. In September 2024, groundwater samples were collected from MW-01 through MW-03 during inferred low-groundwater conditions for the Property. Total arsenic was detected in MW-02 at a concentration of 35 micrograms per liter (ug/L) and dissolved arsenic was detected at a concentration of 38 ug/L in the field-filtered sample, exceeding the MTCA Method A CUL of 5 ug/L and the natural background for the Yakima Basin of 6 ug/L (Ecology 2022). Total and dissolved arsenic were detected in MW-01 at concentrations below the MTCA Method A CUL and natural background for the Yakima Basin and were not detected in MW-03 (MFA 2025).

In April 2025, groundwater samples were collected from MW-01 through MW-03 during inferred high-groundwater conditions for the Property. Total arsenic was detected in MW-02 at a concentration of 55 ug/L and dissolved arsenic was detected at a concentration of 52 ug/L in the field-filtered sample, above the MTCA Method A CUL of 5 ug/L and the natural background for the Yakima Basin of 6 ug/L. Total and dissolved arsenic were detected in MW-01 at a concentration below the MTCA Method A CUL and natural background for the Yakima Basin and was not detected in MW-03 (MFA 2025).

Arsenic exceeds the natural background for the Yakima Basin (Ecology 2022) and the MTCA Method A CUL in groundwater for protection of human health at the Property. Arsenic is considered a COC for groundwater. Other chemicals detected at the site do not exceed applicable screening criteria or are not considered representative of groundwater conditions at the Property and are therefore not carried forward as COCs.

3.2 Fate and Transport Processes

Fate and transport mechanisms include natural biodegradation of organic chemicals, sorption of chemicals to soil, physical dispersion of adsorbed chemicals, leaching of chemicals from soil to groundwater, and volatilization from soil to air. The relative importance of these processes varies, depending on the chemical and physical properties of the released contaminant. The properties of the soil and the dynamics and elevation of groundwater also affect contaminant fate and transport.

Contaminants in shallow soil may volatilize and impact indoor air quality; however, volatile and semivolatile chemicals were generally non-detect or below MTCA Method A CULs. One soil location identified volatile contaminants (oil-range hydrocarbons) above the MTCA Method A CUL; however, the proposed development plan does not include building construction in the vicinity. Therefore, the indoor air exposure pathway is considered insignificant. Volatilization of chemicals to outdoor air would dissipate and not cause significant impacts to air quality.

The Property is primarily undeveloped land with gravel access roads and vegetation. Precipitation and infiltration through unpaved areas on the Property into vadose-zone soil may cause leaching of chemicals to shallow groundwater. The soil-to-groundwater leaching pathway is considered potentially complete.

3.3 Potential Receptors and Exposure Pathways

The Property is currently undeveloped; however, redevelopment plans for the Property include preserving approximately 17 acres for community benefit and natural space and developing approximately 13.4 acres with attainable housing. Therefore, human receptors may include construction workers, occupational workers (including visitors), and residents based on current and potential future uses of the Property. In addition, ecological receptors are expected to be present under current and future conditions.

Potable water provided by the City of Roslyn is available for use in the vicinity of the Property and groundwater beneath the Property is not currently used as a drinking water source. However, unless it can be demonstrated that groundwater is not a future potential source of drinking water based on the criteria set forth in WAC 173-340-720(2), groundwater is classified as potable to protect drinking water beneficial uses. The groundwater direct contact, ingestion and inhalation pathways are considered potentially complete.

The following are the potentially complete exposure pathways for human receptors at the Property:

- Direct contact, ingestion, and inhalation of contaminated soil.
- Direct contact, ingestion, and inhalation of contaminated groundwater.

Ecological receptors, including mammals, birds, plants, and soil biota, may be exposed through the following pathways:

- Direct contact, ingestion, and inhalation of contaminated soil
- Ingestion of chemicals in the tissue of prey species

3.4 Terrestrial Ecological Evaluation

Ecological receptors could potentially be exposed to chemical contamination at the Property via the exposure pathways discussed above. Large portions of the Property are vegetated, and it abuts undeveloped forested land. To determine potential for adverse effects to ecological receptors, a site-specific TEE was conducted (MFA 2025). Based on the site-specific TEE, cleanup planning will incorporate ecological-based CULs in soil for lead and zinc, protective of ecological receptors. No ecological risk is anticipated for other chemicals of ecological potential concern. Areas on the Property that exceed for lead and zinc in soil include the foundry, slag pile, and the vehicle maintenance areas.

4 Cleanup Requirements

MTCA requires that cleanup actions comply with the following minimum regulatory requirements under WAC 173-340-360:

Protect human health and the environment—Cleanup actions that achieve CULs at the applicable point of compliance (POC) and comply with applicable laws are presumed to be protective of human health and the environment, as well as likely vulnerable populations and overburdened communities.

Comply with cleanup standards and applicable state and federal laws—The primary components of cleanup standards are CULs and POCs (see WAC 173-340-700 through 760). CULs determine the concentration at which a substance does not threaten human health or the environment. All material that exceeds a CUL is addressed through a remedy that prevents exposure to the material. POCs represent the locations on the Property where CULs must be met. Applicable or relevant and appropriate requirements based on federal and state laws are provided in WAC 173-340-710.

Provide plans for compliance monitoring—Each cleanup action must include plans for compliance monitoring to ensure that human health and the environment are protected during construction, operation, and maintenance activities; to confirm that the actions have attained cleanup standards, and other performance standards; and to confirm the long-term effectiveness of the action once cleanup standards, and other performance standards have been attained (see WAC 173-340-410 and 173-340-720 through 760).

The final cleanup standards are presented below. Applicable federal, state, and local laws are presented in Section 4.2.

4.1 Cleanup Levels and Points of Compliance

CULs were developed consistent with MTCA to be protective of human health and ecological receptors on the Property and are provided in Tables 4-1 and 4-2 for soil and groundwater, respectively.

Soil. MTCA Method A CULs for arsenic, cadmium, lead, mercury, and oil-range petroleum will be used for protection of human health at the Property. Site-specific CULs for lead and zinc will be used for

protection of ecological receptors at the Property. A summary comparison of concentrations for soil data relative to selected CULs is provided in Table 4-3.

The following describes the COCs that exceed soil CULs at the Property. These areas are shown on Figure 4-1:

- Cleanup Area 1 (Foundation for Vehicle Maintenance) exceeds CULs for arsenic, cadmium, lead, mercury, and zinc.
- Cleanup Area 2 (Former Foundry) exceeds CULs for arsenic, cadmium, lead, and zinc.
- Cleanup Area 3 (Slag Pile) exceeds CULs for arsenic, cadmium, lead, and mercury.
- Cleanup Area 4 (Former Power Transformers) exceeds CULs for arsenic, cadmium, and mercury.
- Cleanup Area 5 (Former Powerhouse) exceeds CULs for arsenic, mercury, and oil-range petroleum.
- Cleanup Area 6 (Vegetated Area) exceeds the CUL for arsenic.

Groundwater. The arsenic natural background concentration for groundwater in the Yakima Basin will be considered for the groundwater CUL at the Property. Exceedances for arsenic in groundwater are limited to MW-02 location. Groundwater data screened to the selected CUL is provided in Table 4-4.

The POC for human exposure via direct contact is 0 to 15 feet bgs for soil throughout the Property (WAC 173-340-740 (6)(d)). The standard POC for groundwater throughout the site is the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be affected (WAC 173-340-720 (8)(b)).

There are no CULs associated with coal and Ecology and EPA do not have specific guidance for handling or disposal requirements for raw (unburned coal). Despite the lack of PAHs detected in coal specific to the Property, in recognition that PAHs are sometimes present in coal, soil with visible coal content will be subject to special handling requirements discussed in SMP (see Appendix B).

4.2 Applicable Regulations and Cleanup Standards

WAC 173-340-710 states that cleanup actions conducted under the MTCA 70A.305 Revised Code of Washington will comply with applicable state and federal laws. This WAC section also addresses relevant and appropriate requirements, substantive (as opposed to procedural) requirements and local government permits and approvals. This section summarizes the analysis completed to conform with WAC 173-340-710. The following federal and state laws and regulations and local requirements were determined to be applicable or relevant and appropriate requirements in the analysis of brownfield cleanup alternatives (ABCA) (MFA 2023b).

4.2.1 Federal

4.2.1.1 Joint Permit Application

The joint aquatic resource permit application (JARPA) is administered by the U.S. Army Corps of Engineers (USACE) to facilitate application for federal and state permits for projects impacting waters of the U.S. and state waters. The regulations relevant to cleanup at the Property are summarized in the following subsections.

4.2.1.2 USACE Section 404 Permit

Wetlands were delineated at the property in 2020 (see Attachment A in Appendix A). The definition of Waters of the United States has changed since the delineation was completed. Forterra will either assume that all delineated wetlands are subject to federal jurisdiction or will contract a wetland biologist to update the wetland delineation using the most current Waters of the United States definition. If Forterra opts to assume wetlands are jurisdictional or if a re-delineation identifies jurisdictional wetlands, Forterra will prepare permit documents fulfilling the requirements of Clean Water Act (CWA) Section 404. It is expected that the proposed work could be permitted under Nationwide Permit 38—Cleanup of Hazardous and Toxic Waste. This general action permit provides for a streamlined effort for specific activities required to affect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority.

4.2.1.3 Endangered Species Act

If a JARPA is needed, Forterra will prepare a biological assessment to evaluate whether adverse or negative impacts to endangered species and their critical habitats during or resulting from site cleanup should be anticipated.

4.2.1.4 CWA Section 401 Certification

If a JARPA is needed, Forterra will prepare a pre-filing request to allow Ecology to determine whether a pre-filing meeting is required at least 30 days prior to submitting the JARPA to Ecology's 401 program. Following notification of whether a pre-filing meeting is required, Forterra and Ecology will either attend a pre-filing meeting or, if a meeting is not required, submit the application for the 401 certification. During soil excavation, it may be necessary to implement engineering controls to prevent soil erosion. Soil excavation activities will take place during dry conditions and are not expected to impact nearby surface waters; however, best management practices (BMPs) for controlling soil erosion will be described in the JARPA.

4.2.1.5 Cultural Resources

Prior to initiating ground-disturbing activities or submitting the JARPA (if needed), Forterra will subcontract with a cultural resources firm to comply with National Historic Preservation Act requirements within the cleanup action areas.

4.2.2 State

4.2.2.1 Cleanup Oversight and Regulations

The cleanup design and cleanup action will comply with MTCA standards.

4.2.2.2 Water Quality Standards for Surface Waters and Groundwaters of the State

The cleanup does not involve groundwater or surface water remediation. Any stormwater discharged from the site would be subject to the CWA as described in Section 4.2.1.4 above and Section 4.2.2.3 below.

4.2.2.3 National Pollutant Discharge Elimination System Stormwater Permit Program

National Pollutant Discharge Elimination System construction stormwater permits are required for construction sites of 1 acre or larger or for smaller sites with known soil and/or groundwater contamination. The project will apply for and receive coverage under the construction stormwater general permit.

4.2.2.4 Air Quality Standards

During soil excavation activities, it may be necessary to implement engineering controls such as soil wetting to control particulate emissions. BMPs to control fugitive dust emissions will be described in the JARPA (if needed). Visual inspection will be performed, as indicated in the SMP, to verify that no fugitive dust emissions occur. If results demonstrate that requirements have not been met, additional BMPs will be implemented.

4.2.2.5 Noise Regulations

Construction activities will comply with local noise regulations and be completed during regular working hours.

4.2.2.6 State Environmental Policy Act

A State Environmental Policy Act review will be conducted for the project design by Forterra.

4.2.2.7 Washington Safety and Health Administration

All work will be performed under a site health and safety plan in conformance with the applicable Washington Industrial Safety and Health Administration regulations.

4.2.3 Local

Forterra will coordinate with the City of Roslyn to identify which permits will be required and obtain those required permits prior to implementing cleanup actions on the Property.

5 Cleanup Action Alternatives and Analysis

5.1 Cleanup Action Alternatives

Multiple remedial alternatives were considered for the cleanup action at the Property. The alternatives are described in detail in the ABCA report (MFA 2023b) and are summarized below:

Alternative 1 – No Action: This alternative represents a baseline condition only and is not considered a long-term solution for cleanup of the Property.

Alternative 2 - Excavation and Offsite Disposal: This remediation and restoration scenario assumes full excavation for all six cleanup action areas. Excavated soil that exceeds MTCA CULs would be

disposed of offsite in an appropriately permitted landfill. Following excavation, the excavation base and sidewalls would be sampled to ensure the soil concentrations above MTCA CULs were removed off site. The excavations would then be backfilled with clean soil.

Alternative 3 - Excavation, Consolidation, and Protective Cap Installation: This remediation and restoration scenario would consolidate soil excavated from natural space and open space under an engineered cap within the development area. The scenario assumes that the areas planned for natural space with wetland improvements in the central and western portions of the Property would be excavated and used as fill in areas planned for development and then capped with 2-foot thick soil cap or a hard cap (e.g., building footprints, asphalt, gravel, or any other permanent surface approved by Ecology). All capped areas would have demarcation fabric separating contaminated soil from overlying clean cap soil. Following excavation, the leave surfaces would be sampled to ensure the soil concentrations above MTCA CULs were removed. The excavations would then be backfilled with clean soil.

5.2 Preferred Cleanup Alternative

An evaluation was performed to compare effectiveness, long-term reliability, implementability, implementation risk, climate change concerns, sustainability, and cost for each alternative. A discussion of each factor is provided in the ABCA report (MFA 2023b). While Alternative 3 ranks slightly higher in sustainability; it ranks lower in long-term-reliability, cost, implementability, and climate change risk than Alternative 2. For these reasons, Alternative 2 was selected as the preferred alternative.

6 Proposed Cleanup Action

Cleanup actions will be conducted in six (6) discrete areas on the Property (Cleanup Area 1 through 6), which include remediation of the former vehicle maintenance area, former foundry, slag pile, former powerhouse, former transformers, and vegetated area, respectively (see Figure 4-1). This includes cleanup within wetlands and their associated buffer areas. More details are provided in the Wetland Protection Plan (Appendix A). Full excavation for each cleanup area is proposed. This cleanup approach is largely consistent with the preferred alternative from the ABCA (MFA 2023b).

6.1 Cleanup Areas

Full excavation for each cleanup area is proposed to the depths shown on Figure 3-1. Source removal will break the exposure pathway. Arsenic-contaminated groundwater at the Property will be addressed through source removal of arsenic-contaminated soil. Specifically, the planned cleanup actions for each area are:

- **Cleanup Area 1:** Cleanup in Area 1 will consist of full excavation. Excavation will occur approximately 60 feet outside of the 100-foot buffer of Wetland G. This approach was selected because it maximizes source removal and does not require installation of a cap or ongoing

maintenance. In addition, full source removal reduces potential leaching of arsenic into groundwater. This area will not be backfilled because development is planned in this area.

- **Cleanup Area 2:** Pre-construction sampling will be conducted in this location to verify the lateral extent of impacts. Cleanup in Area 2 will consist of excavation to the extent possible and a soil cap where necessary. This approach was selected because full excavation may be limited by the presence of mature trees. Capping without excavation would raise the ground surface and alter the hydrology. Conducting limited excavation combined with capping to match pre-construction grade maximizes source removal at this location while minimizing the impact to the wetland and buffer. In addition, source removal reduces potential leaching of arsenic into groundwater. Excavated contaminated soil will be replaced with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs and graded to match the original topography.

  Implementation of cleanup actions in Area 2 have the potential to temporarily impact Wetlands H and G and their associated buffers. As avoidance of impact is not possible given where the contamination was identified in relation to the wetlands, the temporary impacts caused through cleanup will be offset through restoration of the wetlands to preconstruction conditions or better following completion of the cleanup action. This will be achieved by seeding and planting with native species appropriate for the location to restore biodiversity to pre-construction conditions or better.

- **Cleanup Area 3:** Cleanup in Area 3 will consist of full excavation. This approach was selected because it maximizes source removal and minimizes impact to the wetland. In addition, full source removal reduces potential leaching of arsenic into groundwater. Slag in this area will be removed as needed to facilitate excavation of the contaminated soil. Excavated contaminated soil will be replaced with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs and graded to match the original topography. Cleanup in Area 3 will occur directly within the delineated boundary of Wetland G and its buffer. Restoration of the wetland, to pre-construction conditions or better, will occur following completion of the cleanup action in Area 3. This will be achieved by seeding and planting with native species appropriate for the location to restore biodiversity to pre-construction conditions or better.

- **Cleanup Area 4:** Cleanup in Area 4 will consist of full excavation. This approach was selected because it maximizes source removal and does not require installation of a cap or ongoing maintenance. In addition, full source removal reduces potential leaching of arsenic into groundwater. Excavated contaminated soil will be replaced with clean soil and graded to match the original topography. Cleanup in Area 4 could potentially impact Wetland C and its associated buffer. Although future development is planned in this area, excavated areas in Area 4 will be backfilled with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs and restored to pre-construction conditions. As avoidance of impact is not possible given where the contamination was identified in relation to the wetland buffer, the temporary impacts caused through cleanup will be offset through restoration of the buffer to preconstruction conditions or better following completion of the cleanup action.

- **Cleanup Area 5:** Cleanup in Area 5 will consist of full excavation. This approach was selected because it maximizes source removal and does not require installation of a cap or ongoing maintenance. In addition, full source removal reduces potential leaching of arsenic into groundwater. A portion of Area 5 outside of the wetland buffer will be developed over with a roadway for housing access and therefore will not be backfilled as part of the remedy. The remainder of Area 5 extends into a buffer area and will be backfilled with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs. The disturbed buffer area will be seeded and

planted with native species appropriate for the location that will restore biodiversity to the buffer to pre-construction conditions or better.

- **Cleanup Area 6:** Cleanup in Area 6 will consist of full excavation. Excavation will occur approximately 30 feet outside of the 100-foot buffer of Wetland D. This approach was selected because it maximizes source removal. In addition, full source removal reduces potential leaching of arsenic into groundwater. The planned development includes a stormwater pond over Area 6 and therefore this area will not be backfilled as part of the remedy.

6.2 Mobilization and Site Preparation

Anticipated excavation extents are defined on Figure 4-1, and will be located and painted by the engineering consultant. The final extent of the soil excavation will be confirmed by laboratory-analyzed confirmation samples for the COCs associated with each cleanup area. Before excavation, the locations of subsurface utilities near excavation areas will be identified by One Call Utility Notification Center and a private utility locating company.

Exclusion zones using temporary fencing and warning tape as well as any additional appropriate site controls necessary will be established as described in the SMP. The sitework contractor shall coordinate and mark any road closures with appropriate signage and traffic control.

Erosion-control measures will be installed by the sitework contractor. A silt fence and a construction entrance may be installed on the Property. Soil stockpiles will be managed in accordance with the SMP (see Appendix B). Erosion-control measures will be installed before excavation activities begin and will be maintained throughout the construction effort.

Wetlands, streams, and buffers (critical areas) are present on the Property, and will be impacted during cleanup activities due to the presence of contaminated soil within critical areas. The impacts to the wetlands cannot be avoided since the alternative would be to leave contaminated soil remaining in the wetlands. Impacts to critical areas on the Property will be minimized to the maximum extent practicable through implementation of BMPs during cleanup action. Excavation and ground disturbing activities that occur in critical areas on the Property will follow the procedures described in the WPP (see Appendix A).

6.3 Excavation and Management

6.3.1 Soil Excavation

The anticipated horizontal and vertical extents of excavation for the cleanup areas are presented in Figure 4-1. The excavation extents represent boundaries located at least 5 feet horizontally in each direction from sample locations that exceed CULs. The excavation boundaries presented in Figure 4-1 are approximate and will be refined in the field using a handheld X-ray fluorescence (XRF) analyzer. Final excavation extents will be determined through base and sidewall confirmation samples where COCs are below respective CULs using XRF and laboratory analysis, as described below. Oversight and monitoring for consistency with this plan will be performed under the direction of a professional engineer registered in the state of Washington.

In-situ screening: Upon reaching the anticipated excavation boundary for each cleanup area, a handheld XRF analyzer will be used to field-screen the base and sidewalls of the excavation in-situ to

verify the removal of metal-impacted soil. If the XRF analyzer indicates the presence of metal impacted soil remaining above the CULs, additional soil may be removed outside of the initial horizontal and vertical extents at the direction of the engineering consultant with approval from Forterra.

Confirmation soil sampling: Confirmation soil sampling will be conducted upon reaching an excavation extent where in-situ XRF readings indicate remaining soil in the sidewalls and base of the excavation are below the CULs. Confirmation soil samples will be collected and analyzed ex-situ by XRF or submitted to an analytical laboratory for analysis of a combination of arsenic, cadmium, lead, mercury, and zinc by EPA Method 6020B or oil-range petroleum by Method NWTPH-Dx as indicated below. Laboratory analysis of soil samples may be rushed to minimize contractor downtime, if necessary. Sample collection and analytical testing will be performed on confirmation samples in accordance with the SMP (see Appendix B). The following excavation sampling and analysis frequency is proposed:

- **Base:** A minimum of one discrete confirmation soil sample for every 400 square feet will be collected from the floor of the excavation and submitted to an analytical laboratory for analysis of the COCs that exceeded CULs in that cleanup area.
- **Sidewalls:** Discrete confirmation soil samples will be collected at a frequency of one sample per 20 linear feet on each sidewall. Sidewall confirmation samples from the excavation area will be collected halfway between the floor of the excavation and the ground surface. Sidewall confirmation samples will be analyzed ex-situ by XRF. One sidewall sample per excavation area will also be submitted to an analytical laboratory to verify the XRF results.

If laboratory confirmation samples indicate that soils with metal or oil-range petroleum concentrations above CULs are still present at the excavation limits, additional soil may be removed outside of the initial horizontal and vertical extents at the direction of the engineering consultant with approval from Forterra. Excavation in any cleanup area may stop due to physical or financial constraints. If the sidewalls or base of excavation still have metals above the CULs when excavation stops, demarcation fabric will be installed and the extent of soil above the CUL will be surveyed prior to backfill. The engineering consultant will provide approval of the final excavation extents after reviewing the confirmation sampling data.

The estimated volume of metals and petroleum-impacted soil removed and disposed of at a Subtitle D landfill is 560 cubic yards.

6.3.2 Groundwater Management

Groundwater elevations at the Property are anticipated to be highest in the spring (April 2025 measurements ranged from approximately 1.1 to 7.7 feet bgs) and lowest in the late summer/early fall (September 2024 measurements ranged from approximately 5.5 to 12.1 feet bgs). As the proposed cleanup excavation depths are relatively shallow (one to three feet bgs) and the cleanup construction is anticipated to be conducted in the summer or early fall, it is not anticipated that groundwater will be encountered during the cleanup excavation activities. If groundwater is encountered, it will be managed in accordance with the SMP.

6.3.3 Dust Control

The excavation process will disturb soil and has the potential to generate dust. Procedures for dust control during soil disturbing activities are described in the SMP.

6.3.4 Stockpiling

Contaminated soil will be handled by off-site disposal. The contaminated soil that is generated from cleanup activities should not be placed on any portions of the Property except for the purpose of temporary stockpiling with appropriate protective measures employed to avoid cross-contamination or stormwater infiltration. Soil management procedures for stockpiling are provided in the SMP.

6.3.5 Waste Characterization and Designation

Metals-impacted soils were characterized during previous investigations. The number of analytical samples collected were sufficient to effectively designate soils as nonhazardous and nondangerous waste suitable for disposal at a Subtitle D landfill for cleanup areas 1, 3, 4, 5, and 6. Therefore, a waste profile will be generated from the existing analytical data for those areas and sampling for disposal purposes is not anticipated. During prior investigations, one soil sample at cleanup area 2 exceeded TCLP for lead. As such, excavated soil at cleanup area 2 will require separate stockpiling and sampling for TCLP to support waste characterization in accordance with the SMP.

6.4 Backfill, Compaction, and Final Grade

Following confirmation sampling, authorization to proceed with backfill operations will be provided by the engineering consultant. Excavations in cleanup areas 1, 6, and a portion of cleanup area 5 will not be backfilled due to planned development activities. Excavation slopes will be laid back to three horizontal to 1 vertical for safety and stability.

The excavations for cleanup areas 2, 3, 4, and the portion of 5 within the wetland buffer will be backfilled with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs. Imported soil will be from a commercial source or will be sampled prior to import in accordance with the SMP (Appendix B).

The imported clean general fill will be compacted. Topsoil will be graded to match the original topography and will be left uncompacted to facilitate plant growth. Disturbed areas will be reseeded and planted with native species appropriate for the location that will restore the areas to preconstruction conditions or better.

6.5 Capping

The planned remedy is full excavation; however, removal of all soil that exceeds CULs may not be possible in some locations due to the presence of mature trees with extensive root networks, access issues, or financial constraints. If contaminated soil that exceeds CULs is left in place, the extent of contaminated soil will be surveyed and demarcation fabric will be installed prior to installation of a soil cap, which will be consistent with the soil backfill described in Section 6.4 unless contamination will remain within the footprint of future development that may serve as a cap (e.g., roadways or buildings).

6.6 Reporting and Post-Remedy Monitoring

The engineering consultant will prepare and submit a report describing the construction work completed. This will include documentation of the construction work, evaluation of the analytical

results, data validation and quality assurance/quality control, and next steps (e.g., environmental covenant if contamination remains above CULs, no further action determination if no media exceed CULs at POCs).

Per Ecology Policy 840, all collected data for the Property will be uploaded to Ecology's Environmental Information Management System database. Consistent with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated will be submitted in both hard copy and electronic format.

Post-cleanup compliance monitoring will only be required for soil if contaminated soil is left in place beneath a cap. Source removal of contaminated soil is expected to reduce potential leaching of arsenic into groundwater. Following the remedial action, post-remedy groundwater monitoring will be conducted to evaluate and monitor the effectiveness of the remedy in accordance with the SMP (see Appendix B). If contaminated soil is left in place beneath a cap, the project completion report will include discussion of the monitoring and maintenance requirements for that cap.

References

Ecology. 2022. *Natural Background Groundwater Arsenic Concentrations in Washington State, Publication No. 14-09-044.* Washington State Department of Ecology: Olympia, WA. January.

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HC. 2007. *Phase II Environmental Site Assessment, Section 17/No. 4 Mine Area, Roslyn, Washington.* Prepared for Suncadia LLC. Hart Crowser, Inc. October 2.

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MFA. 2020. *Phase I Environmental Site Assessment, Kittitas County Parcel 456234, Roslyn, Washington 98941.* Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. October 7.

MFA. 2022. Emily Hess and Phil Wiescher, Maul Foster & Alongi, Inc. *Site Conditions of Roslyn Mine No. 4, Kittitas County Parcel 456234 in Roslyn, Washington 98941.* Memorandum to Jeff Newschwander and Mary Monahan, Washington State Department of Ecology. June 22.

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MFA. 2025. *Supplemental Investigation Report, Roslyn No. 4 Mine*. Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. April 28.

Tabor, R.W. 2000. *Geologic Map of the Snoqualmie Pass 30x60 Minute Quadrangle, Washington.* R.W. Tabor, V.A. Frizzell Jr., D.B. Booth, and R.B. Waitt. U.S. Department of Interior, U.S. Geological Survey.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Figures

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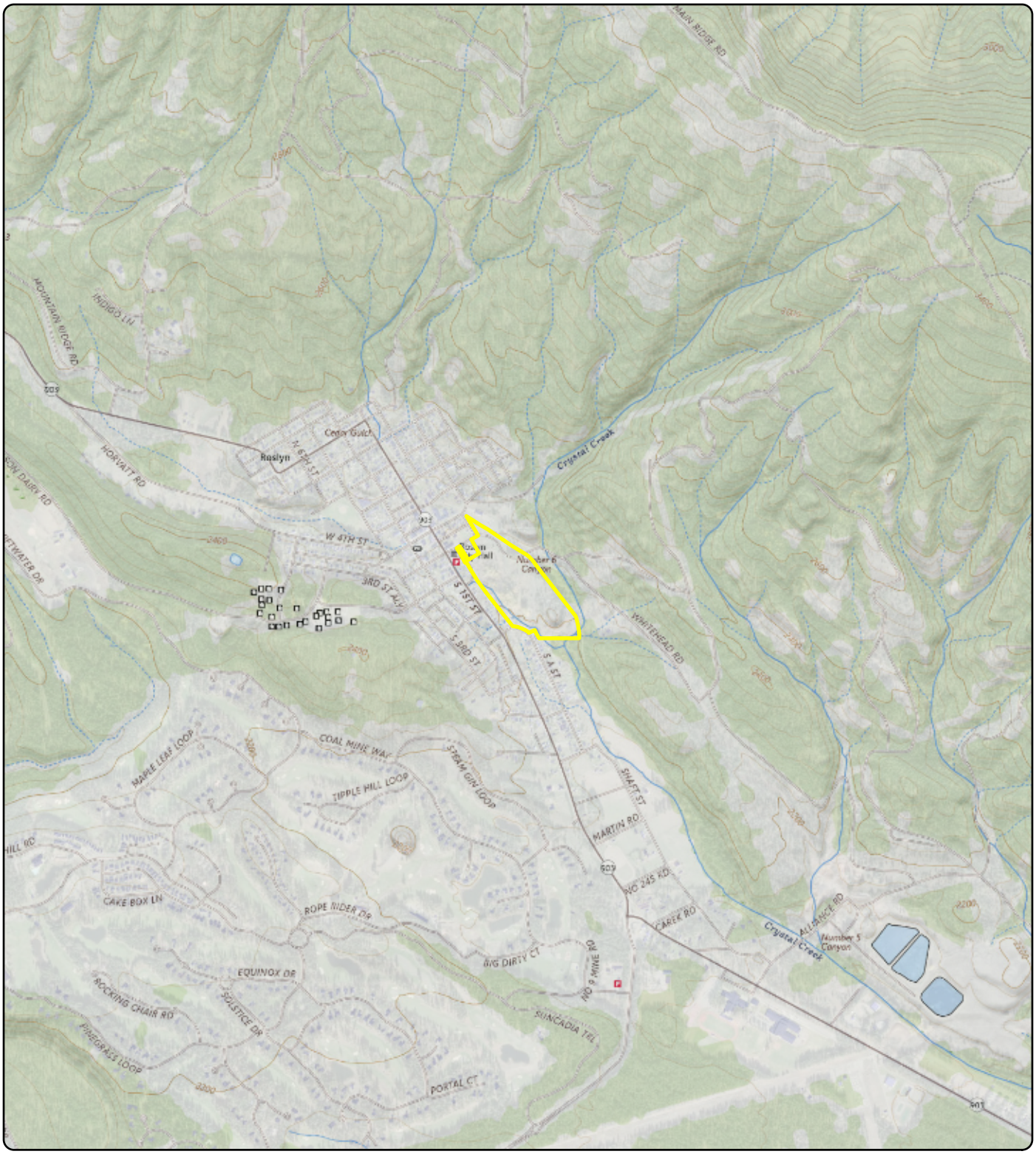

Notes
U.S. Geological Survey 7.5-minute topographic quadrangle (2020): Cle Elum.
Township 20 north, range 15 east, section 17.

Data Source
Property boundary obtained from Kittitas County.

Legend

Property Boundary

Figure 1-1
Property Location

Roslyn No. 4 Mine
205 E Dakota Ave
Roslyn, WA

0 2,000
Feet

MAUL FOSTER ALONGI
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Path: X:\1122.05\006\Pro\M1122_05_006_001.aprx\Fig 1-1 Property Location
Print Date: 10/10/2024
Reviewed By: ehess
Produced By: bmurphy
Project: M1122.05.006

Figure 2-1
Property Overview

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Property Boundary
- Feature of Interest
- Wetland
- Wetland Buffer (Seawall-generated)
- Wetland Buffer (Determined by RMC)
- Stream

Notes
Property features are approximate.
RMC = Roslyn Municipal Code.

0 200
Feet

Data Sources
Aerial photograph obtained from the U.S. National Agriculture Imagery Program; property boundary obtained from Kittitas County; wetland extent, wetland buffer, and select features obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance. Hydrography data obtained from U.S. Geological Survey National Hydrography Dataset.

MAUL FOSTER ALONGI
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Path: X:\1122.05\006\Pro\M1122_05_006_010.aprx\Fig 2-1 Property Overview
Print Date: 4/11/2025
Reviewed By: ahees
Produced By: jroberts
Project: M1122.05.006

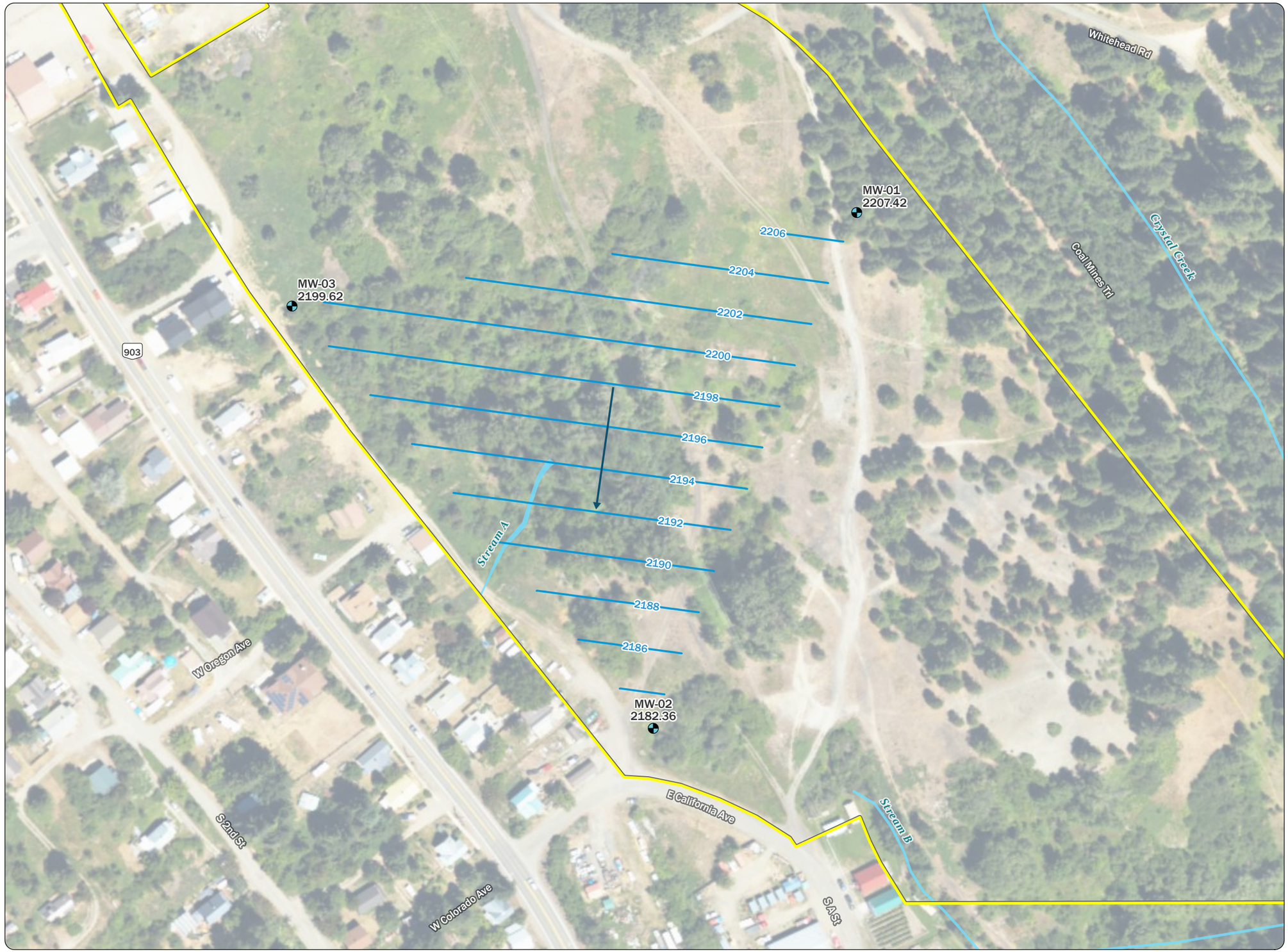

Figure 2-2
Groundwater Elevation Contours: September 2024

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Approximate Groundwater Flow Direction
- Monitoring Well
- Groundwater Elevation Contour (feet NAVD 88)
- Property Boundary
- Stream

Notes
Water levels measured on September 20, 2024.
All features are approximate.
NAVD 88 = North American Datum of 1988.

0 120
Feet

Data Sources
Aerial photograph obtained from National Agriculture Imagery Program; tax lot data obtained from Kittitas County. Streams obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Hydrography data obtained from U.S. Geological Survey National Hydrography Dataset.

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Path: X:\1122.05\006\Pro\M1122_05_006_001.aprx\Fig 2-3 GW Elevation Contours Apr2025
Print Date: 4/23/2025
Reviewed By: ehess
Produced By: bmurphy
Project: M1122.05.006

Figure 2-3
Groundwater Elevation Contours: April 2025

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

MW-01
2211.76

MW-03
2203.97

MW-02
2188.86

2210
2208
2206
2204
2202
2200
2198
2196
2194
2192
2190

903
Whitehead Rd
Coal Mines Trl
Crystal Creek
Stream A
Stream B
W Oregon Ave
S 2nd St
W Colorado Ave
E California Ave
SR 903

Legend

- Approximate Groundwater Flow Direction
- Monitoring Well
- Groundwater Elevation Contour (feet NAVD 88)
- Property Boundary
- Stream

Notes
Water levels measured on April 1, 2025.
All features are approximate.
NAVD 88 = North American Datum of 1988.

0 120
Feet

Data Sources
Aerial photograph obtained from National Agriculture Imagery Program; tax lot data obtained from Kittitas County. Streams obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Hydrography data obtained from U.S. Geological Survey National Hydrography Dataset.

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Figure 2-4
Soil Sample Locations and Exceedances

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Property Boundary
- Feature of Interest
- Monitoring Well (2024)
- Soil Sample (2024)
- Soil Sample (2023)
- Soil Sample (2004-2020)

Exceedance Type: MTCA Method A or Site-specific CUL

- Metals and TPH
- Metals

Notes

Boring locations from 2023 and 2024 were recorded on a handheld GPS with sub-meter accuracy.
Sample locations from 2004-2020 and property features obtained by others are approximate.
Metal exceedances include arsenic, cadmium, lead, mercury, and zinc.
CUL = cleanup level.
GPS = global positioning system.
MTCA = Model Toxics Control Act.
TPH = diesel- and oil-range total petroleum hydrocarbons.

0 100
Feet

Data Sources

Aerial photograph obtained from National Agriculture Imagery Program; tax lot data obtained from Kittitas County. Select features obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance.

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Figure 2-5
Groundwater Sample Locations and Exceedances

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Property Boundary
- Feature of Interest
- Monitoring Well (2024)
- Groundwater Boring (2023)
- Soil and Groundwater Boring (2023)
- Miniwell (HC 2007)
- Stream

Exceedance Type

- Not Representative
- Arsenic MTCA Method A CUL and Yakima Basin Natural Background

Notes

Boring locations from 2023 were recorded on a handheld GPS with sub-meter accuracy.
Sample locations from 2004-2020 and property features obtained by others are approximate.
Exceedances are shown for dissolved metal results.
CUL = cleanup level.
GPS = global positioning system.
MTCA = Model Toxics Control Act.

0 90
Feet

Data Sources

Aerial photograph obtained from National Agriculture Imagery Program; tax lot data obtained from Kittitas County. Select features obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance.

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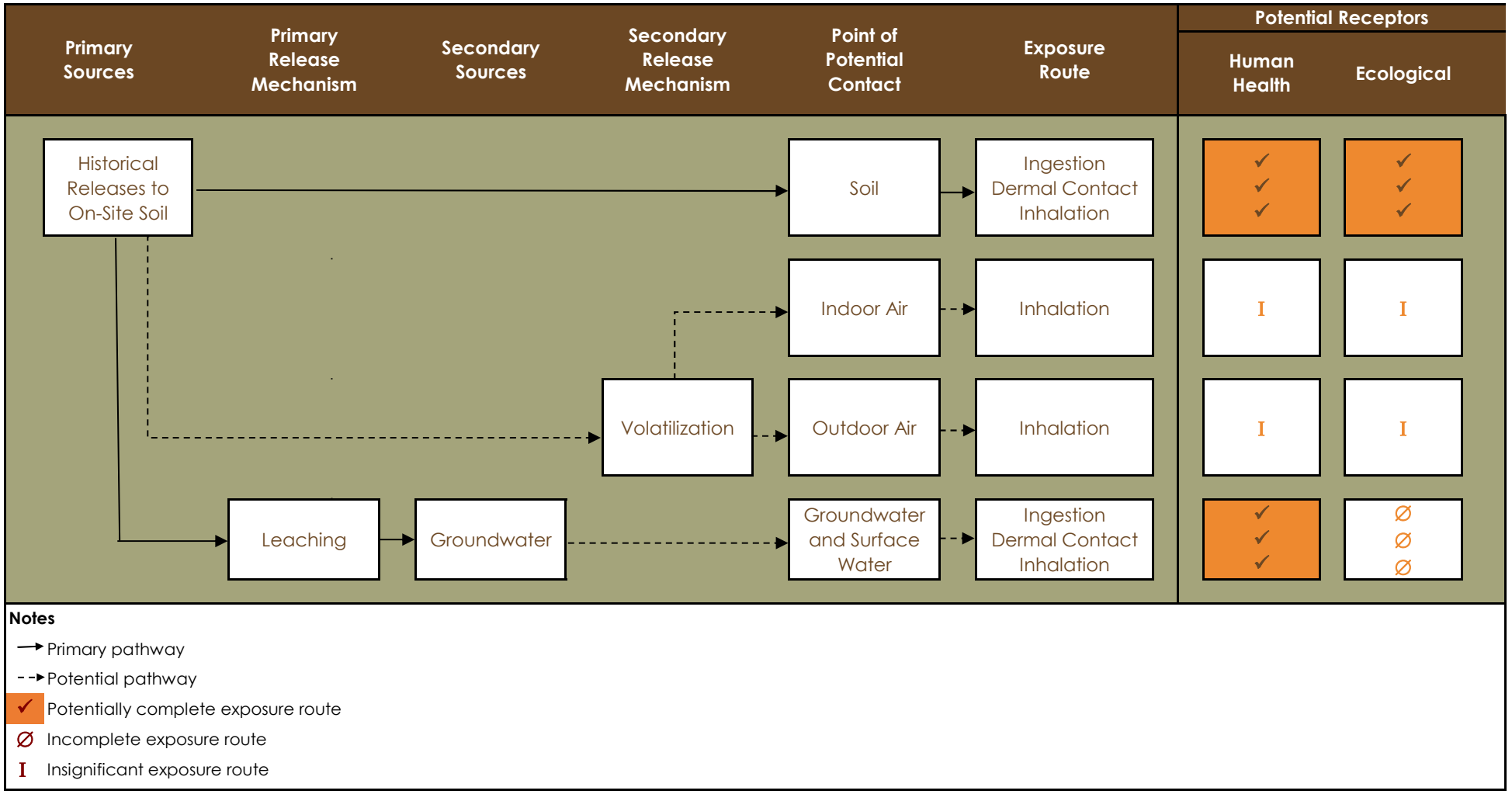
Figure 3-1
Conceptual Site Model
Roslyn No. 4 Mine
205 E Dakota Ave, Roslyn, Washington



Notes

→ Primary pathway

- -→ Potential pathway

✓ Potentially complete exposure route

∅ Incomplete exposure route

I Insignificant exposure route

Figure 4-1
Proposed Excavation Areas

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Soil Sample (2004-2024)
- MTCA Method A or Site-specific CUL Exceedance
- Feature of Interest

Excavation Areas (Depth)

- 1 ft
- 2 ft
- 3 ft
- Wetland
- Wetland Buffer (Seawall-generated)
- Wetland Buffer (Determined by RMC)
- Stream
- Property Boundary

Notes

Boring locations from 2023 and 2024 were recorded on a handheld GPS with sub-meter accuracy.
Sample locations from 2004-2020 and property features obtained by others are approximate.
Excavation extents are approximate and will be refined in the field using an XRF analyzer.
All inset maps are displayed at the same scale.
CUL = cleanup level.
ft = feet.
GPS = global positioning system.
MTCA = Model Toxics Control Act.
RMC = Roslyn Municipal Code.
SF = square feet.
XRF = X-ray fluorescence.

0 100
Feet

Data Sources

Aerial photograph obtained from the U.S. National Agriculture Imagery Program; property boundary obtained from Kittitas County; wetland extent, wetland buffer, and select features obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance.

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Path: X:\1122.05\006\Pro\M1122_05_006_010.aprx\Fig 4-1 Proposed Excavation Areas
Print Date: 5/2/2025
Reviewed By: kbeaudoin
Produced By: bmurphy
Project: M1122.05.006

Tables

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Table 4-1
Soil Cleanup Levels
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Analyte	MTCA Method A[1]
Metals (mg/kg)	
Arsenic	20
Cadmium	2
Lead	250[a][2]
Mercury	2
Zinc	360[a][2]
TPH (mg/kg)	
Diesel+Oil	2,000[b][3]

Notes

[a]Ecological-based cleanup level for lead and zinc, protective of ecological receptors based on the site-specific TEE.

[b]Consistent with Ecology Implementation Memorandum No. 4, the diesel- and oil-range TPH results will be summed.

mg/kg = milligrams per kilogram.

MTCA = Model Toxics Control Act.

TPH = total petroleum hydrocarbons.

References

[1]Ecology. 2025. Cleanup Levels and Risk Calculation (CLARC) table. Washington State Department of Ecology, Toxics Cleanup Program. February.

[2]MFA. 2025. Supplemental Investigation Report, Roslyn No. 4 Mine. Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. April 28.

[3]Ecology. 2004. Tim Nord, Washington State Department of Ecology. *Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil* . Memorandum to Interested Parties. June 17.

Table 4-2
Groundwater Cleanup Levels
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Analyte	Washington State Background Arsenic, Yakima Basin[1]
Metals (ug/L)	
Arsenic	6

Notes

MTCA = Model Toxics Control Act.

ug/L = micrograms per liter.

References

[1]Ecology. 2022. Natural Background Groundwater Arsenic Concentrations in Washington State, Publication No. 14-09-044. Washington State Department of Ecology: Olympia, WA. January.

Table 4-3
Cleanup Level Exceedances in Soil
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Location	Sample Name	Collection Date	Collection Depth (ft bgs)	Metals (mg/kg)					TPH (mg/kg)		
				Arsenic	Cadmium	Lead	Mercury	Zinc	Diesel-range hydrocarbons	Oil-range hydrocarbons[(a)]	Diesel+Oil[(b)]
MTCA Method A CUL[(1)]:				20	2	250[(c)(2)]	2	360[(c)(2)]	2,000	2,000	2,000
Cleanup Area 1 - Vehicle Maintenance											
HB1	HB1-S1	06/14/2004	0-0.5	11	2.7	250	0.5 U	25	20 U	50 U	50 U
TP10	TP10-S1	07/28/2006	0-2	2 U	1 U	130	0.5 U	12	20 U	50 U	50 U
TP8	TP8-S1	07/28/2006	0-3	150	8.6	110	0.54	7.8	20 U	50 U	50 U
TP9	TP9-S1	07/28/2006	0-2	4.1	1 U	24	0.5 U	5.1	20 U	50 U	50 U
HC-SB-6	HC-SB-6-S1	08/9/2007	0-4	5	0.2 U	27	0.1	20 J	--	--	--
	HC-SB-6-S2	08/9/2007	4-8	6 U	0.2 U	5	0.05 U	61 J	--	--	--
HC-SS-13	HC-SS-13	08/10/2007	0-0.5	10	0.6	83	0.09	164 J	--	--	--
HC-SS-14	HC-SS-14	08/10/2007	0-0.5	10	0.7	152	22.9	210 J	--	--	--
HC-SS-15	HC-SS-15	08/10/2007	0-0.5	90	5.8	153	0.13	392 J	--	--	--
VM-DP-1	VM-DP-1-SB-0.5	04/12/2023	0.5	14.6	1 U	67.9	1 U	105	--	--	--
VM-DP-2	VM-DP-2-SB-0.5	04/12/2023	0.5	9.08	1 U	81	1 U	108	--	--	--
VM-DP-3	VM-DP-3-SB-0.5	04/12/2023	0.5	25.9	5.33	301	1 U	4,110	--	--	--
	VM-DP-3-SB-2.5	04/12/2023	2.5	3.5	1 U	6.49	--	--	--	--	--
VM-DP-4	VM-DP-4-SB-0.5	04/11/2023	0.5	9.52	1 U	28.7	1 U	67.7	--	--	--
[(2)]MFA. 2025. Supplem	VM-DP-5-SB-0.5	09/19/2024	0.5	3.8	1 U	99 J	1 U	100	--	--	--
VM-DP-6	VM-DP-6-SB-0.5	09/19/2024	0.5	5.0	1 U	110	1 U	130	--	--	--
	VM-DP-6-SB-0.5-DUP	09/19/2024	0.5	4.1	1 U	180	1 U	130	--	--	--
	VM-DP-6-SB-1.5	09/19/2024	1.5	--	--	75 J	--	--	--	--	--
VM-DP-7	VM-DP-7-SB-0.4	09/19/2024	0.4	8.3	1 U	44	1 U	34	--	--	--
Cleanup Area 2 - Former Foundry											
HB3	HB3-S1	06/14/2004	0.4-0.5	7.6	1.1	620	0.5 U	180	20 U	50 U	50 U
TP3	TP3-S1	07/27/2006	0-2	3.7	1 U	84	1.2	53	20 U	50 U	50 U
TP4	TP4-S1	07/27/2006	0-2	2 U	1 U	13	0.5 U	48	20 U	50 U	50 U
TP5	TP5-S1	07/27/2006	0-2	2 U	1 U	7.9	0.5 U	93	20 U	50 U	50 U
HC-SB-8	HC-SB-8-S1	08/09/2007	0-4	6 U	0.3 U	8	0.05 U	58 J	--	--	--
	HC-SB-8-S2	08/09/2007	4-8	20 U	0.6 U	8	0.06	81 J	--	--	--
HC-SS-11	HC-SS-11	08/10/2007	0-0.5	20	0.5 U	149	0.07 J	239	--	--	--
HC-SS-12	HC-SS-12	08/10/2007	0-0.5	40	0.5 U	130	0.06 J	324	--	--	--
FO-DP-1	FO-DP-1-SB-1.0	04/11/2023	1.0	2.56	1 U	6.95	1 U	59.4	--	--	--
FO-DP-2	FO-DP-2-SB-0.5	04/11/2023	0.5	1.82	1 U	11.4	1 U	56.7	--	--	--
FO-DP-3	FO-DP-3-SB-0.5	04/11/2023	0.5	15.4	5.45	988	1 U	1,720	--	--	--
	FO-DP-3-SB-2.5	04/11/2023	2.5	--	1 U	72.1	--	--	--	--	--
FO-DP-4	FO-DP-4-SB-0.5	04/11/2023	0.5	2.48	1 U	6.86	1 U	67.5	--	--	--

Table 4-3
Cleanup Level Exceedances in Soil
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Location	Sample Name	Collection Date	Collection Depth (ft bgs)	Metals (mg/kg)					TPH (mg/kg)		
				Arsenic	Cadmium	Lead	Mercury	Zinc	Diesel-range hydrocarbons	Oil-range hydrocarbons[a]	Diesel+Oil[b]
MTCA Method A CUL[1]:				20	2	250[c][2]	2	360[c][2]	2,000	2,000	2,000
Cleanup Area 2 - Former Foundry (cont.)											
FO-DP-5	FO-DP-5-SB-0.5	09/19/2024	0.5	23	4.3	2,600	1.8	1,600	--	--	--
	FO-DP-5-SB-0.5-DUP	09/19/2024	0.5	31	5.6	2,000	1.4	1,800	--	--	--
	FO-DP-5-SB-1.5	09/19/2024	1.5	69	15	9,700	1 U	7,800	--	--	--
FO-DP-6	FO-DP-6-SB-0.5	09/19/2024	0.5	6.8	1 U	200	1 U	180	--	--	--
	FO-DP-6-SB-1.3	09/19/2024	1.3	--	--	200	--	150	--	--	--
FO-DP-8	FO-DP-8-SB-0.3	09/19/2024	0.3	15	3.0	1,000	--	--	--	--	--
	FO-DP-8-SB-1.1	09/19/2024	1.1	--	5.1	2,400	--	--	--	--	--
Cleanup Area 3 - Slag Pile											
HB5	HB5-S1	06/14/2004	0.3-0.5	2 U	1 U	32	0.5 U	2.2	--	--	--
Slag Pile	Slag Pile	06/14/2004	0-0.5	2 U	1 U	36	0.5 U	2.8	--	--	--
TP1	TP1-S1	07/27/2006	0-2	4.8	1.2	290	5.2	19	--	--	--
TP2	TP2-S1	07/27/2006	0-2	6.9	1 U	200	4.9	58	--	--	--
HC-SB-7	HC-SB-7-S1	08/09/2007	0-4	10 U	0.5 U	9	0.04 U	87 J	--	--	--
	HC-SB-7-S2	08/09/2007	4-8	20 U	0.6 U	8	0.06	74 J	--	--	--
HC-SS-7	HC-SS-7	08/10/2007	0-0.5	10 U	0.5 U	62	0.05 J	229	--	--	--
HC-SS-8	HC-SS-8	08/10/2007	0-0.5	10 U	0.7	101	0.08 J	277	--	--	--
HC-SS-9	HC-SS-9	08/10/2007	0-0.5	10 U	0.5 U	54	0.05 J	90	--	--	--
HC-SS-10	HC-SS-10	08/10/2007	0-0.5	10 U	0.5 U	27	0.05 J	81	--	--	--
TP-104	TP-104, S-1	07/15/2020	1.5	22	4.1	100	0.26 U	130	--	--	--
	TP-104, S-2	07/15/2020	3	10 U	2.1	74	0.26 U	77	--	--	--
TP-105	TP-105, S-1	07/15/2020	1.5	24	6.7	45	0.26 U	56	--	--	--
	TP-105, S-2	07/15/2020	3	17	3	130	0.26 U	100	--	--	--
TP-106	TP-106, S-1	07/15/2020	1.5	11 U	1.5	34	0.28 U	59	--	--	--
	TP-106, S-2	07/15/2020	3	11 U	1.4	31	0.26 U	52	--	--	--
SP-DP-1	SP-DP-1-SB-0.5	04/11/2023	0.5	4.85	1 U	14.7	1 U	51.1	--	--	--
SP-DP-2	SP-DP-2-SB-0.5	04/11/2023	0.5	3.95	1 U	14.6	1 U	45.4	--	--	--
	SP-DP-2-SB-0.5-DUP	04/11/2023	0.5	4.41	1 U	41.7	1 U	56.2	--	--	--
SP-DP-3	SP-DP-3-SB-0.5	04/11/2023	0.5	9.78	2.66	91.3 J	1 U	242	--	--	--
	SP-DP-3-SB-0.5-DUP	04/11/2023	0.5	--	2.32	--	--	--	--	--	--
	SP-DP-3-SB-2.5	04/11/2023	2.5	--	1 U	--	--	--	--	--	--
SP-DP-4	SP-DP-4-SB-0.5	09/19/2024	0.5	4.6	1 U	13	1 U	25	--	--	--
SP-DP-5	SP-DP-5-SB-0.4	09/19/2024	0.4	7.7	1.0	85	1 U	120	--	--	--
SP-DP-6	SP-DP-6-SB-0.5	09/19/2024	0.5	3.8	1 U	28 J	1 U	53	--	--	--
	SP-DP-6-SB-0.5-DUP	09/19/2024	0.5	4.4	1 U	53 J	1 U	61	--	--	--
SP-DP-7	SP-DP-7-SB-0.4	09/19/2024	0.4	4.4	1 U	19	1 U	52	--	--	--

Table 4-3
Cleanup Level Exceedances in Soil
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Location	Sample Name	Collection Date	Collection Depth (ft bgs)	Metals (mg/kg)					TPH (mg/kg)		
				Arsenic	Cadmium	Lead	Mercury	Zinc	Diesel-range hydrocarbons	Oil-range hydrocarbons[(a)]	Diesel+Oil[(b)]
MTCA Method A CUL[(1)]:				20	2	250[(c)(2)]	2	360[(c)(2)]	2,000	2,000	2,000
Cleanup Area 4 - Former Transformers											
HB6	HB6-S1	06/14/2004	0.5-1	--	--	--	--	--	20 U	50 U	50 U
HB8	HB8-S1	06/14/2004	0.5-1	2 U	1 U	30	0.5 U	3.3	20 U	50 U	50 U
TP11	TP11-S1	07/28/2006	0-2	2 U	1 U	7.3	0.5 U	80	20 U	50 U	50 U
TP12	TP12-S1	07/28/2006	0-2	2.1	2	50	8	35	20 U	50 U	50 U
HC-SS-4	HC-SS-4	08/10/2007	0-0.5	5 U	0.2 U	15	0.19 J	36.4	--	--	--
HC-SS-5	HC-SS-5	08/10/2007	0-0.5	6	0.5	61	3.04 J	122	180	410	590
HC-SS-6	HC-SS-6	08/10/2007	0-0.5	8	0.4	65	0.32 J	114	--	--	--
TF-DP-1	TF-DP-1-SB-1.0	04/12/2023	1	38.1	3.54	24.3	1 U	108	--	--	--
	TF-DP-1-SB-3.0	04/12/2023	3	1 U	1 U	--	--	--	--	--	--
TF-DP-2	TF-DP-2-SB-0.5	04/12/2023	0.5	24.7	1.87	50.8	1 U	141	--	--	--
	TF-DP-2-SB-2.5	04/12/2023	2.5	6.16	--	--	--	--	--	--	--
TF-DP-3	TF-DP-3-SB-0.5	09/19/2024	0.5	7.5	1 U	42	1 U	57	--	--	--
TF-DP-4	TF-DP-4-SB-0.4	09/19/2024	0.4	22	1 U	61	1 U	90	--	--	--
	TF-DP-4-SB-1.3	09/19/2024	1.3	34	--	--	--	--	--	--	--
TF-DP-5	TF-DP-5-SB-0.3	09/19/2024	0.3	7.9	1 U	26	1 U	42	--	--	--
TF-DP-6	TF-DP-6-SB-0.4	09/19/2024	0.4	5.0	1 U	24	1 U	34	--	--	--
TF-DP-8	TF-DP-8-SB-0.4	09/19/2024	0.4	5.4	--	--	--	--	--	--	--
TF-DP-9	TF-DP-9-SB-0.3	09/19/2024	0.3	7.1	--	--	--	--	--	--	--
Cleanup Area 5 - Former Powerhouse											
TP13	TP13-S1	07/28/2006	0-2	9.2	1 U	68	4	31	20 U	2,100	2,100
TP14	TP14-S1	07/28/2006	0-2	2 U	1 U	5.6	0.5 U	11	20 U	210	230
HC-SB-5	HC-SB-5-S1	08/09/2007	0-4	10	0.6 U	11	0.04	62 J	--	--	--
	HC-SB-5-S2	08/09/2007	4-8	6 U	0.2 U	4	0.05 U	79 J	--	--	--
HC-SS-1	HC-SS-1	08/10/2007	0-0.5	58	1.8	57	0.83 J	252	190	320	510
HC-SS-2	HC-SS-2	08/10/2007	0-0.5	9	0.4	28	0.06 J	95	--	--	--
HC-SS-3	HC-SS-3	08/10/2007	0-0.5	26	0.8	68	0.16 J	147	240	380	620
PH-DP-1	PH-DP-1-SB-1.5	04/12/2023	1.5	4.96	1 U	13.2	1 U	10.5	140	250 U	270
PH-DP-2	PH-DP-2-SB-0.5	04/12/2023	0.5	16.3	1 U	10.5	1 U	113	50 U	250 U	250 U
PH-DP-3	PH-DP-3-SB-0.8	04/12/2023	0.8	4.26	1 U	119	1 U	62.3	90	980	1,100
PH-DP-4	PH-DP-4-SB-0.5	04/12/2023	0.5	46.5 J	1.36	33.7 J	1 U	173 J	210	250 U	340
	PH-DP-4-SB-2.5	04/12/2023	2.5	7.6	--	--	--	--	--	--	--

Table 4-3
Cleanup Level Exceedances in Soil
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Location	Sample Name	Collection Date	Collection Depth (ft bgs)	Metals (mg/kg)					TPH (mg/kg)		
				Arsenic	Cadmium	Lead	Mercury	Zinc	Diesel-range hydrocarbons	Oil-range hydrocarbons[(a)]	Diesel+Oil[(b)]
MTCA Method A CUL[(1)]:				20	2	250[(c)(2)]	2	360[(c)(2)]	2,000	2,000	2,000
Cleanup Area 5 - Former Powerhouse (cont.)											
PH-DP-5	PH-DP-5-SB-0.8	04/12/2023	0.8	4.96	1 U	21.1	1 U	62.2	50 U	610	640
	PH-DP-5-SB-0.8-DUP	04/12/2023	0.8	4.51	1 U	15.7	1 U	59.5	130	1,100	1,200
PH-DP-6	PH-DP-6-SB-0.5	09/19/2024	0.5	2.2	1 U	5.4	1 U	49	--	--	--
PH-DP-7	PH-DP-7-SB-0.3	09/19/2024	0.3	8.8	1 U	13	1 U	23	--	--	--
PH-DP-8	PH-DP-8-SB-0.4	09/19/2024	0.4	4.0	1 U	81	1 U	190	--	--	--
	PH-DP-8-SB-1.3	09/19/2024	1.3	--	--	--	--	16	--	--	--
Cleanup Area 6 - Vegetated Area											
HC-WS-1	HC-WS-1	08/10/2007	0-0.5	8 U	0.6	47	0.19	161	--	--	--
HC-WS-2	HC-WS-2	08/10/2007	0-0.5	30	0.8	33	0.05	87	--	--	--
HC-WS-3	HC-WS-3	08/10/2007	0-0.5	7	0.2 U	15	0.19	49 J	--	--	--
WL-DP-1	WL-DP-1-SB-0.5	04/12/2023	0.5	4.61	1 U	11.9	1 U	65.2	--	--	--
	WL-DP-1-SB-0.5-DUP	04/12/2023	0.5	5.73	1 U	13.2	1 U	69.5	--	--	--
WL-DP-2	WL-DP-2-SB-0.3	04/12/2023	0.3	3.82	1 U	10.7	1 U	73.2	--	--	--
WL-DP-3	WL-DP-3-SB-0.5	04/12/2023	0.5	3.69	1 U	5.57	1 U	49	--	--	--
WL-DP-4	WL-DP-4-SB-0.5	04/12/2023	0.5	6.47	1 U	15.7	1 U	36.3	--	--	--
Tailings Pile											
TP-96	TP-96	07/15/2020	3	11 U	0.82	8.1	0.27 U	73	27 U	69	83
TP-97	TP-97	07/15/2020	3	11 U	0.78	7.8	0.27 U	68	29	69	98
TP-98	TP-98	07/15/2020	3	11 U	0.64	7.9	0.26 U	51	110	250	360
TP-99	TP-99	07/15/2020	3	11 U	0.54 U	5.4	0.27 U	36	370	860	1,200
TP-100	TP-100	07/15/2020	3	15	0.58	12	0.27 U	55	140	380	520
TP-101	TP-101	07/15/2020	3	12	0.53 U	5.3 U	0.27 U	43	42	110	150
TP-102	TP-102	07/15/2020	3	11 U	0.63	8.8	0.27 U	68	95	270	370
TP-103	TP-103	07/15/2020	3	11 U	0.68	9.8	0.27 U	69	65	170	240

Table 4-3
Cleanup Level Exceedances in Soil
Roslyn No. 4 Mine
205 E Dakota Avenue, Roslyn, Washington

Notes

Data summation rules are as follows: non-detect results are multiplied by one-half when used for sums. When all results are non-detect, the highest reporting limit is provided as the sum.

Purple shading indicates values that exceed soil CULs; non-detects (U) were not compared with screening criteria.

-- = not analyzed.

cont. = continued

CUL = cleanup level

ft bgs = feet below ground surface.

J = result is estimated.

mg/kg = milligrams per kilogram.

MTCA = Model Toxics Control Act.

NV = no value.

TPH = total petroleum hydrocarbons.

U = result is non-detect at the method reporting limit.

[a]Oil-range hydrocarbons are historical results with varying nomenclature, including heavy fuel oil-, lube oil-, and motor oil-range hydrocarbons.

[b]Diesel+Oil is the sum of diesel-range and oil-range hydrocarbons.

[c]Ecological-based cleanup level for lead and zinc, protective of ecological receptors based on the site-specific TEE.

References

[1]Ecology. 2025. Cleanup Levels and Risk Calculation (CLARC) table. Washington State Department of Ecology, Toxics Cleanup Program. February.

[2]MFA. 2025. Supplemental Investigation Report, Roslyn No. 4 Mine. Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. April 28.

Table 4-4
Cleanup Level Exceedances in Groundwater
Roslyn No. 4 Mine, Roslyn, Washington
Forterra Roslyn LLC

Location:	Washington State Background Arsenic, Yakima Basin[1]	MW-01			MW-02			MW-03	
Sample Name:		MW-01-GW-15.0	MW-01-GW-15.0-DUP	MW-01-GW-15.0	MW-02-GW-15.0	MW-02-GW-15.0	MW-02-GW-15.0-DUP	MW-03-GW-13.0	MW-03-GW-11.5
Collection Date:		09/20/2024	09/20/2024	04/01/2025	09/20/2024	04/01/2025	04/01/2025	09/20/2024	04/01/2025
Collection Depth (ft bgs):		15.0	15.0	15.0	15.0	15.0	15.0	13.0	11.5
Total Metals (ug/L)									
Arsenic	6	2.9	2.5	2.3	35	54	55	1 U	1.7
Dissolved Metals—Field-Filtered (ug/L)									
Arsenic	6	2.5	2.5	2.1	38	50	52	1 U	1 U
Dissolved Metals—Laboratory-Filtered (ug/L)									
Arsenic	6	1 UJ	1 UJ	2.2	1.5 J	13	14	1 UJ	1 U

Notes

Shading (color key below) indicates values that exceed screening criteria; non-detects (U and UJ) were not compared with screening criteria.

ft bgs = feet below ground surface.

J- = result is estimated, but the result may be biased low.

U = result is non-detect at the method reporting limit.

ug/L = micrograms per liter.

UJ = result is non-detect with an estimated method reporting limit.

Reference

[1]Ecology. 2022. Natural Background Groundwater Arsenic Concentrations in Washington State, Publication No. 14-09-044. Washington State Department of Ecology.

Appendix A

Wetland Protection Plan

MAUL FOSTER ALONGI

Technical Memorandum

To:	Mary Monahan Washington State Department of Ecology	Date:	May 5, 2025
From:	Brenden Murphy, Maul Foster & Alongi, Inc.	Project No.:	M1122.05.006
Re:	Wetland Protection Plan Roslyn No. 4 Mine 205 E Dakota Avenue, Roslyn, Washington		

On behalf of Forterra Roslyn LLC (Forterra), Maul Foster & Alongi, Inc. (MFA), has prepared this wetland protection plan (WPP) for the cleanup action at the Roslyn No. 4 Mine, located at 205 E Dakota Avenue in Roslyn, Washington (the Property; see Figure 1). The Property is currently vacant but was formerly used for a variety of operations, including a coal mine (referred to as the No. 4 Mine). Forterra is the owner of the Property. The Property is listed with the Washington State Department of Ecology (Ecology) under facility site ID 66921 and cleanup site ID 15545.

Regulatory Framework and Purpose

The Property is currently enrolled in Ecology's Voluntary Cleanup Program. Forterra received a grant from the Washington State Department of Commerce (Commerce) (Capital Agreement contract No. 24-62310-001), with an effective date of June 3, 2024. The grant supports Forterra's environmental site assessment, analysis of cleanup alternatives, and site planning for redeveloping the Property with attainable housing for community benefit. This WPP has been prepared in accordance with the Capital Agreement with Forterra through Commerce for Roslyn No. 4 Mine Cleanup Project, and is intended to supplement the cleanup action plan. The planned cleanup action is intended to mitigate exposure risk for residents, visitors, workers, and ecological receptors at the Property from metals and petroleum-contaminated soil and arsenic in groundwater.

The purpose of the WPP is to provide the basis for protecting regulated surface waters (e.g., wetlands, streams, and associated buffers [collectively referred to as critical areas]) during cleanup actions at the Property. This document will describe guidelines for managing field verified critical areas on the Property during cleanup actions and demonstrate compliance with applicable regulations.

Critical Areas

Results from a wetland delineation and a determination of wetland and stream, boundaries or buffers on or within 300 feet of the Property are detailed in the critical area report prepared by Sewall Wetland Consulting, Inc (SWC 2022). A copy of the critical area report is provided as Attachment A. A brief summary of the key findings from the critical areas report is provided below:

A total of nine wetlands and two streams were identified on the Property (see Figure 2). All wetlands on the Property, with the possible exception of Wetland I, appear to have formed in historic mining disturbance areas. All wetlands are Category III with a 100-foot buffer width based on the 2014 Ecology Wetland Rating System for Eastern Washington (Ecology 2014) and criteria established in Roslyn Municipal Code (RMC) 18.90.270 through 18.90.310. The wetlands on the Property range from approximately 1,000 square feet to 52,000 square feet (SWC 2022).

Two streams are present on the Property, including a narrow, ditched outflow of Wetland F, and a small, ditched stream channel that exits Wetland E. Both streams eventually drain into Crystal Creek. In addition, Crystal Creek flows through the southeast corner of the Property (see Figure 2). RMC designates buffers on streams as 100 feet for Crystal Creek and its tributaries. Both streams and the portion of Crystal Creek on the Property have a 100-foot buffer. The Crystal Creek buffer is entirely contained within Wetland I on the Property (SWC 2022).

Planned Cleanup Actions

Cleanup actions will be conducted in six (6) discrete areas on the Property (Cleanup Area 1 through 6), which include remediation of the former vehicle maintenance area, former foundry, slag pile, former powerhouse, former transformers, and the vegetated area, respectively (see Figure 3). The excavation boundaries presented in Figure 3 are approximate and will be refined in the field using a handheld X-ray fluorescence (XRF) analyzer. Final excavation extents will be determined through base and sidewall confirmation samples to verify chemicals of concern are below respective cleanup levels. The planned cleanup actions for each area are:

- **Cleanup Area 1:** Cleanup in Area 1 will consist of full excavation. Excavation would occur approximately 60 feet from the 100-foot buffer of Wetland G. Avoidance of this wetland and its buffer would occur during the cleanup of Area 1. This approach was selected because it maximizes source removal and does not require installation of a cap or ongoing maintenance. In addition, full source removal reduces potential leaching of arsenic into groundwater. This area will not be backfilled because development is planned in this area.
- **Cleanup Area 2:** Pre-construction sampling will be conducted in this location to verify the lateral extent of impacts. Cleanup in Area 2 will consist of excavation to the extent possible and a soil cap where necessary. This approach was selected because full excavation may be limited by the presence of mature trees. Capping without excavation would raise the ground surface and alter the hydrology. Conducting limited excavation combined with potential capping to match pre-construction grade maximizes source removal at this location while minimizing the impact to the wetland and buffer. In addition, source removal reduces potential leaching of arsenic into groundwater. Excavated contaminated soil will be replaced with clean general fill to 12 inches below ground surface (bgs) and topsoil from 0 to 12 inches bgs and graded to match the original topography.

  Implementation of cleanup actions in Area 2 have the potential to temporarily impact Wetlands H and G and their associated buffers. As avoidance of impact is not possible given where the contamination was identified in relation to the wetlands, the temporary impacts caused through cleanup will be offset through restoration of the wetlands to preconstruction conditions or better following completion of the cleanup action. This would be achieved by seeding and planting with native species appropriate for the location to restore biodiversity to pre-construction conditions or better.
- **Cleanup Area 3:** Cleanup in Area 3 will consist of full excavation. This approach was selected because it maximizes source removal and minimizes impact to the wetland. In addition, full source removal reduces potential leaching of arsenic into groundwater. Slag in this area will be

removed as needed to facilitate excavation of the contaminated soil. Excavated contaminated soil will be replaced with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs and graded to match the original topography. Cleanup in Area 3 would occur directly within the delineated boundary of Wetland G and its buffer. Restoration of the wetland, to pre-construction conditions or better, would be occur following completion of the cleanup action in Area 3. This would be achieved by seeding and planting with native species appropriate for the location to restore biodiversity to pre-construction conditions or better.

- **Cleanup Area 4:** Cleanup in Area 4 will consist of full excavation. This approach was selected because it maximizes source removal and does not require installation of a cap or ongoing maintenance. In addition, full source removal reduces potential leaching of arsenic into groundwater. Excavated contaminated soil will be replaced with clean topsoil and graded to match the original topography. Cleanup in Area 4 could potentially impact Wetland C and its associated buffer. Although future development is planned in this area, excavated areas in Area 4 will be backfilled and restored to pre-construction conditions. As avoidance of impact is not possible given where the contamination was identified in relation to the wetland buffer, the temporary impacts caused through cleanup will be offset through restoration of the buffer to preconstruction conditions or better following completion of the cleanup action
- **Cleanup Area 5:** Cleanup in Area 5 will consist of full excavation. This approach was selected because it maximizes source removal and does not require installation of a cap or ongoing maintenance. In addition, full source removal reduces potential leaching of arsenic into groundwater. A portion of Area 5 outside of the wetland buffer will be developed over with a roadway for housing access and therefore will not be backfilled as part of the remedy. The remainder of Area 5 extends into a buffer area and will be backfilled with clean general fill to 12 inches bgs and topsoil from 0 to 12 inches bgs. The disturbed buffer area will be seeded and planted with native species appropriate for the location that will restore biodiversity to the buffer to pre-construction conditions or better.
- **Cleanup Area 6:** Cleanup in Area 6 will consist of full excavation. Excavation would occur approximately 30 feet from the 100-foot buffer of Wetland D. Avoidance of this wetland and its buffer would occur during the cleanup. This approach was selected because it maximizes source removal. In addition, full source removal reduces potential leaching of arsenic into groundwater. The planned development includes a stormwater pond over Area 6 and therefore this area will not be backfilled as part of the remedy.

The potential for impacts to critical areas were considered during cleanup action planning to avoid and minimize impacts to the extent possible while still cleaning up contamination that poses unacceptable risk to human and ecological receptors. Planned cleanup actions will result in temporary impacts to critical areas on the Property, specifically in Wetland H in Cleanup Area 2 and Wetland G in Cleanup Area 3, near the slag pile and former foundry, respectively. In addition, cleanup actions in Cleanup Area 5, near the former powerhouse, will result in impacts to the buffer of Wetland F. The remaining cleanup areas on the Property are located outside of designated critical areas, and cleanup of those areas will not result in impacts to wetlands, streams, or their buffers.

Direct temporary impacts to wetlands will occur due to the excavation and removal of contaminated soil in those areas. Other activities that could temporarily disturb critical areas during cleanup actions may include heavy equipment and vehicle traffic, staging equipment, placement of excavated contaminated soil, placement of clean backfill, and erosion and sedimentation. The following sections in this WPP described the guidelines for minimizing impacts to critical areas during the cleanup action on the Property.

Wetland Protection Guidelines

Under the RMC 18.90.090, impacts to critical areas should be avoided, minimized, then mitigated. The impacts to Wetlands C, G, and H and wetland buffer areas for this cleanup action cannot be avoided since the only alternative is to take no action and leave metal-contaminated soil above the cleanup levels in the wetlands. That is not a practical alternative since the selected remedy includes removal and potential capping of contaminated soil in select areas on the Property. To achieve cleanup goals and be protective of human health and the environment, removal and potential capping of metal-contaminated soil is required in Cleanup Areas 2, 3, 4, and 5. Cleanup actions conducted in Cleanup Areas 1, 6, and a portion of cleanup area 5 will occur outside of critical areas and will avoid impacts to wetlands, streams, and buffers on the Property.

General Impact Minimization

Temporary impacts to critical areas will be minimized by implementing the following general guidelines and best management practices during implementation of the cleanup action at the Property:

- Establish clear access routes that minimize vehicle and heavy equipment traffic through critical areas.
- Designate areas for placement of stockpiled contaminated and clean fill soil outside of wetland and buffer areas to the maximum extent practicable.
- Establish erosion and sediment controls and best management practices (BMPs) that protect critical areas during construction.
- Minimize general disturbance in critical areas (e.g., foot traffic, equipment storage, parked vehicles). This can be achieved through tailgate meetings during cleanup construction to discuss and determine staging areas, walking paths, and parking areas.
- Disturbed areas will be reseeded with native species appropriate to the location.
- Where possible, position equipment outside of the critical area to conduct the work.

Mitigation

Mitigation beyond implementation of the cleanup action is not required for the temporary impacts to wetlands or wetland buffers. While construction-related temporary impacts will occur to wetland or wetland buffer areas, the proposed action is considered self-mitigating. The purpose of the cleanup action is to mitigate exposure risk for residents, visitors, workers, and ecological receptors at the Property from metals and petroleum in soil and arsenic in groundwater. Removal and potential capping of these contaminated areas will protect human health and improve the function and ecological characteristics of the wetland areas. While removal of contaminated soil would achieve cleanup objectives protecting human health and the environment, the cleanup design also includes backfilling to match natural contours in disturbed areas and revegetation with native species to restore the wetlands and buffers to pre-construction conditions. The removal of contaminated material in combination with the proposed wetland restoration elements of the cleanup action serve as sufficient mitigation to offset the temporary impacts to wetlands from the cleanup construction.

In the future, impacts may occur to other wetland areas on the Property during development of the housing units and associated infrastructure; however, this WPP is intended to only address impacts to critical areas during the cleanup actions described in the cleanup action plan. Mitigation of

impacts to wetland areas on the Property associated with the future site development will be described in a separate mitigation plan and submitted to appropriate agencies for review and approval.

Conclusions

A cleanup action at the Property is being conducted for the protection of human health and the environment. An aspect of the cleanup will require removal and potential capping of contaminated soil within wetlands and their buffers. The impacts to these wetland areas cannot be avoided since the alternative would be to leave contaminated soil remaining in the wetlands. Impacts to critical areas on the Property will be minimized to the maximum extent practicable through implementation of BMPs during cleanup action. Mitigation is not required because the removal of contaminated soil from the wetland areas in combination with the proposed restorative measures, is considered self-mitigating.

Attachments

References

Limitations

Figures

A—Critical Area Report

References

SWC. 2022. Ed Sewall, Sewall Wetland Consulting, Inc. *Critical Area Report - #4 Mine Site Parcel #456234, City of Roslyn, Washington, SWC Job #20-137.* Letter to Danial Osterhage, Forterra Roslyn LLC. November 21.

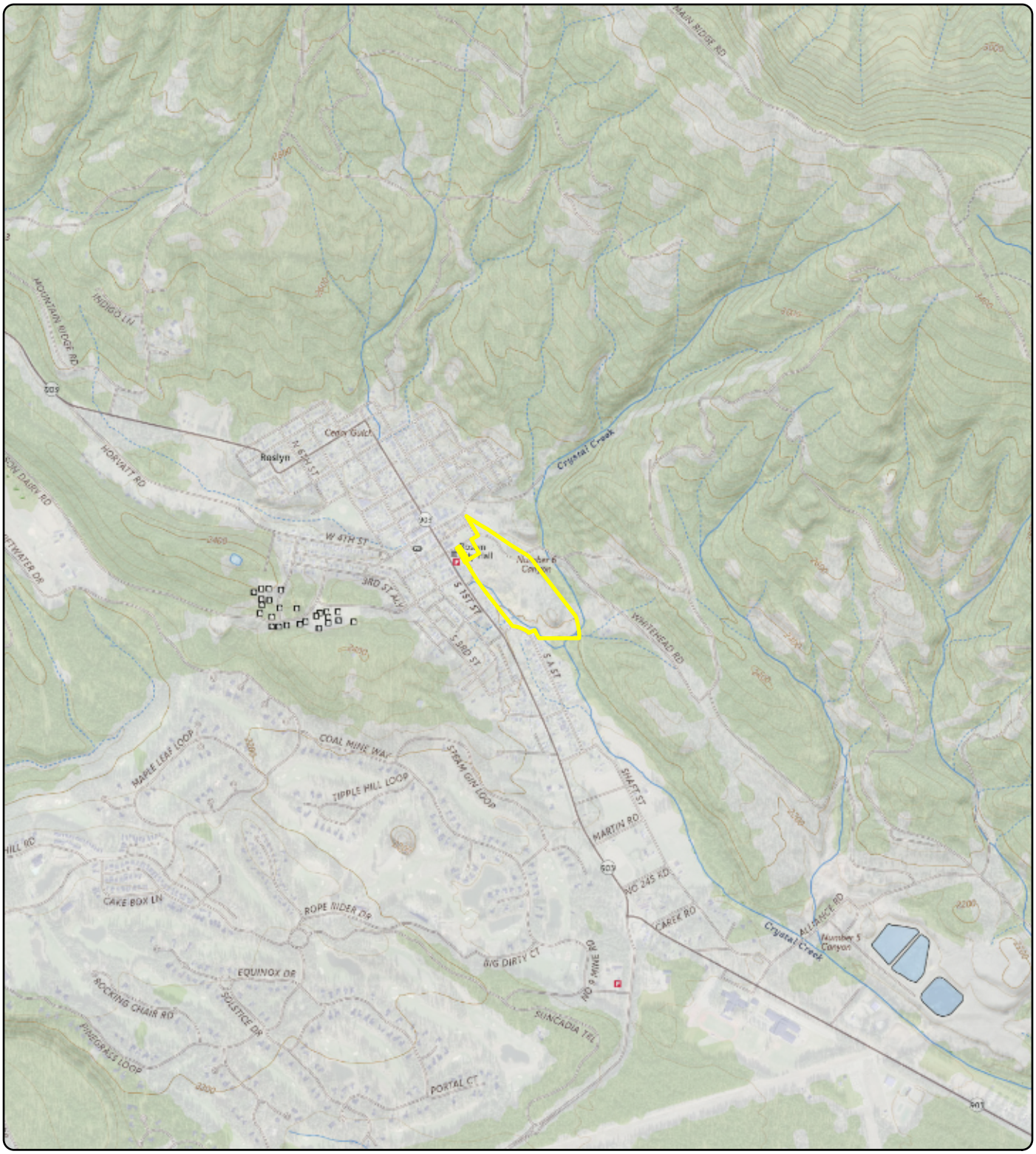
Limitations

The services undertaken in completing this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this technical memorandum.

Figures

MAUL
FOSTER
ALONGI



Notes
U.S. Geological Survey 7.5-minute topographic quadrangle (2020): Cle Elum.
Township 20 north, range 15 east, section 17.

Data Source
Property boundary obtained from Kittitas County.

Legend

Property Boundary

Figure 1
Property Location

Roslyn No. 4 Mine
205 E Dakota Ave
Roslyn, WA

0 2,000
Feet

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Path: X:\1122.05\006\Pro\M1122_05_006_001.aprx\Fig 1-1 Property Location
Print Date: 10/10/2024
Reviewed By: ehess
Produced By: bmurphy
Project: M1122.05.006

Figure 2
Property Overview

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Property Boundary
- Feature of Interest
- Wetland
- Wetland Buffer (Seawall-generated)
- Wetland Buffer (Determined by RMC)
- Stream

Notes
Property features are approximate.
RMC = Roslyn Municipal Code.

0 200
Feet

Data Sources
Aerial photograph obtained from the U.S. National Agriculture Imagery Program; property boundary obtained from Kittitas County; wetland extent, wetland buffer, and select features obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance. Hydrography data obtained from U.S. Geological Survey National Hydrography Dataset.

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Path: X:\1122.05\006\Pro\M1122_05_006_010.aprx\Fig 2-1 Property Overview
Print Date: 4/11/2025
Reviewed By: ahees
Produced By: jroberts
Project: M1122.05.006

Figure 3
Proposed Excavation Areas

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Soil Sample (2004-2024)
- MTCA Method A or Site-specific CUL Exceedance
- Feature of Interest

Excavation Areas (Depth)

- 1 ft
- 2 ft
- 3 ft
- Wetland
- Wetland Buffer (Seawall-generated)
- Wetland Buffer (Determined by RMC)
- Stream
- Property Boundary

Notes

Boring locations from 2023 and 2024 were recorded on a handheld GPS with sub-meter accuracy.
Sample locations from 2004-2020 and property features obtained by others are approximate.
Excavation extents are approximate and will be refined in the field using an XRF analyzer.
All inset maps are displayed at the same scale.
CUL = cleanup level.
ft = feet.
GPS = global positioning system.
MTCA = Model Toxics Control Act.
RMC = Roslyn Municipal Code.
SF = square feet.
XRF = X-ray fluorescence.

0 100
Feet

Data Sources

Aerial photograph obtained from the U.S. National Agriculture Imagery Program; property boundary obtained from Kittitas County; wetland extent, wetland buffer, and select features obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance.

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Path: X:\1122.05\006\Pro\M1122_05_006_010.aprx\Fig 4-1 Proposed Excavation Areas
Print Date: 5/2/2025
Reviewed By: kbeaudoin
Produced By: bmurphy
Project: M1122.05.006

Attachment A

Critical Area Report

MAUL FOSTER ALONGI

Sewall Wetland Consulting, Inc.
PO Box 880
Fall City, WA 98024
Phone: 253-859-0515

November 21, 2022

Daniel Osterhage
Forterra Roslyn LLC
PO Box 4189
Seattle, Washington 98194

RE: Critical Area Report – #4 Mine Site Parcel #456234
City of Roslyn, Washington
SWC Job #20-137

Dear Daniel,

This report describes our observations of any jurisdictional wetlands, streams and/or buffers on or within 300' of Parcel #456234, located at 205 East Dakota Avenue in the City of Roslyn, Washington.

Above: Vicinity Map of site from the Kittitas County Taxsifter website.

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Above: Aerial photograph of the study area from Kittitas Mapsifter website.

The site is an irregular shaped, 30.62 acre parcel containing several gravel roads and remnants of coal mining work on the site. The site is located within the SE ¼ of Section 17, Township 20 North, Range 15 east of the W.M. in Kittitas County, Washington.

1.0 METHODOLOGY

Ed Sewall of Sewall Wetland Consulting, Inc. inspected the site and areas within 300' of the site between May and December of 2020.

The site was reviewed using methodology described in the ***Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*** (USACOE September 2008) as required

by the US Army Corps of Engineers starting in June of 2009. This is the methodology currently recognized by the City of Roslyn for wetland determinations and delineations. The site was also reviewed using methodology described in Soil colors were identified using the 1990 Edited and Revised Edition of the ***Munsell Soil Color Charts*** (Kollmorgen Instruments Corp. 1990.

Wetlands in the City of Roslyn are rated using the 2014 Washington State Department of Ecology Washington State *Wetland Rating System for Eastern Washington, 2014 Update* dated June 2014 Publication No. 14-06-018.

The ordinary high water mark (OHWM) of any streams was located based upon the criteria described in the *Washington Department of Ecology publication Determining The Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (WADOE Publication 16-06-029, March 2010 revised October 2016).

2.0 OBSERVATIONS

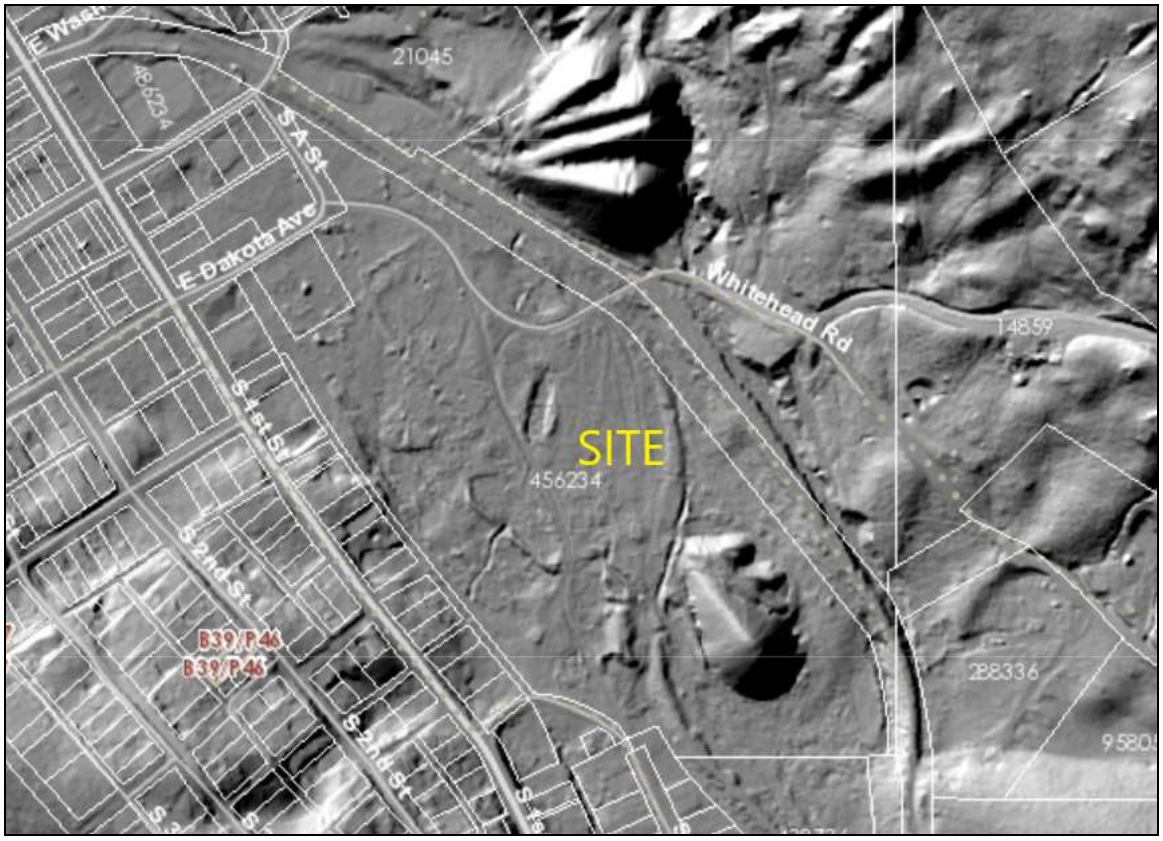
Existing Site Documentation.

Prior to visiting the site, a review of several natural resource inventory maps was conducted. Resources reviewed included the Kittitas Taxsifter website, National Wetland Inventory Map, WDNR Fpars Stream Typing Map, Kittitas County flood & critical areas mapping, WDFW Priority Habitats and Species Maps, and the NRCS Soil Survey online mapping and Data.

2.1.1 Kittitas Taxsifter Website

The Kittitas Taxsifter website with streams and wetland layers activated depicts a stream (identified as Type F) along the southwest side of the site. This mapping is a re-iteration of the NWI mapping of the site.

Above: Kittitas County Taxsifter with wetland and stream layers activated.



Above: Kittitas County Taxsifter Lidar mapping of the site.

2.1.2 National Wetlands Inventory (NWI)

The NWI map depicts the same stream as the Kittitas County website. These areas were interpreted from aerial photographs by the US Fish and Wildlife Service using 2017 aerial photographs with no ground-truthing.

Above: NWI map of the area of the site

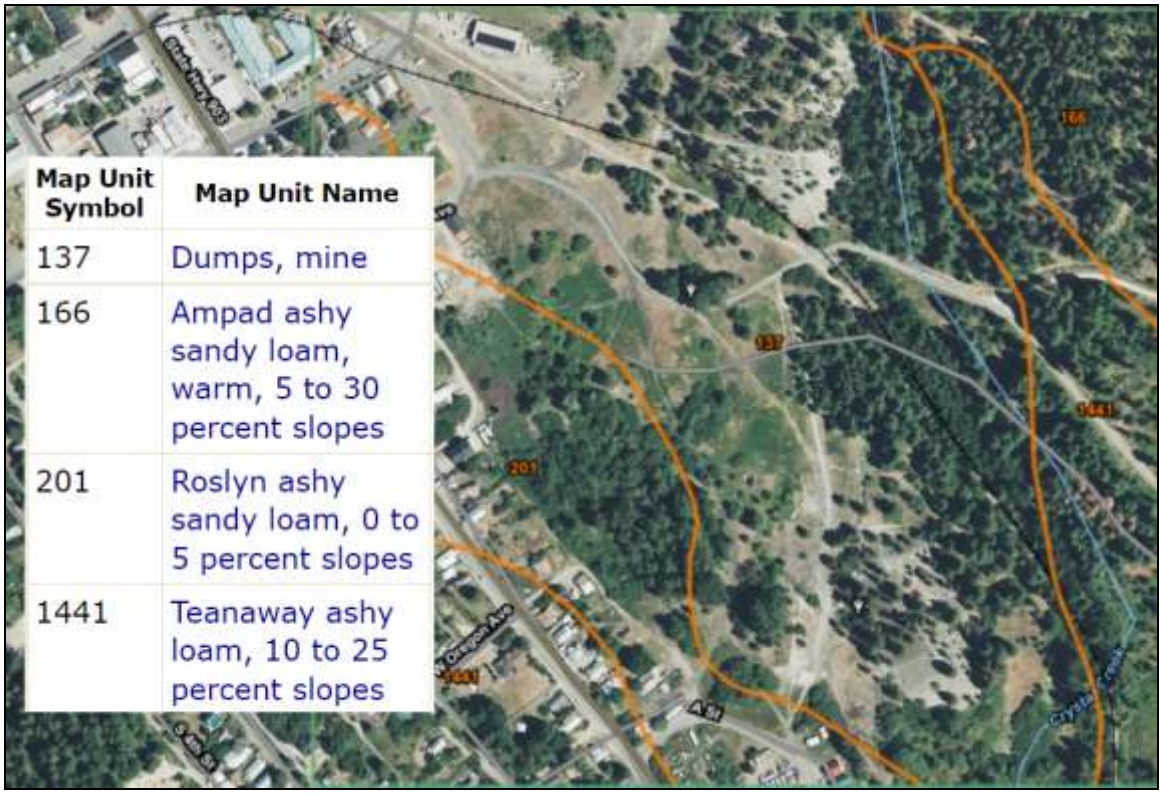
2.1.3 Soil Survey

According to the NRCS Soil Mapper website, the site is mapped as containing two different soil types.

The eastern side of the site is mapped as “Dumps, mines”. This is an area disturbed by past mining activity eliminating the natural soil type that was originally present on the site prior to mining.

The western side of the site is mapped as Roslyn ashy sandy loam. Roslyn soils are well drained soils formed in glacial drift with loess and volcanic ash as part of the soil profile.

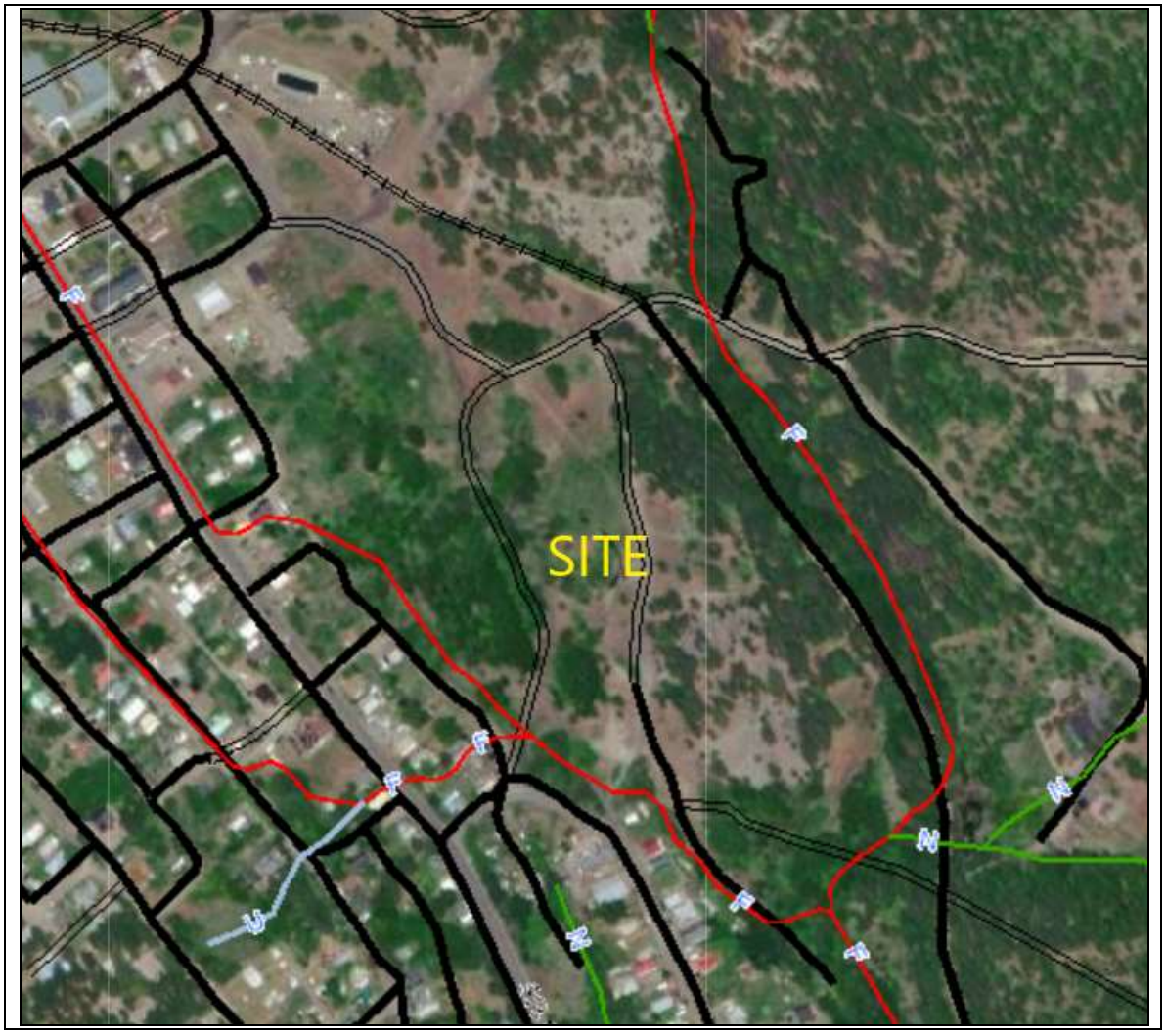
Neither of these soils are not considered "hydric" or wetland soils according to the publication Hydric Soils of the United States (USDA NTCHS Pub No.1491, 1991).



Above: NRCS soil map of the study area of the site.

2.1.4 WADNR FPARS website

According to the WADNR FPARS website with stream types layers activated depicts a Type F stream along the southwest side of the site. Crystal Creek, located off-site to the east of the Coal Mine Trail is also depicted as a Type F water.



Above: WDNR Fpars Stream Mapping of the area of the site.

2.2 Field observations

The site is the former location of the Number 4 Coal mine and as a result, nearly 100% of the land surface has been disturbed in the recent past. Old mine shafts, foundations, slabs, foundry waste area, tailing piles, excavations, two existing sewer lines, and storm drain line are present on the site. Gravel roads and mountain bike trails are also present throughout the landscape. A total of nine (9) wetlands were found on the site and are generally the woody vegetated parts of the site with much of

the remainder of the site being grassland and scattered shrubs over past mining disturbance.

Vegetation in the upland portion of the site includes scattered and clumps of black cottonwood, Washington hawthorne, rose, plum and apple trees, bitter cherry, ponderosa pine, alder and small douglas firs. Understory and open area vegetation includes quackgrass, cheatgrass, knapweed, snowberry, blue elderberry, yarrow, and fescue.

Soil pits excavated throughout the site revealed a mix of soil types including old fill, tailings and slag, generally with chromas of 2 & 3 with no hydric soil indicators.

Critical Areas

A total of nine (9) wetlands and two (2) streams were found on the site. The following is a description of these critical areas;

2.2.1 Wetlands

As previously described nine (9) separate wetlands were identified and delineated on the site. All of these, with the possible exception of Wetland I (which is associated with Crystal Creek), appear to have formed in historic mining disturbance areas. These are generally depressions where surficial groundwater, or old mine drainage and seepage have created wetland conditions by draining out in the surface of these depressions.

Wetland A

Wetland A is a small (1,046sf), isolated, scrub-shrub wetland located on the north end of the site in a small depression near the historic stable location. This well defined wetland was flagged with pink flagging labeled A1-A6.

This wetland contains red-osier dogwood, twinberry, crabapple and some fescue.

Soil pits excavated within this wetland revealed a black, gravelly sandy loam with a soil color of 10YR 2/1 which was saturated to the surface

during our winter observations in December of 2020 and was dry during our summer observation in the summer of 2020.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PSS1C (palustrine, scrub-shrub, broad leaved deciduous, seasonally flooded).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 18 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland B

Wetland B is a 7,107sf, forested and emergent wetland located south of Wetland A in a very well defined depression. This wetland was flagged with pink flagging labeled B1-B12. This wetland has a small sloping seep on its northern end, which drains south into the main body of the wetland, which is a depression. This seep appears to provide the majority of the hydrology of this wetland. It is unknown if this is a natural seep, or an old mine vent or drainage which feeds this area. A gravel road passes along the south end of the wetland. Water at the south end of the wetland may pass in a buried culvert into Wetland F, located to the southwest. Water also seeps across the road bed in the winter and spring periods of high water.

The emergent portion of this wetland contains sedge, cattail, and Baltic rush. The forested portion contains willow, red-osier dogwood, twinberry, cattail and some skunk cabbage.

Soil pits excavated within this wetland revealed a black, sapric muck with a soil color of 10YR 2/1 which was inundated with up to 12" of water during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PFO1C (palustrine, forested, broad leaved deciduous, seasonally flooded) and PEM1E (palustrine, emergent, persistent saturated).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 17 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland C

Is a small (2,392sf) emergent wetland located southeast of Wetland D. This is located in a shallow depression that appears to be an outflow of mine water which drains through the wetland to the south where it infiltrates in more porous soil. This water has a strong hydrogen sulfide smell and has the characteristic of mine drainage.

This wetland was flagged with pink wire flags labeled C1-C10. The wetland is vegetated with a mix of quackgrass, creeping buttercup, and scattered cattail around the seepage source.

Soil pits excavated within the wetland revealed a black (1-0YR 2/1) gravelly soil which was saturated to the surface during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PEM1E (palustrine, emergent, persistent, saturated).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 17 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland D

Wetland D is a 7,084sf, scrub-shrub wetland located on the southwest side of the site along A Street. Gravel roads surround this small depression and the wetland was flagged with pink flagging labeled D1-D8. This wetland appears to be a groundwater or mine drainage discharge point and creates a seasonally flooded water regime in the depression. Water within the wetland drains into the roadside ditches and storm system along A Street.

This wetland has a shrub strata of pacific willow with red osier dogwood, Hawthorne, and reed canary grass in the understory.

Soil pits excavated within this wetland revealed a black, sapric muck with a soil color of 10YR 2/1 which was saturated within 4" of the surface during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PSS1C (palustrine, scrub-shrub, broad leaved deciduous, seasonally flooded).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 17 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland E

Wetland is a 2,583sf, scrub-shrub wetland located on the southwest side of the site to the south of Wetland D and bordering a single family home off-site. This wetland was flagged with flags E1-E6. A small ditched stream (Stream B) drains out of this wetlands eastern corner and flows off-site to the south behind single family homes eventually draining into Crystal Creek.

This wetland has a shrub strata of sitka willow with reed canary grass in the understory.

Soil pits excavated within this wetland revealed a black, sapric muck with a soil color of 10YR 2/1 which was saturated within 4" of the surface during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PSS1C (palustrine, scrub-shrub, broad leaved deciduous, seasonally flooded).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 17 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using

the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland F

Wetland F is a 25,568sf, forested and emergent wetland located on the central west side of the site. Water within this wetland forms the headwater of a small stream (Stream A) which drains out of the wetland to the west and enters a storm pipe going south of the site to eventually join Crystal Creek.

This wetland was flagged with pink flagging labeled F1-F21. This wetland is topographically well-defined by berms and soil/tailing piles surrounding its sides. As with the other wetlands on the site, this wetland formed within disturbed areas caused by historic mining. The source of water to this wetland is likely old mine drainage from vents or surface seepage.

The wetland is vegetated with an overstory of black cottonwood and alder with red-osier dogwood twinberry, reed canary grass and skunk cabbage in the understory.

Soil pits excavated within this wetland revealed a black, gravelly loam with a soil color of 10YR 2/1 which was inundated with up to 4" of water during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PFO1C (palustrine, forested, broad leaved deciduous, seasonally flooded) and PEM1E (palustrine, emergent, persistent saturated).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland

as a “depressional” wetland, this wetland scored a total of 17 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100’ buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland G

Wetland G is a 23,273sf, forested, scrub shrub and emergent wetland located along the west property line where the two sewer lines run through the site. This wetland is separated from Wetland H by a concrete slab and disturbance from the historic foundry located in this area.

This wetland was flagged with pink flagging labeled G1-G20. This wetland is emergent on the north where the wetland drains down to a depression along the sewer lines. The remainder is a mix of immature forested wetland scrub-shrub wetland. The wetland is well defined by old fill slopes as well as an area of slag from the old foundry. A ditch runs along the west edge and carries water from this wetland to the south off-site into the storm drainage system in the gravel roadbed west of the site.

The emergent portion of this wetland contains sedge, cattail, and reed canary grass. Species within the forested and scrub-shrub portions include cottonwood, pacific willow, red alder, red-osier dogwood, horsetail and sitka willow.

Soil pits excavated within this wetland revealed a black, sapric muck with a soil color of 10YR 2/1 which was inundated with up to 12” of water during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PFO1C

(palustrine, forested, broad leaved deciduous, seasonally flooded), PSS1C (palustrine, scrub-shrub, broad leaved deciduous, seasonally flooded), and PEM1E (palustrine, emergent, persistent saturated).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 18 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland H

Wetland H is a 4,760sf, forested wetland located just west of the power line passing through the site and just south of Wetland G. This wetland is separated from Wetland G by a concrete slab and disturbance from the historic foundry located in this area.

This wetland was flagged with pink flagging labeled H1-H6. This wetland contains slag piles, excavations and other disturbance from past mining activity. Species within the wetland cottonwood, pacific willow, red alder, red-osier dogwood, horsetail and sitka willow.

Soil pits excavated within this wetland revealed a black, gravelly loam with coal fines mixed throughout the profile. The soil color of 10YR 2/1 which was saturated at the surface during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PFO1C (palustrine, forested, broad leaved deciduous, seasonally flooded).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 16 points with 5 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 5 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 5 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

Wetland I

Wetland I is a 52,526sf forested and scrub-shrub wetland located on the south side of the site and south of the large tipple pile. This wetland extends off-site to the south and includes Crystal Creek within its boundaries.

This wetland was flagged with pink flagging labeled I1-I16. The wetland is a mix of slope wetland and depressional wetland with Crustal Creek being located within a ditched stream channel through the wetland draining to the southwest.

The scrub-shrub portion contains hawthorn, red-osier dogwood and small alders. The forested portion contains black cottonwood, red alder, hawthorn and red-osier dogwood.

Soil pits excavated within this wetland revealed a black, sapric muck with a soil color of 10YR 2/1 which was inundated with up to 6" of water during our site visits.

Using the US Fish and Wildlife Service Wetland Classification system (Cowardin et al 1979), this wetland would be classified as PFO1C (palustrine, forested, broad leaved deciduous, seasonally flooded), and PSS1C (palustrine, scrub-shrub, broad leaved deciduous, seasonally flooded).

Using the 2014 *Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington*, and rating this wetland as a "depressional" wetland, this wetland scored a total of 17 points with 6 for habitat. This indicates a Category III wetland. City of Roslyn Code lists habitat scores for the older 2004 rating system but references using the latest version of the WADOE ratings system as detailed in RMC 18.90.290.1. The conversion of a Category III wetland with 6 habitat points is the equivalent of a 20 point habitat score under the older rating system. A Category III wetland with 6 habitat points, in moderate land use intensity has a 100' buffer.

Points for Habitat from Wetland Rating Form	≤ 21	22	23	24	25	≥ 26
Wetland Buffer Width	100	120	140	160	180	200

2.2.2 Streams

There are three streams that are located on the site, one of which is Crystal Creek which just touches the southeast corner of the site. Streams A & B are channels exiting wetlands on the site and draining eventually to Crystal Creek. Below is a description of these streams;

Stream A

Stream A is a narrow ditched outflow of Wetland F which drains from the west side of this wetland to the west where it enters a small culvert and drains to the south off-site. The ordinary high water mark (OHWM) of this stream was flagged with blue flags N1-N6 and S1-S6. This stream only flows when Wetland F has enough standing water to overflow into this ditch. This ditch enters a culvert and drains to the south, eventually draining into Crystal Creek off-site.

Under RMC 18.90.240.3.A, this stream would have a 100' buffer as it is a Crystal Creek tributary and it is not in the urban forest and watershed zone.

City of Roslyn Municipal Code designates buffers on streams as follows:

18.90.240 Fish and wildlife habitat conservation area riparian buffers.

A. Standard Buffer Widths. Streams shall be protected with vegetated buffers, which also provide riparian wildlife habitat. These buffers shall have the following standard widths, measured perpendicular from the ordinary high water mark of the water body:

1. Crystal Creek and its tributaries: 100 feet;

2. All streams in the urban forest and watershed zones, including seasonal streams: 300 feet; and

3. All other streams: 50 feet.

Stream B

A small ditched stream channel exits Wetland E and drains to the south eventually connecting to Crystal Creek further south from the site. This stream is in a well-defined channel that runs along the west side of an old railroad grade and is approximately 18" wide.

City of Roslyn Municipal Code designates buffers on streams as follows:

18.90.240 Fish and wildlife habitat conservation area riparian buffers.

A. Standard Buffer Widths. Streams shall be protected with vegetated buffers, which also provide riparian wildlife habitat. These buffers shall have the following standard widths, measured perpendicular from the ordinary high water mark of the water body:

1. Crystal Creek and its tributaries: 100 feet;

2. All streams in the urban forest and watershed zones, including seasonal streams: 300 feet; and

3. All other streams: 50 feet.

Stream B would have a 100' buffer measured from the OHWM. This buffer is completely within Wetland I and its buffer on-site.

Crystal Creek

As previously mentioned, Crystal Creek, a Type F stream, just touches the southeast corner of the site. Crystal Creek is in a well-defined ditched configuration in this area and does not appear to flood into Wetland I.

City of Roslyn Municipal Code designates buffers on streams as follows:

18.90.240 Fish and wildlife habitat conservation area riparian buffers.

A. Standard Buffer Widths. Streams shall be protected with vegetated buffers, which also provide riparian wildlife habitat. These buffers shall have the following standard widths, measured perpendicular from the ordinary high water mark of the water body:

1. Crystal Creek and its tributaries: 100 feet;

The 100' buffer of Crystal Creek is entirely contained within Wetland I on the site.

Proposed Project

The proposed project is the construction of a residential plat with associated infrastructure on the east side of the site. In 2017 the Roslyn Downtown Association (RDA) saw an opportunity to purchase a 30-acre parcel of land at the closed #4 Mine site. The RDA reached out to Forterra for help. After due diligence and with a supporting grant from Washington State for the initial purchase, Forterra closed on the property in November 2020. Starting in early 2021, and continuing through 2022, Forterra has met with community leaders and held community meetings to design together a plan for the development of the No. 4 Mine Site. Forterra engaged two PNW-based architects with experience in town planning, to support the community-driven design. Roslyn residents have had and will continue to have an opportunity to share community needs and guide the overall property development and planning process. Site opportunities are varied, including the possibility of community space, commercial space and livable, affordable, and sustainable housing that fits with the character of Roslyn.

The proposed roads to and through the site will expand on existing gravel roads that are present on the site at this time. Due to the location of the various small wetlands scattered across the site, the proposal includes the fill of two small Wetlands (A&C) as well as a portion of a third wetland (Wetland B). These are disturbed, lower function areas that are the result of past mine activity. The larger wetlands on the western side of the site will be left undisturbed, with the exception of the proposed expansion of Wetland F as mitigation for filling of the wetlands previously mentioned. In addition, some buffer averaging as allowed by Code is proposed.

Typically, a sequencing of mitigation is employed to avoid or minimize impacts to critical areas on a site from a development, below is the proposed mitigation sequencing for this project;

a) *Avoidance* - The proposed project has been designed to best avoid critical areas on the site as possible. Less than half of the area of the site is being proposed for development. The site is restricted by existing City road connections, existing critical areas as well as sewer and power easements and mine hazard areas. As a result, construction of a feasible plat will require some impacts to critical area.

b) *Minimizing Impacts* - The proposed project will attempt to minimizing impacts by limiting the degree or magnitude of the actions and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts. This has been done by moving all of the proposed work to the east to avoid the larger, more high function wetlands and buffer areas.

c) *Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.* This is generally not feasible on a project of this type. However, some restoration of remaining wetlands on the site will occur as part of the mitigation proposal.

d) *Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.* This is not applicable for a project of this type.

e) *Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.* The proposed project will

compensate for impacts to wetlands and buffers at the mitigation ratios dictated by RMC 18.90.310.

As depicted on the Sewall Wetland Consulting, Inc. "Wetland Mitigation Plan - #4 Mine Development" dated 8-18-22, the proposed impacts to wetlands consist of filling 7,943sf of Category III wetland. This will include all of Wetlands A, C and a portion of Wetland B.

According to RMS 18.90.310;

A. All significant adverse impacts to wetlands and buffers as determined by the planning official shall be mitigated in accordance with the standards in RMC 18.90.090 and 18.90.100 and this section, and with reference to the Department of Ecology's Guidance on Wetland Mitigation in Washington State, Part 2 (Ecology Publication No. 04-06-013B) and Appendix 8-C of the Department of Ecology's Wetlands in Washington – Volume 2: Guidance for Protecting and Managing Wetlands (Ecology Publication No. 05-06-008), or updated guidance by Ecology.

B. If impacts to wetlands are unavoidable, mitigation to achieve compensation for wetland functions shall be approached in the following order of preference:

1. Reestablishment of natural or historic functions to a former wetland, through restoration of physical, chemical or biological processes (e.g., removing fill, plugging ditches, breaking drain tiles, breaching dikes, etc.).

Response: These options are not possible as it appears all of the wetlands on the site are the result of past disturbance of the site from mining. It is likely none of these wetlands existed until the mining was abandoned on the site ears ago. Hydrology of these wetland primarily appears to be water that has collected in underground mine areas and has reached the surface from old ventilation or drain routes.

2. Rehabilitation of natural or historic functions of a degraded wetland through restoration of physical, chemical or biological processes (e.g., removing fill, plugging ditches, breaking drain tiles, breaching dikes, etc.).

Response: As previously described, this is not possible on this site.

3. Creation of wetlands on disturbed upland sites, where the post-project hydrologic regime can demonstrably support the proposed wetland plant community.

Response: As depicted on the mitigation Plan, we are proposing to create wetland as a 2:1 ratio as required by Code (RMC 18.90.310.f) for Category III wetland impacts by creating 15,886sf of wetland along the north and south ends of Wetland F. Our preliminary review of these areas indicates that groundwater is present below the surface at the proposed grades, and can be intercepted to create wetland conditions, enlarging the largest wetland on the site. The two areas will be excavated to create wetland conditions and brought to grade with topsoil's to create an adequate growing medium for native trees and shrubs. The area will then be planted with a mix of native trees and shrubs to create areas that will develop into scrub-shrub and forested wetland. These areas will then be monitored for 5 years as required by Code (RMC 18.90.310.G.4).

4. Enhancement of vegetation or other characteristics of a wetland site to improve specific functions, such as filtration of pollutants or wildlife habitat.

Response: NA

5. Preservation or protection of a wetland that would not be adequately accomplished through existing regulations.

Response: NA

Proposed Buffer averaging

Several areas of buffer averaging are proposed to accommodate the roads into the site from the existing City road intersections and alignments. In addition some of the reduction areas are where roads will follow existing roadbeds which already intrude in wetland buffers.

RMC 18.90-290C & D have provisions for buffer reductions with enhancement and averaging with maximum allowed reductions of 35% and 25% for averaging. Several areas of the proposed reductions exceed these thresholds and will require a Variance from the general standards.

As depicted on the Wetland Mitigation Plan dated 8-18-22, there are 5 areas of reduction proposed for roads around the wetland complex remaining on the western side of the site.

D. Buffer Averaging. Except in the urban forest and watershed zones, the planning official shall have the authority to average buffer widths on a case-by-case basis, where a qualified wetlands professional demonstrates, as part of a critical area report, that all of the following criteria are met:

1. The total area contained in the buffer after averaging is no less than that contained within the buffer prior to averaging;

Response: The total area of reduced buffer is 21,031sf. The total area of added buffer is 21031sf meeting this criteria.

2. Decreases in width are generally located where wetland functions may be less sensitive to adjacent land uses and increases are generally located where wetland functions may be more sensitive to adjacent land uses, to achieve no net loss or a net gain in functions; and

Response: Generally all of the areas of the reduced/averaged buffer area areas of existing gravel roads and open disturbed ground with low function. None of these areas contain high functioning, well vegetated buffers.

The increase areas are slightly better in function as they generally contain shrub covered areas around the wetlands but outside the standard buffers. These areas provide more of the functions attributed to wetland buffers than those of the decrease areas.

3. The averaged buffer, at its narrowest point, shall not result in a width less than 75 percent of that allowed under other provisions of this section; provided, that minimum buffer widths shall never be less than 50 feet for Category I, Category II and Category III wetlands and 25 feet for Category IV wetlands.

Response: As previously noted, some of these buffer areas are already functionally reduced by existing gravel roads through the site which are closer than the 75% allowed reduction in Code. As a result of using these existing road alignments and making sure they align with abutting

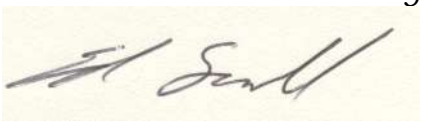
City street intersections, it is not possible to meet the minimum 75% threshold.

4. Effect of Mitigation. If wetland mitigation occurs such that the rating of the wetland changes, the requirements for the category of the wetland after mitigation shall apply.

Response: The proposed mitigation for this project will not change wetland ratings of any of the wetlands on the site.

If you have any questions in regards to this report or need additional information, please feel free to contact me at (253) 859-0515 or at esewall@sewallwc.com .

Sincerely,
Sewall Wetland Consulting, Inc.



Ed Sewall
Senior Wetlands Ecologist PWS #212

REFERENCES

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Reed, P., Jr. 1988. National List of Plant Species that Occur in Wetlands: Northwest (Region 9). 1988. U. S. Fish and Wildlife Service, Inland Freshwater Ecology Section, St. Petersburg, Florida.

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Sewall Wetland Consulting, Inc. August 18, 2022 Wetland Mitigation Plan - #4 Mine Development

USDA NRCS & National Technical Committee for Hydric Soils, September 1995. Field Indicators of Hydric Soils in the United States - Version 2.1

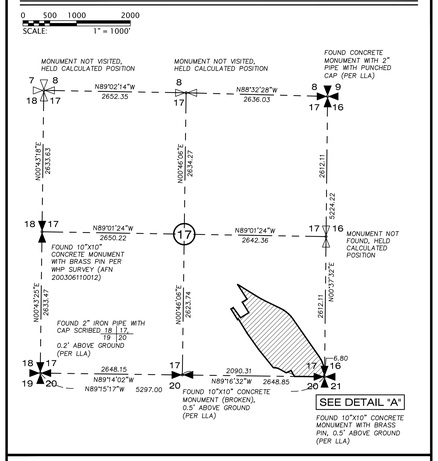
Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACOE September 2008)

Washington Department of Ecology publication Determining The Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State (WADOE Publication 16-06-029, March 2010 revised October 2016).

Washington State Department of Ecology Washington State Wetland Rating System for Eastern Washington, 2014 Update dated June 2014 Publication No. 14-06-018.

ALL OF THE SE 1/4 OF SECTION 17, TOWNSHIP 20 N, RANGE 15 E, W.M.
CITY OF ROSLYN, KITTITAS COUNTY, WASHINGTON

SUBDIVISION CONTROL



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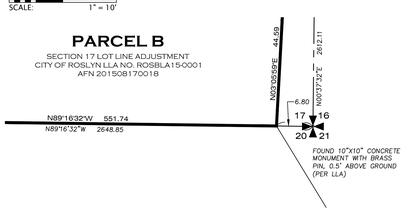
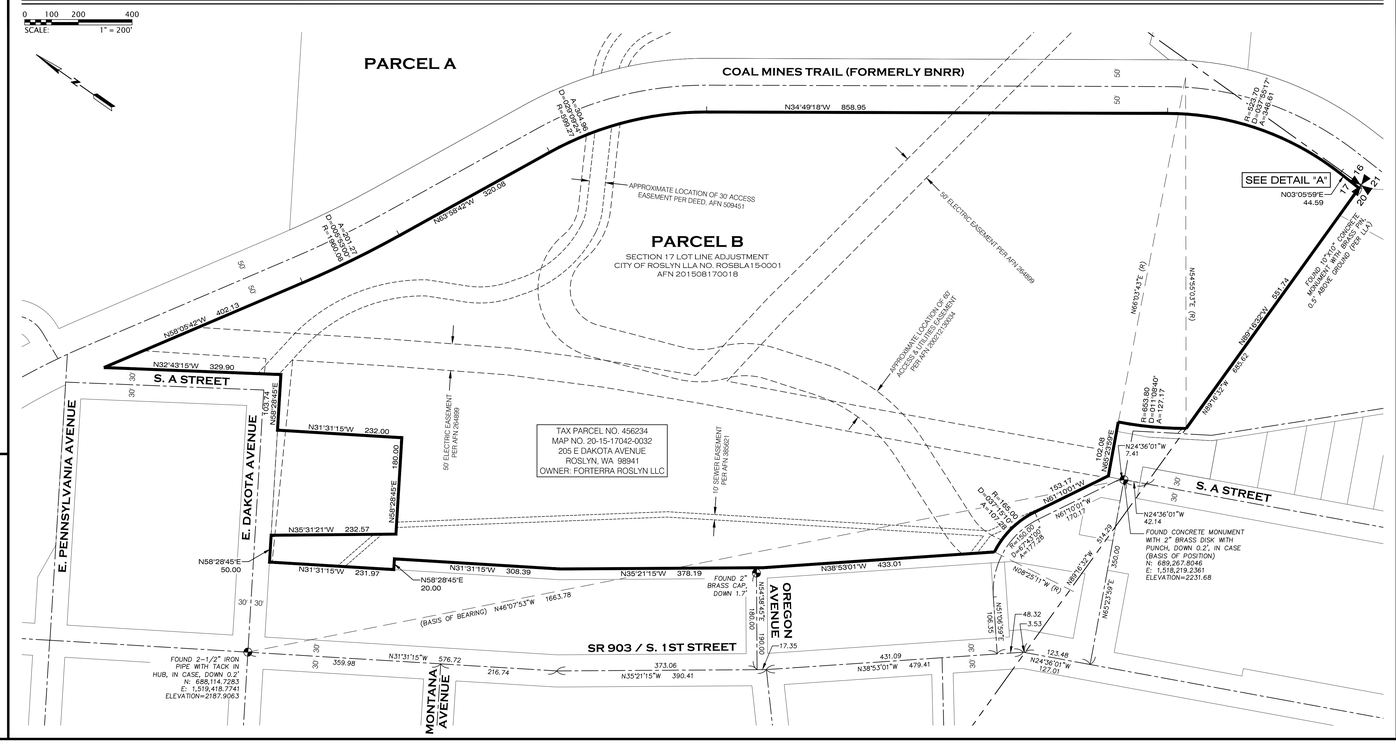


SURVEY CONTROL



SURVEY NOTES

1. HORIZONTAL DATUM: NAD 83/2011 EPOCH 2010.00 STATE PLANE, WASHINGTON SOUTH ZONE, PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN).
2. BASIS OF POSITION: A CENTERLINE MONUMENT IN SOUTH A STREET, AT A POINT ON THE WEST LINE OF PARCEL NUMBER 721234 (501 S. A STREET), NORTHEAST OF THE 'ROSLYN TOWING' BUILDING (502 S. A STREET). MONUMENT LOCATION CAN BE ALSO DESCRIBED AS THE INTERSECTION OF SOUTH A STREET AND PREVIOUSLY NAMED CALIFORNIA AVENUE. SAID MONUMENT FOUND BEING A FOUND 2 INCH DIAMETER BRASS DISC WITH PUNCH, IN CASE, 0.2 FEET BELOW GRADE OF THE ROAD.
3. BASIS OF BEARINGS: HELD THE BEARING BETWEEN THE ABOVE NOTED BASIS OF POSITION AND THE MONUMENTED INTERSECTION OF SOUTH 1ST STREET AND EAST DAKOTA STREET (AND WEST DAKOTA STREET) TO BE N 46°07'53" W. THE MONUMENT IS A 2-1/2" IRON PIPE WITH TACK IN HUB, IN CASE, DOWN 0.2 FEET BELOW GRADE OF THE ROAD.

   NOTE: PER THE SECTION 17 LOT LINE ADJUSTMENT, CITY OF ROSLYN LLA NO. ROSBLA15-0001, RECORDED UNDER RECORDING NUMBER 201508170018, RECORDS OF KITTITAS COUNTY, WASHINGTON, SAID MONUMENT WAS PREVIOUSLY FOUND BY GOLDSMITH TO BE A 2 INCH DIAMETER BRASS DISC AND "X" SET IN CONCRETE IN A 2 INCH PIPE, IN CASE, 0.7 FEET BELOW GRADE OF THE ROAD. IT IS ASSUMED SAID MONUMENT WAS REPLACED SOMETIME BETWEEN GOLDSMITH'S INITIAL LOCATION OF IT AND THE TIME OF THIS SURVEY, BASED ON THE NEGLIGIBLE DIFFERENCE BETWEEN THE LOCATIONS OF THE ORIGINAL AND CURRENT MONUMENT.
4. VERTICAL DATUM: NAVD 88, PER THE WASHINGTON STATE REFERENCE NETWORK (WSRN).

   SITE BENCHMARK NO. 1: BENCHMARK IS THE ABOVE-DESCRIBED BASIS OF POSITION.
   ELEVATION = 2231.68 FEET

   SITE BENCHMARK NO. 2: BENCHMARK IS THE MONUMENT DESCRIBED ABOVE USED TO ESTABLISH THE BASIS OF BEARINGS.
   ELEVATION = 2187.91 FEET
5. THE FOLLOWING INFORMATION WAS REFERENCED IN PREPARING THIS SURVEY:

   A) SECTION 17 LOT LINE ADJUSTMENT, CITY OF ROSLYN LLA NO. ROSBLA15-0001, RECORDED UNDER RECORDING NUMBER 201508170018, RECORDS OF KITTITAS COUNTY, WASHINGTON.

   B) KITTITAS COUNTY QUARTER GIS DATA AS SHOWN PER 'KITTITAS COUNTY COMPAS'.
6. ALL DISTANCES SHOWN HEREON ARE GROUND DISTANCES UNLESS NOTED OTHERWISE. THE COMBINATION FACTOR USED FOR THIS SITE WAS 0.99996255, WHERE GRID DISTANCE DIVIDED BY THE COMBINATION FACTOR EQUALS GROUND DISTANCE. THEREFORE, THE ONLY TRUE WASHINGTON STATE PLANE COORDINATE IS THE BASIS OF POSITION. DISTANCES ARE ALL IN U.S. SURVEY FEET.
7. ALL TITLE INFORMATION SHOWN ON THIS MAP HAS BEEN EXTRACTED FROM INFORMATION CONTAINED IN KITTITAS TITLE AND ESCROW, FILE NUMBER 374034AM, COMMITMENT DATE OCTOBER 30, 2020. IN PREPARING THIS MAP, HUGH G. GOLDSMITH AND ASSOCIATES, INC. CONDUCTED NO INDEPENDENT TITLE SEARCH, NOR IS HUGH G. GOLDSMITH AND ASSOCIATES, INC. AWARE OF ANY TITLE ISSUES AFFECTING THE PROPERTY OTHER THAN THOSE SHOWN ON THE MAP AND DISCLOSED BY THE REFERENCED COMMITMENT. HUGH G. GOLDSMITH AND ASSOCIATES, INC. HAS RELIED WHOLLY ON SAID TITLE COMPANYS REPRESENTATION OF THE TITLES CONDITION TO PREPARE THIS SURVEY AND THEREFORE HUGH G. GOLDSMITH AND ASSOCIATES, INC. QUALIFIES THE MAPS ACCURACY AND COMPLETENESS TO THAT EXTENT.
8. THE SUBJECT PROPERTY CONTAINS 1,334,007 SQUARE FEET OR 30.62 ACRES, MORE OR LESS.
9. TRAVERSING AND DATA COLLECTION WERE PERFORMED USING ONE OR MORE OF THE FOLLOWING INSTRUMENTS: A 3-SECOND GT-503 TOPCON TOTAL STATION, A 3-SECOND PS-103A TOPCON TOTAL STATION, A 5-SECOND GPT-3005W TOPCON TOTAL STATION.

   ADDITIONAL FIELD WORK WAS PERFORMED USING TOPCON HIPER HR AND/OR HEMISPHERE S321 GNSS POSITIONING SYSTEMS, THE WASHINGTON STATE REFERENCE NETWORK, AND/OR THE NATIONAL GEODETIC SURVEY'S ONLINE POSITIONING USER SERVICE (OPUS).

   ALL FIELD WORK WAS PERFORMED, AND EQUIPMENT MAINTAINED, IN COMPLIANCE WITH WAC 332-130.
10. PLANIMETRIC INFORMATION SHOWN HEREON IS A COMBINATION OF FIELD TOPOGRAPHY COLLECTED BY GOLDSMITH BETWEEN OCTOBER 4 & OCTOBER 15 OF 2021 AND EXISTING OCCUPATION AS GRAPHICALLY DEPICTED ON SECTION 17 LOT LINE ADJUSTMENT, CITY OF ROSLYN LLA NO. ROSBLA15-0001, RECORDED UNDER RECORDING NUMBER 201508170018, RECORDS OF KITTITAS COUNTY, WASHINGTON. BASED ON SURVEY SCOPE, NO ADDITIONAL UTILITY RESEARCH OR OCCUPATION REVIEW WAS COMPLETED DURING THE COURSE OF THIS SURVEY. TRAILS ON-SITE ARE SHOWN IN THEIR APPROXIMATE LOCATION PER AN ORTHOGRAPHIC PHOTO.
11. TOPOGRAPHY SHOWN HEREON IS PER LIDAR CONTOURS AS SHOWN ON AN EXHIBIT BY THORNTON LAND SURVEYING, DATED JUNE 29, 2020. SAID EXHIBIT NOTING:

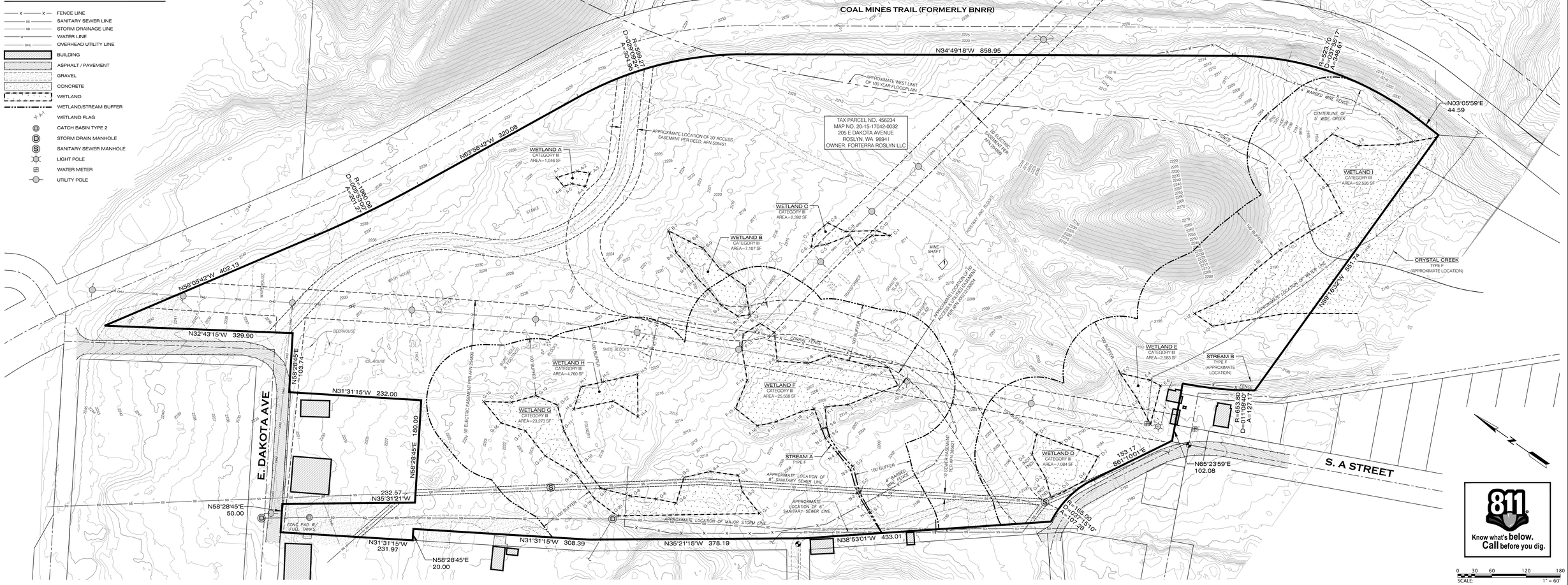
    "CONTOUR DATA SHOWN HERE BASED ON YAKIMA RIVER BASIN, WA LIDAR SURVEY, ALSO KNOWN AS YAKIMA K2K 2014, PRECISION AND ACCURACY DATA CAN BE FOUND IN THE METADATA REPORT ISSUED BY QUANTUM SPATIAL INC, IN FEBRUARY 2015, AVAILABLE ON THE WASHINGTON STATE LIDAR PORTAL: LIDARPORTAL.DNR.WA.GOV"
12. CENTERLINE MONUMENTS SHOWN AS FOUND WERE FIELD VISITED ON OCTOBER 4, 2021. SUBDIVISION MONUMENTATION WAS HELD AS DEPICTED ON SECTION 17 LOT LINE ADJUSTMENT, CITY OF ROSLYN LLA NO. ROSBLA15-0001, RECORDED UNDER RECORDING NUMBER 201508170018, RECORDS OF KITTITAS COUNTY, WASHINGTON.
13. WETLANDS SHOWN HEREON WERE FIELD LOCATED AS DELINEATED ON-SITE BY SEWALL WETLAND CONSULTING, INC. IN OCTOBER OF 2021. BUFFERS SHOWN HEREON ARE PER A CONCEPTUAL PLAN PROVIDED BY SEWALL WETLAND CONSULTING, INC. ON JANUARY 12, 2022. WETLANDS A, B & C DO NOT SHOW A BUFFER AS THEY ARE PROPOSED TO BE FILLED.
14. THE 100 YEAR FLOODPLAIN SHOWN HEREON IS PER THE CONCEPTUAL PLAN AS REFERENCED ABOVE AND IS SHOWN IN ITS APPROXIMATE LOCATION.
15. THE PURPOSE OF THIS SURVEY IS TO PROVIDE EXISTING CONDITIONS BASE DATA INFORMATION SUFFICIENT FOR FOR DESIGN AND BUILDING PERMITTING REQUIREMENTS. THIS SURVEY IS NOT A BOUNDARY SURVEY.

LEGAL DESCRIPTION

PARCEL B AS DESCRIBED AND DELINEATED ON THAT CERTAIN LOT LINE ADJUSTMENT, RECORDED AUGUST 17, 2015, IN BOOK 39 OF SURVEYS, PAGE 222 THROUGH 231, UNDER AUDITORS FILE NO. 201508170018, RECORDS OF KITTITAS COUNTY, STATE OF WASHINGTON; BEING A PORTION OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 20 NORTH, RANGE 15 EAST, W.M., KITTITAS COUNTY, STATE OF WASHINGTON.

OCCUPATION LEGEND

- FENCE LINE
- SANITARY SEWER LINE
- STORM DRAINAGE LINE
- WATER LINE
- OVERHEAD UTILITY LINE
- BUILDING
- ASPHALT / PAVEMENT
- GRAVEL
- CONCRETE
- WETLAND
- WETLAND/STREAM BUFFER
- WETLAND FLAG
- CATCH BASIN TYPE 2
- STORM DRAIN MANHOLE
- SANITARY SEWER MANHOLE
- LIGHT POLE
- WATER METER
- UTILITY POLE



811 Know what's below. Call before you dig.

0 30 60 120 180
SCALE 1" = 60'

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LAND DEVELOPMENT SERVICES
11400 SE 8th St, Suite 450, Bellevue, WA 98004 | PO Box 3565, Bellevue, WA 98009
T 425 462 1080 www.goldsmithengineering.com

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LEE D. LYNCH — 3/18/22

FORTERRA
TOPOGRAPHIC SURVEY FOR
FORTERRA ROSLYN LLC
205 E. DAKOTA AVENUE, CITY OF ROSLYN KITTITAS COUNTY, WASHINGTON

JOB NO. 20058
SHEET 1/1

Wetland A

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: State: WA Sampling Point: DP#1

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No

Hydric Soil Present? Yes ✓ No

Wetland Hydrology Present? Yes No

Is the Sampled Area within a Wetland? Yes ✓ No

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Cornus stolonifera	40		FACW
2. Lonicera involucrata	40		FAC
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No

Remarks:

SOIL

Sampling Point: DPA1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 2/1						organic mtl w/ coal fines	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): -2

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

upland east of wet A

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: _____ State: WA Sampling Point: DP2

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	Is the Sampled Area within a Wetland? Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Symphoricarpos albus	60		FACU
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: DP#2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR2/2						gsl	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

North of Wet A

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: _____ State: WA Sampling Point: DP#3

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Agrostis spp	40	✓	FAC
2. Centaurea maculosa	10		NI
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1/2 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ✓ Yes _____ No _____

Remarks:

SOIL

Sampling Point: DP#3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
14	10YR 2/2						SL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

wetland B

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: State: WA Sampling Point: DP#4

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Salix sp.	10		FACW
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No

Remarks:

SOIL

Sampling Point: DP#4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 2/1						sapric muck	

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

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

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 12

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

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

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

west of Wlt B

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: _____ State: WA Sampling Point: DP#5

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Prunus spp	30		UPL
2. Symphoricarpos albus	40		FACU
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: DP #5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/2						SiL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

north of wet B

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: State: WA Sampling Point: DP#6

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes No

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Symphoricarpos albus	30		FACU
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Agropyron repens	50		FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 50	x 3 =	150
FACU species 30	x 4 =	120
UPL species	x 5 =	
Column Totals: 80 (A)		270 (B)

Prevalence Index = B/A = 3.37

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No ✓

Remarks:

SOIL

Sampling Point: DP#6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 2/2						sl	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

wet C

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: _____ State: WA Sampling Point: DPC-1

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ~~✓~~, Soil ~~✓~~, or Hydrology ~~✓~~ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Agropyron repens	40		FAC
2. Ranunculus repens	40		FACW
3. Typha	10		OBL
4.			
5.			
6.			
7.			
8.			
	_____	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ ✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: DP#C1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 2/1		Few Fa	Few	Fnl		gl	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 1"

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

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

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

Wetland D

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: State: WA Sampling Point: DP#7

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Salix exigua	20	Y	FACW
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Phalaris arundinacea	60	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ✓ Yes No

Remarks:

SOIL

Sampling Point: DP#7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR2/1		Few Fair Faint				gr Lm/coa	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): ~2"

Wetland Hydrology Present? Yes _____ **No** _____

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

Remarks:

east of wet D

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: State: WA Sampling Point: DP #8

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes No

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Sambucus cerulea	30		FACU
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1. Achillea millefolium	80		FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No ✓

Remarks:

SOIL

Sampling Point: _____

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/2						gsL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

wet E

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-14-20

Applicant/Owner: _____ State: WA Sampling Point: DP#9

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Salix s. fuscus	60	✓	FACW
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	5%	✓	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: DP#9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/2		Few	Few	Pref		gr L	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

wetland F

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: DP#10

Applicant/Owner: State: WA Sampling Point:

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes No

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size:)			
1. Populus balsamifera	40		FAC
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. Cornus stolonifera	20		FACW
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum % Cover of Biotic Crust

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1 00 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ✓ Yes No

Remarks:

SOIL

Sampling Point: DP#10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 2/2		common	mod	distinct		sil	w/ coal

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches) 1"

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

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

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

Wetland G

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-15-20

Applicant/Owner: _____ State: WA Sampling Point: DP#11

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	30		FAC
2.			
3.			
4.			
	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Equisetum spp.	30		FAC
2. Phalaris arundinacea	40		FACW
3.			
4.			
5.			
6.			
7.			
8.			
	_____	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: DP #11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
4	10YR 3/2							
16	10YR 3/2		common med. distinct				gsl	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0'

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

wetland H

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortera #4 Mine Site City/County: City of Roslyn Sampling Date: 12-21-20

Applicant/Owner: _____ State: WA Sampling Point: DP #12

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. Alnus rubra	20		FAC
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Cornus stolonifera	40		FACW
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: DP#12

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/2		com	med	d.		gr L	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0'

Wetland Hydrology Present? Yes ✓ **No** _____

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

Remarks:

wetland I

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Fortena #4 Mine Site City/County: City of Roslyn Sampling Date: 12-22-20

Applicant/Owner: _____ State: WA Sampling Point: DP#13

Investigator(s): Ed Sewall Section, Township, Range: S17 T20N R15E

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

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

Soil Map Unit Name: _____ NWI classification: _____

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

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

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

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	Is the Sampled Area within a Wetland? Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks: Area of old mines, soils disturbed historically

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Crataegus spp	20		FAC
2. Cornus stolonifera	30		FACW
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	30		FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: DP#13

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/2		Comm. red	2	d	M	SiL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

Wetland name or number A

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Forkland Wet A Date of site visit: 12-14-20

Rated by Ed Sewell Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 III

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	H M (L)	H (M) L	(H) M L
Score Based on Ratings	6	6	6

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number A

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number A

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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

Wetland name or number A

classes present within your wetland. 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 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 unable still 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 name or number A

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 wetland unit have the potential to improve water quality?

D 1.1 Characteristics of surface water flows out of the wetland unit:
- 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 surface outlet points = 1

→ 5

D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)*
YES points = 3 NO points = 0

D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)
- Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5
- Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3
- Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1
- Wetland has persistent, ungrazed vegetation <1/10 of area points = 0

→ 5

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 points = 3
- Area seasonally ponded is ¼ - ½ total area of wetland points = 1
- Area seasonally ponded is < ¼ total area of wetland points = 0

→ 3

Total for D 1 — Add the points in the boxes above → 13

Rating of Site Potential If score is: 12 – 16 = H 6 – 11 = M 0 – 5 = L
Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?

D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 No = 0	0
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants	Yes = 1 No = 0	1
D2.3 Are there are septic systems within 250 ft of the wetland unit?	Yes = 1 No = 0	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	1

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 society?

D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 No = 0	0
Total for D 3	Add the points in the boxes above	

Rating of Value If score is: 2-4 = H 1 = M 0 = L
Record the rating on the first page

Wetland name or number A

DEPRESSIONAL WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion.

Points (only 1 score per box)

D 4. 0 Does the wetland unit have the potential to reduce flooding and erosion?

D 4.1 Characteristics of surface water flows out of the wetland unit:
- Wetland has no surface water outlet points = 8
- Wetland has an intermittently flowing outlet points = 4
- Wetland has a highly constricted permanently flowing outlet points = 4
- Wetland has a permanently flowing surface outlet points = 0
- *(If outlet is a ditch and not permanently flowing treat unit 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 units with no outlet measure from the surface of permanent water or deepest part (if dry).*
- Seasonal ponding: => 3 ft above the lowest point in unit or the surface of permanent ponding points = 8
- Seasonal ponding: 2 ft - < 3 ft above the lowest point in unit or the surface of permanent ponding points = 6
- The wetland is a "headwater" wetland points = 4
- Seasonal ponding: 1 ft - < 2 ft points = 4
- Seasonal ponding: 6 in - < 1 ft points = 2
- Seasonal ponding: <6 in orr unit has only saturated soils points = 0

→ 2

Total for D 4 — 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

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?

D5.1 Does the unit receive any stormwater discharges?	Yes = 1 No = 0	0
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0	0
Total for D 5	Add the points in the boxes above	1

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

D 6.0 Are the hydrologic functions provided by the site valuable to society?

D 6.1 Is the unit is in a landscape that has flooding problems?
Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*
- ☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND
  - o Damage occurs in sub-basin that is immediately downgradient of unit points=2
  - o Damage occurs in a sub-basin further down-gradient points = 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 unit. points = 0

→ 1

D 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
Record the rating on the first page

Wetland name or number A

These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ___Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover / Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ___Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check (points = 0)	1
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point (NO = 0 points)	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September? *Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points (NO = 0 points)	0
H 1.4. Richness of Plant Species Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* # of species ____ Scoring: > 9 species = 2 points (4-9 species = 1 point) < 4 species = 0 points	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* (None = 0 points) Low = 1 point Moderate = 2 points High = 3 points High = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure__ 0

Wetland name or number A

H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* / Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ___Cattails or bulrushes are present within the unit. ___Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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*) *Maximum score possible = 6*	1
H 1. TOTAL Score - Add the check marks in the box above	2
Rating of Site Potential **If score is:** 12 – 16 = H 6 - 11 = M (0 - 5 = L) *Record the rating on the first page*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat 1% + [(% moderate and low intensity land uses)/2] 78 = 3 % 4 If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle (points = 0)	0
H2.2 Undisturbed habitat in 1km circle around unit. If: Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches (points = 2) Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	2
H2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) Does not meet criterion above (points = 0)	0
H 2.4 ☐ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) points = 3	0
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential **If score is:** 4- 6 = 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?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? (*choose the highest score*) Site meets ANY of the following criteria: (points = 2) __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) / It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	2
Rating of Value **If score is:** (2 = H) 1 = M 0 = L *Record the rating on the first page*	

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number A

SC 3.0 Wetlands with High Conservation Value (WHCV) SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____ not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of masses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number A

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*) YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast-growing species. (*see Table 7*) YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

Wetland name or number A

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number B

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wet B Date of site visit: 12-14-20

Rated by Ed Sarty Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 III

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	H M (L)	H (M) L	(H) M L
Score Based on Ratings	5	6	6

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number B

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
~~Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat~~	~~H 2.1, H2.2~~	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4~~	
~~Plant cover of trees, shrubs, and herbaceous plants~~	~~L 1.2~~	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number B

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.

___Does the water leaves the wetland **without being impounded**?

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 <3ft diameter and less than 1 foot deep).

NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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

Wetland name or number B

classes present within your wetland. 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 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 unable still 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 name or number 4

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 wetland unit have the potential to improve water quality?	
D 1.1 Characteristics of surface water flows out of the wetland unit:	
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	3
Wetland has a permanently flowing surface outlet points = 1	
D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)* YES points = 3 NO points = 0	0
D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)	
Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5	
Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3	
Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1	5
Wetland has persistent, ungrazed vegetation <1/10 of area points = 0	
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 > ⅓ total area of wetland points = 3	
Area seasonally ponded is ¼ - ⅓ total area of wetland points = 1	3
Area seasonally ponded is < ¼ total area of wetland points = 0	
Total for D 1 Add the points in the boxes above	11

Rating of Site Potential **If score is:** **12 – 16 = H** **6 – 11 = M** **0 – 5 = L**
Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?	
D2.1 Does the Wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants Yes = 1 No = 0	0
D2.3 Are there are septic systems within 250 ft of the wetland unit? Yes = 1 No = 0	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source mine discharge Yes = 1 No = 0	1
Total for D 2 Add the points in the boxes above	1

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 society?	
D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist? Yes = 1 No = 0	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)? Yes = 1 No = 0	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)* Yes = 2 No = 0	0
Total for D 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 5

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream erosion.	Points (only 1 score per box)
D 4. 0 Does the wetland unit have the potential to reduce flooding and erosion?	
D 4.1 Characteristics of surface water flows out of the wetland unit:	
Wetland has no surface water outlet points = 8	
Wetland has an intermittently flowing outlet points = 4	
Wetland has a highly constricted permanently flowing outlet points = 4	4
Wetland has a permanently flowing surface outlet points = 0	
(If outlet is a ditch and not permanently flowing treat unit as "intermittently flowing")	
D 4.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).*	
Seasonal ponding: => 3 ft above the lowest point in unit or the surface of permanent ponding points = 8	
Seasonal ponding: 2 ft - < 3 ft above the lowest point in unit or the surface of permanent ponding points = 6	
The wetland is a "headwater" wetland points = 4	
Seasonal ponding: 1 ft - < 2 ft points = 4	4
Seasonal ponding: 6 in - < 1 ft points = 2	
Seasonal ponding: <6 in orr unit has only saturated soils points = 0	
Total for D 4 Add the points in the boxes above	9

Rating of Site Potential **If score is:** **12 – 16 = H** **6 - 11 = M** **0 - 5 = L**
Record the rating on the first page

~~D 5.0 Does the landscape have the potential to support hydrologic functions at the site?~~	
D5.1 Does the unit receive any stormwater discharges? Yes = 1 No = 0	0
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff? Yes = 1 No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

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

D 6.0 Are the hydrologic functions provided by the site valuable to society?	
D 6.1 Is the unit is in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*	
☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND	
○ Damage occurs in sub-basin that is immediately downgradient of unit points=2	
○ Damage occurs in a sub-basin further down-gradient points = 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	1
☐ There are no problems with flooding downstream of the unit. points = 0	
D 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**
Record the rating on the first page

Wetland name or number B

These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ✓ Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ___Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ✓ Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check points = 0	1
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre **OR** 10% of its area during the March to early June **OR** in August to the end of September? *Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points	0
H 1.4. Richness of Plant Species Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk).* # of species ___ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* **None** = 0 points **Low** = 1 point **Moderate** = 2 points **High** = 3 points **High** = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure__ 1

Wetland name or number B

H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* ___Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ___Cattails or bulrushes are present within the unit. ___Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*	1
H 1. TOTAL Score - Add the check marks in the box above	4
Rating of Site Potential **If score is:** **12 – 16 = H** **6 - 11 = M** **0 - 5 = L** *Record the rating on the first page*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat 1 + [(% moderate and low intensity land uses)/2] 7 = 4 % If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle points = 0	0
H2.2 Undisturbed habitat in 1km circle around unit. If: Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	2
H2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) Does not meet criterion above points = 0	0
H 2.4 ☒ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. *(Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs)* points = 3	0
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential **If score is:** **4- 6 = 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?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)* Site meets ANY of the following criteria: points = 2 __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	2
Rating of Value **If score is:** **2 = H** **1 = M** **0 = L** *Record the rating on the first page*	

Wetland name or number 13

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season.	
YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number 13

SC 3.0 Wetlands with High Conservation Value (WHCV) SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ___not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate (CaCO3) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number 3

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO *–not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*) YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. (*see Table 7*) YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	

Wetland name or number B

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number: C

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland C Date of site visit: 12-14-20

Rated by Ed Sarb Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depress Unit 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 II

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	H M (L)	H (M) L	(H) M L
Score Based on Ratings	5	6	6

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
Alakali	I	
Wetland with high conservation value	I	
Bog	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 name or number: C

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number C

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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

Wetland name or number C

classes present within your wetland. 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 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 unable still 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 name or number C

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 wetland unit have the potential to improve water quality?		
D 1.1 Characteristics of surface water flows out of the wetland unit:		
Wetland has no surface water outlet -	points = 5	
Wetland has an intermittently flowing outlet	points = 3	3
Wetland has a highly constricted permanently flowing outlet	points = 3	
Wetland has a permanently flowing surface outlet	points = 1	
D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)*		
YES points = 3 NO (points = 0)		0
D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)		
Wetland has persistent, ungrazed, vegetation for > 2/3 of area	points = 5	
Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area	points = 3	5
Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area	points = 1	
Wetland has persistent, ungrazed vegetation <1/10 of area	points = 0	
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	points = 3	
Area seasonally ponded is ¼ - ½ total area of wetland	points = 1	3
Area seasonally ponded is < ¼ total area of wetland	points = 0	
Total for D 1	Add the points in the boxes above	11

Rating of Site Potential If score is: 12 – 16 = H (6 – 11 = M) 0 – 5 = L

Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?		
D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 (No = 0)	0
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants	Yes = 1 (No = 0)	0
D2.3 Are there are septic systems within 250 ft of the wetland unit?	Yes = 1 (No = 0)	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source mine outflow	(Yes = 1) No = 0	1
Total for D 2	Add the points in the boxes above	1

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 society?		
D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 (No = 0)	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 (No = 0)	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 (No = 0)	0
Total for D 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 C

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

Rating of Site Potential If score is: 12 – 16 = H (6 - 11 = M) 0 - 5 = L

Record the rating on the first page

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?		
D5.1 Does the unit receive any stormwater discharges?	Yes = 1 (No = 0)	0
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	(Yes = 1) No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 (No = 0)	0
Total for D 5	Add the points in the boxes above	1

Rating of Landscape Potential If score is: 3 = H (1,2 = M) 0 = L

Record the rating on the first page

D 6.0 Are the hydrologic functions provided by the site valuable to society?		
D 6.1 Is the unit is in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*		
☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND		
o Damage occurs in sub-basin that is immediately downgradient of unit	points=2	
o Damage occurs in a sub-basin further down-gradient	(points = 1)	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 unit.	points = 0	
D 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

Record the rating on the first page

Wetland name or number C

These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ✓ Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ___Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ___Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check points = 0	6
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September? *Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points	0
H 1.4. Richness of Plant Species Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)*~~ # of species ____ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* None = 0 points Low = 1 point Moderate = 2 points High = 3 points High = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure__ 0

Wetland name or number C

H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* ___Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ✓ Cattails or bulrushes are present within the unit. ___Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*	1
H 1. TOTAL Score - Add the check marks in the box above	2
Rating of Site Potential **If score is:** **12 – 16 = H** **6 - 11 = M** **0 - 5 = L** *Record the rating on the first page*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat 1 + [(% moderate and low intensity land uses)/2] 7 = 4 % If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle points = 0	0
H2.2 Undisturbed habitat in 1km circle around unit. If: Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	2
H2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) Does not meet criterion above points = 0	0
H 2.4 ☒ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. *(Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs)* points = 3	0
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential **If score is:** **4- 6 = H** **2-3 = M** **< 1 = L** *Record the rating on the first page*	

H 3.0 Is the Habitat provided by the site valuable to society?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)* Site meets ANY of the following criteria: points = 2 __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	2
Rating of Value **If score is:** **2 = H** **1 = M** **0 = L** *Record the rating on the first page*	

Wetland name or number C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — ~~Surface water is present for less than 120 days during the "wet" season.~~ YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? ~~YES = Category II~~ ~~NO = Category III~~	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands ~~Does the wetland unit meets one of the following two criteria?~~ — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high ~~pH. Thus~~, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number C

SC 3.0 Wetlands with High Conservation Value (WHCV) ~~SC 2.1 Has the Department of Natural Resources updated their web site to include the list of~~ Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the ~~DNR database~~ as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have ~~more than 70% cover of mosses~~ at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number_____

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets at least **one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*) YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. *(see Table 7)* YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

Wetland name or number_____

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number D

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland D Date of site visit: 12-14-20

Rated by Ed Sewell Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 III

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	H M (L)	H (M) L	(H) M L
Score Based on Ratings	5	6	6

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number D

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number D

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO – go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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

Wetland name or number D

classes present within your wetland. 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 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 unable still 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 name or number D

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 wetland unit have the potential to improve water quality?		
D 1.1 Characteristics of surface water flows out of the wetland unit: 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 = 5 Wetland has a permanently flowing surface outlet points = 1		3
D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)* YES points = 3 NO points = 0		0
D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0		5
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 points = 3 Area seasonally ponded is ¼ - ½ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0		1
Total for D 1	Add the points in the boxes above	9

Rating of Site Potential If score is: 12 – 16 = H 6 – 11 = M 0 – 5 = L

Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?		
D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants	Yes = 1 No = 0	0
D2.3 Are there are septic systems within 250 ft of the wetland unit?	Yes = 1 No = 0	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	1

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 society?		
D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0	
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0	
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 No = 0	
Total for D 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 D

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

Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L

Record the rating on the first page

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?		
D5.1 Does the unit receive any stormwater discharges?	Yes = 1 No = 0	1
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0	0
Total for D 5	Add the points in the boxes above	2

Rating of Landscape Potential If score is: 3 = H 1 or 2 = M 0 = L

Record the rating on the first page

D 6.0 Are the hydrologic functions provided by the site valuable to society?		
D 6.1 Is the unit is in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. *Do not add points.* *Choose the highest score if more than one condition is met.* ☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND o Damage occurs in sub-basin that is immediately downgradient of unit points=2 o Damage occurs in a sub-basin further down-gradient points = 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 unit. points = 0		1
D 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

Record the rating on the first page

Wetland name or number D

These questions apply to wetlands of all HGM classes. (only 1 score per box)

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1. Does the wetland unit have the potential to provide habitat for many species?

H 1.1 Categories of vegetation structure

Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres

____Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover
____Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover
____Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover
__✓__Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3
____Forested (areas where trees have >30% cover) 3 checks points = 2
2 checks points = 1
1 check points = 0

1

H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points 0

H 1.3. Surface Water

H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September?
Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)?
YES = 3 points NO = 0 points 0

H 1.4. Richness of Plant Species

Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)

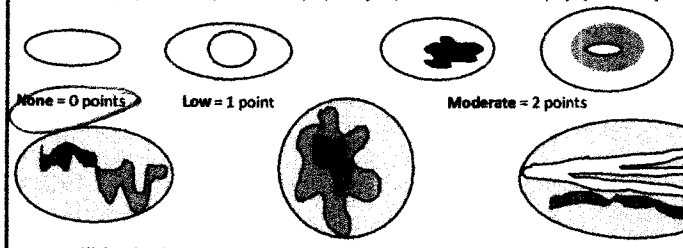
# of species ____ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points 0

H 1.5. Interspersion of habitats

Figure__

Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none.

Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3



None = 0 points Low = 1 point Moderate = 2 points

High = 3 points High = 3 points riparian braided channels with 2 classes = High

NOTE: If you have four or more classes or three plants classes and open water the rating is always "high". 0

Wetland name or number D

H 1.6. Special Habitat Features:

Check the habitat features that are present in the wetland unit. The number of checks is the score.
____Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.
____Cattails or bulrushes are present within the unit.
____Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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*) *Maximum score possible = 6* 1

H 1. TOTAL Score - Add the check marks in the box above 2

Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L
Record the rating on the first page

H 2.0 . Does the landscape have the potential to support habitat at the site?

H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:*
% undisturbed habitat 7 + [(% moderate and low intensity land uses)/2] 7 = 4 %
If total accessible habitat is:
> 1/3 (33.3%) of 1km circle (~100 hectares) points = 3
20 - 33% of 1km circle points = 2
10- 19% of 1km circle points = 1
<10% of 1km circle points = 0 0

H2.2 Undisturbed habitat in 1km circle around unit. If:
Undisturbed habitat > 50% of circle points = 3
Undisturbed habitat 10 - 50% and in 1-3 patches points = 2
Undisturbed habitat 10 - 50% and > 3 patches points = 1
Undisturbed habitat < 10% of circle points = 0 2

H2.3 Land use intensity in 1 km circle. If:
> 50% of circle is high intensity land use points = (- 2)
Does not meet criterion above points = 0 0

H 2.4 ☐ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) points = 3 0

Total for H 2 Add the points in the boxes above 2

Rating of Landscape Potential If score is: 4- 6 = 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?

H3.1Does the site provides habitat for species valued in laws, regulations or policies? (*choose the highest score*)
Site meets ANY of the following criteria: points = 2
__It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists)
__It is a "priority area" for an individual WDFW species
__It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources
__It has 3 or more priority habitats within 100m (see Appendix B)
__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 100m (see Appendix B) points = 1 2
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 name or number D

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. ~~Surface water is present for less than 120 days during the "wet" season.~~ YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? ~~YES = Category II~~ ~~NO = Category III~~	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets one of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number P

SC 3.0 Wetlands with High Conservation Value (WHCV) ~~SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value?~~ YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number D

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets at least one of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*) YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast-growing species. (*see Table 7*) YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

Wetland name or number D

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number E

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland E Date of site visit: 12-14-20

Rated by Ed Sinn Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 ____

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M L
Landscape Potential	H (M) L	H (M) L	H M L
Value	H M (L)	H (M) L	H M L
Score Based on Ratings	5	6	6

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number E

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
~~Width of unit vs. width of stream (can be added to another figure)~~	~~R 4.1~~	
Polygon of area 1km from wetland edge -Including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4~~	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
~~Boundary of 150 ft buffer (can be added to another figure)~~	~~L 2.2~~	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number E

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 unable still 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 name or number E

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 wetland unit have the potential to improve water quality?

D 1.1 Characteristics of surface water flows out of the wetland unit:

Wetland has no surface water outlet	points = 5	
Wetland has an intermittently flowing outlet	points = 3	3
Wetland has a highly constricted permanently flowing outlet	points = 3	
Wetland has a permanently flowing surface outlet	points = 1	

D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)*
YES points = 3 NO points = 0 — 0

D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)

Wetland has persistent, ungrazed, vegetation for > 2/3 of area	points = 5	
Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area	points = 3	5
Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area	points = 1	
Wetland has persistent, ungrazed vegetation <1/10 of area	points = 0	

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	points = 3	
Area seasonally ponded is ¼ - ½ total area of wetland	points = 1	1
Area seasonally ponded is < ¼ total area of wetland	points = 0	

Total for D 1 — Add the points in the boxes above — 9

Rating of Site Potential If score is: 12 – 16 = H 6 – 11 = M 0 – 5 = L
Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?

D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 No = 0	0
~~D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants~~	~~Yes = 1 No = 0~~	1
~~D2.3 Are there are septic systems within 250 ft of the wetland unit?~~	~~Yes = 1 No = 0~~	0
D2.4 Are there other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	1

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 society?

D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 No = 0 — 0
Total for D 3	Add the points in the boxes above

Rating of Value If score is: 2-4 = H 1 = M 0 = L
Record the rating on the first page

Wetland name or number E

DEPRESSIONAL WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion.

Points (only 1 score per box)

D 4. 0 Does the wetland unit have the potential to reduce flooding and erosion?

D 4.1 Characteristics of surface water flows out of the wetland unit:

Wetland has no surface water outlet	points = 8	
Wetland has an intermittently flowing outlet	points = 4	4
Wetland has a highly constricted permanently flowing outlet	points = 4	
Wetland has a permanently flowing surface outlet	points = 0	

(If outlet is a ditch and not permanently flowing treat unit as "intermittently flowing")

D 4.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).*

Seasonal ponding: => 3 ft above the lowest point in unit or the surface of permanent ponding	points = 8	
Seasonal ponding: 2 ft - < 3 ft above the lowest point in unit or the surface of permanent ponding	points = 6	
The wetland is a "headwater" wetland	points = 4	
Seasonal ponding: 1 ft - < 2 ft	points = 4	
Seasonal ponding: 6 in - < 1 ft	points = 2	2
Seasonal ponding: <6 in orr unit has only saturated soils	points = 0	

Total for D 4 — Add the points in the boxes above — 6

Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L
Record the rating on the first page

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?

D5.1 Does the unit receive any stormwater discharges?	Yes = 1 No = 0	0
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0	0
Total for D 5	Add the points in the boxes above	1

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

D 6.0 Are the hydrologic functions provided by the site valuable to society?

D 6.1 Is the unit is in a landscape that has flooding problems?
Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*

- ☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND
  - o Damage occurs in sub-basin that is immediately downgradient of unit — points=2
  - o Damage occurs in a sub-basin further down-gradient — points = 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 — 1
- ☐ There are no problems with flooding downstream of the unit. — points = 0

D 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
Record the rating on the first page

Wetland name or number E

These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ___Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ✓ Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ___Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ___Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check points = 0	1
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September? ~~Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points	0
H 1.4. ~~Richness of Plant Species~~ Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russion Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* # of species ___ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points	2
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* **None** = 0 points **Low** = 1 point **Moderate** = 2 points **High** = 3 points **High** = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure___ 0

Wetland name or number E

H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* ___Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ___Cattails or bulrushes are present within the unit. ___Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*	1
H 1. TOTAL Score - Add the check marks in the box above	2
Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L *Record the rating ~~on the first page~~*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat 2 + [(% moderate and low intensity land uses)/2] 7 = 4 % If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle points = 0	0
H2.2 Undisturbed habitat in 1km circle around unit. If: Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	2
H2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) Does not meet criterion above points = 0	-2
H 2.4 ☐ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not ~~influenced by irrigation practices, dams, or water control structures.~~ *(Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs)* points = 3	3
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential If score is: 4- 6 = 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?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)* Site meets ANY of the following criteria: points = 2 __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (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 name or number E

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number E

SC 3.0 Wetlands with High Conservation Value (WHCV)	
SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3	**Cat. I**
SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV	
SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhqwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV	
SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____not an WHCV	
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2	
SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating*	
SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4	
NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5	**Cat. I**
5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6	
6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I**

Wetland name or number E

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO – *not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees *(see Table 7)* YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. *(see Table 7)* YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

Wetland name or number E

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number F

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Fortuna Wet F Date of site visit: 12-21-20

Rated by EJ Smith Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 ____

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	H M (L)	H (M) L	(H) M L
Score Based on Ratings	5	6	6

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number F

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number F

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 unable still 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 name or number F

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 wetland unit have the potential to improve water quality?		
D 1.1 Characteristics of surface water flows out of the wetland unit:		
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~~	3
Wetland has a permanently flowing surface outlet	points = 1	
D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)*		
YES points = 3	NO ~~points = 0~~	0
D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)		
Wetland has persistent, ungrazed, vegetation for > 2/3 of area	~~points = 5~~	
Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area	~~points = 3~~	
Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area	points = 1	5
Wetland has persistent, ungrazed vegetation <1/10 of area	points = 0	
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	points = 3	
Area seasonally ponded is ¼ - ½ total area of wetland	points = 1	1
Area seasonally ponded is < ¼ total area of wetland	points = 0	
Total for D 1	Add the points in the boxes above	9

Rating of Site Potential **If score is:** **12 – 16 = H** **6 – 11 = M** **0 – 5 = L**

Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?		
D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants	Yes = 1 No = 0	0
D2.3 Are there are septic systems within 250 ft of the wetland unit?	Yes = 1 No = 0	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	1

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 society?		
D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 No = 0	2
Total for D 3	Add the points in the boxes above	3

Rating of Value **If score is:** **2-4 = H** **1 = M** **0 = L**

Record the rating on the first page

Wetland name or number F

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

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?		
D5.1 Does the unit receive any stormwater discharges?	Yes = 1 No = 0	0
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	2

Rating of Landscape Potential **If score is:** **3 = H** **1,2 = M** **0 = L**

Record the rating on the first page

D 6.0 Are the hydrologic functions provided by the site valuable to society?		
D 6.1 Is the unit is in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*		
☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND		
o Damage occurs in sub-basin that is immediately downgradient of unit	points=2	
o Damage occurs in a sub-basin further down-gradient	points = 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 unit.	points = 0	1
D 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**

Record the rating on the first page

Wetland name or number F

These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ___Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ___Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ___Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check points = 0	1
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September? *Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points	0
H 1.4. Richness of Plant Species Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow flag Iris, and Salt Cedar (Tamarisk).* # of species ____ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* None = 0 points Low = 1 point Moderate = 2 points High = 3 points High = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure__ 1

Wetland name or number F

H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* ___Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ___Cattails or bulrushes are present within the unit. ___Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*	2
H 1. TOTAL Score - Add the check marks in the box above	5
Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L *Record the rating on the first page*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat _____ + [(% moderate and low intensity land uses)/2] ____ =_____% If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle points = 0	
~~H2.2 Undisturbed habitat in 1km circle around unit: If:~~ Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	
~~H2.3 Land use intensity in 1 km circle: If:~~ > 50% of circle is high intensity land use points = (- 2) ~~Does not meet criterion above points = 0~~	
~~H 2.4 If~~ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. *(Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs)* points = 3	
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential If score is: 4- 6 = 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?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)* Site meets ANY of the following criteria: points = 2 __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	2
Rating of Value If score is: 2 = H 1 = M 0 = L *Record the rating on the first page*	

Wetland name or number P

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. ~~— Surface water is present for less than 120 days during the "wet" season.~~ YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
~~SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)?~~ ~~YES = Category II NO = Category III~~	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets one of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number P

SC 3.0 Wetlands with High Conservation Value (WHCV) ~~SC 2.1 Has the Department of Natural Resources updated their web site to include the list of~~ Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils.)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number F

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets at least one of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO – *not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*) YES = Category I NO = go to SC 5.2	Cat. I
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	Cat. I
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. *(see Table 7)* YES = Category II NO = go to SC 5.5	Cat. II
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	Cat. II
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

Wetland name or number F

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number G

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Fortune Wet G Date of site visit: 12-21-20

Rated by Ed Sarah Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 III

1. Category of wetland based on FUNCTIONS

___ **Category I** - Total score = 22 – 27

___ **Category II** - Total score = 19 - 21

III **Category III** - Total score = 16 - 18

___ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H (M) L
Landscape Potential	H (M) L	(H) M L	H (M) L
Value	H M (L)	H (M) L	H (M) L
Score Based on Ratings	5	7	6

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number C

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Polygon of area 1km from wetland edge -Including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (Including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (Including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number G

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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

Wetland name or number C

classes present within your wetland. 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 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 unable still 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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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 wetland unit have the potential to improve water quality?		
D 1.1 Characteristics of surface water flows out of the wetland unit:		
Wetland has no surface water outlet	points = 3	
Wetland has an intermittently flowing outlet	points = 3	
Wetland has a highly constricted permanently flowing outlet	points = 3	3
Wetland has a permanently flowing surface outlet	points = 1	
D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)*		
YES points = 3	NO points = 0	0
D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)		
Wetland has persistent, ungrazed, vegetation for > 2/3 of area	points = 5	
Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area	points = 3	
Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area	points = 1	5
Wetland has persistent, ungrazed vegetation <1/10 of area	points = 0	
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	points = 3	
Area seasonally ponded is ¼ - ½ total area of wetland	points = 1	1
Area seasonally ponded is < ¼ total area of wetland	points = 0	
Total for D 1	Add the points in the boxes above	9

Rating of Site Potential If score is: 12 – 16 = H | 6 – 11 = M | 0 – 5 = L

Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?		
D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
~~D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants~~	~~Yes = 1 No = 0~~	0
~~D2.3 Are there are septic systems within 250 ft of the wetland unit?~~	~~Yes = 1 No = 0~~	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	1

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 society?		
D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 No = 0	0
Total for D 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 G

DEPRESSIONAL WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion.

		Points (only 1 score per box)
D 4. 0 Does the wetland unit have the potential to reduce flooding and erosion?		
D 4.1 Characteristics of surface water flows out of the wetland unit:		
Wetland has no surface water outlet	points = 8	
Wetland has an intermittently flowing outlet	points = 4	
Wetland has a highly constricted permanently flowing outlet	points = 4	4
Wetland has a permanently flowing surface outlet	points = 0	
(if outlet is a ditch and not permanently flowing treat unit as "intermittently flowing")		
D 4.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).*		
Seasonal ponding: => 3 ft above the lowest point in unit or the surface of permanent ponding	points = 8	
Seasonal ponding: 2 ft - < 3 ft above the lowest point in unit or the surface of permanent ponding	points = 6	
The wetland is a "headwater" wetland	points = 4	
Seasonal ponding: 1 ft - < 2 ft	points = 4	
Seasonal ponding: 6 in - < 1 ft	points = 2	2
Seasonal ponding: <6 in orr unit has only saturated solis	points = 0	
Total for D 4	Add the points in the boxes above	6

Rating of Site Potential If score is: 12 – 16 = H | 6 - 11 = M | 0 - 5 = L

Record the rating on the first page

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?		
D5.1 Does the unit receive any stormwater discharges?	Yes = 1 No = 0	1
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3 is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	3

Rating of Landscape Potential If score is: 3 = H | 1,2 = M | 0 = L

Record the rating on the first page

D 6.0 Are the hydrologic functions provided by the site valuable to society?		
D 6.1 Is the unit is in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*		
☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND		
o Damage occurs in sub-basin that is immediately downgradient of unit	points=2	
o Damage occurs in a sub-basin further down-gradient	points = 1	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 unit.	points = 0	
D 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

Record the rating on the first page

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These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ✓Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ✓Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ___Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check points = 0	2
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point (NO = 0 points)	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September? *Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points (NO = 0 points)	0
~~H 1.4. Richness of Plant Species~~ 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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk).* # of species ___ Scoring: > 9 species = 2 points (4-9 species = 1 point) < 4 species = 0 points	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* None = 0 points Low = 1 point (Moderate = 2 points) High = 3 points High = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure__ 2

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H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* ✓Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ___Cattails or bulrushes are present within the unit. ✓Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*	2
H 1. TOTAL Score - Add the check marks in the box above	7
Rating of Site Potential If score is: 12 – 16 = H (6 - 11 = M) 0 - 5 = L *Record the rating on the first page*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat 1 + [(% moderate and low intensity land uses)/2] 6 = 4 % If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle points = 0	0
H2.2 Undisturbed habitat in 1km circle around unit. If: Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches (points = 2) Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	2
H2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) Does not meet criterion above (points = 0)	0
H 2.4 ☒ The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not ~~influenced by irrigation practices, dams, or water control structures. (Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs~~) points = 3	0
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential If score is: 4- 6 = 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?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)* Site meets ANY of the following criteria: points = 2 __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (see Appendix B) (points = 1) Site does not meet any of the criteria above points = 0	1
Rating of Value If score is: 2 = H (1 = M) 0 = L *Record the rating on the first page*	

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CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

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SC 3.0 Wetlands with High Conservation Value (WHCV) SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____ not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

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SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO *–not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have ~~a forest canopy where more than 50% of the tree~~ species (by cover) are slow growing native trees *(see Table 7)* YES = Category I NO = go to SC 5.2	Cat. I
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	Cat. I
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. *(see Table 7)* YES = Category II NO = go to SC 5.5	Cat. II
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	Cat. II
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

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Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number_____

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Fortune Wetland H Date of site visit: 12-21-20

Rated by Ed Sarell Trained by Ecology? Yes ✓ No___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 III

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	~~H M (L)~~	~~H (M) L~~	~~H (M) L~~
Score Based on Ratings	5	6	5

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
Alakali	I
Wetland with high conservation value	I
Bog	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 name or number H

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
~~Width of unit vs. width of stream (can be added to another figure)~~	~~R 4.1~~	
Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4~~	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
~~Boundary of 150 ft buffer (can be added to another figure)~~	~~L 2.2~~	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number H

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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

Wetland name or number H

classes present within your wetland. 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 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 unable still 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 name or number H

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 wetland unit have the potential to improve water quality?

D 1.1 Characteristics of surface water flows out of the wetland unit:

- Wetland has no surface water outlet - points = 5
- Wetland has an intermittently flowing outlet points = 3 (circled)
- Wetland has a highly constricted permanently flowing outlet points = 3
- Wetland has a permanently flowing surface outlet points = 1

→ 3

D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soils)*
YES points = 3 NO points = 0 (circled) → 0

D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)

- Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 (circled)
- Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3
- Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1
- Wetland has persistent, ungrazed vegetation <1/10 of area points = 0

→ 5

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 points = 3
- Area seasonally ponded is ¼ - ½ total area of wetland points = 1 (circled)
- ~~Area seasonally ponded is < ¼ total area of wetland points = 0~~

→ 1

Total for D 1 — Add the points in the boxes above → 9

Rating of Site Potential If score is: 12 – 16 = H | 6 – 11 = M (circled) | 0 – 5 = L
Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?

D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 (circled) No = 0	1
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants	Yes = 1 No = 0 (circled)	0
D2.3 Are there are septic systems within 250 ft of the wetland unit?	Yes = 1 No = 0 (circled)	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0 (circled)	0
Total for D 2	Add the points in the boxes above	1

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

D 3.0 Is the water quality improvement provided by the site valuable to society?

D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0 (circled)	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0 (circled)	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? *(answer YES if there is a TMDL for the drainage or basin in which unit is found)*	Yes = 2 No = 0 (circled)	0
Total for D 3	Add the points in the boxes above	0

Rating of Value If score is: 2-4 = H | 1 = M | 0 = L (circled)
Record the rating on the first page

Wetland name or number H

DEPRESSIONAL WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion.

Points (only 1 score per box)

D 4. 0 Does the wetland unit have the potential to reduce flooding and erosion?

D 4.1 Characteristics of surface water flows out of the wetland unit:

- Wetland has no surface water outlet points = 8
- Wetland has an intermittently flowing outlet points = 4 (circled)
- Wetland has a highly constricted permanently flowing outlet points = 4
- Wetland has a permanently flowing surface outlet points = 0

(if outlet is a ditch and not permanently flowing treat unit as "intermittently flowing")

→ 4

D 4.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).*

- Seasonal ponding: => 3 ft above the lowest point in unit or the surface of permanent ponding points = 8
- Seasonal ponding: 2 ft - < 3 ft above the lowest point in unit or the surface of permanent ponding points = 6
- The wetland is a "headwater" wetland points = 4
- Seasonal ponding: 1 ft - < 2 ft points = 4
- Seasonal ponding: 6 in - < 1 ft points = 2 (circled)
- Seasonal ponding: <6 in orr unit has only saturated soils points = 0

→ 2

Total for D 4 — Add the points in the boxes above → 6

Rating of Site Potential If score is: 12 – 16 = H | 6 - 11 = M (circled) | 0 - 5 = L
Record the rating on the first page

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?

D5.1 Does the unit receive any stormwater discharges?	Yes = 1 (circled) No = 0	1
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0 (circled)	0
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0 (circled)	0
Total for D 5 — Add the points in the boxes above		1

Rating of Landscape Potential If score is: 3 = H | 1,2 = M (circled) | 0 = L
Record the rating on the first page

D 6.0 Are the hydrologic functions provided by the site valuable to society?

D 6.1 Is the unit is in a landscape that has flooding problems?
Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.*

- ☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND
  - o Damage occurs in sub-basin that is immediately downgradient of unit points = 2
  - o Damage occurs in a sub-basin further down-gradient points = 1 (circled)
- ☐ 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 unit. points = 0

→ 1

D 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 (circled) | 0 = L
Record the rating on the first page

Wetland name or number H

These questions apply to wetlands of all HGM classes.	(only 1 score per box)
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Categories of vegetation structure *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres* ___Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ___Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ___Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ___Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3 ___Forested (areas where trees have >30% cover) 3 checks points = 2 2 checks points = 1 1 check points = 0	0
H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points	0
H 1.3. Surface Water H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September? ~~*Note: 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 unit have an intermittent or permanent, and unvegetatе,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, (*answer yes only if H 1.3.1 is NO*)? YES = 3 points NO = 0 points	
~~H 1.4. Richness of Plant Species~~ Count the number of plant species in the wetland that cover at least 10 ft². (*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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk).* # of species ___ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none. *Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3* None = 0 points Low = 1 point Moderate = 2 points High = 3 points High = 3 points riparian braided channels with 2 classes = High NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".	Figure__ 0

Wetland name or number H

H 1.6. Special Habitat Features: *Check the habitat features that are present in the wetland unit. The number of checks is the score.* ___Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream. ___Cattails or bulrushes are present within the unit. ✓ Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*	2
H 1. TOTAL Score - Add the check marks in the box above	3
Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L *Record the rating on the first page*	

H 2.0 . Does the landscape have the potential to support habitat at the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:* % undisturbed habitat ____ + [(% moderate and low intensity land uses)/2] ____ =____% If total accessible habitat is: > 1/3 (33.3%) of 1km circle (~100 hectares) points = 3 20 - 33% of 1km circle points = 2 10- 19% of 1km circle points = 1 <10% of 1km circle points = 0	0
H2.2 Undisturbed habitat in 1km circle around unit. If: Undisturbed habitat > 50% of circle points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of circle points = 0	2
H2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) Does not meet criterion above points = 0	0
H 2.4 ☐ ~~The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs~~) points = 3	0
Total for H 2 Add the points in the boxes above	2
Rating of Landscape Potential If score is: 4- 6 = 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?	
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)* Site meets ANY of the following criteria: points = 2 __It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __It is a "priority area" for an individual WDFW species __It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources __It has 3 or more priority habitats within 100m (see Appendix B) __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 100m (see Appendix B) points = 1 Site does not meet any of the criteria above points = 0	1
Rating of Value If score is: 2 = H 1 = M 0 = L *Record the rating on the first page*	

Wetland name or number H

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number H

SC 3.0 Wetlands with High Conservation Value (WHCV) SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES ____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *is not a bog for rating* SC 4.3. Does an area within the unit have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 *NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.* SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 **5.** Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number H

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have ~~a forest canopy where more than 30% of the tree~~ species (by cover) are slow growing native trees *(see Table 7)* YES = Category I NO = go to SC 5.2	**Cat. I**
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	**Cat. I**
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. *(see Table 7)* YES = Category II NO = go to SC 5.5	**Cat. II**
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	**Cat. II**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	NA

Wetland name or number 17

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152)*.

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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 name or number I

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Forbes Wetland I Date of site visit: 12-22-20

Rated by Ed Smith Trained by Ecology? Yes ✓ No ___ Date of training 9-12-18

HGM Class Used for Rating Depressional Unit 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 III

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 Quality	Hydrologic	Habitat
	Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H (M) L
Landscape Potential	H (M) L	H (M) L	H (M) L
Value	H M (L)	H (M) L	H (M) L
Score Based on Ratings	5	6	6

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
Alakali	I	
Wetland with high conservation value	I	
Bog	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 name or number I

Maps and figures required to answer questions correctly (Eastern Washington)

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2, H1.3	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D1.4	
Boundary of 150 ft buffer (*can be added to another figure*)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	
Area of open water (*can be added to map of hydroperiods*)	H1.3.1	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2, H1.3	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
~~Width of unit vs. width of stream (can be added to another figure)~~	~~R 4.1~~	
Polygon of area 1km from wetland edge -including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	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 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (*can be added to another figure*)	L 2.2	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number I

HGM Classification of Wetland Units in Eastern Washington

For questions 1-4 the criteria described must apply to the entire unit being rated for it to be classified correctly.

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 wetland 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 acres (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.
   - ___Does the water leaves the wetland **without being impounded**?

   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 <3ft diameter and less than 1 foot deep).

   NO - go to 3 YES – The wetland class is **Slope**

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 ten years.

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

   NO - go to 4 YES – The wetland class is **Riverine**

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. IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 unable still 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 name or number I

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 wetland unit have the potential to improve water quality?	
D 1.1 Characteristics of surface water flows out of the wetland unit: 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 surface outlet points = 1	1
D 1.2 The soil 2 inches below the surface (or duff layer) is clay or ~~organic~~ *(use NRCS definitions of soils)* YES points = 3 NO points = 0	0
D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0	5
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 > ⅓ total area of wetland points = 3 Area seasonally ponded is ¼ - ⅓ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0	0
Total for D 1 Add the points in the boxes above	6

Rating of Site Potential If score is: 12 – 16 = H 6 – 11 = M 0 – 5 = L
Record the rating on the first page

D 2.0 Does the landscape have the potential to support the water quality function at the site?		
D2.1 Does the Wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2 Is > 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants	Yes = 1 No = 0	1
D2.3 Are there are septic systems within 250 ft of the wetland unit?	Yes = 1 No = 0	0
D2.4 Are there are other sources of pollutants coming into the wetland that are not listed in questions D2.1 – D2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	2

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 society?		
D3.1 Does the unit discharge directly (within 1 mile) to a stream, river, or lake that is on the 303dlist?	Yes = 1 No = 0	0
D 3.2 Is the unit in a basin or sub-basin where water quality is an issue in some aquatic resource (303d list, eutrophic lakes, problems with nuisance and toxic algae)?	Yes = 1 No = 0	0
D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage or basin in which unit is found*)	Yes = 2 No = 0	0
Total for D 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 I

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

Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L
Record the rating on the first page

D 5.0 Does the landscape have the potential to support hydrologic functions at the site?		
D5.1 Does the unit receive any stormwater discharges?	Yes = 1 No = 0	1
D5. Is >10% of the land use within 150 ft of the wetland in a land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3 Is more than 25% of the contributing basin of the wetland unit covered with intensive human land uses?	Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above		2

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

D 6.0 Are the hydrologic functions provided by the site valuable to society?	
D 6.1 Is the unit is in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. *Do not add points. Choose the highest score if more than one condition is met.* ☐ The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g. salmon redds), AND o Damage occurs in sub-basin that is immediately downgradient of unit points=2 o Damage occurs in a sub-basin further down-gradient points = 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 unit. points = 0	1
D 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
Record the rating on the first page

Wetland name or number I

These questions apply to wetlands of all HGM classes. (only 1 score per box)

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1. Does the wetland unit have the potential to provide habitat for many species?

H 1.1 Categories of vegetation structure

Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ acre or >= 10% of the unit if unit is < 2.5 acres

___ Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover
___ Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover
___ Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover
✓ Scrub/shrub (areas where shrubs have >30% cover) 4-6 checks points = 3
___ Forested (areas where trees have >30% cover) 3 checks points = 2
2 checks points = 1
1 check points = 0

2

H 1.2. Is one of the vegetation types "aquatic bed?" YES = 1 point NO = 0 points

0

H 1.3. Surface Water

H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre OR 10% of its area during the March to early June OR in August to the end of September?

Note: 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 unit have an intermittent or permanent, and unvegetate,d stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, *(answer yes only if H 1.3.1 is NO)*?

YES = 3 points NO = 0 points

0

H 1.4. Richness of Plant Species

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 Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites, Canadian Thistle, Yellow flag Iris, and Salt Cedar (Tamarisk)

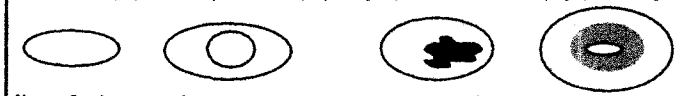
# of species ___ Scoring: > 9 species = 2 points 4-9 species = 1 point < 4 species = 0 points

2

H 1.5. Interspersion of habitats

Decide from the diagrams below whether interspersion between types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, medium, low, or none.

Use map of Cowardin plant classes prepared for questions H1.1 and map of open water from H1.3



None = 0 points **Low** = 1 point **Moderate** = 2 points

High = 3 points **High** = 3 points riparian braided channels with 2 classes = High

NOTE: If you have four or more classes or three plants classes and open water the rating is always "high".

Figure__

3

Wetland name or number I

H 1.6. Special Habitat Features:

Check the habitat features that are present in the wetland unit. The number of checks is the score.

✓ Loose rocks larger than 4" or large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.
___ Cattails or bulrushes are present within the unit.
✓ Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) 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)* *Maximum score possible = 6*

2

H 1. TOTAL Score - Add the check marks in the box above

9

Rating of Site Potential If score is: 12 – 16 = H 6 - 11 = M 0 - 5 = L

Record the rating on the first page

H 2.0 . Does the landscape have the potential to support habitat at the site?

H 2.1 Accessible habitat (only area of habitat abutting wetland unit). *Calculate:*

% undisturbed habitat _____ + [(% moderate and low intensity land uses)/2] ____ =_____%

If total accessible habitat is:

> 1/3 (33.3%) of 1km circle (~100 hectares) points = 3
20 - 33% of 1km circle points = 2
10- 19% of 1km circle points = 1
<10% of 1km circle points = 0

0

H2.2 Undisturbed habitat in 1km circle around unit. If:

Undisturbed habitat > 50% of circle points = 3
Undisturbed habitat 10 - 50% and in 1-3 patches points = 2
Undisturbed habitat 10 - 50% and > 3 patches points = 1
Undisturbed habitat < 10% of circle points = 0

1

H2.3 Land use intensity in 1 km circle. If:

> 50% of circle is high intensity land use points = (- 2)
Does not meet criterion above points = 0

0

~~H 2.4 If The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. *(Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs)* points = 3~~

Total for H 2 Add the points in the boxes above

1

Rating of Landscape Potential If score is: 4- 6 = 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?

H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose the highest score)*

Site meets ANY of the following criteria: points = 2
___ It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists)
___ It is a "priority area" for an individual WDFW species
___ It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources
___ It has 3 or more priority habitats within 100m (see Appendix B)
___ 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 100m (see Appendix B) points = 1

Site does not meet any of the criteria above points = 0

1

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

Record the rating on the first page

Wetland name or number I

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools Is the wetland unit **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
~~SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)?~~ ~~YES = Category II~~ ~~NO = Category III~~	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ⅓ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. **YES = Category I** NO – *not an alkali wetland*	**Cat. I**

Wetland name or number I

SC 3.0 Wetlands with High Conservation Value (WHCV) SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? YES - Go to SC 2.2 NO – Go to SC 2.3 SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? YES = Category I NO = not a WHCV SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf YES____ – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? YES = Category I NO ____ not an WHCV	**Cat. I**
SC 4.0 Bogs and Calcareous Fens Does the wetland unit (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens. *Use the key below to identify if the wetland is a bog or calcareous fen. If you answer yes you will still need to rate the wetland based on its functions.* SC 4.1. Does an area within the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix C for a field key to identify organic soils)? Yes - go to SC 4.3 No - go to SC 4.2 SC 4.2. Does an area within the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?? Yes - go to SC 4.3 No - *Is not a bog for rating* SC 4.3. Does an area within the unit have more than ~~70% cover of mosses~~ at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes – Category I bog No - go to SC 4.4 ~~*NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.*~~ SC 4.4 Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy **Yes – Category I bog** NO – go to question SC 4.5 5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes – Is a Calcareous Fen for purpose of rating No - go to Question 6 6. Do the species listed in Table 6 comprise at least 10% of the total plant cover an area of peats and mucks, AND one of the two following conditions is met: • Marl deposits (calcium carbonate ($CaCO_3$) precipitate) occur on the soil surface or plant stems • The pH of free water ≥ 6.8 AND electrical conductivity ≥ 200 uS/cm at multiple locations within the wetland **Yes – Is a Category I calcareous fen** No - Is not a calcareous fen	**Cat. I** **Cat. I**

Wetland name or number I

SC 5.0 Forested Wetlands Does the wetland unit have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified a forested class is present in question H 1.1*) • The wetland is within the "100 year" floodplain of a river or stream • aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*	
SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*) YES = Category I NO = go to SC 5.2	Cat. I
SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species. YES = Category I NO = go to SC 5.3	Cat. I
SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species. (*see Table 7*) YES = Category II NO = go to SC 5.5	Cat. II
SC 5.4 Is the forested component of the wetland within the "100 year floodplain" of a river or stream? YES = Category II	Cat. II
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories.* If you answered NO for all types enter "Not Applicable" on p.1	

Wetland name or number I

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (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. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf)

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

___**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

___**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 p. 152*).

___**Old-growth/Mature forests:** Old-growth east of Cascade crest: 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 25 trees/ha (10 trees/acre) that are > 53 cm (21 in) dbh, and 2.5-7.5 snags/ha (1 – 3 snags/acre) that are > 30-35 cm (12-14 in) 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. Mature forests: Stands with average diameters exceeding 53 cm (21 in) 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:** Woodlands 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 7.6 m (25 ft) high and occurring below 5000 ft.

___**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) 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 needlegrass (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.

Assessment of state waters 303d | Water Quality Atlas - Map

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DEPARTMENT OF ECOLOGY State of Washington

Water Quality Atlas Map

Legend | Filter | Zoom | Tools | Home | Add/Remove Map Data | My Maps | Print | Share | About

Assessed Water/Sediment

Filter

Water

- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
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Sediment

- Category 5 - 303d
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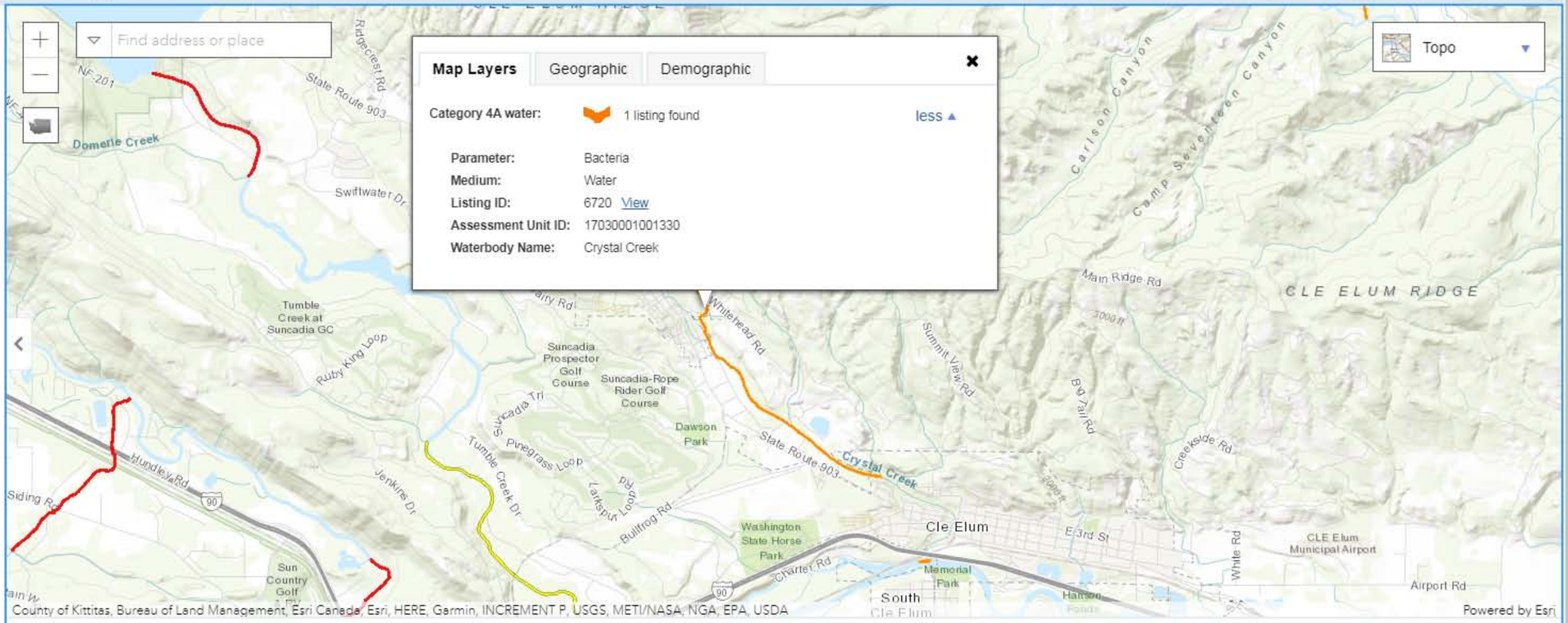

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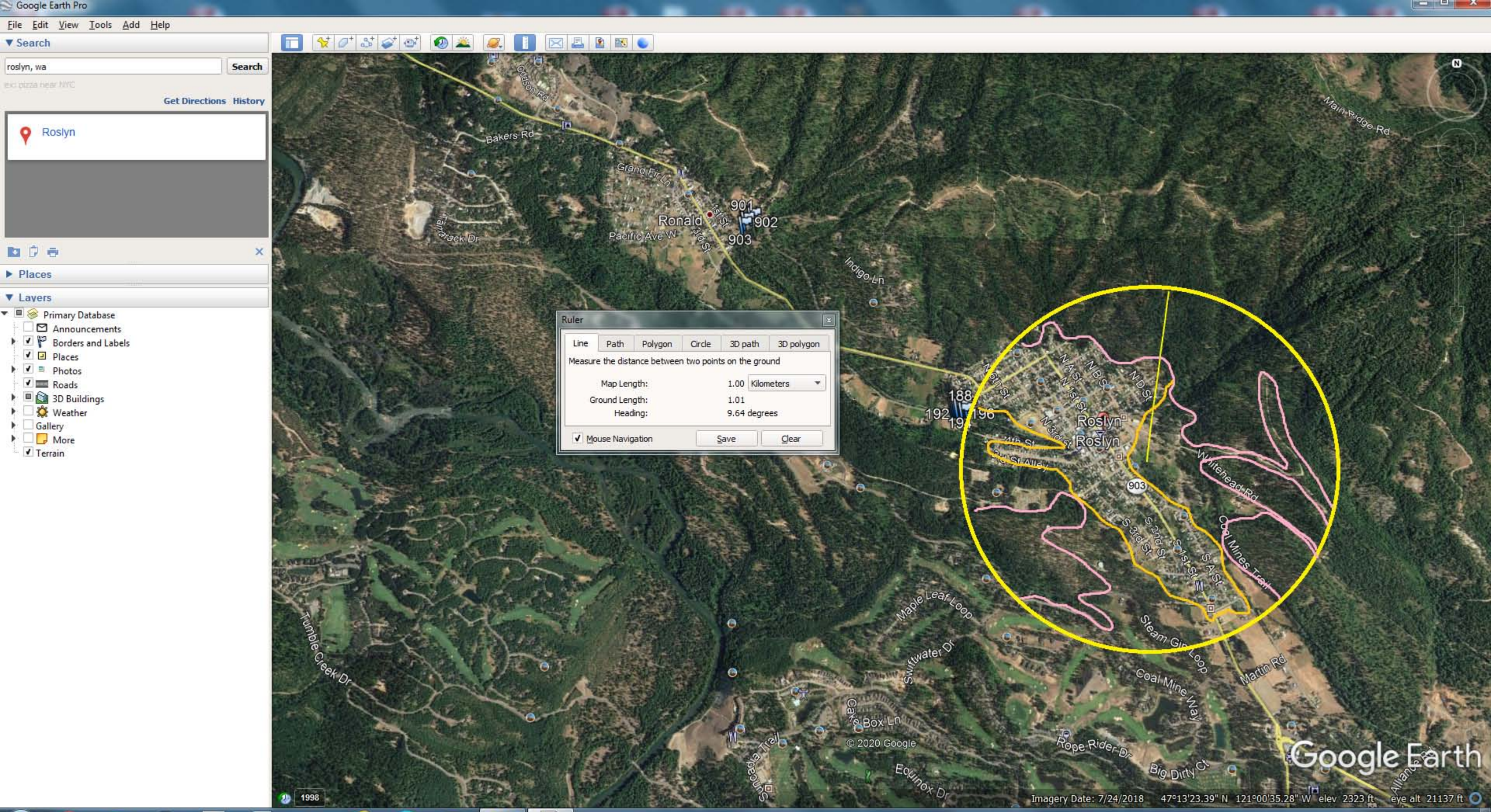
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Indigo Ln
Main Ridge Rd
Whitehead Rd
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Maple Leaf Loop
Steam Gin Loop
Coal Mine Way
Martin Rd
Tumble Creek Dr
Swiftwater Dr
Cake Box Ln
Rope Rider Dr
Big Dirty Ct
Equinox Dr
© 2020 Google
Google Earth
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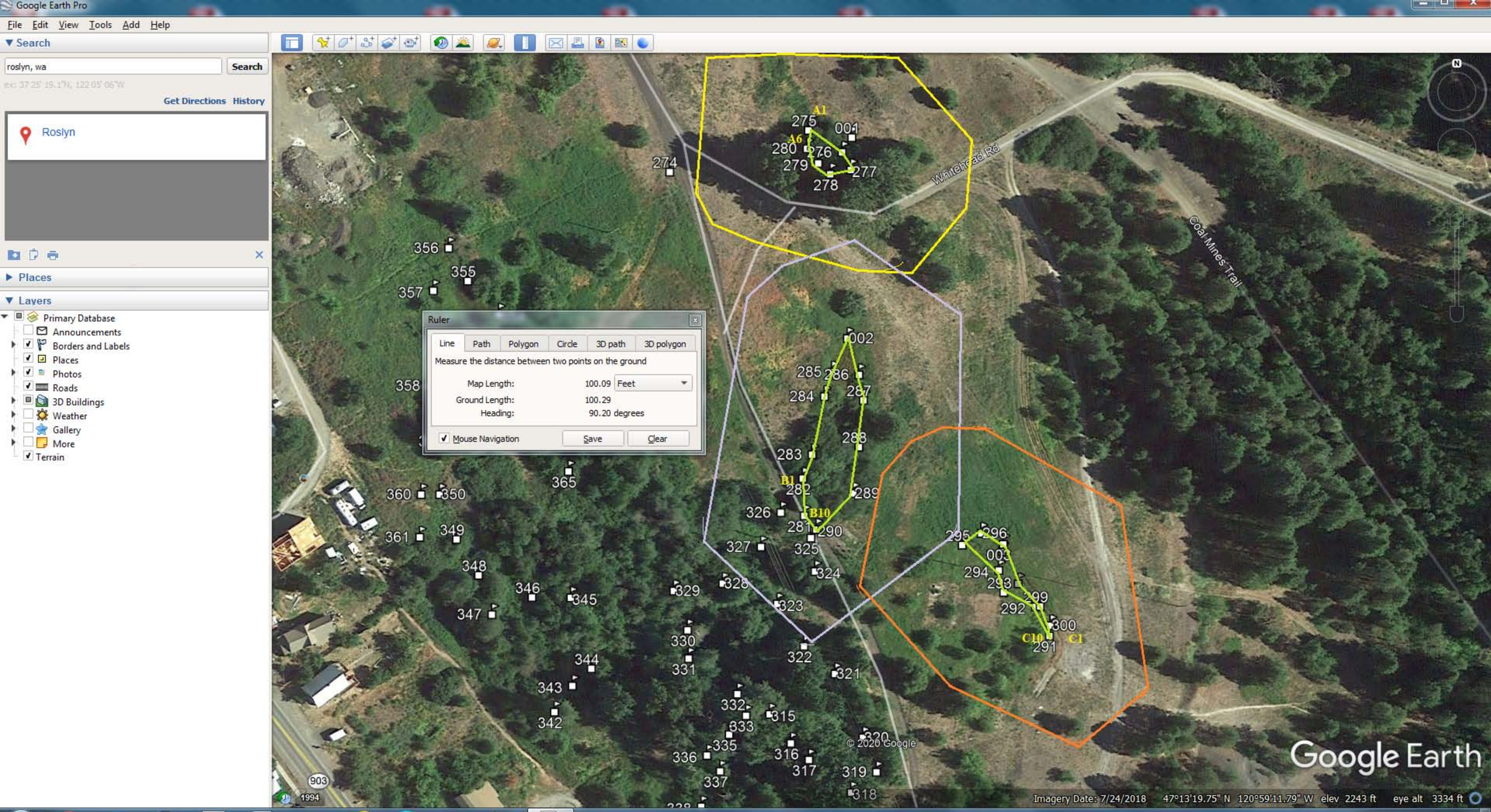
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Whitehead Rd
Coal Mines Trail
© 2020 Google
Google Earth
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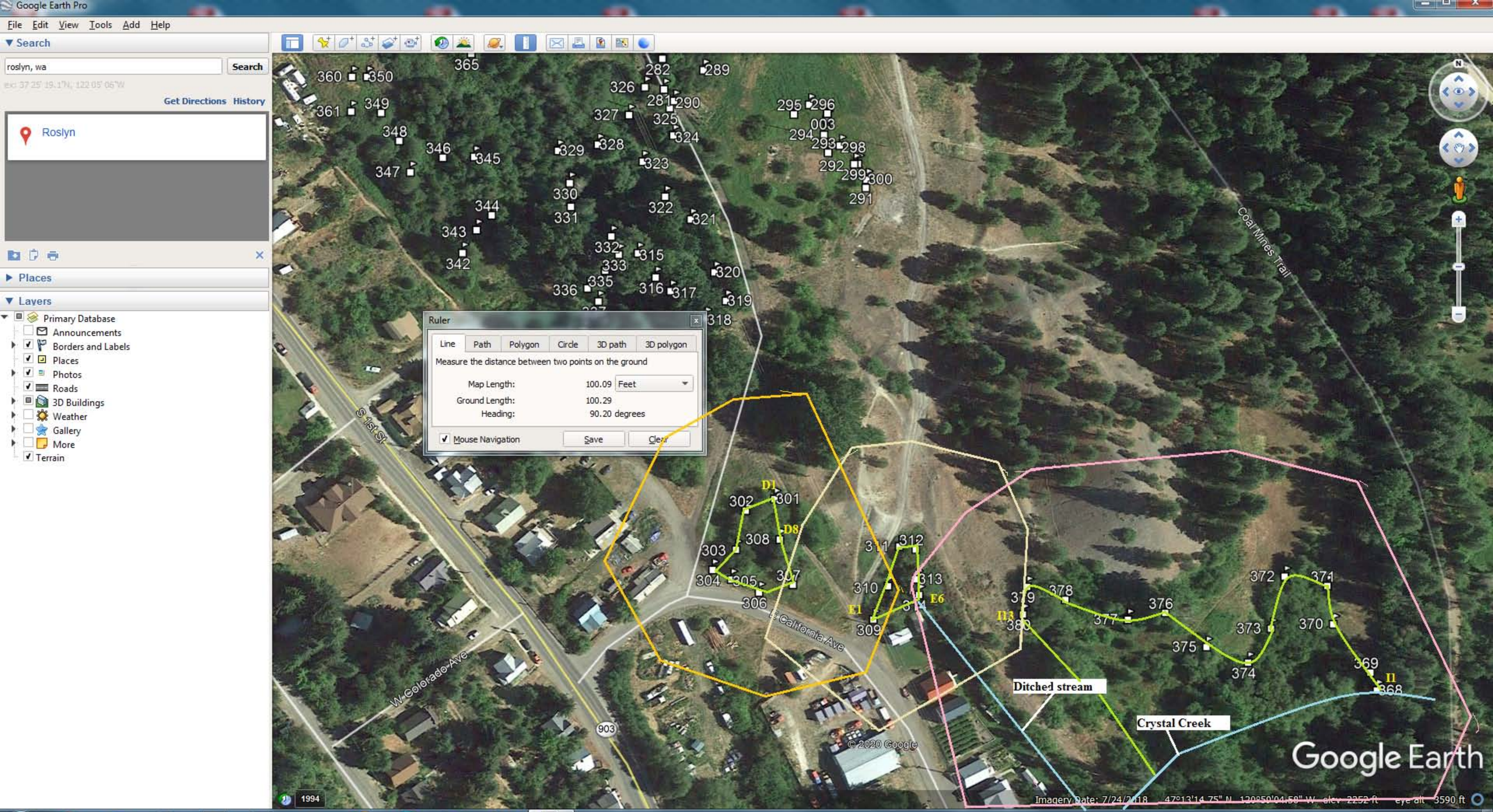
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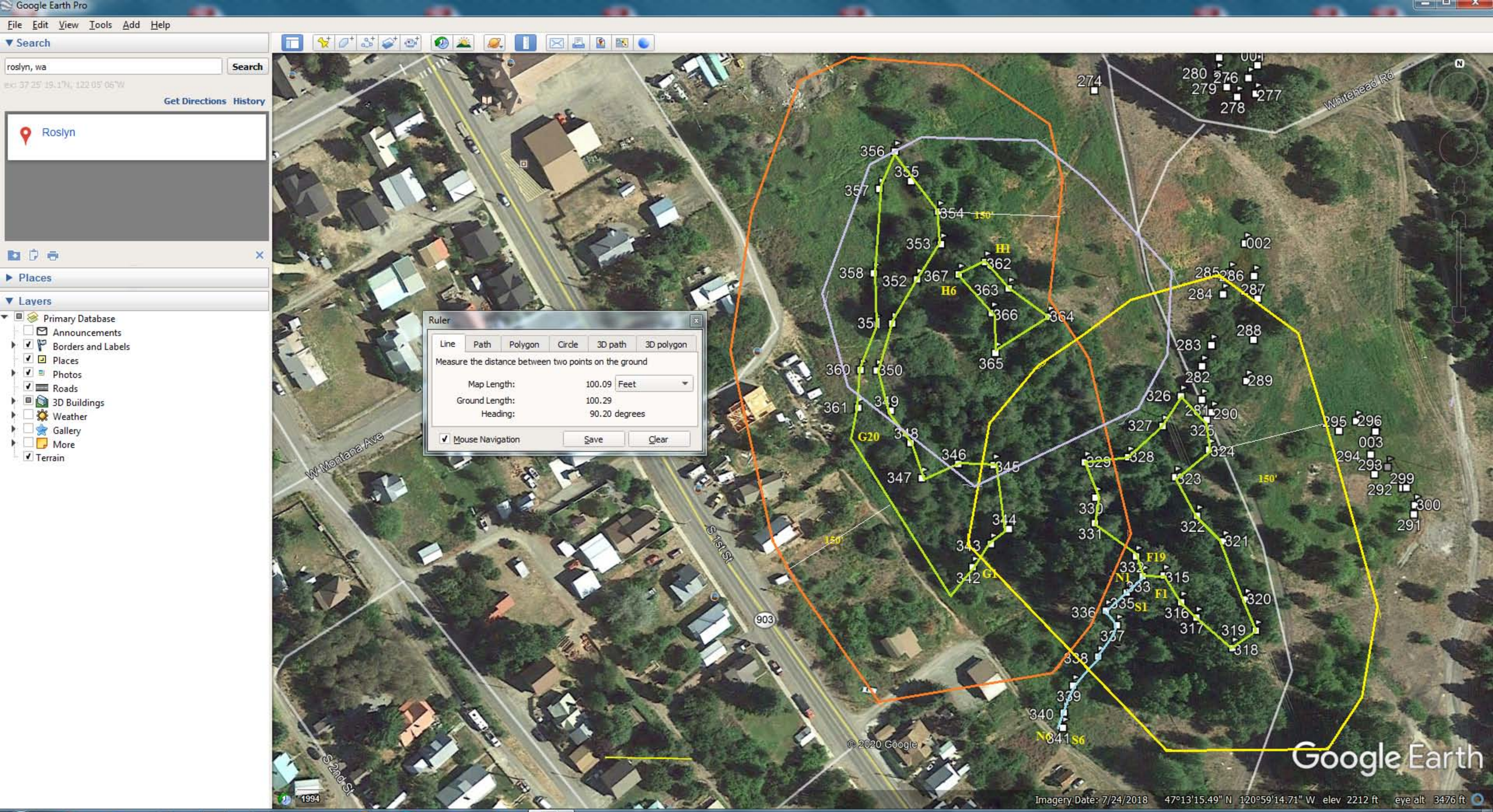
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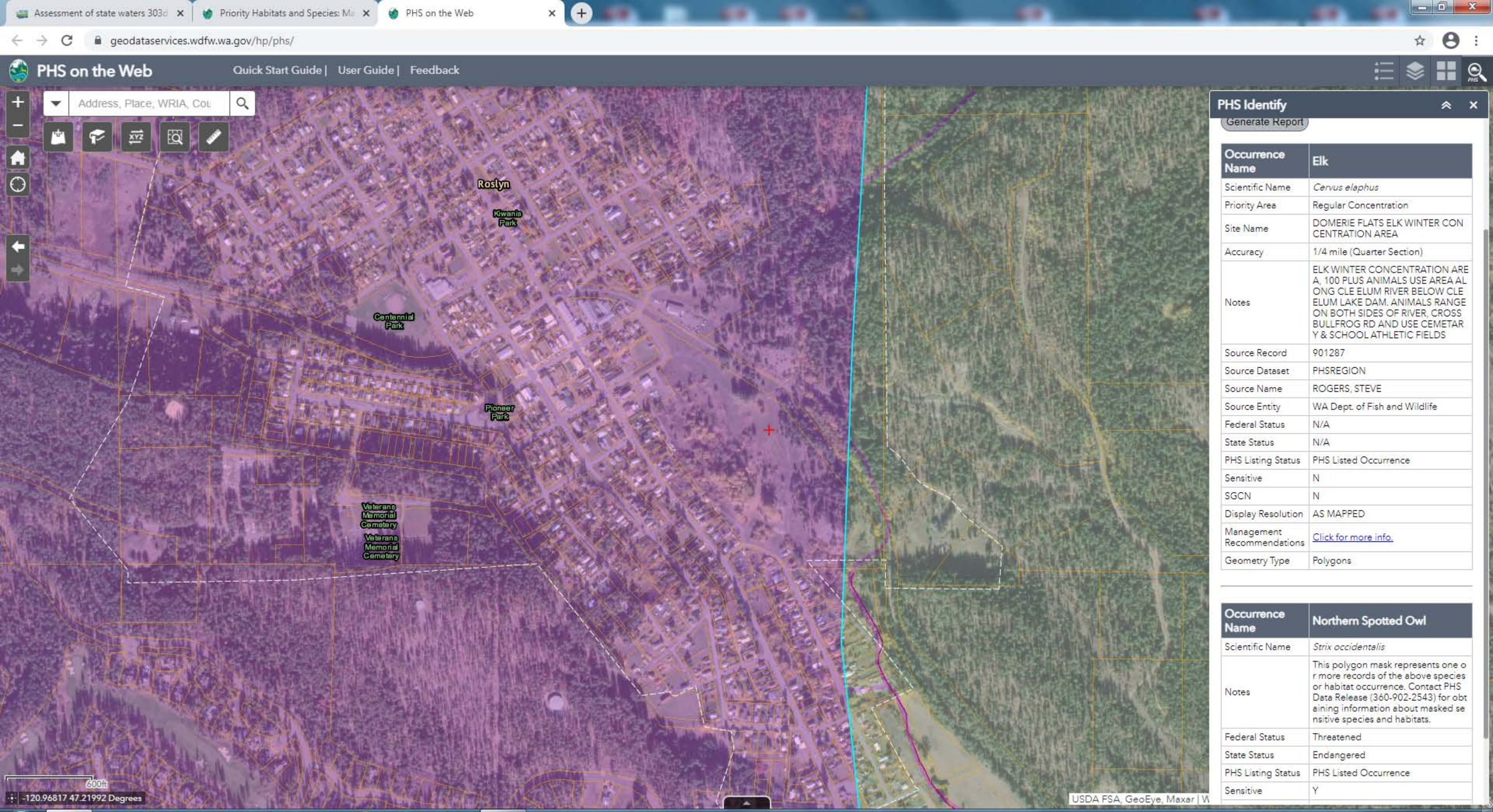
Assessment of state waters 303d
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Centennial Park
Pioneer Park
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Veterans Memorial Cemetery
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USDA FSA, GeoEye, Maxar | W
PHS Identify
Generate Report
Occurrence Name | Elk
Scientific Name | Cervus elaphus
Priority Area | Regular Concentration
Site Name | DOMERIE FLATS ELK WINTER CON CENTRATION AREA
Accuracy | 1/4 mile (Quarter Section)
Notes | ELK WINTER CONCENTRATION ARE A, 100 PLUS ANIMALS USE AREA AL ONG CLE ELUM RIVER BELOW CLE ELUM LAKE DAM. ANIMALS RANGE ON BOTH SIDES OF RIVER, CROSS BULLFROG RD AND USE CEMETAR Y & SCHOOL ATHLETIC FIELDS
Source Record | 901287
Source Dataset | PHSREGION
Source Name | ROGERS, STEVE
Source Entity | WA Dept. of Fish and Wildlife
Federal Status | N/A
State Status | N/A
PHS Listing Status | PHS Listed Occurrence
Sensitive | N
SGCN | N
Display Resolution | AS MAPPED
Management Recommendations | Click for more info.
Geometry Type | Polygons
Occurrence Name | Northern Spotted Owl
Scientific Name | Strix occidentalis
Notes | This polygon mask represents one o r more records of the above species or habitat occurrence. Contact PHS Data Release (360-902-2543) for obt aining information about masked se nsitive species and habitats.
Federal Status | Threatened
State Status | Endangered
PHS Listing Status | PHS Listed Occurrence
Sensitive | Y
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Appendix B

Soil Management Plan

MAUL FOSTER ALONGI

Soil Management Plan

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington
Ecology Cleanup Site ID 15545

Prepared for:

Forterra Roslyn LLC

May 5, 2025
Project No. M1122.05.006

Prepared by:

Maul Foster & Alongi, Inc.
330 E Mill Plain Boulevard, Suite 405, Vancouver, WA 98660

MAUL FOSTER ALONGI

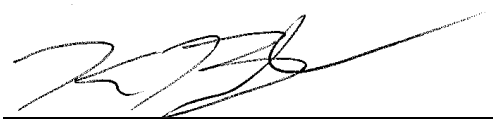
Soil Management Plan

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington
Ecology Cleanup Site ID 15545

The material and data in this report were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.

Calen Busch, LG
Project Geologist



Kara Beaudoin
Director of Engineering

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Abbreviations

bgs	below ground surface
CAP	cleanup action plan
COC	chemical of concern
CUL	cleanup level
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ESA	environmental site assessment
Forterra	Forterra Roslyn LLC
HC	Hart Crowser, Inc.
ICE	Icicle Creek Engineers, Inc.
MFA	Maul Foster & Alongi, Inc.
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTCA	Model Toxics Control Act
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
the Property	Roslyn No. 4 Mine, 205 E Dakota Avenue, Roslyn, Washington
SMP	Soil Management Plan
TCLP	toxicity characteristic leaching procedure
TEE	terrestrial ecological evaluation
TPH	total petroleum hydrocarbon
ug/L	micrograms per liter

1 Introduction

On behalf of Forterra Roslyn LLC (Forterra) Maul Foster & Alongi, Inc. (MFA), has prepared this Soil Management Plan (SMP) for the cleanup action at the Roslyn No. 4 Mine, located at 205 E Dakota Avenue in Roslyn, Washington (the Property; see Figure 1-1). The Property is currently vacant but was formerly used for a variety of operations, including a coal mine (referred to as the No. 4 Mine). Forterra is the owner of the Property. The Property is listed with the Washington State Department of Ecology (Ecology) under facility site ID 66921 and cleanup site ID 15545.

The Property is currently enrolled in Ecology's Voluntary Cleanup Program. Forterra received a grant from the Washington State Department of Commerce which supports Forterra's environmental site assessment, analysis of cleanup alternatives, and site planning for redeveloping the Property with attainable housing for community benefit. Concurrent with this SMP, MFA is preparing a cleanup action plan (CAP; MFA 2025b) providing guidance for identifying the cleanup action and describing the rationale for the selected action. The cleanup action is intended to mitigate exposure risk for residents, visitors, workers, and ecological receptors at the Property from metals and petroleum-contaminated soil and arsenic in groundwater.

This SMP has been prepared in accordance with the requirements of Washington Administrative Code 173-340-440 and related provisions of the 2023 update to the Washington State Department of Ecology (Ecology) Model Toxics Control Act. This SMP provides procedures for managing known or potential contaminated media during the cleanup action.

This SMP was prepared to provide a summary of environmental investigations conducted at the Property, describe the nature and extent of contamination based on the findings of the investigations, and present procedures for managing contaminated media at the Property.

1.1 Purpose of SMP

This SMP is designed to inform the cleanup action activities providing guidelines for assessing and managing Impacted Soil and Contaminated Soil that is generated during removal and disposal activities. This SMP also provides guidance for handling remnant coal present in shallow soil throughout the Property. The terms "impacted" and "contaminated" in this SMP refers to the presence of contamination based on field indictors (e.g., odors, stains) and/or laboratory analysis of soil and groundwater samples. Laboratory data for samples at the Property provide the basis for identifying chemicals of concern (COCs), which are chemicals that have been detected in media on the Property at concentrations exceeding the Model Toxics Control Act (MTCA) Method A soil cleanup levels (CULs) for unrestricted land use (Ecology 2024) or site-specific CULs for lead and zinc used for protection of ecological receptors (MFA 2025a).

This SMP describes guidelines and procedures for soil handling; waste characterization and disposal; erosion-control, dust-control, and stormwater protection measures; groundwater management; and general operation and maintenance. These guidelines and procedures should be implemented during cleanup.

Unless otherwise specified, it is the responsibility of Forterra to follow (and require its contractors to follow) this SMP during cleanup action. If contamination remains following the cleanup action (e.g., beneath soil cap), an environmental covenant and associated Contaminated Media Management Plan will be developed.

1.2 Distribution of SMP

Implementation of this SMP is a condition of removal and disposal of impacted and contaminated media at the Property.

1.3 Property Description and History

The Property is located in section 17 of township 20 north and range 15 east of the Willamette Meridian. The Property consists of one 30.4-acre parcel (Kittitas County parcel 456234) and is situated in the southeast portion of the City of Roslyn (see Figures 1-1 and 1-2). The Property is currently vacant and is covered with low lying vegetation, trees, and open grass. Dirt and gravel roads are present throughout the Property. Remnant foundations of former structures, including a foundation used for auto maintenance, former pump house, and an unidentified brick structure are present. The Property is generally flat with a slight increase in slope to the north. A tailings pile represents a topographic high on the southeast portion of the Property. The Property is bordered by forested land and the Coal Mines Trail, a recreational walking and biking trail, to the northeast. Residential and commercial properties border the Property to the north and the southwest. Crystal Creek, located adjacent to the northeast of the Property, generally flows south in the vicinity. A tributary of Crystal Creek is present on the western and southwestern portions of the Property.

An underground coal mine, the No. 4 Mine, was active at the Property from the 1880s until about 1909. Historical structures on the Property included a powerhouse, wash house, two barns, two warehouses, a foundry, the tipple and entrance shaft for the No. 4 Mine, the tipple for the No. 6 and No. 8 Mines, and several small buildings. The powerhouse and foundry were fueled by coal and coke. Electrical transformers were formerly located northeast of the powerhouse between the 1960s and 1980s, until a new power substation was constructed off-property in the town of Roslyn. Although the mine was no longer active after 1909, the foundry remained operational through the mid-1970s to service the remaining mines in Roslyn that operated through the mid-1960s. All remaining structures on the Property were removed in the 1980s. As detailed in the following sections, remnant coal is present at the surface and in shallow soil across the Property and will likely be encountered during cleanup action.

2 Environmental Background

This section summarizes the environmental conditions at the Property based on the following environmental assessments completed at the Property:

- Phase I and Phase II Environmental Site Assessments (ESAs) completed in 2004, 2006, and 2007 by Hart Crowser, Inc. (HC) (HC 2004, 2006, 2007)

- Follow-up investigation in 2020 by Icicle Creek Engineers, Inc. (ICE) (ICE 2020)
- Phase I ESA completed in 2020 by MFA (MFA 2020)
- Data gaps investigation completed in 2023 by MFA (MFA 2023)
- Supplemental investigation completed in 2025 by MFA (MFA 2025a)

A summary of the investigations is provided below. Figure 1-2 presents soil sample locations with MTCA A CUL exceedances, site-specific CUL exceedances, and observed coal material.

2004 HC Environmental Assessment. HC completed a Phase I and limited Phase II ESA that included soil sampling and analysis (HC 2004). HC evaluated historic uses of the Property and identified four areas of potential concern: Former foundry area and associated slag pile, building foundation area used for vehicle maintenance, power transformers, and mine tailings pile and surface mine rock fill on the Property. Phase II sampling included advancing nine hand auger borings and surface soil grab sampling of the slag and tailings piles and laboratory analysis of select soil samples for potential contaminants associated with historical use at the Property. Diesel- and heavy-oil-range total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and mercury were not detected in any of the soil samples submitted. One soil sample, collected near the bottom of the foundation used for vehicle maintenance, had a concentration of cadmium (2.7 milligrams per kilogram [mg/kg]) that marginally exceeded the MTCA Method A CUL (2 mg/kg). A soil sample collected near the former foundry had a concentration of lead (620 mg/kg) that exceeded the MTCA Method A CUL (250 mg/kg). A review of the hand auger logs showed that only one sample, HB-8-S1, was described as containing coal fragments.

2006 HC Environmental Assessment. HC completed an additional environmental assessment at the Property that included completion of 14 test pits advanced in and near the four areas previously identified as areas of potential concern. Select soil samples were submitted for laboratory analysis of for potential contaminants associated with historical use at the Property. Gasoline-range TPH, diesel range TPH, PCBs, and volatile organic compounds were not detected in any of the soil samples. Heavy oil-range TPH was detected at 2,100 mg/kg (MTCA Method A CUL 2,000 mg/kg) in a sample from near the former powerhouse. PAHs were detected in one soil sample (TP-12; described as moist, dark gray sand with brick and coal fragments) near the power transformer area at concentrations below their respective MTCA CULs. MTCA Method A CULs for arsenic, cadmium, mercury, and lead were exceeded in five soil samples. A review of the test pit logs showed that soil containing coal fragments was encountered in four test pits from the surface to depths ranging from 2 to 10 feet below ground surface (bgs).

2007 HC Environmental Assessment. HC performed additional assessment to evaluate the former foundry area and associated slag pile, building foundation area used for vehicle maintenance, former area of power transformers and the powerhouse, and wetland area. HC collected near surface soil samples in these areas, advanced four direct push borings to eight feet bgs, and installed four mini-wells in the wetland area. Selected soil, sediment, and groundwater samples were analyzed for diesel- and heavy-oil-range TPH and total metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc). TPH was below MTCA CULs in all soil samples, while cadmium, arsenic, and mercury exceeded MTCA CULs. The mini wells targeted seasonal perched groundwater and three of the perched groundwater samples had concentrations of total metals, particularly lead, chromium, or arsenic, that exceeded MTCA Method A CULs. However, field notes from HC indicate the turbidity of these samples was elevated (350 to 400 Nephelometric Turbidity Units) and

sediment in the samples likely contributed to the CUL exceedances for metals. A review of the boring and mini well logs showed that coal containing coal fragments was encountered in two borings from the surface to depths ranging from 3.5 to 4 feet bgs.

2020 ICE Investigation. ICE conducted additional soil sampling in the vicinity of the mine tailings pile and slag pile in 2020. Concentrations of diesel- and heavy-oil-range petroleum and metals in the vicinity of the mine tailings pile were below MTCA CULs. Concentrations of cadmium and arsenic in the vicinity of the slag pile were above MTCA CULs, while lead, chromium, copper, nickel, mercury, and zinc concentrations were below MTCA CULs (ICE 2020).

2023 MFA Data Gaps Investigation. MFA conducted a data gaps investigation at the Property in April 2023 to characterize potential environmental impacts based on identified features of interest associated with historical operations and areas of contamination identified during previous sampling activities (MFA 2023). A total of 22 direct-push borings were advanced across the Property for collection of soil and groundwater, which were analyzed for a combination of metals and diesel- and oil-range TPH.

The lateral extent of metals in soil was delineated for the wetland area; however, the extent of metals was not delineated for the remaining features of interest (i.e., the vehicle maintenance area, former foundry, slag pile, former powerhouse, and former transformers). In addition, elevated total and dissolved metals were observed in a reconnaissance groundwater sample. However, the turbidity of the sample was elevated, and metals concentrations in the groundwater sample were not anticipated to be representative of groundwater conditions at the Property. MFA recommended additional soil investigation to delineate the lateral extent of metals impacts and later installation of monitoring wells to collect representative groundwater samples and refine the conceptual site model (MFA 2023). A review of the boring logs showed that soil containing coal fragments was encountered in seven borings from the surface or near surface to depths ranging between 0.5 to 3.5 feet bgs.

2024 MFA Supplemental Investigation. MFA conducted a supplemental investigation at the Property in September 2024 to delineate the nature and extent of contamination at the features of interest (MFA 2024). A total of 32 direct-push borings were advanced to a depth of 2.0 feet bgs for collection of discrete soil samples. In addition, three permanent monitoring wells (MW-01 to MW-03) were installed to a maximum depth of 20 feet bgs on the Property. Soil and groundwater samples were analyzed for a combination of metals. Additionally, a site-specific terrestrial ecological evaluation (TEE) was conducted at the Property.

All total lead concentrations in samples from FO-DP-5, FO-DP-6, and FO-DP-8 at the former foundry area exceed the toxicity characteristic leaching procedure (TCLP) rule of 20 concentration (100 mg/kg). At least one sample from each boring was analyzed for lead by the TCLP method for informational purposes to assess whether the material could be classified as a federal characteristic hazardous waste if transported for disposal off-site. The U.S. Environmental Protection Agency (EPA) TCLP regulatory criteria is 5 milligrams per liter (mg/L). In FO-DP-5, lead was detected in the TCLP extract at 4.4 mg/L and 9.7 mg/L, from 0.5 feet bgs and 1.5 feet bgs, respectively. Lead was not detected in the TCLP extract for FO-DP-6 and was detected at 1.3 mg/L at 1.1 feet bgs in FO-DP-8. One soil sample near the former foundry exceeded the TCLP rule of 20 for lead, but lead was not detected in the TCLP extract.

A review of the boring logs showed that soil containing coal fragments was encountered in two of the three monitoring well borings from the surface to depths ranging between approximately 8 and 12

feet bgs. Soil with coal fragments was also identified in most of the shallow direct push borings to approximately 2 feet bgs.

The analytical results of the data gaps investigation indicated the extent of contamination was delineated for all features of interest, with the exception of an area near the former foundry and near the former transformers. It was concluded that additional testing would be conducted during cleanup actions at the Property and that ecological-based CULs for lead and zinc in soil will be incorporated into cleanup planning based on the site-specific TEE. MFA recommended that a CAP be prepared to identify the cleanup approach and establish final CULs at the site (MFA 2025a).

Coal Presence at Property: As indicated above, coal has been observed in soil on the Property in varying amounts during previous investigations. Ecology and EPA do not have specific guidance for handling or disposal requirements for raw (unburned coal). Disposal and handing requirements for coal post-combustion or use (coal tar, fly ash, coal ash, or coal combustion residuals) are available, but not relevant to the raw coal associated with the Property. While PAHs have been shown to be present in coal materials at other sites, only one soil sample at the Property had detections of PAHs, which did not exceed MTCA CULs (HC 2004). Of the PAH compounds detected in the sample, Phenanthrene, Fluoranthene, and Pyrene are commonly used in plastics and dyes while Benzo(a)Anthracene and Chrysene are associated with incomplete combustions of fossil fuel, wood, coal tar, or creosote. PAHs detected in this location are indicative of the burning of plastic materials. Despite the lack of PAHs detected in coal specific to the Property, in recognition that PAHs are sometimes present in coal, soil with visible coal content (greater than 20 percent coal by volume) will be subject to special handling recommendations discussed in later sections.

3 Cleanup Standards

As described in Section 2, investigations conducted have identified concentrations of COCs in soil and groundwater at Property that exceed applicable CULs. This section of the plan describes the applicable MTCA and site-specific CULs and how they are applied to the remedy to assess soil for re-use or disposal.

3.1 Soil

Soil screening levels are established to support decisions regarding the management, disposal, and relocation of soil excavated during cleanup actions. Figure 3-1 shows a flow chart for excavated soil classification. The following screening levels are considered for soil in this SMP:

- MTCA Method A CULs for arsenic (20 mg/kg), cadmium (2 mg/kg), mercury (2 mg/kg), diesel- and heavy oil-range TPH (2,000 mg/kg) will be used as a general comparison of detected concentrations relative to statewide criteria based on human and ecological receptors.
- Site-specific CULs for lead (250 mg/kg) and zinc (360 mg/kg) will be used for protection of ecological receptors at the Property (MFA 2025b).
- Visible presence of coal (greater than 20 percent coal by volume).

- Soil reuse criteria and categories as established in Ecology's *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology 2016) to guide appropriate end-use soil disposal options. Table 12.1 of the guidance defines specific screening levels for each category of soil. Ecology defines four categories of soil reuse:
  - Category 1 soil—No detectable petroleum components, lead, or PCBs above specified concentrations and must not exhibit physical evidence of contamination (such as staining, odor, or sheen). Soil can be reused anywhere the use is allowed under other regulations.
  - Category 2 soil—Low concentrations of petroleum components and lead within specified concentrations, but no detectable PCBs above a specified concentration. May exhibit some physical evidence of contamination. Reuse permitted as commercial fill above the water table.
  - Category 3 soil—Moderate concentrations of petroleum components and lead within specified concentrations, but no detectable PCBs above a specified concentration. May exhibit some physical evidence of contamination. Reuse permitted as paving base material and road construction.
  - Category 4 soil—High concentrations of petroleum components and lead within specified concentrations and not a characteristic hazardous waste. Soil must be landfilled or used for asphalt manufacturing.

In this SMP, the following have been defined:

Clean Soil: Soil that is Category 1 soil, has COC concentrations below MTCA Method A and site-specific CULs, and coal is not visibly present at greater than 20 percent by volume.

Impacted Soil: Soil that is Category 2 or 3 soil, has COC concentrations below MTCA Method A and site-specific CULs, and coal may or may not be visibly present.

Contaminated Soil: Soil that has COC concentrations that exceed MTCA Method A CULs or site-specific CULs. Coal may or may not be visibly present. Soil characterized for disposal that exceeds 5 mg/L lead in TCLP extract will be disposed of at a Subtitle C landfill.

3.2 Groundwater

Groundwater screening levels are established to support an overall evaluation of general site conditions and decisions regarding potential risks to human and/or ecological receptors. The screening levels considered for groundwater in this SMP are MTCA Method A CULs and natural background arsenic concentration in groundwater for the Yakima Basin, Washington (Ecology 2022) because unless it can be demonstrated that groundwater is not a future potential source of drinking water based on the criteria set forth in WAC 173-340-720(2), groundwater is classified as potable to protect drinking water beneficial uses.

In September 2024, groundwater samples were collected from MW-01 through MW-03 during inferred low-groundwater conditions for the Property. Total arsenic was detected in MW-02 at a concentration of 35 micrograms per liter (ug/L) and dissolved arsenic was detected at a concentration of 38 ug/L in the field-filtered sample, exceeding the MTCA Method A CUL of 5 ug/L and the natural background for the Yakima Basin of 6 ug/L. Total and dissolved arsenic were detected in MW-01 at concentrations below the MTCA Method A CUL and natural background for the Yakima Basin and were not detected in MW-03 (MFA 2025a).

In April 2025, groundwater samples were collected from MW-01 through MW-03 during inferred high-groundwater conditions for the Property. Total arsenic was detected in MW-02 at a concentration of 55 ug/L and dissolved arsenic was detected at a concentration of 52 ug/L in the field-filtered sample, above the MTCA Method A CUL of 5 ug/L and the natural background for the Yakima Basin of 6 ug/L. In the laboratory-filtered sample, dissolved arsenic was detected in MW-02 at a concentration of 14 ug/L. Total and dissolved arsenic were detected in MW-01 at a concentration below the MTCA Method A CUL and natural background for the Yakima Basin and was not detected in MW-03 (MFA 2025a).

Groundwater encountered during the cleanup action at the Property will therefore require management as detailed in Section 5.

4 Soils Management Procedures

The following actions are proposed to address known environmental issues at the property.

As detailed in the CAP (MFA 2025b) full excavation of Contaminated Soils is proposed, where feasible. In areas where mature trees or other site features prevent full removal, capping of Contaminated Soil will be implemented. Cleanup actions will be conducted in six discrete areas on the Property (Cleanup Area 1 through 6), which include remediation of the former vehicle maintenance area, former foundry, slag pile, former powerhouse, former transformers, and vegetated area, respectively (see Figure 1-2). The following describes the COCs that exceed CULs at the Property:

- Cleanup Area 1 (Foundation for Vehicle Maintenance) exceeds CULs for arsenic, cadmium, lead, mercury, and zinc.
- Cleanup Area 2 (Former Foundry) exceeds CULs for arsenic, cadmium, lead, and zinc. One soil sample exceeded the EPA lead TCLP extract regulatory criteria of 5 mg/kg.
- Cleanup Area 3 (Slag Pile) exceeds CULs for arsenic, cadmium, lead, and mercury.
- Cleanup Area 4 (Former Power Transformers) exceeds CULs for arsenic, cadmium, and mercury.
- Cleanup Area 5 (Former Powerhouse) exceeds CULs for arsenic, mercury, and oil-range petroleum.
- Cleanup Area 6 (Vegetation Area) exceeds the CUL for arsenic.

4.1 Excavation of Contaminated Soil

Excavation activities will be performed consistent with this SMP, a site-specific stormwater pollution prevention plan, and an inadvertent discovery plan (the latter two will be prepared during design). Excavated soils will be managed in one of two ways:

- Off-site disposal. Excavation and off-site disposal is the most protective approach for soils with hazardous substance concentrations above CULs, consistent with WAC 173-340-360. Further, excavation and off-site disposal constitutes a permanent solution employed to the maximum

extent practicable, consistent with WAC 173-340-360 (3). During prior investigations, one soil sample at Cleanup Area 2 exceeded TCLP for lead. As such, excavated soil at Cleanup Area 2 will require separate stockpiling and sampling for TCLP to support waste characterization. The contractor shall follow the excavation and stockpiling procedures in Sections 4.1.1 and 4.1.2. and the stockpile sampling procedures as detailed in Section 8.2. Per these procedures Contaminated Soil excavated from Cleanup Area 2 will be analyzed for lead by EPA Method 6020B with TCLP method. As shown on Figure 3-1, if Contaminated Soil contains lead above the EPA TCLP extract regulatory criteria it will require disposal at a Subtitle C landfill.

- Soil Reuse. Excavated soil may be reused on the Property if it does not exceed CULs. Soil re-use restrictions will be based on whether the soil is classified at Clean Soil or Impacted Soil (see Section 3.1), enabling beneficial reuse and reducing the need for transportation and off-site disposal at a permitted landfill.

4.1.1 Excavation

These requirements apply to handling of Contaminated Soil. Any soil exhibiting evidence of unknown chemical contamination that is encountered will be treated as potentially contaminated soil. Contractors are required to comply with the following procedures:

- Before beginning excavation, the owner and/or contractor must establish an exclusion zone around the proposed work area to limit potential exposure to and spread of contamination in the work area.
- Excavation equipment must be maintained and in good working order. The excavation contractor will immediately clean up any contaminated soil resulting from spilled hydraulic oils or other hazardous materials that leak from equipment.
- Vehicles wheels will be cleared using manual methods (brushes, brooms, or equivalent) and trucks transporting soil will wet or cover loads to prevent tracking contaminated soil beyond the work area.
- The owner/contractor will document the locations of all areas where potentially impacted soil is disturbed and soil management procedures were implemented.
- Silt fence will be installed and maintained downgradient of earthwork activities. All erosion-control measures will be installed before excavation activities begin and will be maintained throughout the construction effort until the disturbed area is stabilized.
- Any additional requirements as set forth in the site-specific stormwater pollution prevention plan.
- Confirmation sampling will be conducted consistent with Section 8.

4.1.2 Stockpiling

To minimize soil volume management, the contractor shall place excavated soil onto impervious sheeting. Excavated soil may be temporarily stockpiled on heavy plastic sheeting or in a temporary storage container or bin. If stockpiled on plastic sheeting, temporary stockpiles must be constructed with a raised containment berm made of sandbags, straw wattle, cover soil, or similar material. Stockpiles should be stabilized under the following conditions:

- High winds that result in visible dust
- Significant precipitation events

- When the stockpile will remain inactive for one week during the dry season (May 1 to September 30) and two days during the wet weather season (October 1 to April 30)

Stockpile covers will be secured by rope and/or sandbags. Stockpile covers will be inspected daily and maintained to prevent exposure of soil to precipitation.

4.2 Encountering Potential Impacts in Other Areas

If unknown potential sources of contamination or soil exhibiting evidence of unknown chemical contamination are observed, construction activities will stop. The construction contractor will immediately notify the environmental consultant regarding the nature of suspected contamination and identify next steps. Potential next steps will likely include material stockpiling (see Section 4.1.2) and segregation pending further analysis. Characterization sampling will be performed to identify whether the material is impacted and may include additional analyses to assess the nature of impacts and source of the release. Assessment and reporting protocols will be followed depending on the nature of source identification and associated releases.

4.3 Import and Mixing of Clean Fill

Excavated soil will be replaced with clean soil and graded with the existing grade. A portion of the clean soil may be offset by Categories 2 or 3 soil for beneficial reuse if the category requirements are met. Imported soil will be obtained from a commercial source or characterized prior to placement to ensure it is not contaminated. If obtained from a non-commercial source, a sampling plan will be developed appropriate to the potential COCs at that source location.

4.4 Institutional Controls

Once the remedy is implemented, the need for institutional controls will be evaluated and will provided as a draft with the project completion report.

5 Groundwater Management Procedures

Groundwater elevations at the Property are anticipated to be highest in the spring (April 2025 measurements ranged from 1.1 to 7.7 feet bgs) and lowest in the late summer/early fall (September 2024 measurements ranged from 5.5 to 12.1 feet bgs). As the proposed cleanup excavation depths are relatively shallow (one to three feet bgs), and cleanup is planned to occur during lower groundwater times of the year, it is not anticipated that groundwater will be encountered during the cleanup excavation activities.

In the event that groundwater is encountered, the sitework contractor shall mobilize equipment necessary to treat or collect groundwater that accumulates in the excavation. The sitework contractor shall be responsible for obtaining the necessary discharge permits.

6 Stormwater Management Procedures

During and following the cleanup action, stormwater runoff from the Property will be managed consistent with the City of Roslyn's surface water general requirements, the site-specific stormwater pollution prevention plan, and any other relevant code or regulations. The Property owner will obtain coverage under a Construction Stormwater General Permit during construction.

7 Site Controls and Operations and Monitoring

The generation of Contaminated Soil triggers the requirement to implement specific site controls. These controls are required in order to protect the environment and reduce potential exposure of the public to the Contaminated Soil.

7.1 Controlling Access

Exclusion zones using temporary fencing and warning tape as well as any additional appropriate site controls necessary will be established in accordance with the site-specific health and safety plan developed by the contractors for cleanup. The excavation area will be secured when the engineering consultant or sitework contractor are not present. Mobilized equipment and sitework contractor vehicles may be staged on the Property. Equipment that contacts metals-impacted soils must be cleaned prior to leaving the excavation area.

7.2 Decontamination

During construction activities, the following decontamination procedures must be implemented:

- If trucks are traveling over uncapped areas, soil will be removed from tires with brushes, brooms, or another equivalent method, as needed before vehicles leave unpaved areas of the Property to prevent tracking potentially contaminated soil off-property.
- Wash water generated during equipment decontamination may be treated off site at an approved facility.
- The decontamination area shall be managed so that all wash water is fully controlled or contained.

Personnel decontamination procedures should be defined in a project-specific HASP.

7.3 Dust Control

The excavation process will disturb soil and has the potential to generate dust. Appropriate dust-control methods will be employed during excavation as necessary to prevent the generation of airborne contaminants. These control methods will include soil wetting and misting, at a minimum. The excavation area may be wetted before excavation, should the work be completed during excessively dry weather, by spraying the area immediately around the excavation and spraying newly exposed soil during excavation so that visible dust emissions are controlled.

The sitework contractor will locate a nearby water source (e.g., fire hydrant) to fill a water tank/truck and will keep water readily available during the construction activities. Soil will be kept wet during handling until the soil is placed in haul trucks and covered, pending transport to an off-site permitted landfill. Dry excavation, dry shoveling, or dry sweeping of soil will not be permitted.

7.4 Health and Safety

Contractors for cleanup will be required to prepare a health and safety plan before beginning work. The health and safety plan should set forth the requirements and protections for working in areas containing soil that may be chemically contaminated, and may include the following:

- Current Hazardous Waste Operations and Emergency Response certification for workers
- Identification of COCs and a brief description of the Property's history
- Personal protective equipment
- Personal hygiene and decontamination protocols
- Medical surveillance
- Hazard communication and site control
- Recordkeeping and reporting

The Property owner will retain a contractor that will complete the cleanup work in compliance with federal, state, and local regulations.

7.5 Hazard Communication

Appropriate training must be provided for personnel who will come in contact with potentially contaminated material. Additionally, all waste containers must be labeled consistent with 29 Code of Federal Regulations § 1910.1200.

Before they start work, contractors doing work on site must be provided the data concerning known contamination present at the Property.

7.6 Notification and Reporting

The Property owner shall notify Ecology if unanticipated contamination is encountered or if they plan to deviate from the procedures in this SMP.

The Property owner shall maintain weekly reports of field activities during any active construction that disturbs Impacted Soil or Contaminated Soil at the Property and provide these reports to the Ecology upon request. The Property owner will prepare or oversee the preparation of a project completion report to document the management of Impacted Soil and Contaminated Soil for each project in which such work is conducted. The report will document the management techniques used and the approximate volumes of materials handled, and will provide disposal information, disposal manifests, analytical data generated during management of the contaminated or impacted material, and surveyed boundaries of any Impacted Soil that was re-used onsite. The project completion report, including the items listed above, will be provided to Ecology.

8 Monitoring and Maintenance

Per WAC 173-340-410, there are three types of compliance monitoring identified for cleanup actions performed under MTCA. The purpose of the compliance monitoring and evaluation of the data are to do the following:

Protection monitoring. Confirm that human health and the environment are adequately protected during construction and the operation and maintenance period of an interim action or cleanup action as described in the safety and health plan.

Performance monitoring. Confirm that the interim action or cleanup action has attained cleanup standards and, if appropriate, remediation levels or other performance standards such as construction quality control measurements or monitoring necessary to demonstrate compliance with a permit or, where a permit exemption applies, the substantive requirements of other laws.

Confirmational monitoring. Confirm the long-term effectiveness of the interim action or cleanup action once cleanup standards and, if appropriate, remediation levels or other performance standards have been attained.

It is the responsibility of Forterra, or its successor, to implement the compliance monitoring activities. Post-cleanup compliance monitoring for soil will only be required if Contaminated Soil is left in place beneath a cap. If contaminated soil is left in place beneath a cap, the project completion report will include discussion of the monitoring and maintenance requirements for that cap. Source removal of Contaminated Soil is expected to reduce potential leaching of arsenic into groundwater. Following the remedial action, post-remedy groundwater monitoring will be conducted to evaluate and monitor the effectiveness of the remedy in accordance with Section 8.3.2.

8.1 Protection Sampling

Protection monitoring promotes the preservation of human health and the environment during remedial construction activities. Visual monitoring should be routinely performed during any soil disturbing activities to verify no fugitive dust.

8.2 Performance Sampling

Performance monitoring ensures that remedial actions meet the accepted cleanup standards. If unanticipated impacts are identified on the Property during the remedy, as described in Section 4.6, the soil will be segregated in a stockpile. Further, performance sampling will be carried out to evaluate the soil for disposal or reuse. The number of stockpile samples collected depends on the total amount of material excavated. While WAC 173-340-410 does not define a required number of samples, Washington State Department of Ecology's *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology 2016) offers direction for stockpile sampling at petroleum-impacted properties. Table 6.9 (Ecology 2016, reproduced below) provides the number of samples needed to adequately characterize stockpiled soil.

Table 8-1. Typical Number of Samples Needed to Adequately Characterize Stockpiled Soil

Cubic Yards of Soil	Number of Aliquots for Chemical Analysis
0-100	3
101-500	5
501-1,000	7
1,001-2,000	10
>2,000	10 +1 for each additional 500 cubic yards

Note
Table adapted from Table 6.9 of Ecology 2016.

The soil in each stockpile is expected to be homogenized through the excavation and placement into piles. Composite sampling combined with homogenization through handling should result in samples that are representative of each stockpile. Therefore, based on stockpile size, the appropriate number of aliquots per composite sample will be collected according to the guidance (Ecology 2016) and Table 8-1, and then composited into a single sample for laboratory analysis.

Performance samples will be analyzed for the Property soil COCs. Sampling procedures (e.g., container requirements, preservation, holding times, preferred analytical methods and performance criteria) for the below COCs are provided in Tables 8-2 and 8-3:

- Total metals (arsenic, cadmium, lead, mercury, and zinc) by EPA Method 6020B
- Diesel- and oil-range TPH by NWTPH-Dx Method

If stockpile samples indicate that excavated soil contains COC concentrations below MTCA and site-specific CULs, the material may be reused as excavation backfill consistent with the classified Category. If the excavated soil contains COC concentrations above MTCA CULs, the soil will be managed according to the procedures described in Section 4.1.

Imported fill, if not obtained from a commercial source, will be sampled to ensure it is suitable for placement and will not re-contaminate the excavated area. A sampling plan will be developed appropriate to the potential COCs at that source location.

8.3 Confirmation Sampling

8.3.1 Soil

Confirmation monitoring is performed to evaluate the long-term effectiveness of the implemented action. Following excavation at the six Cleanup Areas, sidewall and bottom confirmation samples will be collected to evaluate whether MTCA and site-specific CULs have been achieved. Following excavation, a combination of handheld X-ray fluorescence field-screening and confirmation sampling will be conducted along the excavation sidewalls and base at the frequency specified in the CAP. Confirmation samples will be analyzed for those COCs that exceeded CULs at their specific Cleanup Area. Excavation and confirmation sampling will continue until the CULs have been achieved.

8.3.2 Groundwater

Following excavation at the six Cleanup Areas, post-remedy groundwater monitoring at MW-02, the inferred downgradient well, will be conducted to evaluate the effectiveness of the remedy at reducing arsenic concentrations in Property groundwater.

Container requirements, preservation, and holding times are provided in Table 8-2 and preferred analytical methods and performance criteria and provided in Table 8-3.

9 Notification and Reporting

9.1 Notification and Reporting

The contractor will maintain weekly reports of field activities during any active construction that disturbs soil. The Property owner will prepare a project completion report to document the management of contaminated or impacted soil for each project in which such work is conducted. The report will document management techniques employed, approximate volumes of handled material, placement or disposal information, disposal manifests, and analytical data generated during contaminated or impacted material management.

9.2 Recordkeeping

The contractor will prepare a report documenting soil disturbance activities. The report will include at least the following:

- Location and extent of soil removal. Location coordinates will be recorded by a professional surveyor licensed by the State of Washington.
- Estimated volume of soil excavated.
- Disposition of the excavated soil.
  - If excavated Impacted Soil is placed on the Property, the location where it is placed will be recorded.

- If excavated soil is disposed of off-property, documentation will include soil characterization, waste profile for disposal, manifests or trip tickets, disposal certificates, and agreement with disposal facility.

The report prepared under this section will be provided to the Property owner.

References

Ecology. 2016. *Guidance for Remediation of Petroleum Contaminated Sites.* Publication No. 10-09-057. Washington Department of Ecology, Toxics Cleanup Program: Olympia, WA. June.

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MFA. 2025b. *Cleanup Action Plan, Roslyn No. 4 Mine.* Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. May 5.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Figures

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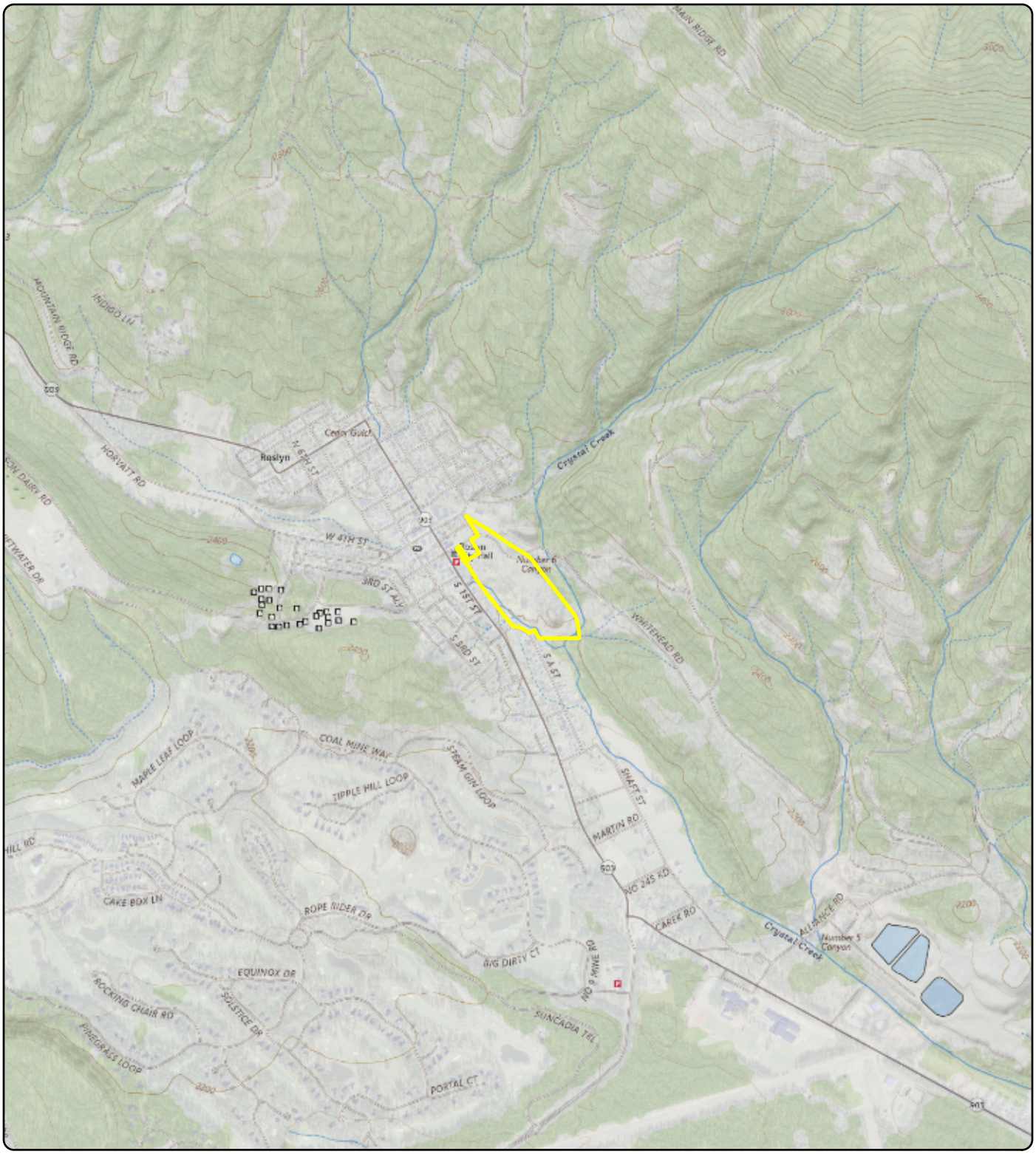

Notes
U.S. Geological Survey 7.5-minute topographic quadrangle (2020): Cle Elum.
Township 20 north, range 15 east, section 17.

Data Source
Property boundary obtained from Kittitas County.

Legend

Property Boundary

Figure 1-1
Property Location

Roslyn No. 4 Mine
205 E Dakota Ave
Roslyn, WA

0 2,000
Feet

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Path: X:\1122.05\006\Pro\M1122_05_006_001.aprx\Fig 1-1 Property Location
Print Date: 10/10/2024
Reviewed By: ehess
Produced By: bmurphy
Project: M1122.05.006

Figure 1-2
Proposed Excavation Areas

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Legend

- Soil Sample (2004-2024)
- MTCA Method A or Site-specific CUL Exceedance
- Coal Presence Noted at Location
- Feature of Interest

Excavation Areas (Depth)

- 1 ft
- 2 ft
- 3 ft
- Wetland
- Wetland Buffer (Determined by RMC)
- Wetland Buffer (Seawall-generated)
- Stream
- Property Boundary

Notes

Boring locations from 2023 and 2024 were recorded on a handheld GPS with sub-meter accuracy.
Sample locations from 2004-2020 and property features obtained by others are approximate.
Excavation extents are approximate and will be refined in the field using an XRF analyzer.
All inset maps are displayed at the same scale.
CUL = cleanup level.
ft = feet.
GPS = global positioning system.
MTCA = Model Toxics Control Act.
RMC = Roslyn Municipal Code
SF = square feet.
XRF - X-ray fluorescence.

0 100
Feet

Data Sources

Aerial photograph obtained from National Agriculture Imagery Program; tax lot data obtained from Kittitas County. Select features, including streams, wetlands and wetland buffers, obtained from Goldsmith Engineering topographic survey, dated March 18, 2022. Other features obtained from Hart Crowser Phase I ESA (2004) and from MFA site reconnaissance.

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Path: X:\1122.05\006\Pro\M1122_05_006_002.aprx\Fig 1-2 Proposed Excavation Areas
Print Date: 5/2/2025
Reviewed By: kbeaudoin
Produced By: bmurphy
Project: M1122.05.006

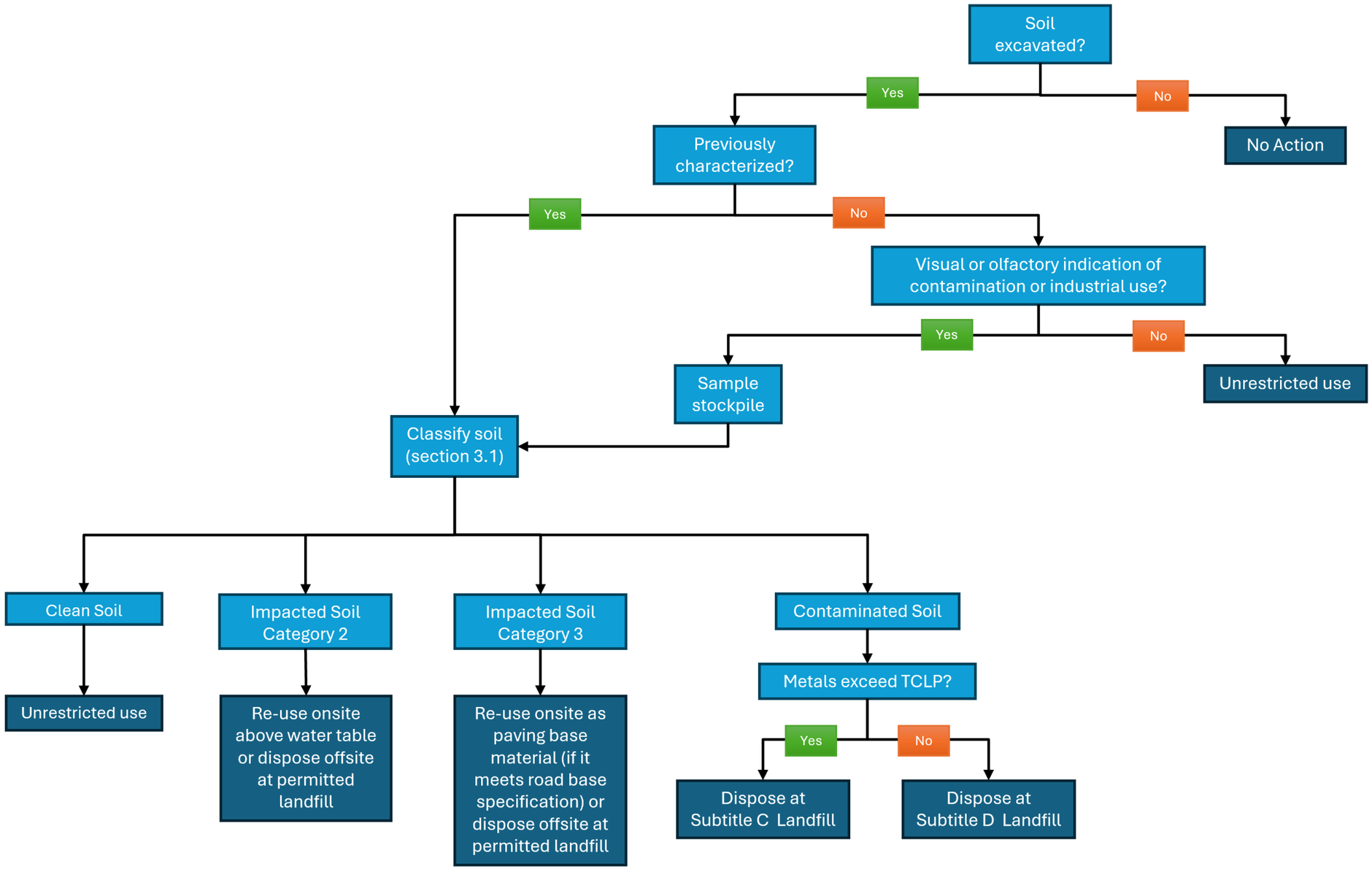

Figure 3-1
Soil Management Flowchart

Roslyn No. 4 Mine
205 E Dakota Avenue
Roslyn, Washington

Notes
Soil categories are defined in Washington State Department of Ecology's guidance for remediation of petroleum sites.

clean soil= category 1 soil and soil that does not exceed MTCA Method A CUL or site-specific CULs for lead and zinc.

impacted soil = category 2 and 3 soil.

contaminated soil = category 4 soil and soil that exceeds MTCA CULs and site-specific CULs for lead and zinc.

site specific CULs = cleanup levels for lead and zinc used for protection of ecological receptors.

CUL = cleanup level.

MTCA = Model Toxics Control Act.

TCLP = toxicity characteristic leaching procedure.

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Tables

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Table 8-2
Container Requirements, Preservation, and Holding Times
Rosyln No. 4 Mine Soil Management Plan
Forterra Rosyln, LLC

Parameter	Method	Suggested Volume	Container	Preservative	Holding Time from Collection
Soil					
Diesel- and oil-range hydrocarbons	NWTPH-Dx	8-ounce jar	G, Teflon-lined cap	4°C	14 days
Total metals—arsenic, cadmium, lead, mercury, and zinc	EPA 6020B				6 months
TCLP metals—lead	EPA 1311/6020B				
Groundwater					
Total arsenic	EPA 6020B	500 mL	HDPE	HNO_3 to pH<2, samples will be kept cool	6 months
Dissolved arsenic[(a)]		500 mL	HDPE		

Notes

°C = degree Celsius.

EPA = U.S. Environmental Protection Agency.

G = glass.

HDPE = high-density polyethylene.

HNO_3 = nitric acid.

mL = milliliter.

NWTPH = Northwest Total Petroleum Hydrocarbons.

TCLP = toxicity characteristic leaching procedure.

[(a)]Sample filtration is recommended within 15 minutes of sample collection.

Table 8-3
Preferred Analytical Methods and Performance Criteria
Rosyln No. 4 Mine Soil Management Plan
Forterra Rosyln, LLC

Analyte	Analytical Method	Method Detection Limit[a]	Method Reporting Limit[a]	MS/MSD Accuracy (Percent)	MS/MSD Precision (RPD)	LCS Accuracy (Percent)	LCS/LCSD Accuracy (RPD)	Laboratory Duplicate Precision (RPD)	Completeness (Percent)	Screening Criteria[1][2][3]
Soil										
Total Petroleum Hydrocarbons (mg/kg)										
Diesel-range hydrocarbons	NWTPH-Dx	25	50	64-136	20	78-121	20	20	90	2,000[b]
Oil-range hydrocarbons		37	250	64-136	20	78-121	20	20	90	2,000[b]
In situ XRF Metals (ppm)										
Arsenic	EPA 6200	NA	40	NA						20[b]
Cadmium		NA	100							2[b]
Lead		NA	20							250[c]
Mercury		NA	30							2[b]
Zinc		NA	50							360[c]
Total Metals (mg/kg)										
Arsenic	EPA 6020B	0.17	1	75-125	20	80-120	20	20	90	20[b]
Cadmium		0.05	1	75-125	20	80-120	20	20	90	2[b]
Lead		0.032	1	75-125	20	80-120	20	20	90	250[c]
Mercury		0.033	1	75-125	20	80-120	20	20	90	2[b]
Zinc		0.58	5	75-125	20	80-120	20	20	90	360[c]
TCLP Metals (ug/L)										
Lead	EPA 1311/6020B	0.064	1	80-120	20	80-120	20	20	90	5,000[d]
Groundwater										
Metals (ug/L)										
Total arsenic	EPA 6020B	0.18	1	75-125	20	80-120	20	20	90	6[f]
Dissolved arsenic[e]		0.18	1	75-125	20	80-120	20	20	90	6[f]

Table 8-3
Preferred Analytical Methods and Performance Criteria
Rosyln No. 4 Mine Soil Management Plan
Forterra Rosyln, LLC

Notes

EPA = U.S. Environmental Protection Agency.

LCS = laboratory control sample.

LCSD = laboratory control sample duplicate.

mg/kg = milligrams per kilogram.

MS = matrix spike.

MSD = matrix spike duplicate.

MTCA = Model Toxics Control Act.

NA = not applicable.

NWTPH = Northwest Total Petroleum Hydrocarbons.

ppm = parts per million.

RPD = relative percent difference.

TCLP = toxicity characteristic leaching procedure.

ug/L = micrograms per liter.

[a]Method detection limit and method reporting limit based on values received from Friedman & Bruya, Inc. Actual limits may differ, based on sample matrix and/or dilutions. In situ XRF limits based on interface-free lower limits of detection in quartz sand.

[b]MTCA Method A cleanup level.

[c]Site-specific cleanup level.

[d]Toxicity characteristic regulatory limit from Table 1 of U.S. 40 Code of Federal Regulations part 261.24.

[e]Dissolved arsenic will be filtered in the field.

[f]Washington State Background Arsenic, Yakima Basin.

References

[1]Ecology. 2025. *Cleanup Levels and Risk Calculation (CLARC) table*. Washington State Department of Ecology, Toxics Cleanup Program. February.

[2]Ecology. 2022. *Natural Background Groundwater Arsenic Concentrations in Washington State* , Publication No. 14-09-044. Washington State Department of Ecology. January.

[3]MFA. 2025. *Cleanup Action Plan, Roslyn No. 4 Mine*. Prepared for Forterra Roslyn LLC. Maul Foster & Alongi, Inc.: Vancouver, WA. Forthcoming.