UNION HILL WATER ASSOCIATION OVERLAKE SCHOOL WATER MAIN, PHASE 2 WETLAND RESTORATION CRITICAL AREAS REPORT

Prepared for Union Hill Water Association

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Prepared by:
RH2 Engineering, Inc.
22722 29th Drive SE, Suite 210
Bothell, WA 98021
800.720.8052

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Responsible Parties

Applicant	Critical Areas Consultant	Design Consultant
Union Hill Water Association Teresa Fowlkes, General Manager 5020 236th Avenue NE Redmond, WA 98053 (425) 497-1812 teresa@uhwa.org	RH2 Engineering, Inc. Alicia Pettibone, PWS 22722 29th Drive SE, Suite 210 Bothell, WA 98021 (425) 951-5400 apettibone@rh2.com	RH2 Engineering, Inc. Doug Schlepp, PE 3535 Factoria Blvd SE, Suite 520 Bellevue, WA 98006 (425) 951-5320 dschlepp@rh2.com

Preface

This report has been prepared for use by the Union Hill Water Association (Association). In preparing this report, RH2 Engineering, Inc., (RH2) used site information from environmental data review and field investigations completed by RH2, topographic survey and design information from Stantec, and site plans reflecting wetland delineations completed by Altmann Oliver and Associates (AOA) in 2018, which were provided by the Overlake School (the property owner). Data and mapping used to prepare this report was obtained from King County (County), the Washington Department of Fish and Wildlife (WDFW), the Washington State Department of Natural Resources (DNR), the Washington State Department of Ecology (Ecology), and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), among others. Findings detailed in this report are based on information gathered in the field at the time of investigation by RH2, as well as RH2's understanding of federal, state, and local regulations governing wetland and stream areas. The critical areas boundaries, classifications, and recommended buffers reflect the County Critical Areas Code based on the site conditions at the time of the investigation and preparation of this report. These recommendations are subject to change pending review by the appropriate jurisdictional agencies.

General Information

1. Project Name: Overlake School Water Main Phase 2 Wetland Restoration

2. Name of Applicant: Union Hill Water Association

3. Name of Organization Providing this Information: RH2

4. Technical Expertise/Qualifications: Resumes for RH2 staff involved in preparing this report are provided in **Appendix A**.

5. Date Prepared: December 1, 2025

6. Location of the Project: The Association completed a water main extension along NE 106th Place and 202nd Avenue NE roadways, which are within the Overlake School main campus in the Union

Hill/Novelty Hill area of King County. The project occurred on parcel nos. 1243100160 and 1243100145, within Section 32 of Township 26N and Range 06 East.

7. Identification of the Project: During construction of the water main extension on 202nd Avenue NE, the Association's contractor encountered groundwater upwelling in the water main trench. To alleviate the situation and continue water main installation, the contractor installed a bentonite dam in the water main trench, and then placed approximately 70 linear feet (lf) of 4-inch perforated polyvinyl chloride (PVC) pipe, which was installed due north of the water main, along with an area for draining of the upwelling groundwater. The perforated PVC pipe was wrapped with geotextile fabric and topped with gravel and earthen material. This work involved inadvertent clearing, grading, and placement of fill within wetland and buffer habitats. This report summarizes the as-built conditions following this inadvertent violation and proposes a permanent solution, including restoration of the disturbed wetland area, placement of a permanent groundwater flow splitter in the wetland buffer, and wetland mitigation to compensate for the initial disturbance and the proposed permanent solution.

8. Description of Existing Site: NE 106th Place provides access to the Overlake School from NE Redmond Road, and 202nd Avenue NE provides internal access to the buildings and infrastructure of the school. At the site of the water main extension, the areas north and south of 202nd Avenue NE are forested. North of the roadway, a slope wetland is present, which has been significantly modified and reduced over time through land use activities. Consequently, areas surrounding the wetland are regularly mowed, and the wetland boundary and portions of the interior, are overrun with blackberry (*Rubus sp*.) and other noxious weeds.

9. Report Accuracy: This report was prepared to reflect the project site conditions and detail inadvertent impacts and proposed restoration of the impacted wetland and buffer areas. This report reflects critical areas classification and reporting requirements outlined in King County Code (KCC) Chapters 21A.24 and 23.32.

10. Site Design: Plans detailing the as-built conditions, proposed restoration, and permanent groundwater flow splitter are in **Appendix B**.

11. Bibliography: Sources cited are listed in the **References** section.

Introduction

Project Overview

Construction of the Overlake School Water Main Phase 2 was completed in summer 2025. The Phase 2 water main connected water main completed in Phase 1, allowing the Association to better serve the Overlake School with water service. Construction of this phase was accomplished by Team Nelson (contractor), with design plans provided by Stantec and services during construction provided by RH2. Phase 2 water main installation adjacent to 202nd Avenue NE encountered upwelling groundwater. This situation was remedied by installing 70 lf of 4-inch perforated PVC pipe to divert the clean groundwater north of the water main and return flows to the perceived downslope drainage pathway. The result was a more concentrated groundwater flow into an existing wetland, altering the wetland's hydrology. Clearing and grading to install this remedy resulted in the advertent clearing of approximately 929 square feet (sf) of brush (Himalayan blackberry, reed canary grass, and emergent

wetland species), which was identified later by the Overlake School as a wetland (delineated in 2018 by AOA). The wetland affected by construction is a Category 3 slope wetland, delineated by RH2 in late July 2025 and referred to herein as Wetland D.

The proposed project will restore the disturbed wetland area through the removal of the PVC pipe and rock, earthen, and geotextile fill materials, and restoration with native planting. Additionally, the project proposes a permanent groundwater flow splitter through the installation of 4-inch solid and perforated PVC pipe, located in the wetland buffer west of the wetland itself. Finally, the project proposes approximately 3,900 sf of wetland buffer enhancement by removing invasives and replanting with natives. Wetland buffer mitigation will be installed around the location of the proposed flow splitter. The proposed wetland restoration compensates for the initial wetland disturbance from the Phase 2 water main construction, as well as the permanent groundwater flow splitter at a nearly 3:1 ratio.

Regulatory Requirements

This report has been prepared to detail existing conditions with respect to Wetland D, the inadvertent disturbance of the wetland, proposed restoration, proposed permanent infrastructure, and wetland buffer mitigation, which are required per Chapter 21A.24 KCC. It is anticipated that the project will be reviewed and approved by the County through a Grading Permit process, necessitating State Environmental Policy Act (SEPA) and Critical Areas Ordinance reviews.

Background and Methodology

Prior to environmental site investigations, RH2 reviewed the following data: existing and historical aerial photography (Google Earth, historical aerials); stream and wetland mapping (County, Ecology, WDFW, and U.S. Fish and Wildlife Service (USFWS)); topography (County, and U.S. Geological Survey); LIDAR (DNR); floodplain mapping (County and the Federal Emergency Management Agency); geologic hazards (DNR and County); fish and wildlife occurrence data (WDFW, National Marine Fisheries Service, and USFWS); and soils data (NRCS Soil Conservation Service).

Field investigations were completed on July 25, and July 28, 2025, by Alicia Pettibone and Kyle Wisner of RH2. During these field investigations, the following activities were completed:

- Identified and characterized aquatic critical areas on the project site.
- Identified and delineated the boundary of wetlands on the project site.
- Observed and recorded fish and wildlife usage of the project site or adjacent habitat areas.
- Collected photographs and environmental data on the project site.

The following methodologies were used to identify, rate, and characterize the wetland:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (U.S. Army Corps of Engineers (USACE) Publication ERDC/EL TR-10-3, 2010).
- *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby, Ecology Publication 14-06-029, 2014).
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, USFWS

Publication FWS/OBS-79/31, 1979).
- *A Hydrogeomorphic Classification for Wetlands* (Brinson, USACE Publication WRP-DE-4, 1993).
- Chapter 21A.24 KCC – Critical Areas

Results

Existing Environmental Data

The County's iMap GIS data, along with Ecology's Environmental Information Management database map and AOA's 2018 site plans, indicate that there are waterbodies, streams, and wetlands in proximity to the project area. The AOA site plan shows several wetlands surrounding the project site in proximity to NE 108th Street and 202nd Avenue NE. Mackey Creek, a Type F stream located approximately ¼ miles northeast of the project site, flows east to west and drains into Lake Sammamish. An unnamed Type F watercourse and associated freshwater ponds are located approximately ¼ miles southwest of the project site. The unnamed stream flows southeast to northwest and drains into Lake Sammamish.

The USFWS National Wetland Inventory mapper shows Mackey Creek as a riverine system located southeast of the project area. A 0.42-acre (ac) excavated palustrine waterbody and a 3.32-ac freshwater forested/shrub wetland both associated with Mackey Creek are present approximately 0.3 miles east of the project site.

According to the Statewide Integrated Fisheries Database mapper, Mackey Creek has been documented to support fall Chinook salmon (*Oncorhynchus tshawytscha*), winter steelhead trout (*O. mykiss*), has the potential to support sockeye salmon (*O. nerka*), and supports transported spawning of coho salmon (*O. kisutch*). The unnamed stream southwest of Wetland D has the potential to support fall Chinook, coho, sockeye, and winter steelhead.

According to the USFWS Information for Planning and Consultation (IPaC) database, marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), northwestern pond turtle (*Actinemys marmorata*), bull trout (*Salvelinus confluentus*), monarch butterfly (*Danaus plexippus*), and Suckley's cuckoo bumble bee (*Bombus suckleyi*) are listed as potentially present in the vicinity of Wetland D; however, no suitable habitat was observed by RH2 in the project area for any of these species.

According to County GIS data, the project site is not mapped as being within the 100- or 500-year flood zones.

According to DNR's Washington Natural Heritage Program Data Explorer, no rare plant and nonvascular species of high conservation value occur within or near the project site.

DNR's Forest Practices Activity Map is consistent with the previously described streams and wetlands mapped in the project area.

Refer to **Appendix C** for background maps and data.

General Site Conditions

The project area is in unincorporated King County approximately 1 mile east of Redmond city limits. The water main alignment is located along the eastern right-of-way (ROW) of NE 108th Street and the northern ROW of 202nd Avenue NE. The area is moderately developed and within the Rural, one dwelling per 5 acres (RA-5) County zoning designation. The surrounding land supports single-family homes and Overlake School educational facilities, with the Overlake School main campus located south of the alignment. The area is dominated by mature, fragmented coniferous forest stands underlain by a shrub and herbaceous understory. Lawns and recreational areas associated with residential and Overlake School development comprise the remaining land coverage surrounding the project area. Due north of the Phase 2 water main project and 202nd Avenue NE, vegetation is dominated by mature deciduous trees and native shrubs, as well as emergent areas, which comprise an on-site wetland. Current and historical aerial imagery of the site is included in **Appendix C**. Site photographs are included in **Appendix D**.

The site sits on a shallow terrace with sloping terrain descending east to west, increasing in grade along the western edge of the alignment. The steepest slopes are associated with the 202nd Avenue NE embankment, which reaches a maximum grade of 27 percent. The shallowest slopes are associated with the wetland north of the site and have slopes as little as 2-percent grade. Precipitation onsite accumulates within ditches along roadways and in wetlands surrounding the project site, following local topography and eventually draining into the greater Mackey Creek watershed.

Critical areas observed onsite include two wetlands located north and south of the project area. The wetland north of the project area, herein referred to as Wetland D, is addressed in this report and documented on site plans provided by AOA. The unnamed wetland south of the project alignment is not addressed in this report but was delineated by AOA in 2018, and its presence was confirmed by RH2 during July 2025 site investigations. No impacts to this southerly wetland occurred or are proposed.

Wetland D

Wetland D is a slope wetland encompassing approximately 51,000 sf of area north of the Overlake School's main facility buildings (**Figure 1**). Wetland D's geography consists of a shallow topographic slope with emergent, scrub-shrub, and forested vegetation. It is located on parcels no. 1243100160 and 1243100145, both privately owned by the Overlake School. NE 108th Street and 202nd Avenue NE run parallel to Wetland D's southern border. Residential homes and Overlake School structures surrounding the wetland are dispersed within patches of forested land fragmented by sparsely vegetated areas and paved roads. There is very little undisturbed land directly adjacent to the wetland. The land immediately surrounding Wetland D has been cleared and grassed, and is regularly mowed as school ground areas. Mulched walking paths have been installed within and surrounding the wetland, and a gravel parking area was installed west of the wetland boundary. These present-day conditions appear to have occurred prior to and since the 2018 AOA delineations.

Wetland D exhibits characteristics of habitat fragmentation indicative of historical site alterations. During RH2's site investigations, evidence of past clearing was observed onsite, including cut tree stumps and associated logs, mulch and topsoil fill, and large communities of invasive species such as Himalayan blackberry (*Rubus armeniacus*), cut-leaf blackberry (*R. laciniatus*), reed canary grass

(*Phalaris arundinacea*), and bird's-foot trefoil (*Lotus corniculatus*) along the wetland boundary and beginning to overtake its interior. A cleared and mulched footpath exists within the eastern portion of the site, having entrances located on the southeast and northern border of Wetland D. Heavily stunted hydrophytic plant species such as skunk cabbage (*Lysichiton americanus*) were observed by RH2 staff in dryer portions of Wetland D and overgrown with Himalayan blackberry, providing further evidence of the extent of the wetland's alteration. Review of historical aerial photographs obtained through the County, Google Earth, and historical aerials shows evidence of heavy clearing activity within Wetland D dated to as early as 1964. Later aerial imagery showed that much of the wetland remained an emergent wetland Cowardin class from 1990 to 1998, when evidence of shrub and tree growth is seen. It appears many of the alterations to wetland occurred within the 2018 delineated wetland boundary since that time. **Appendix C** includes recent and historical aerial imagery of Wetland D.

Vegetation

Wetland D consists of forested Cowardin-class plant coverage, with pockets of scrub-shrub understory distributed within. The southwest portion of the wetland differs from this pattern and consists of primarily emergent plants, with small pockmarks of scrub-shrub coverage along the southern and western borders.

Dominant wetland herbaceous species include soft rush (*Juncus effusus*), slough sedge (*Carex obnupta*), creeping buttercup (*Ranunculus repens*), reed canary grass, and redtop bentgrass (*Agrostis gigantea*). Other, non-dominant herbaceous wetland species observed include pointed broom sedge (*Carex scoparia*) and eggbract sedge (*Carex leporina*). Dominant wetland shrub species include red alder saplings (*Alnus rubra*) and red-osier dogwood (*Cornus alba*). Dominant wetland tree species include red alder (*Alnus rubra*).

Within the Wetland D buffer, dominant upland herbaceous plant species include trailing blackberry (*Rubus ursinus*). Other non-dominant upland herbaceous species observed include orchard grass (*Dactylis glomerata*), sweet vernal grass (*Anthoxanthum odoratum*), and tiny vetch (*Vicia hirsuta*). Upland woody vine species include Himalayan blackberry and cut-leaf blackberry. Western red cedar (*Thuja plicata*) and Douglas fir (*Pseudotsuga menziesii*) were observed in the wetland's northern buffer.

Non-native and invasive species observed at the site include Himalayan and cut-leaf blackberries, reed canary grass, sweet vernal grass, Canada thistle (*Cirsium arvense*), and bird's-foot trefoil.

Soils

According to NRCS soil survey data, Wetland D is within the Alderwood gravelly sandy loam, 8 to 15 percent slopes soil map unit, which is primarily comprised of a moderately well-drained sandy loam underlain by very gravelly sandy loam. Sandy clay loam and clay loam were the dominant textures of test pits dug in wetland areas, while test pits dug in upland areas were loam, sandy loam, and sandy clay loam, which generally coincided with NRCS descriptions. Wetland soil predominately exhibited the hydric soil indicator Depleted Below Dark Surface (A11); Hydrogen Sulfide Smell (A4) was also observed.

Soil test pits (TP) excavated in Wetland D exhibited a matrix color of very dark grayish brown/black in the surface layer (Munsell 10YR 3/2 or 2/1) underlain by a depleted matrix of dark grayish

brown/grayish brown (Munsell 10YR 4/2 or 2.5Y 5/2). The depleted matrix contained very dark brown, strong brown, and reddish yellow (Munsell 7.5YR 2.5/2, 4/6 and 5/8) redoximorphic concentrations. Redox concentrations observed in the test pits were categorized primarily as common (2 to 20 percent concentration), fine (less than 2 millimeters (mm)) to medium (2 to 5 mm) sized, and prominent in color. Non-hydric soils were brown (Munsell 10YR 4/3) and lacked redox features.

Drainage/Hydrology

Commonly observed hydrology indicators were High Water Table (A2), Saturation (A3), Hydrogen Sulfide Odor (C1), and Stunted or Stressed Plants (D1). The secondary hydrology indicator FAC-Neutral Test (D5) was also met. The site's hydrology is mainly driven by groundwater discharge, with precipitation and runoff likely to be a prominent source of inundation during the wet season. Based on observations from on-site features and aerial imagery, groundwater hydrology likely originates from a water table intersection at the ground surface. The wetland's hydrology outlet is a Type N drainage at the northwest corner of the wetland, likely draining northwest into Mackey Creek via an unidentified tributary. Evidence of seasonal and occasional inundation, and saturated only hydroperiods were observed onsite and on aerial imagery.

Table 1. Wetland D Evaluation Summary

Wetland D Evaluation Summary		
Wetland Name	Wetland D	 Facing northeast from just north of 202nd Avenue NE.
Location	Parcel nos. 1243100160, 1243100145	
Local Jurisdiction	King County	
Ecology Rating (Hruby, 2014)	Category III	
Buffer Width	110 feet	
Wetland Size	~51,000 sf (1.17 ac)	
Cowardin Classification	PEM/PSS/PFO	
HGM Classification	Slope	
Associated Waterbody	Mackey Creek	
Data Sheet(s)	TP-1, TP-3 (IN) TP-2, TP-4 (OUT)	
Dominant Vegetation	Red alder, Himalayan blackberry, trailing blackberry, cut-leaf blackberry, reed canary grass, slough sedge, soft rush, creeping buttercup, redtop bentgrass	
Soil Indicators	Hydrogen Sulfide Smell (A4), Depleted Below Dark Surface (A11)	
Hydrology Indicators	High Water Table (A2), Saturation (A3), Hydrogen Sulfide Odor (C1), Stunted or Stressed Plants (D1), FAC – Neutral Test (D5)	

Functional Wetland Assessment

The functional assessment of wetland habitat is based on wetland ratings completed using Ecology's 2014 *Wetland Rating System for Western Washington*. This system is designed to provide a rapid, qualitative rating of wetland functions. It does not replace a full assessment of wetland functions. For rating purposes, wetland functions are divided into water quality, hydrologic, and habitat. Site potential, landscape potential, and value are assessed for each of these functions. **Table 2** provides a summary of the wetland habitat functions based on this rating. Wetland rating data and maps are contained in **Appendix E**.

Table 2. Qualitative Rating of Wetland D

Function	Qualitative Rating of Function
Water Quality Functions	
Site Potential to Improve Water Quality	Moderate
Landscape Potential to Support Water Quality Functions	Moderate
Value Rating for the Water Quality Improvement	High
Hydrologic Functions	
Site Potential to Perform Hydrologic Functions	Low
Landscape Potential to Support Hydrologic Functions	Moderate
Value Rating for the Hydrologic Functions	Moderate
Habitat Functions	
Site Potential to Provide Habitat	Moderate
Landscape Potential to Support Habitat Functions	Moderate
Value Rating for Habitat Functions	High
Total Rating Score	**19**
Wetland Category	**III**

Water Quality Functions

Wetland D has a moderate potential for water quality improvement. The wetland is densely vegetated by emergent, scrub-shrub, and woody plant species and exists within a slight depressional area that can trap sediments during storm events and uptake pollutants. Wetland D's landscape has the potential to support water quality functions via its proximity to lands with institutional, residential, and pasture uses that can generate additional runoff, sediments, and pollutants therein. Wetland D provides moderate societal value for water quality improvement due to its location adjacent to a sub-basin with a 303(d) listed water body, specifically an unnamed tributary to Mackey Creek (and ultimately Bear Creek) located 1 mile west of the site. Although Wetland D does not discharge directly to this waterbody, it contributes to improving water quality in both the subbasin it occupies and adjacent sub-basins. In addition, a Total Maximum Daily Load (TMDL) has been issued for the Bear-Evans Creek basin, which encompasses the site.

Hydrologic Functions

Wetland D is rated as having a moderately low hydrologic function. The wetland lacks dense, uncut, rigid plants over 90 percent of its area, which would serve to reduce water velocity in a high flow or flood scenario. However, more than 25 percent of the area 150 feet upslope of Wetland D consists of land use that generate excess runoff, allowing it to uptake and sequester excess surface runoff from adjacent land; therefore, giving Wetland D a moderate landscape potential to support hydrologic function. Although Wetland D is not identified as being important for regional flood control, it does offer some surface flooding alleviation for sub-basins downstream.

Habitat Functions

Wetland D exhibits a moderately high potential for supporting habitat functions in the area. It received a moderate score for its potential to enhance surrounding habitat due to factors such as moderate plant diversity, various hydroperiods, and presence of special habitat features (e.g., large woody debris, standing snags, and amphibian habitat). The landscape potential of Wetland D to support habitat functions of the site is moderate since the greater surrounding area contains a low amount of directly accessible yet moderately undisturbed habitat. However, the surrounding area hosts a variety of WFDW priority habitats, including mature forests, snags and logs, and instream habitat, thereby enhancing the societal value of Wetland D's habitat.

Wildlife and Endangered Species Use

Since Wetland D is within a moderately developed area, bird, mammal, and amphibian usage is likely limited to more common urban wildlife species. Wildlife usage within the wetland is likely to be higher due to the presence of favorable habitat characteristics (e.g., canopy cover, water source, interspersion of habitats, proximity to undisturbed forested areas, etc.). Various songbirds including willow flycatcher (*Empidonax traillii*), American robin (*Turdus migratotius*), and American goldfinch (*Spinus tristis*), as well as other bird species were heard and observed by RH2. Wetland D provides moderate amphibian habitat; RH2 audibly observed an unidentified frog species while conducting site investigations, and habitat is available for amphibians in general. Other wildlife expected to be present on and near the site includes garter snakes, squirrel, rodents, coyote, raccoon, and opossum.

Based on a review of WDFW's Priority Habitat and Species (PHS) data, the site does not provide habitat for any PHS-listed species. USFWS IPaC data does not show any critical habitat on or near the project site.

Based on a review of the DNR Natural Heritage data, as well as RH2's site investigations, the project site does not support locally important, priority, or state or federally listed plant species.

Project Impacts and Mitigation

Mitigation Sequencing

KCC 21A.24.125 requires applicants proposing development adjacent to or within critical areas to employ mitigation sequencing, to be implemented in order, as follows:

1. Avoiding the impact or hazard by not taking a certain action;

2. Minimizing the impact or hazard by:
   a. limiting the degree or magnitude of the action with appropriate technology; or
   b. taking affirmative steps, such as project redesign, relocation or timing.
3. Rectifying the impact to critical areas by repairing, rehabilitating or restoring the affected critical area or its buffer;
4. Minimizing or eliminating the hazard by restoring or stabilizing the hazard area through engineered or other methods;
5. Reducing or eliminating the impact or hazard overtime by preservation or maintenance operations during the life of the development proposal or alteration;
6. Compensating for the adverse impact by enhancing critical areas and their buffers or creating substitute critical areas and their buffers; and
7. Monitoring the impact, hazard or success of required mitigation and taking remedial action.

Project disturbance to Wetland D occurred inadvertently during construction. The Association and contractor encountered unexpected groundwater in the water main trench and devised the groundwater dispersion pipe solution quickly to remedy the situation. The construction parties were not aware that the solution involved disturbance to a wetland and buffer until after the groundwater dispersion solution had been implemented. Consequently, for the wetland restoration proposed, mitigation sequencing involves steps 6 and 7.

For the proposed permanent groundwater flow splitter, design has focused on removing the pipeline from the wetland itself and proposes installing the 4-inch PVC pipe in the buffer areas, targeting areas that are maintained right-of-way grass and/or disturbed with a prevalence of noxious weeds. Proposed mitigation will occur around the permanent groundwater flow splitter to both compensate for the initial inadvertent wetland disturbance and the proposed permanent groundwater flow splitter, and to slow velocities and trap sediment from the groundwater discharge and return hydrology to the wetland in a distributed fashion (more closely mimicking existing hydrology delivery in this wetland). In this way, design of the wetland restoration, project improvements, and buffer mitigation follows the County's mitigation sequencing.

Project Impacts

Phase 2 water main improvements adjacent to 202nd Avenue NE encountered upwelling groundwater within the utility trench. To remedy the situation, a bentonite dam was installed in the water main trench and groundwater was diverted due north to redirect encountered groundwater to its perceived downstream flow pathway. Groundwater was diverted north through the installation of approximately 70 lf of 4-inch perforated PVC pipe wrapped in geotextile fabric and covered with gravel and earthen material. This work resulted in clearing and grading within approximately 929 sf of area (879 sf within the wetland and 50 sf in the southerly buffer) and placement of approximately 21 cubic yards (cy) of washed gravel and earthen fill material (refer to the As-Built Plans in **Appendix B**). In addition to clearing, grading, and fill material, the construction fix has resulted in more of a concentrated surface water discharge into the wetland. During RH2's delineation work, an active overland flow pathway was observed with more prevalence of inundation (1- to 2-inch depth) downstream of the groundwater dispersion pipe than other

areas of the wetland.

The proposed wetland restoration will remove the groundwater dispersion pipe, fill material, and cleared vegetative debris, and replant the wetland and buffer with native shrub and emergent species. The existing PVC pipe within the buffer will be intercepted with approximately 110 lf of 4-inch PVC pipe and directed west and north into the wetland buffer west of the wetland. The solid PVC pipe will then be outfitted with a 4-inch PVC perforated pipe (20 feet long), buried shallowly, and bedded with washed rock and earthen material (level-spreader). This proposed permanent groundwater flow splitter will involve clearing and grading over 460 sf and fill of 25 cy in the existing wetland buffer, in areas of maintained lawn and blackberry infested buffer (refer to the Existing and Proposed Site Plan in **Appendix B**). **Table 3** summarizes the prior and proposed project impacts to critical areas.

Table 3. Summary of Project Impacts

Impact Duration	Impact Type	Project Actions	Impact Locations		
			Wetland (sf)/ Fill (cy)	Wetland Buffer (sf)/ Fill (cy)	Total (sf/ac)
Temporary (area to be restored)	Clearing, grading, and fill from groundwater dispersion pipe	Removal of groundwater dispersion pipe materials and restoration of area	929/21	50	929/0.02
Permanent	Clearing, grading, and fill for permanent groundwater flow splitter	Clearing and grading within buffer to install new groundwater flow splitter	--	460/25	460/0.01

Wetland Restoration and Buffer Mitigation

The proposed wetland restoration will remove the groundwater dispersion pipe, fill material, and cleared vegetative debris, and replant the wetland and buffer with native shrub and emergent species.

Groundwater will be intercepted and piped west and north within permanent 4-inch PVC pipe, which will deliver groundwater to the wetland buffer and discharge via dispersed flow (proposed groundwater flow splitter), allowing flow into the wetland to more closely mimic the existing wetland hydrology regime (i.e., groundwater upwelling). The wetland buffer area proposed to be impacted by the permanent groundwater flow splitter has been impacted by adjacent land use clearing, allowing for an overgrowth of blackberry. Consequently, proposed wetland mitigation also includes clearing of a large infestation of blackberry within the wetland buffer and replanting with native trees and shrubs. Native shrubs will be planted downslope and surrounding the groundwater flow splitter to uptake and slow groundwater flows and sediment prior to reaching the wetland (refer to the Existing and Proposed Site Plan and Wetland Restoration and Mitigation Plan in **Appendix B**). **Table 4** summarizes the proposed project mitigation.

Table 4. Summary of Project Mitigation

Category of Mitigation	Proposed Mitigation Activities	Required Mitigation Ratio	Proposed Mitigation Ratio	Required Area (sf)	Proposed Area (sf)
Wetland Restoration	Remove groundwater dispersion pipe and fill and replant	2:1[1]	3:1	1,858	4,829 (929 restoration of disturbed wetland and 3,900 buffer mitigation)
Wetland Buffer Enhancement	Remove blackberry and replant buffer with natives, compensate for permanent groundwater flow splitter in buffer	1:1[2]		460[3]	
				Total	**4,829**

[1] KCC 21A.24.340C establishes mitigation ratios for temporary alteration to wetlands. Distinction is made between permanent conversion of forested and shrub wetlands into emergent wetlands, and temporal loss of forested and shrub wetlands that are revegetated in kind. Wetland D exhibits both forested and shrub, and emergent categories and proposed restoration will replace vegetation according to existing communities (i.e., both shrub and emergent plant communities). Therefore, a ratio of 2:1 was used.
[2] KCC 21A.24.340.B requires a restoration ratio of 1:1 for alterations to a wetland buffer.
[3] Reflects the area of proposed buffer impact for the permanent groundwater flow splitter pipe and level spreader.

Avoidance and Minimization Measures

The following minimization measures are recommended for proposed construction activities to avoid further adverse impacts to Wetland D and its buffer. These measures reflect the requirements in Chapter 21A.24 KCC to the extent they are applicable.

- Employ appropriate temporary erosion and sediment control measures, such as marking clearing limits, installing silt fence, timing construction outside of the wet season, disposing of noxious weeds removed offsite, etc.
- Avoid further removal of native vegetation within Wetland D and its buffer. Retain all native trees and shrubs in the construction work areas.
- Constrain clearing limits for the permanent groundwater flow splitter and wetland mitigation areas.
- Use hand tools and manpower in Wetland D to remove the groundwater dispersion pipe, fill material, and vegetative debris. No heavy equipment is permitted. Similarly, utilize light-duty equipment, hand tools, and manpower for clearing and grading activities in the proposed wetland buffer areas.
- Limit wetland restoration and buffer work to daytime hours to minimize disturbance to wildlife.
- Restore the ground to preexisting or better conditions using a native seed mix and native vegetation in Wetland D and all impacted buffer areas.
- Prevent the introduction of non-native vegetation or wildlife species during construction. For example, limit non-native seed in planting material, properly wash equipment used in proximity to or within Wetland D and its buffer before and after entry, contain and properly dispose of invasive or noxious weed species during clearing and grading activities, etc.

Mitigation Goals and Objectives

The following goals are guiding mitigation efforts:

- Restore the disturbance to Wetland D by removing the groundwater diversion pipe and materials and replanting with native emergent and shrub species.
- Compensate for impacts to Wetland D by restoring the disturbed area and enhancing existing wetland buffer habitat.
- Construct a permanent groundwater dispersion flow splitter that will return groundwater intercepted in the water main trench to Wetland D in a manner that mimics pre-construction hydrology delivery to the wetland (i.e., through groundwater upwelling).
- Compensate for temporary and permanent wetland buffer impacts from installation of the permanent groundwater flow splitter.

The following objectives are guiding mitigation efforts:

- Restore approximately 929 sf of Wetland D and adjacent buffer in the location of the groundwater dispersion pipe.
- Compensate for construction of a permanent groundwater flow splitter in the wetland buffer and impacts to Wetland D by enhancing approximately 3,900 sf of existing degraded wetland buffer. Enhance the existing noxious weed dominant wetland buffer with native trees and shrubs.
- Restore wetland hydrology to Wetland D in a diffuse manner that mimics pre-construction pathways and does not cause channelization of flows, erosion, or adversely impact the functions of Wetland D.

Performance Measures and Standards

Performance measures and standards are used to quantify whether the mitigation goals and objectives are being met. Monitoring of the site will occur for at least 5 years unless the site meets the standards of success sooner or monitoring is needed for a longer duration to achieve performance standards. Performance of the site, in accordance with the measures and standards that follow, will be assessed annually in permanent monitoring plots for the duration of monitoring efforts. Monitoring shall be performed by a qualified professional biologist or wetland ecologist with reports prepared documenting site progress. Monitoring is recommended to begin the first growing season following mitigation installation, and annually thereafter. Monitoring is the responsibility of the Association or its assigns. The following performance measures and standards are proposed for this restoration and mitigation site.

Survival of Installed Plantings

- Performance Measure (Year 1): There will be 100-percent survival of installed plantings. If all dead plantings are replaced, this measure will be met.
- Performance Standard (Year 5): There will be at least 80-percent survival of installed plants.

Percent Cover

- Performance Measure (Year 2): Aerial cover of native emergent, shrub, and tree species (planted and volunteer) will be at least 20 percent.
- Performance Measure (Year 3): Aerial cover of native emergent, shrub, and tree species

(planted and volunteer) will be at least 30 percent.
- Performance Standard (Year 5): Aerial cover of native emergent, shrub, and tree species, and emergent and groundcover species, will be at least 50 percent.

Non-Native and Invasive Species

- Performance Measure (All years): County-listed Class A, B, and C noxious weeds, including non-native blackberries (i.e., *Rubus armeniacus* and *R. laciniatus*) and reed canary grass (*Phalaris arundinacea*) will not exceed 20-percent aerial cover at the mitigation site.
- Performance Standard (Year 5): County-listed Class A, B, and C noxious weeds, non-native blackberries, and reed canary grass will not exceed 20-percent aerial cover at the mitigation site.

Hydrology

- Performance Measure (All years): Within areas downslope of the permanent groundwater flow splitter (recommended 50-foot radius downslope of the flow splitter), document visual indicators of hydrology such as ponding, saturation, inundation, or surface flow.
- Performance Measure (Years 2, 3, and 5): In the hydrology monitoring area downslope of the groundwater flow splitter, excavate sample test pit(s) and document the extent of saturation between the soil surface and a 16-inch depth. Document development of hydric soils, such as redoximorphic features or depleted matrix.
- Performance Standard (All years): Hydrology from intercepted groundwater is returned to the wetland in a manner that mimics prior hydrology delivery, and wetland hydrology is established downslope of the permanent groundwater flow splitter.

Monitoring Program

Monitoring of the mitigation area is the responsibility of the Association or its assigns. Monitoring will begin the first growing season following mitigation installation and shall continue for a period of 5 years unless the site meets the standards of success sooner and/or monitoring is required to be longer to meet site success. Monitoring activities shall occur annually, preferably in the spring or summer, to facilitate site maintenance by the fall season. The results of monitoring activities will be summarized in reports submitted annually. Reports shall be provided to the County for review. Monitoring methods will include the following activities:

- During final inspection of construction activities, flag installed plantings and label one in five species for future identification. Note any dead or struggling plantings for replacement.
- Establish four photopoint locations to record mitigation site progress, capturing the entire mitigation area. Collect photos at each photopoint during all monitoring site visits and include photos with monitoring reports. Record photopoint locations on a monitoring plan map and include with monitoring reports.
- Report on plant survival, diversity, vigor, aerial coverage, etc., for every plant community. Reporting shall be completed to detail the mitigation site's success in general, as well as to assess the site's success in meeting performance measures and standards.
- Establish at least 3 permanent 50-foot linear transects that will adequately assess the percent

cover of plants in the wetland restoration and mitigation area. Include mitigation plantings, native and non-native recruitments, and invasive species in aerial cover calculations. Percent cover calculations will be reported, along with associated data forms, in monitoring reports. Record transect locations on a monitoring plan map and include with monitoring reports.

- Establish one 50-foot-diameter permanent radial plot for monitoring of wetland hydrology downslope of the permanent groundwater flow splitter. Include the location on the monitoring plan map.
- Report on invasive species control and specific maintenance activities, and provide recommendations for continued invasive species control, as needed.
- Report on any dead or dying specimens and provide recommendations for replacement, as necessary. Replace all dead plant material within 30 days of discovery.
- Report on on-site hydrology, including extent of surface water, inundation, and saturation in and/or downslope of the mitigation area. Report on channelization or erosion observed at/around the groundwater flow splitter.
- Report on wildlife use, nests, or evidence of use of the mitigation site or surrounding areas.
- Include any receipts for off-site dumping, replaced structural repair, or other materials associated with monitoring and maintenance activities.

If any of the performance measures and standards are not being met, monitoring reports will detail discrepancies and provide a list of applicable activities to bring the site into compliance. If contingencies are necessary to remedy issues at the mitigation site, provide recommendations in monitoring reports.

Maintenance Program

The maintenance program will be the responsibility of the Association or its assigns. To achieve performance standards and ensure success of the mitigation site, maintenance activities will continue for the duration of the monitoring period.

Maintenance activities shall be performed twice yearly (spring and fall) during the first 3 years to ensure that plantings become established, invasive species are controlled, and any problems encountered are addressed immediately. Subsequent maintenance shall be performed annually; however, more regular maintenance should be implemented as needed for site success.

During each site visit, the following maintenance activities shall be performed:

- Remove all noxious weeds, including Himalayan and evergreen blackberries, reed canary grass, knotweeds, thistles, etc. Remove above-ground plant parts and root mass manually or using light-duty equipment. Protect all mitigation plantings during invasive species removal. Dispose of all removed plant parts offsite. Restore ground surface to pre-existing conditions, as needed, following weedy species removal.
- Remove all litter and garbage from the mitigation area, including refuse generated during monitoring or maintenance activities.
- Replace damaged or missing structures, such as deer fencing, tree staking, plant labels, etc. Remove deer fencing from around the mitigation site before the end of the monitoring period.
- Ensure the groundwater flow splitter is functional and operating as designed (i.e., delivering flows to the wetland buffer and downslope Wetland D in a dispersed fashion).

- Replace/augment mulch to maintain a minimum 4-inch height in the watering basins. Apply additional mulch as needed to control invasives in the mitigation area.
- Replant uprooted plants or right leaning plants, and generally care for struggling plants.
- Prune dead branches, remove staking when appropriate, and generally care for plants.
- Replace dead plant material. Replacement plantings shall be in-kind unless directed otherwise. Replacement plantings shall be installed during the dormant period.
- Water plantings, as follows:
  - Water-in all plantings to establish them at the site following installation. Plantings installed in the spring through fall months will require additional watering for establishment.
  - Water at least four times between May/June (depending on spring rains) and October, providing 4 gallons of water to each tree and shrub planting at each watering. Adjust watering needs seasonally to account for rainfall, drought, etc.

Contingencies

A contingency plan identifies potential areas of failure and corrective actions for the mitigation activities. If monitoring results indicate that any of the performance standards are not being met, it may be necessary to implement all or part of the contingency plan. Careful attention to maintenance and establishment of the mitigation site is essential to ensuring that problems do not arise. Should any part of the mitigation site fail to meet the criteria for success, a contingency plan consistent with KCC 21A.24.130 will be developed on a case-by-case basis to address the problem at hand. Contingency plans shall be approved by and implemented with oversight from the County. Contingency activities may include the following:

- Replace plants lost to vandalism, drought, disease, wildlife, or pest infestation, as necessary, to satisfy performance measures and standards
- Should a plant species continue to fail on the site (15-percent mortality rate or greater), replace with a similar native species that would be better suited to site conditions. Similarly, if a particular wetland vegetation (i.e., obligate or facultative wet species) does not establish on the site near the groundwater flow splitter, replace with a similar native species better suited to the hydrology regime at the site.
- Should a woody plant species become a nuisance on the site (i.e., establishing over 70-percent aerial cover in any one plant community), selectively trim or remove the individual species.
- If monitoring determines that noxious or invasive plant species become a nuisance on the site (i.e., interfering with the establishment of mitigation plantings and/or exceeding the performance measures for invasive species), control and remove these species. Methods can include manual, mechanical, or chemical means, so long as they are pre-approved by the County and conducted using environmentally conscious methods.
- If monitoring determines that flows from the permanent groundwater flow splitter are causing channelization or erosion, modify the flow splitter, plant additional species downslope, or use other methods determined viable to alleviate the hydrology delivery into the wetland.

Conclusion

This report has been supplied to the Association and County to document conditions and anticipated project impacts associated with the Overlake School Water Main Phase 2 project. This report uses BAS and documents the investigation, best professional judgement, and conclusions of the investigator(s). The preparation of this report relied upon existing environmental databases, site investigations, data obtained from NRCS, WDFW, DNR, AOA, Ecology, and the County, and data collected by RH2. This report has been prepared to comply with the current laws regulating biological critical areas regulated by the County, state, and federal regulatory agencies. The report is correct and complete to the best of our knowledge. The work completed in preparing this report has conformed to the standard of care employed by environmental professionals. No other representation or warranty is made or implied.

RH2 ENGINEERING, INC.

Alicia Pettibone, PWS
Senior Ecologist

Kyle Wisner
Environmental Staff Scientist

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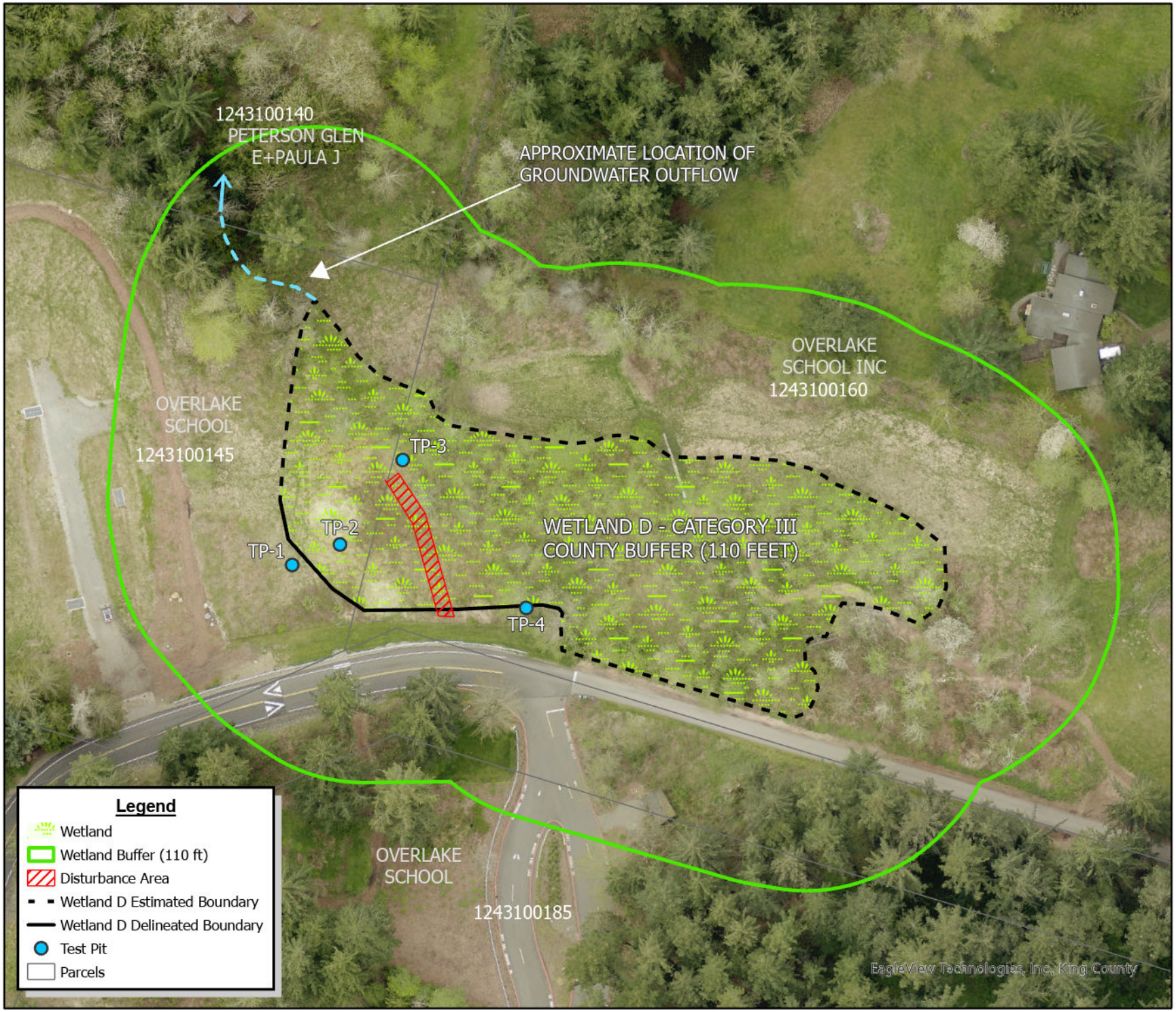
Figure 1

Critical Areas Overview Map



Vicinity Map

Critical Areas Overview

Union Hill Water Association
Overlake School Water Main
Phase 2

UNION HILL WATER ASSOCIATION

1 inch = 80 feet

0 20 40 80 Feet

DRAWING IS FULL SCALE
WHEN BAR MEASURES 1"

RH2

NORTH

J:\DATA\UHW\25-0002\TA10_OVERLAKE SCHOOL WM PH 2\GIS\ENVIRO\OVERLAKESCHOOL.APRX BY: KWISNER PLOT DATE: OCT 27, 2025 COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

Appendix A

Consultant Qualifications

Alicia Pettibone PWS

Senior Ecologist

Alicia manages RH2's environmental group. She works closely with RH2's staff and clients, as well as regulatory agencies throughout the state, to navigate the regulatory environment. She is adept at facilitating project compliance for critical areas-related projects from start to finish and is often involved with RH2's projects from scoping through construction. In all her work, Alicia delivers environmental services that are high-quality, thorough, and reliable.

Alicia has facilitated approvals through local, state, and federal agencies for the following permits: SEPA; NEPA; Hydraulic Project Approval (HPA); Shoreline Management Act compliance; Critical Areas Ordinance compliance; Endangered Species Act (ESA) compliance; Clean Water Act Section 401, Section 404, and Section 10; NPDES Construction Stormwater General Permit (CSGP); Floodplain Development; Land Use, Site Development, Building, and Construction Permits; and Cultural Resources compliance.

Alicia also leads wetland/stream ecology endeavors at RH2. Her project experience includes wetland and OHWM delineation, classification and functional assessment, regulatory compliance including permit applications and reports, restoration and compensatory mitigation design, construction document preparation, and mitigation monitoring.

Representative Project Experience

- Wetland and OHWM Delineation, SEPA, Critical Areas Report for the New Supply Line, City of Mercer Island
- Wetland and OHWM Delineation, SEPA, Critical Areas Report, Mitigation Design for the Tremont Lift Station, City of Bellingham
- Wetland and OHWM Delineations, Critical Areas Report, Wetland Mitigation Design for the Alger I-5 Water Main Replacement, PUD No. 1 of Skagit County
- Wetland and OHWM Delineation, Critical Areas Report, Wetland Mitigation Design, HPA and Section 404 Permit Support for Sub-basin 46.3a Watercourse Stabilization, City of Mercer Island
- Wetland and OHWM Delineation, Critical Areas Technical Memorandum, SEPA, Clearing and Grading, HPA for the C6 Water Main Connection, Covington Water District
- Wetland and OHWM Delineation, Critical Areas Report, SEPA, Shoreline Permitting, Floodplain Development Permit for Waterfront Park Force Main, City of Leavenworth
- OHWM Delineation, Critical Areas Report, SEPA, Shoreline Permitting, FEMA Habitat Assessment, and Special Use Permit for Old Port Lift Station, City of Olympia
- Wetland and OHWM Delineation, SEPA, Critical Areas Report, NEPA, BA, HPA, Cultural Resources facilitation, and Mitigation Design for Telegraph Road Multimodal Improvements, City of Bellingham
- Wetland and OHWM Delineations, SEPA, Critical Areas Report, Shoreline Exemption, Section 404, HPA, and Mitigation Design for Valencia Street Water Main, City of Bellingham
- Wetland Delineation, Critical Areas Compliance, Compensatory Mitigation Design, Wetland Resource Permitting, Project Management for Center Parkway Roadway Extension, City of Richland

Education

BS Environmental Science
Minor, Chemistry
Huxley College of Environmental Studies
Western Washington University 2001

Training/Certifications

Professional Wetland Scientist, No. 4026, SWS (05/2025)

Wetland Status and Trends, Swamp School (2025, 2024, 2023, 2022)

Using the 2021 Interagency Wetland Mitigation Guidance, Ecology CTP (11/2023)

Western Washington Wetland Rating System, Ecology CTP (03/2023)

Know Your Grasses Workshop, WNPS (07/2021)

Eastern Washington Wetland Rating System, Ecology CTP (10/2016)

Affiliations

Washington Native Plant Society

Northwest Association of Environmental Professionals

Society of Wetland Scientists

Experience

24 years of experience
24 years at RH2

Kyle Wisner

Environmental Staff Scientist

Kyle is an environmental scientist with a background in technical writing, environmental compliance, freshwater ecology, and marine ecology. His work focuses on permitting, wetlands, critical areas, and migratory bird assessments. He often utilizes tools such as ArcGIS Pro, AutoCAD, GPS data systems, and remote camera systems to support his field investigations and reporting.

Kyle's strengths in technical writing and his attention to regulatory detail support RH2's high standards for environmental documentation and compliance. He is well-versed in plant and animal ecology, native plant and wildlife identification, aquatic systems, and environmental chemistry. Kyle is actively expanding his expertise in both Washington State and federal permitting processes.

What Kyle enjoys most about his role is the opportunity to collaborate on a diverse range of projects with a team of dedicated professionals who take pride in the quality and impact of their work. He is driven by the belief that solving complex environmental challenges helps play a vital role in improving communities across the region.

Representative Project Experience

- MBTA Monitoring and Compliance for the Eagle Water Reclamation Basin Improvements Project, City of Snoqualmie
- MBTA Monitoring and Compliance for Boulevard Park Sewers, Valley View Sewer District
- MBTA Monitoring and Compliance for RPA-Malaga Industrial Cooling Site, Chelan Douglas Regional Port Authority
- Critical Areas and SEPA for the New Water Supply Pipeline—Phase 1, City of Mercer Island
- Cultural Resources Compliance for Lake Avenue K3 Well, Lakewood Water District
- JARPA, HPA, and Section 401 for Sub-Basin 46.3a Watercourse Stabilization Design, NW Hydraulic Consultants, Inc.
- SEPA for KC 238th Avenue NE Fish Passage Culvert Replacement—Water Main Relocation, Union Hill Water Association
- Wetland Reconnaissance—Wastewater Treatment Plant Improvements, City of Sedro-Woolley
- Wetland Reconnaissance and Pre-Application Meeting—Well No. 3 Improvements, Union Hill Water Association
- Wetland Delineation, Critical Areas and SEPA—Overlake School Water Main, Union Hill Water Association
- Wetland Mitigation Monitoring—Hawks Prairie Sister Standpipe, City of Lacey

Education

BS Environmental Science
Marine Emphasis
Western Washington University
2024

Certifications

Plant Identification for Wetland Delineation, WNPS 2025

Wetland Status and Trends, Swamp School 2025

Basic Wetland Delineation, WTI (2025)

Nationwide Permits, Swamp School (2025)

Affiliations

Washington Native Plants Society

Society of Wetland Scientists

National Association of Wetland Managers

Nooksack Salmon Enhancement Association

Experience

1 year of experience
< 1 year at RH2

Appendix B

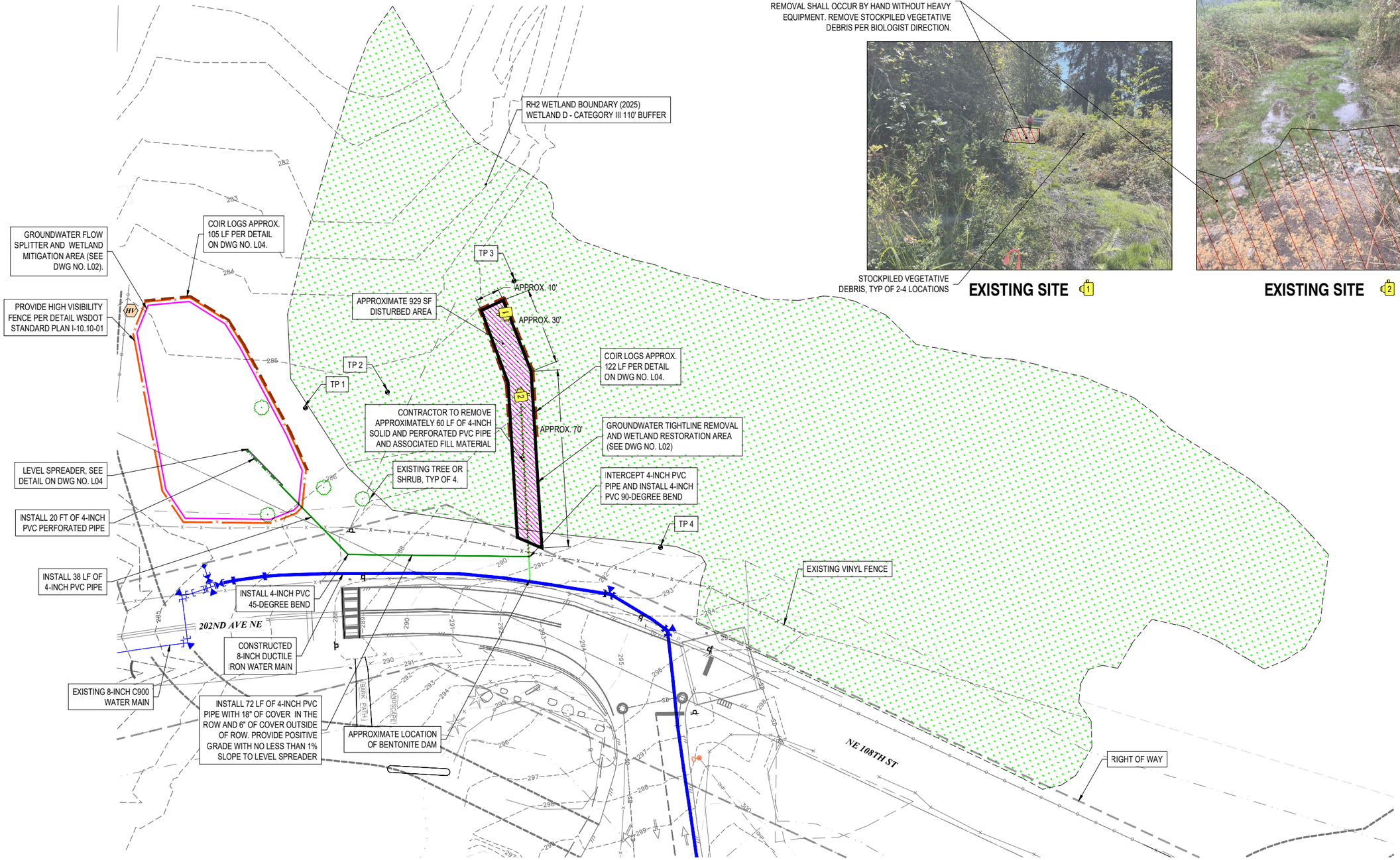
As-Built and Proposed Wetland Restoration Plans

CONTRACTOR TO REMOVE GEOTEXTILE FABRIC, ROCK, AND EARTHEN FILL MATERIAL TO RESTORE DISTURBED AREA TO PRE-CONSTRUCTION CONDITION. MATERIAL REMOVAL SHALL OCCUR BY HAND WITHOUT HEAVY EQUIPMENT. REMOVE STOCKPILED VEGETATIVE DEBRIS PER BIOLOGIST DIRECTION.

STOCKPILED VEGETATIVE DEBRIS, TYP OF 2-4 LOCATIONS

EXISTING SITE 1

EXISTING SITE 2



SITE PLAN OVERVIEW

1" = 20'

RH2

PRELIMINARY

DOUGLAS C. SCHEPPS
STATE OF WASHINGTON
52920
REGISTERED PROFESSIONAL ENGINEER

UNION HILL WATER ASSOCIATION
NE REDMOND RD/NE 106TH PLACE
IMPROVEMENTS, PHASE 2 WATER MAIN

EXISTING AND PROPOSED SITE PLAN

REVISIONS			
NO.	DATE	DESCRIPTION	BY
			REVIEW

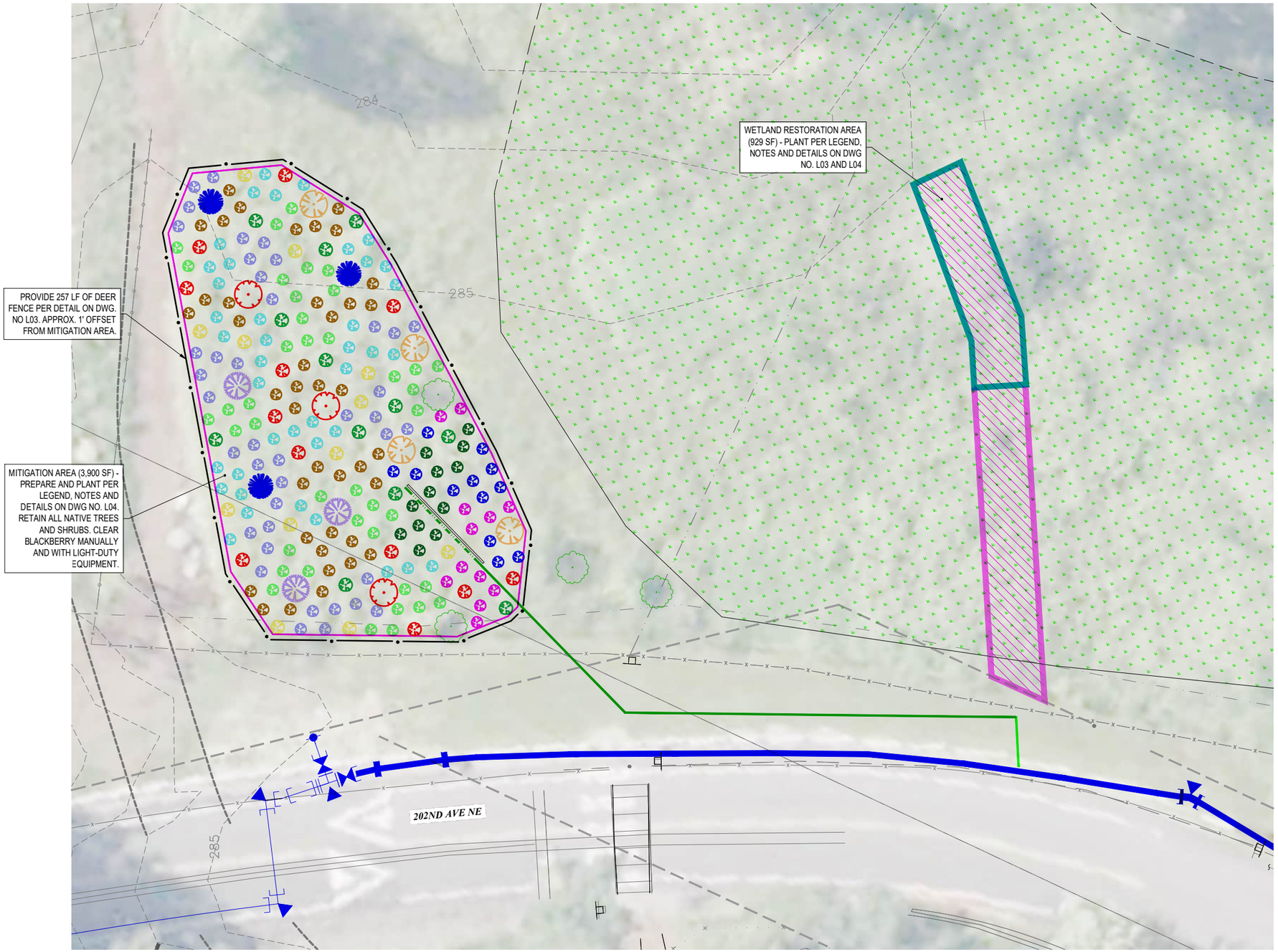
JOB NO.: 25-0002
CLIENT: UHWA
FILENAME: OVR-D-CIV01.DWG
DATE: Oct 29, 2025
PLOT DATE: Oct 29, 2025
ENGINEER: JD
REVIEWED: AP

SCALE: SHOWN

2" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: L01
SHEET NO.: 1 4



WETLAND RESTORATION AND MITIGATION PLAN

1" = 10'

RH2

DOUGLAS C. SCHEPPS
STATE OF WASHINGTON
52920
REGISTERED PROFESSIONAL ENGINEER

PRELIMINARY

UNION HILL WATER ASSOCIATION
NE REDMOND RD/NE 106TH PLACE
IMPROVEMENTS, PHASE 2 WATER MAIN

WETLAND RESTORATION AND MITIGATION PLAN

REVISIONS			
NO.	DATE	DESCRIPTION	BY
			REVIEW

JOB NO.: 25-0002
CLIENT: UHWA
FILENAME: OVR-D-CIV01.DWG
SAVE DATE: Oct 30, 2025
PLOT DATE: Oct 30, 2025
ENGINEER: JD
REVIEWED: AP

SCALE: SHOWN

0" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: L02
SHEET NO.: 2 4

MITIGATION NOTES

GENERAL PLANTING NOTES

- THIS MITIGATION PLAN IS GUIDED BY A CRITICAL AREAS REPORT (CAR) (RH2, OCTOBER 2025 OR AS REVISED). THE CONTRACTOR, ASSOCIATION, AND ITS ASSIGNS SHALL BE FAMILIAR WITH THIS DOCUMENT IN CONDUCTING WETLAND RESTORATION AND MITIGATION ACTIVITIES. MITIGATION GOALS, OBJECTIVES, MONITORING AND MAINTENANCE PROGRAMS ARE DETAILED IN THE CAR.
- SITE PREPARATION, SOIL AMENDMENT AND PLANTING TO OCCUR PER THE LEGEND, AND DETAILS AND NOTES (THIS SHEET).
- THE ASSOCIATION IS RESPONSIBLE FOR ENSURING THE MAINTENANCE AND MONITORING OF THE MITIGATION SITE IS CONDUCTED ACCORDING TO THE CAR. MONITORING AND MAINTENANCE OF THE RESTORATION AND MITIGATION AREAS SHALL BEGIN THE FIRST GROWING SEASON (LATE SPRING/EARLY SUMMER) FOLLOWING INSTALLATION APPROVAL.
- THE CONTRACTOR SHALL COORDINATE A PRE-PLANTING MEETING, SUCCESSFUL PLANT INSTALLATION, AND ASSOCIATION ACCEPTANCE POST-PLANTING. FOLLOWING ACCEPTANCE, THE ASSOCIATION OR ITS ASSIGNS WILL CARE FOR THE SITE.

PLANTING SCHEDULE AND WARRANTY:

PLANTING IS PREFERRED WHEN PLANTS ARE DORMANT (FALL TO SPRING) TO MINIMIZE TRANSPLANT SHOCK AND SUPPLEMENTAL CARE FOR NEW PLANTINGS. WATER-IN ALL NEW PLANTING FOLLOWING INSTALLATION AND IN SUFFICIENT QUANTITY THEREAFTER TO ESTABLISH PLANTINGS.

THE CONTRACTOR SHALL HANDLE AND CARE FOR PLANT STOCK STORED ON-SITE FOR LONGER THAN ONE WEEK. THIS INCLUDES, BUT IS NOT LIMITED TO, WATERING PLANTINGS AND PROTECTING PLANTS FROM DAMAGE BY ELEMENTS, VANDALISM, ETC.

PLANT PROCUREMENT, HANDLING AND STORAGE, AND INSTALLATION SHALL BE SUBJECT TO ASSOCIATION REVIEW, DIRECTION, AND APPROVAL.

PLANTING SEQUENCING:

GENERAL SEQUENCING IS DETAILED BELOW; HOWEVER, THE CONTRACTOR SHALL DETERMINE EXECUTABLE MEANS AND METHODS.

- THE CONTRACTOR SHALL SECURE ALL PLANTS AND PLANTING MATERIALS PRIOR TO BEGINNING WORK. SUBMIT NURSERY AVAILABILITY, SEED MIX AND RELATED SPECIFICATION SHEETS TO THE ASSOCIATION FOR PRIOR APPROVAL.
- THE CONTRACTOR SHALL NOTIFY THE ASSOCIATION AND OVERLAKE SCHOOL 72 HOURS IN ADVANCE OF ANTICIPATED RESTORATION AND MITIGATION ACTIVITIES AND MEET WITH THE ASSOCIATION AND ITS ASSIGNS PRIOR TO THE START OF CONSTRUCTION. ENSURE ALL PARTIES UNDERSTAND PREFERENCES WITH RESPECT TO EXISTING VEGETATION, PLANTING, SOIL AMENDMENT, ETC.
- PREPARE AREAS TO BE PLANTED AS FOLLOWS:

EXISTING GROUNDWATER TIGHLINE REMOVAL AND WETLAND RESTORATION AREA:

a. REMOVE ALL GROUNDWATER TIGHTLINE MATERIALS, INCLUDING ROCK, PIPE, GEOTEXTILE FABRIC, SOIL, AND ANY STOCKPILED VEGETATIVE DEBRIS FROM THE DISTURBED FOOTPRINT AND SURROUNDING AREA. ALL REMOVAL SHALL BE COMPLETED MANUALLY WITHOUT THE USE OF HEAVY EQUIPMENT. NO HEAVY EQUIPMENT IS ALLOWED IN THE WETLAND BOUNDARY. DISPOSE OF VEGETATIVE DEBRIS OFFSITE.

b. FOLLOWING REMOVAL OF GROUNDWATER TIGHTLINE MATERIALS, REPLANT THE DISTURBED AREA PER THE WETLAND RESTORATION AND MITIGATION PLAN, AND DETAILS. PLANTING SHALL ALSO OCCUR BY HAND. HAND-EXCAVATE PLANTING PITS. GRUB ROOTS AND RHIZOMES TO ACCOMMODATE AN AREA OF TWO TIMES PLANTING PITS. NATIVE SOILS FREE OF INVASIVE RHIZOMES/ROOT CROWNS ARE ACCEPTABLE FOR PLANTING PITS. DISPOSE OF INVASIVE ROOTS/RHIZOMES OFF-SITE. INSTALL SHRUB AND EMERGENT PLANT MATERIAL AND BACKFILL PLANTING PITS.

c. HAND SEED RESTORED AREA USING THE NATIVE SEED MIX SPECIFIED.

d. INSTALL MULCH WATERING BASINS AROUND INSTALLED PLANTINGS.

GROUNDWATER FLOW SPLITTER AREA:

a. INSTALL HIGH VISIBILITY FENCE AROUND MITIGATION AREA TO DENOTE CLEARING, GRUBBING AND PLANTING LIMITS. ASSOCIATION BIOLOGIST WILL FLAG NATIVE VEGETATION TO BE RETAINED. RETAIN ALL NATIVE TREE AND/OR SHRUB VEGETATION IN AND ADJACENT TO AREAS TO BE PLANTED.

b. MANUALLY AND/OR WITH LIGHT-DUTY EQUIPMENT CLEAR AND GRUB IS BLACKBERRY IN THE AREA TO BE PLANTED. REMOVE ENTIRE ROOT MASS, ROOT CROWNS, AND ABOVE GROUND BIOMASS OF BLACKBERRY. DISPOSE REMOVED BIOMASS OFFSITE.

c. INSTALL GROUNDWATER FLOW SPLITTER PER PLAN AND DETAILS.

d. FOLLOWING INSTALLATION OF THE GROUNDWATER FLOW SPLITTER, APPLY TOPOSIL AND TILL IN (PER DETAIL THIS SHEET) TO RESTORE GROUND SURFACE TO PRE-EXISTING ELEVATION, AS NEEDED. REPLANT THE DISTURBED AREA PER THE WETLAND RESTORATION AND MITIGATION PLAN, AND DETAILS. PLANTING SHALL ALSO OCCUR BY HAND. HAND-EXCAVATE PLANTING PITS. GRUB ROOTS AND RHIZOMES TO ACCOMMODATE AN AREA OF TWO TIME PLANTING PITS. NATIVE SOILS FREE OF INVASIVE RHIZOMES/ROOT CROWNS ARE ACCEPTABLE FOR PLANTING PITS. DISPOSE OF INVASIVE ROOTS/RHIZOMES OFF-SITE. INSTALL TREE AND SHRUB PLANT MATERIAL AND BACKFILL PLANTING PITS.

e. HAND SEED DISTURBED AREAS AND WETLAND MITIGATION AREA WITH NATIVE SEED MIX SPECIFIED.

f. INSTALL MULCH WATERING BASINS BY HAND AROUND ALL TREE AND SHRUB PLANTINGS.

g. INSTALL DEER FENCE AROUND MITIGATION AREA, INCLUDING GATE FOR ACCESS DURING MAINTENANCE AND MONITORING EFFORTS. ASSOCIATION SHALL REMOVE DEER FENCING AT THE END OF THE MITIGATION MONITORING PERIOD.

- WATER-IN ALL INSTALLED PLANT MATERIAL. CONTINUE WATERING AT A RATE SUFFICIENT TO ENSURE PLANTINGS BECOME ESTABLISHED.
- NOTIFY THE ASSOCIATION UPON COMPLETION OF PLANT INSTALLATION. THE ASSOCIATION WILL NOTIFY THE COUNTY, WHO WILL INSPECT THE SITE NOTING ANY CORRECTIONS, SUBSTITUTIONS, OR MISSING ITEMS, WHICH WILL BE ADDRESSED PRIOR TO FINAL SIGH-OFF OF THE WETLAND RESTORATION AND MITIGATION AREAS.

IRRIGATION:

THE ASSOCIATION SHALL PROVIDE TEMPORARY SEASONAL WATER TO THE RESTORED WETLAND AND WETLAND MITIGATION AREAS TO ESTABLISH THE PLANTINGS IN THESE AREAS IN THE FIRST 2-3 YEARS FOLLOWING PLANTING. WATER SHALL BE SUPPLIED VIA TEMPORARY HOSES AND CONNECTION TO THE ONSITE HYDRANT. SUPPLEMENTAL WATERING SHALL BE PROVIDED TO PLANTINGS WITHIN THE 30-DAY PERIOD POST-PLANTING AND THROUGHOUT THE SUMMER MONTHS (JULY 1 TO SEPTEMBER 30), AS WARRANTED. SUPPLEMENTAL SEASONAL IRRIGATION WILL BE THE SUBJECT OF MONITORING EFFORTS AND THE ASSOCIATIONS BIOLOGIST SHALL RECOMMEND WHEN IRRIGATION MAY CEASE FOR THESE AREAS.

SUMMARY OF PROJECT IMPACTS & MITIGATION

SUMMARY OF PROJECT IMPACTS & MITIGATION

IMPACTS		MITIGATION	
IMPACT CATEGORY / TYPE	IMPACT AREA IN SF AND CY OF FILL / LOCATION	REQUIRED MITIGATION AREA (REQUIRED RATIO)	PROPOSED MITIGATION AREA (RESULTANT RATIO)
CLEARING, GRADING AND FILL FROM GW DISPERSION PIPE / TEMPORARY (AREA TO BE RESTORED)	929 SF AND 21 CY / WETLAND D AND BUFFER	1,858 SF (2:1[1])	4,829 (929 SF RESTORATION OF DISTURBED AREA FROM GW DISPERSION PIPE AND 3,900 SF PROPOSED MITIGATION AREA) (3:1)
CLEARING, GRADING, AND INSTALLATION OF PIPE FOR PERMANENT GW FLOW SPLITTER	460 AND 27 CY ROCK FILL / WETLAND D BUFFER	460 (1:1[1])	
CLEARING BLACKBERRY AND REPLANTING WITH NATIVES FOR PROJECT MITIGATION	3,900 / WETLAND D BUFFER	--	

MITIGATION LEGEND

WETLAND RESTORATION AREA (~929 SF)

SYMBOL	COMMON NAME	SCIENTIFIC NAME	QTY	SIZE	SPACING DIAMETER	PLANT INDICATOR	MATURE HEIGHT / SPREAD (FT)	PLANTING NOTES
SHRUBS								
529 SF	SITKA WILLOW	*SALIX SITCHENSIS*	6	2 GALLON CONTAINER	6' O.C.	FACW	24 / 23	PLANT THROUGHOUT AREA PER THE DETAILS AND NOTES THIS SHEET.
	RED OSIER DOGWOOD	*CORNUS ALBA*	6			FACW	20 / 10	
	PACIFIC NINEBARK	*PHYSOCARPUS CAPITATUS*	6			FACW	12 / 10	
EMERGENTS								
400 SF	SLOUGH SEDGE	*CAREX OBNUPTA*	16	1 GALLON CONTAINER	3' O.C.	OBL	3 / 3	PLANT IN CLUMPS OF 4 PER PLANTING PIT THROUGHOUT EMERGENT AREA SHOWN PER THE DETAILS AND NOTES THIS SHEET.
	SAWBEAK SEDGE	*CAREX STIPATA*	16			OBL	3 / 3	
	SMALL-FRUITED BULLRUSH	*SCIRPUS MICROCARPUS*	16			OBL	3 / 3	

GROUNDWATER FLOW SPLITTER AND WETLAND MITIGATION AREA (~3,900 SF)

SYMBOL	COMMON NAME	SCIENTIFIC NAME	QTY	SIZE	SPACING DIAMETER	PLANT INDICATOR	MATURE HEIGHT / SPREAD (FT)	PLANTING NOTES
TREES								
	CASCARA	*FRANGULA PURSHIANA*	4	5 GALLON	18' O.C.	FAC	30 / 20	PLANT IN LOCATIONS SHOWN PER THE DETAILS AND NOTES THIS SHEET.
	SHORE PINE	*PINUS CONTORTA*	3			FAC	45 / 30	
	WESTERN MOUNTAIN ASH	*SORBUS SITCHENSIS*	3			FAC	30 / 20	
	SITKA SPRUCE	*PICEA SITCHENSIS*	3			FAC	100 / 20	
SHRUBS								
	RED ELDERBERRY	*SAMBUCUS RACEMOSA*	12	2 GALLON CONTAINER	8' O.C.	FACU	20 / 15	PLANT IN LOCATIONS SHOWN PER THE DETAILS AND NOTES THIS SHEET.
	WESTERN HAZELNUT	*CORYLUS CORNUTA*	12			FACU	18 / 12	
	WESTERN HAWTHORN	*CRATAEGUS DOUGLASII*	12			FAC	20 / 15	
	THIMBLEBERRY	*RUBUS PARVIFLORUS*	40		4' O.C.	FAC	8 / 6	
	NOOTKA ROSE	*ROSA NUTKANA*	40			FAC	8 / 5	
	BRISTLY BLACK GOOSBERRY	*RIBES LACUSTRE*	40			FAC	5 / 4	
	SNOWBERRY	*SYMPHORICAROPS ALBUS*	40			FAC	4 / 3	
	PACIFIC NINEBARK	*PHYSOCARPUS CAPITATUS*	12			FACW	12 / 10	PLANT IN LOCATIONS SHOWN AROUND FLOW SPLITTER PER DETAILS AND NOTES THIS SHEET.
	SALMONBERRY	*RUBUS SPECTABILIS*	12			FACW	10 / 6	
	HARDHACK	*SPIREA DOUGLASII*	12			FACW	7 / 5	

NATIVE EMERGENT SEED MIX

COMMON NAME	SCIENTIFIC NAME	INDICATOR	MATURE HEIGHT (FT)	% BY WEIGHT	% PURITY	% GERM	SEEDING NOTES:
SLOUGH SEDGE	*CAREX OBNUPTA*	OBL	3	20	95	90	SEED RATE: 1 PLS LBS PER 1,000 SF INERT/OTHER CROP: 2% MAX WEED SEED: 0% MAX NO NOXIOUS WEEDS ALLOWED IN SEED. USE CERTIFIED SEED TO THE MAXIMUM EXTENT PRACTICAL.
NORTHWESTERN MANNAGRASS	*GLYCERIA OCCIDENTALIS*	OBL	5	20	95	85	
DAGGER-LEAF RUSH	*JUNCUS ENSIFOLIUS*	FACW	2	20	95	80	
SLENDER RUSH	*JUNCUS TENUIS*	FAC	2	20	95	80	
SMALL-FRUITED BULRUSH	*SCIRPUS MICROCARPUS*	OBL	3	20	95	90	

[1] HAND SEED THE WETLAND RESTORATION AREA, PROPOSED MITIGATION AREA AND GROUNDWATER FLOW SPLITTER, AND ALL AREAS DISTURBED IN THE WETLAND AND BUFFER.

RH2

DOUGLAS C. SCHEPPS STATE OF WASHINGTON 52920 REGISTERED PROFESSIONAL ENGINEER

PRELIMINARY

UNION HILL WATER ASSOCIATION
NE REDMOND RD/NE 106TH PLACE
IMPROVEMENTS, PHASE 2 WATER MAIN

WETLAND AND MITIGATION NOTES AND LEGEND

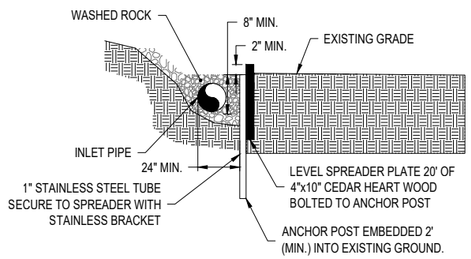
REVISIONS

NO.	DATE	DESCRIPTION	BY	REVIEW

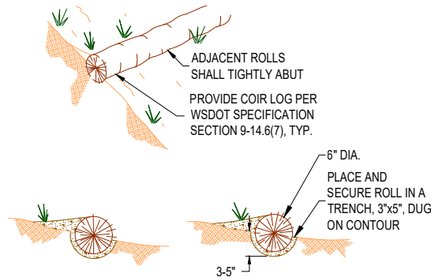
ENGINEER: JD
REVIEWED: AP
DATE: Oct 29, 2025
PLOT DATE: Oct 29, 2025
CLIENT: UHWA
FILENAME: OVR-D-CIV01.DWG
JOB NO.: 25-0002

SCALE: SHOWN
0" 1" 2"
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

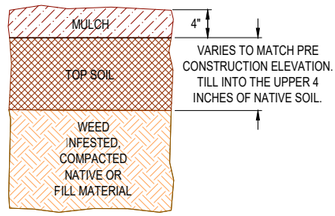
DWG NO.: L03
SHEET NO.: 3 4



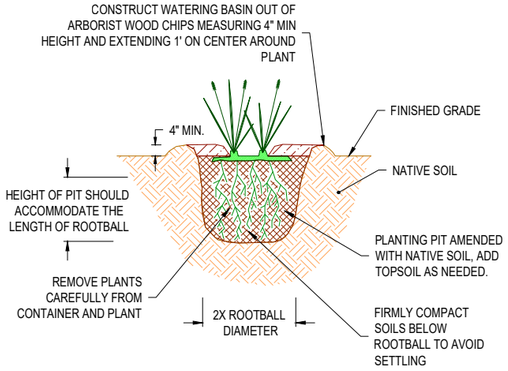
LEVEL SPREADER DETAIL
NOT TO SCALE



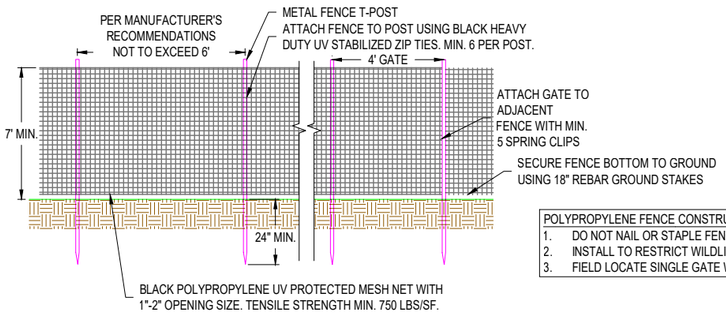
COIR LOG DETAIL
NOT TO SCALE



TOPSOIL REQUIREMENTS FOR PLANTING AREAS
NOT TO SCALE

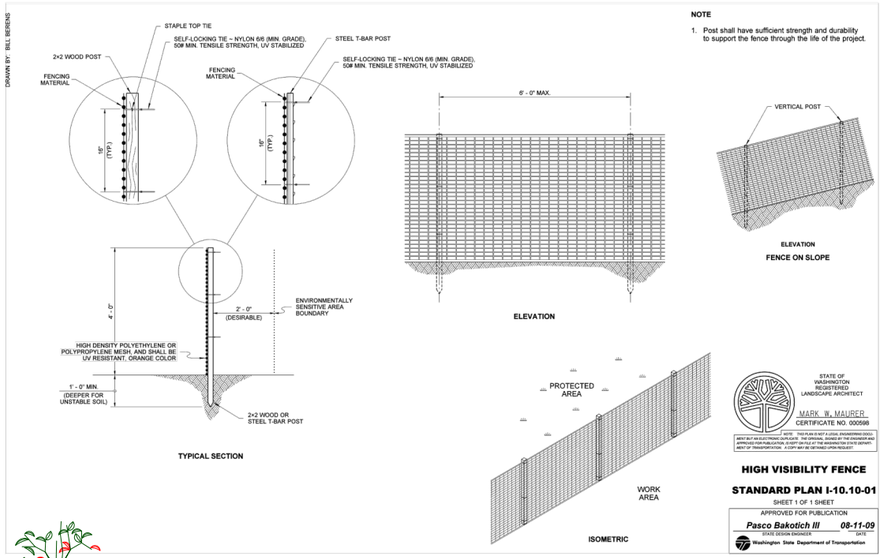


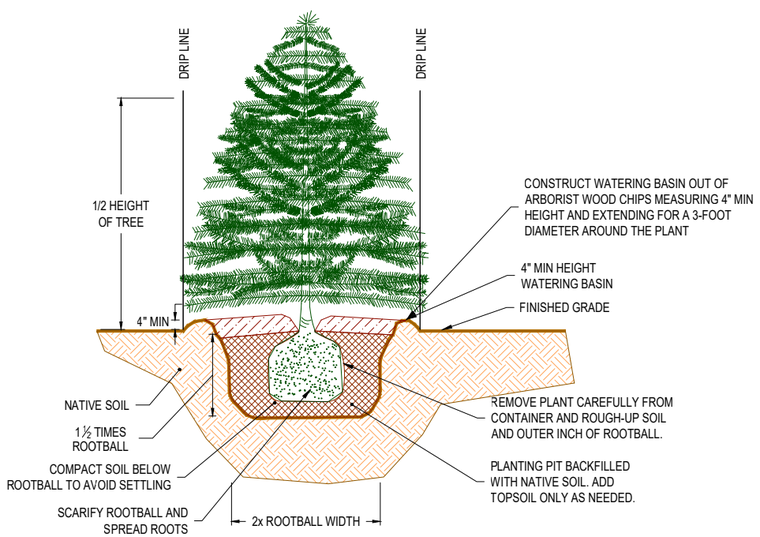
EMERGENT PLANTING DETAIL
NOT TO SCALE



POLYPROPYLENE FENCE CONSTRUCTION NOTES:
1. DO NOT NAIL OR STAPLE FENCE TO TREES.
2. INSTALL TO RESTRICT WILDLIFE FROM MITIGATION AREA.
3. FIELD LOCATE SINGLE GATE WITH ASSOCIATION REPRESENTATIVE.

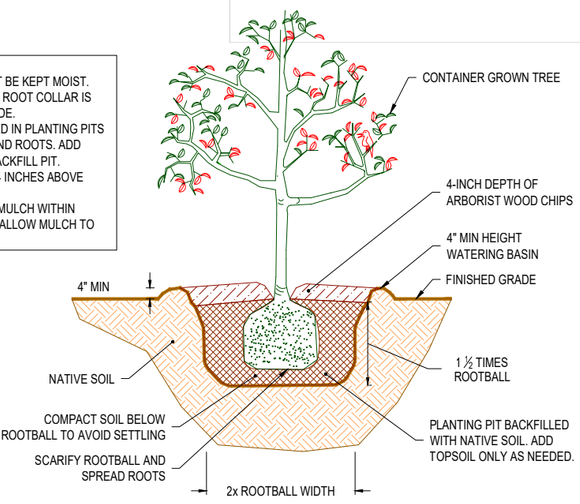
DEER FENCING
NOT TO SCALE

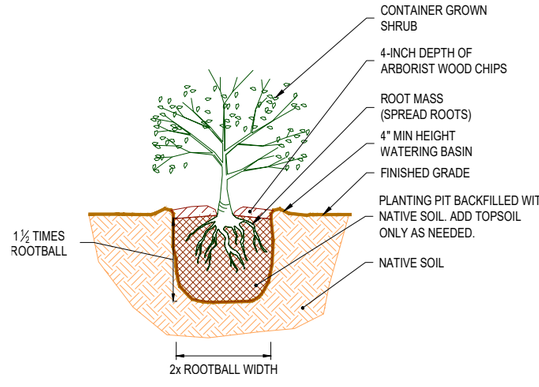




EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

NOTES:
1. ALL PLANT MATERIAL MUST BE KEPT MOIST.
2. PLACE ALL PLANTS SO THE ROOT COLLAR IS LEVEL WITH FINISHED GRADE.
3. ENSURE NATIVE SOILS USED IN PLANTING PITS ARE FREE OF RHIZOMES AND ROOTS. ADD TOPSOIL AS NEEDED TO BACKFILL PIT.
4. FORM A WATERING BASIN 4 INCHES ABOVE FINISHED GRADE.
5. INSTALL 4-INCH DEPTH OF MULCH WITHIN WATERING BASIN. DO NOT ALLOW MULCH TO TOUCH TRUNK.





DECIDUOUS TREE AND SHRUB PLANTING DETAIL
NOT TO SCALE

RH2

PRELIMINARY

DOUGLAS C. SCHEIDT STATE OF WASHINGTON 52920 REGISTERED PROFESSIONAL ENGINEER

UNION HILL WATER ASSOCIATION
NE REDMOND RD/NE 106TH PLACE
IMPROVEMENTS, PHASE 2 WATER MAIN

WETLAND RESTORATION DETAILS AND NOTES

REVISIONS

NO.	DESCRIPTION	DATE	BY	REVIEW

ENGINEER: JD
REVIEWED: AP
PLOT DATE: Oct 28, 2025
SAVE DATE: Oct 28, 2025
CLIENT: UHWA
FILENAME: OVR-D-CIV01.DWG
JOB NO.: 25-0002

SCALE: SHOWN
2" 1" 2"
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: L04
SHEET NO.: 4 of 4

Union Hill Water Association

NE REDMOND RD / NE 106TH PLACE IMPROVEMENTS, PHASE 2 WATER MAIN AND PRV STATION

REVISED TO CONFORM TO CONSTRUCTION RECORDS
09/12/2025
RH2 ENGINEERING INC. DATE

SHEET INDEX	
SHT.#	DESCRIPTION
1	COVER SHEET
2	NOTES, LEGEND & ABBREVIATIONS
3	WATER MAIN PLAN STA. 10+00 - 12+45
4	WATER MAIN PLAN STA. 12+45- END
5	FIRE HYDRANT INSTALLATION DETAILS
6	STANDARD WATER DETAILS
7	STANDARD WATER DETAILS

Stantec
1687 114th Ave SE, Bellevue WA 98004
phone: (425) 869-9448 www.stantec.com

Union Hill Water Association
5020 236th Ave. NE Redmond, WA 98053 Tel. 425-497-1812

BOARD OF DIRECTORS:

AL SPENCER	PRESIDENT
COLBY CAYWOOD	VICE PRESIDENT
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ATTORNEY:
J. RICHARD ARAMBURU

GENERAL MANAGER:
TERESA FOWLKES

FIELD MANAGER:
DAVID SMITH

PROJECT DESCRIPTION

THIS PROJECT INCLUDES, BUT IS NOT LIMITED TO:

INSTALLING APPROXIMATELY 760 LF OF 8" DIAMETER DUCTILE IRON WATER MAIN, VALVES, AND FITTINGS.
(APPROXIMATELY 335 LF OF THE WATER MAIN WILL BE INSTALLED WTHIN AN EASEMENT ON TAX PARCEL 124310-0185)

8" PRV VAULT, AND 4"PVC DRAIN TO DAYLIGHT.

HOT MIX ASPHALT PATCHING AND STREET OVERLAY.

TEMPORARY EROSION CONTROL MEASURES.

TEMPORARY TRAFFIC CONTROL.

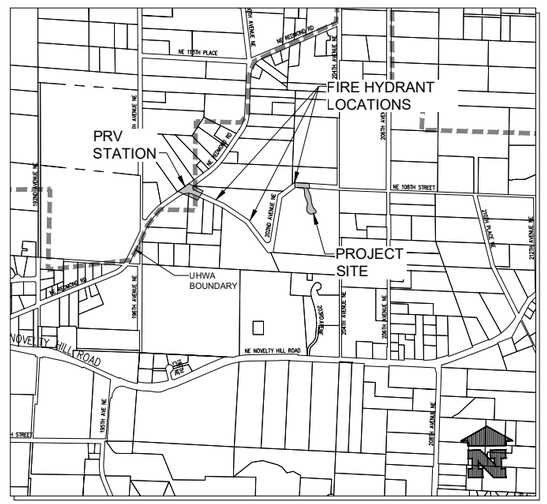
RESTORATION OF DISTURBED SURFACES AND DAMAGED OR OR DISPLACED SITE FEATURES.

PROTECTION OF EXISTING UTILITIES/IMPROVEMENTS.

TAX PARCEL 124310-0185 LEGAL DESCRIPTION

LOT B OF KING COUNTY BOUNDARY LINE ADJUSTMENT NO. BLAD17-0057, RECORDED UNDER RECORDING NUMBER 2018102490001, RECORDS OF KING COUNTY, WASHINGTON SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON

BRIAN P. WOLF
STATE OF WASHINGTON
47049
REGISTERED PROFESSIONAL ENGINEER



VICINITY MAP

WATER GENERAL NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO THE RULES, REGULATIONS AND SPECIFICATIONS OF UNION HILL WATER ASSOCIATION AND THE PROJECT MANUAL FOR THIS PROJECT.
2. THE ASSOCIATION SHALL BE NOTIFIED A MINIMUM OF 2 FULL WORKING DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY UNION HILL WATER ASSOCIATION.
3. ALL CUSTOMERS AFFECTED BY A SYSTEM SHUT DOWN SHALL BE NOTIFIED BY THE CONTRACTOR 48 HOURS IN ADVANCE OF THE SHUT DOWN. CUSTOMERS SHALL ALSO BE NOTIFIED OF THE ANTICIPATED DURATION OF THE SHUT DOWN.
4. WATER MAINS SHALL BE POLYVINYL CHLORIDE PER NSF/ANSI STANDARD 61 AND AWWA SPECIFICATIONS C900 (DR 18) , WITH SIZE AS NOTED ON THE PLANS.
5. ALL VALVES ADJACENT TO TEE OR CROSS SHALL BE FLANGE CONNECTED.
6. ALL VALVES SHALL BE FURNISHED WITH A CONCRETE VALVE MARKER PER ASSOCIATION STANDARDS.
7. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON. CALL BEFORE YOU DIG 811 OR 1-800-424-5555.
8. FLUSHING HYPER-CHLORINATED WATER FROM NEW EXTENSIONS INTO STORM DRAINS OR ANY WATERWAY IS PROHIBITED. FULLY DECHLORINATE HYPER-CHLORINATED WATER BEFORE DISCHARGING TO STORM DITCH OR STORM DRAIN. HYPER-CHLORINATED WATER MUST BE FLUSHED INTO A SANITARY SEWER OR WATER TRUCK AND DISPOSED OF IN A SANITARY SEWER.
9. MINIMUM SEPARATION OF POTABLE WATER AND SANITARY SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY FOR PARALLEL PIPE, AND EIGHTEEN (18) INCHES VERTICALLY FOR PERPENDICULAR OR OBLIQUE CROSSINGS, MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. SEPARATION WILL REQUIRE CONSTRUCTION IN ACCORDANCE WITH SECTION C1-9.1 OF THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AS REVISED AUGUST 2008.
10. WHEN WORKING WITH ASBESTOS CEMENT PIPE, THE CONTRACTOR IS REQUIRED TO MAINTAIN WORKERS' EXPOSURE TO ASBESTOS MATERIAL AT OR BELOW THE LIMIT PRESCRIBED IN WAC 296-62-07705.
11. NOTICE: CAUTION - - EXTREME HAZARD - - OVERHEAD ELECTRICAL SERVICE LINES ARE GENERALLY NOT SHOWN ON THE DRAWINGS. ELECTRICAL LINES SHOWN ON DRAWINGS ARE LOCATED BY POINT-TO-POINT, POWER POLE-TO-POLE CONNECTION. THE CONTRACTOR IS REPSONSIBLE FOR DETERMINING THE EXTENT OF ANY HAZARD CREATED BY OVERHEAD ELECTRICAL POWER IN ALL AREAS AND SHALL FOLLOW PROCEDURES DURING CONSTRUCTION AS REQUIRED BY LAW AND REGULATION. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH UTILITY OWNERS AND DETERMINE THE EXTENT OF HAZARD AND REMEDIAL MEASURES AND SHALL TAKE WHATEVER PRECAUTIONS MAY BE REQUIRED.
12. ALL MJ FITTINGS SHALL BE INSTALLED WITH RESTRAINING GLANDS EXCEPT WHEN CONNECTING TO CAST IRON (CI).
13. THE NEW WATERMAIN SHALL BE CONNECTED TO THE EXISTING SYSTEM ONLY AFTER NEW MAIN IS PRESSURE TESTED, FLUSHED, DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED.
14. TRENCH BACKFILL AND SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OF-WAY USE PERMIT.
15. THE CONTRACTOR SHALL USE A VACUUM SWEEPER TO REMOVE DUST AND DEBRIS FROM PAVEMENT AREAS AS DIRECTED BY THE ENGINEER. FLUSHING OF STREETS SHALL NOT BE PERMITTED WITHOUT PRIOR ASSOCIATION APPROVAL.
16. THE CONTRACTOR SHALL RESTORE THE RIGHT-OF-WAY AND EXISTING PUBLIC UTILITY EASEMENT(S) AFTER CONSTRUCTION TO A CONDITION EQUAL OR BETTER THAN CONDITION PRIOR TO ENTRY. CONTRACTOR SHALL FURNISH A SIGNED RELEASE FROM ALL AFFECTED PROPERTY OWNERS AFTER RESTORATION HAS BEEN COMPLETED.

TOPOGRAPHIC SURVEY INFORMATION

HORIZONTAL DATUM

HORIZONTAL DATUM: NAD 83/91, WASHINGTON COORDINATE SYSTEM NORTH ZONE, BASED ON WGS 810 (NORTH QUARTER SECTION 32) & 811 (NORTHWEST CORNER SECTION 32) AND SCALED TO GROUND ABOUT 810 BY A COMBINED FACTOR OF 1.000047482.

MONUMENT ID: 810 (FOUND PUNCH IN 3" BRASS DISK MONUMENT IN CASE, DOWN -1.2')
NORTH = 258620.38
EAST = 1336391.91

VERTICAL DATUM

VERTICAL DATUM: KCAS PER SITE BENCHMARK ESTABLISHED BY ESM AT THE OVERLAKE SCHOOL TO CONVERT TO NAVD 88 ADD 3.78 TO ALL ELEVATIONS.

MONUMENT ID: 810
ELEVATION = 253.46 (KCAS) 257.24 (NAVD 88)

ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS OTHERWISE NOTED.

THE LOCATION AND DESCRIPTION OF ALL SURVEY MARKERS SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS TAKEN IN APRIL, 2022, UNLESS OTHERWISE INDICATED.

WORK PERFORMED IN CONJUNCTION WITH THIS SURVEY UTILIZED THE FOLLOWING EQUIPMENT AND PROCEDURES: (A) 1" TRIMBLE S7 SERIES ELECTRONIC TOTAL STATION, MAINTAINED TO THE MANUFACTURER'S SPECIFICATIONS PER W.A.C. 332-130-100. (B) FIELD TRAVERSE, EXCEEDING REQUIREMENTS SET FORTH IN W.A.C. 332-130-090.
(C) LEAST SQUARE ADJUSTMENT USING StarNet VERSION 9.0
EXCEEDING REQUIREMENTS PER W.A.C. 332-130-080.

THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT AND DOES NOT PURPORT TO SHOW ALL EASEMENTS.

THIS TOPOGRAPHIC SURVEY DRAWING ACCURATELY REPRESENTS SURFACE FEATURES LOCATED DURING THE COURSE OF THIS SURVEY. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED SOLELY UPON INFORMATION PROVIDED BY OTHERS AND PACE ENGINEERS, INC. DOES NOT ACCEPT RESPONSIBILITY OR ASSUME LIABILITY FOR THEIR ACCURACY OR COMPLETENESS. CONTRACTOR/ENGINEERS SHALL VERIFY EXACT SIZE AND LOCATION PRIOR TO CONSTRUCTION.

CALL FOR LOCATE: UTILITY LOCATION SERVICE: 811

UNDERGROUND MARKINGS WERE PROVIDED BY UNION HILL WATER ASSOC. ONLY

LEGEND

ITEM	EXISTING	PROPOSED
MAIL BOX	MB	
ROAD SIGN	RS	
UTILITY POLE	UP	
UTILITY BOX	UB	
TELEPHONE BOX	TB	
TELEPHONE MANHOLE	TM	
POWER BOX	PB	
CATCH BASIN	CB	
INSTALL CATCH BASIN INSERT		
STRAW WATTLES		
STORM MANHOLE	SM	
SEWER MANHOLE		
SURVEY MONUMENT		
TAX LOT NUMBER	3023049288	
DECIDUOUS TREE	14"MP	
CONIFEROUS TREE	14"FR	
ROCK WALL		
CENTERLINE RIGHT-OF-WAY		
CONTOUR ELEVATION	326	
GRADE BREAK		
FENCE	x x	
EDGE OF PAVEMENT	/// ///	
EDGE OF GRAVEL		
GAS	G G	
SEWER	SS SS	
DITCH CENTERLINE		
STORM DRAIN	SD SD	
UNDERGROUND POWER	P P	
UNDERGROUND TELECOM	T T	
OVERHEAD POWER	OHP	
FILTER FABRIC FENCE		
WATER BLOW-OFF ASSY.	BO	
FIRE HYDRANT	FH	
WATER AIR/VAC ASSY.	AIR/VAC	
WATER VALVE	WV	
WATER FITTINGS		
WATER MAIN	W W	
WATER SERVICE/METER	WM W	
WATER SERVICE/METER/IND. PRV		
WETLAND IDEMS		
ASPHALT PATCH		
CEMENT CONCRETE PAVEMENT RESTORATION (GRIND AND OVERLAY)		
CONSTRUCT ROCK		

ABBREVIATIONS

AC	ASPHALT CONCRETE/ASPHALT CEMENT
ACP	ASPHALT CONCRETE PAVEMENT
ADS	CORRUGATED HDPE PIPE
APPX.	APPROXIMATE
ASPH	ASPHALT PAVING
ASSY.	ASSEMBLY
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
ATB	ASPHALT TREATED BASE
BFV	BUTTERFLY VALVE
BO	BLOW OFF
BTM	BOTTOM
CB	CATCH BASIN
CC	CEMENT CONCRETE
CDF	CONTROLLED DENSITY FILL
CI	CAST IRON
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC.	CONCRETE
CPLG.	COUPLING
CSBC	CRUSHED SURFACING BASE COURSE
CSTC	CRUSHED SURFACING TOP COURSE
CTR	CENTER
CTS	COPPER TUBE SIZE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY
DI	DUCTILE IRON
EL	ELEVATION
EX.	EXISTING
FL	FLANGE
FH	FIRE HYDRANT
G	GAS
GA	GUY ANCHOR
GALV.	GALVANIZED
GV	GAS VALVE
GY	GUY
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HMA	HOT MIX ASPHALT
HSE	HOUSE
I.E.	INVERT ELEVATION
INT.	INTERSECTION
INV.	INVERT
IPS	IRON PIPE SIZE
KC	KING COUNTY
LCPE	LINED CORRUGATED POLYETHYLENE PIPE
LF	LINEAR FEET
LT	LEFT
MAX.	MAXIMUM
MB	MAIL BOX
MDD	MAXIMUM DRY DENSITY
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MOD	MODIFIED
MON	MONUMENT
MVO	MAIN VALVE OPENING
NC	NORMALLY CLOSED
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OHP	OVERHEAD POWER
P	POWER
PB	PHONE STANDBOX
PC	POINT OF CURVE
PC	POINT OF CURVE
POLY	POLYETHYLENE
PRCL	PARCEL
PRV	PRESSURE REDUCING VALVE
PVC	POLYVINYL CHLORIDE
R	RADIUS
RDCR	REDUCER
R.O.W.	RIGHT OF WAY
RS	ROAD SIGN
RT	RIGHT
SCH	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SHT	SHEET
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
ST	STREET
STA	STATION
STD	STANDARD
TB	TRAFFIC BEARING
TE	THICKENED EDGE
TEL	TELEPHONE
TEMP	TEMPORARY
TESC	TEMP. EROSION & SEDIMENTATION CONTROL
TFC	TOP FACE OF CURB
TG	TOP OF GRATE
UP	UTILITY POLE
VAC	VACUUM
W	WATERMAIN
WM	WATER METER
WS	WATER SERVICE
WV	WATER VALVE

REVISED TO CONFORM TO CONSTRUCTION RECORDS

09/12/2025
RH2 ENGINEERING INC. DATE

NO.	DATE	BY	REVISIONS

Stantec
1687 114th Ave SE, Bellevue WA 98004
phone: (425) 869-9448 www.stantec.com

BRIAN P. WOLF — STATE OF WASHINGTON — 47049 — REGISTERED PROFESSIONAL ENGINEER

Approved By

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DESIGN SUPERVISOR	DATE
PROJECT MANAGER	DATE

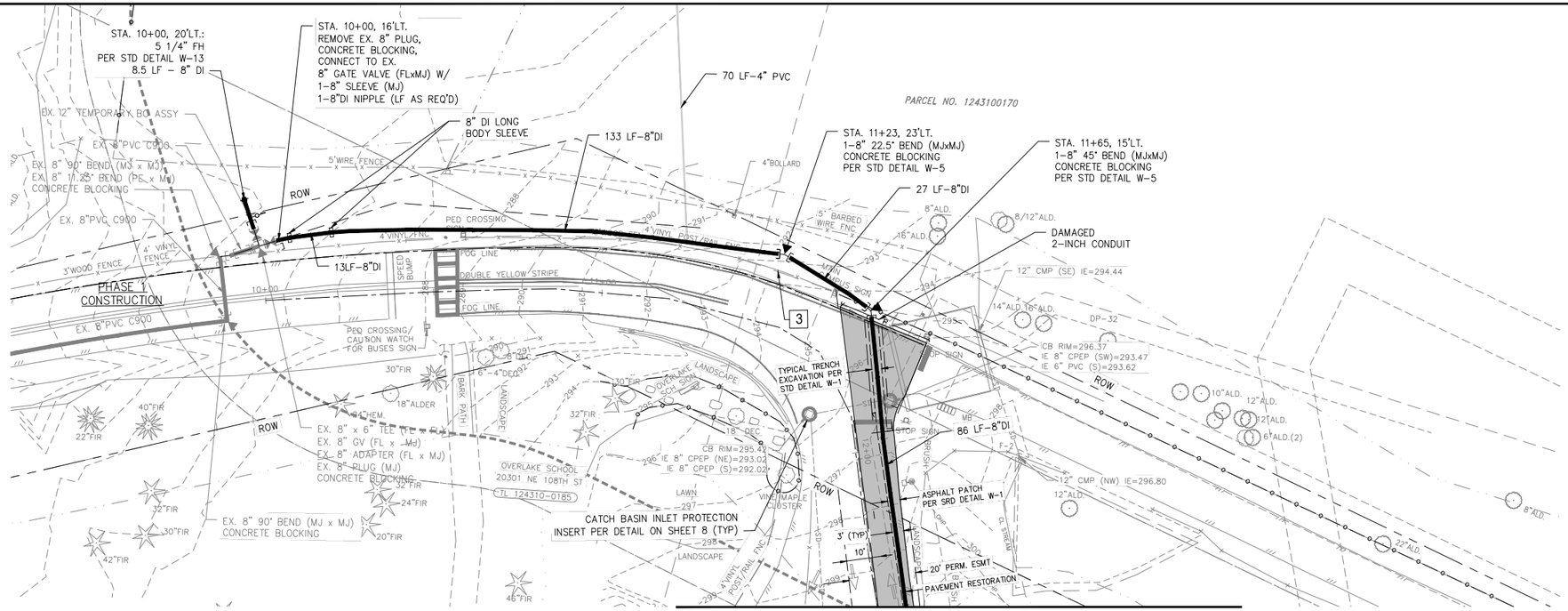
BPW/JEG DESIGNED BY	DATE
I. MIROCHNIK DRAWN BY	DATE
BPW CHECKED BY	DATE

UNION HILL WATER ASSOCIATION

NE REDMOND RD / NE 106TH PLACE IMPROVEMENTS, PHASE 2
WATER MAIN & PRV STATION
NOTES, LEGEND & ABBREVIATIONS

SW 32-26-06 B-2 SHT 2 OF 7

PLOTTING DATE: 9/10/2025 USER: Johan Digiacomo VERSION: 2019 FILE NAME: J:\Data\UHW\25-0002\TA10_Overlake School WM Ph 2\60 SDC\Record Drawings\003885-LGND-PH2-PRV.dwg



MATCHLINE SHEET 4 STA. 12+45

20 0 20 40

SCALE IN FEET

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[3] REMOVE AND RE-INSTALL FENCE AS REQUIRED.

GENERAL TESC NOTES:

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3. MECHANICALLY SWEEP PAVEMENT SURFACES DAILY, AND AS NECESSARY, AND AS DIRECTED BY KING COUNTY INSPECTOR TO PREVENT BLOWING DUST AND TRACKING OF DIRT AND MUD OUTSIDE OF WORK AREA.

GENERAL HMA PAVEMENT PATCHING NOTES:

1. ALL ROAD RESTORATION AND PAVEMENT PATCHING SHALL BE PERFORMED IN ACCORDANCE WITH THE KING COUNTY ROAD STANDARDS AND SHALL BE ACCEPTABLE TO THE KING COUNTY INSPECTOR. REMOVE AND REPLACE TEMPORARY AND PERMANENT PAVEMENT PATCHING NOT ACCEPTED BY KING COUNTY INSPECTOR AT CONTRACTOR'S EXPENSE.
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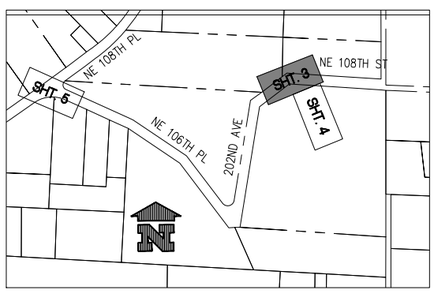

KEY MAP

NO.	DATE	BY	REVISIONS

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BRIAN P. WOLF — STATE OF WASHINGTON — 47049 — REGISTERED PROFESSIONAL ENGINEER

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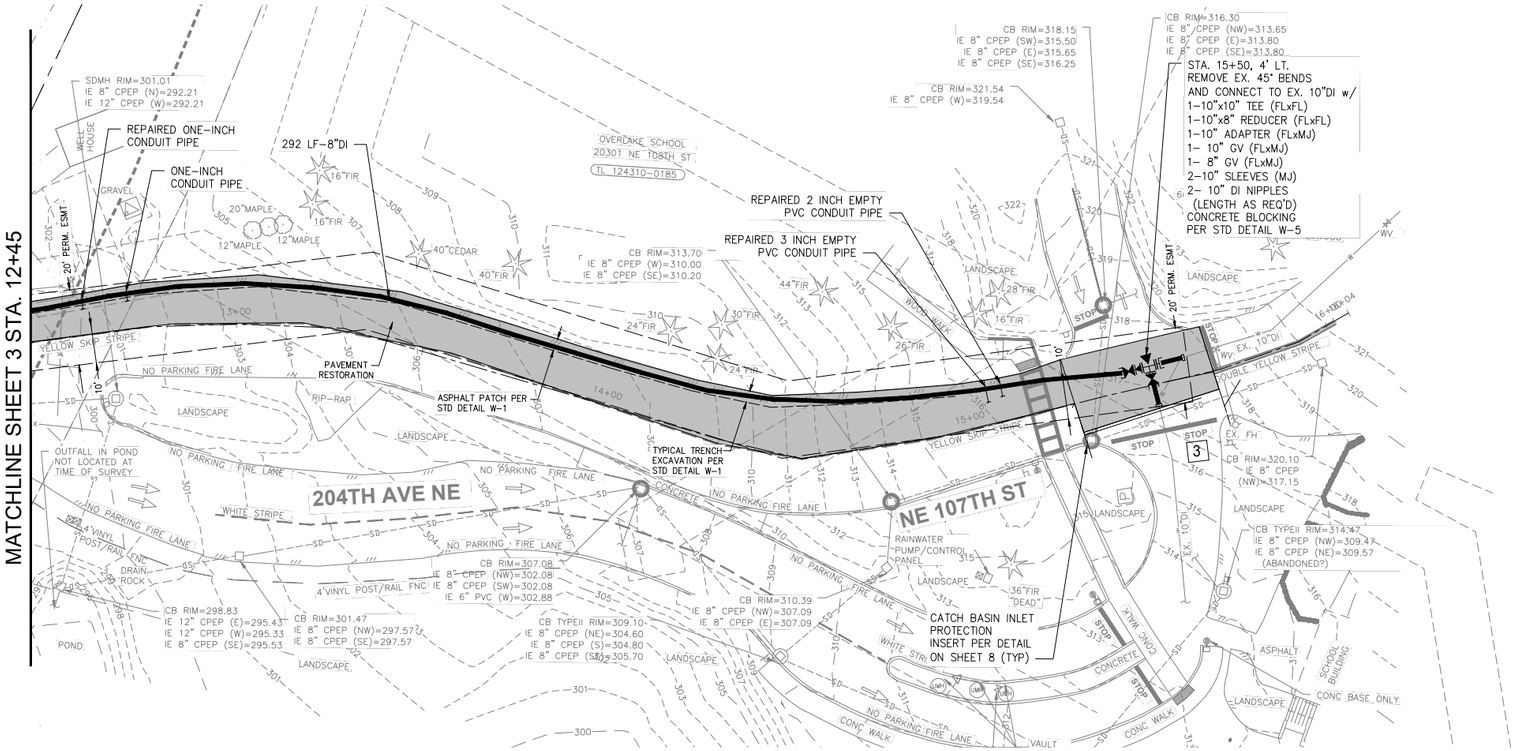
BPW/JEG
DESIGNED BY DATE
I. MIROCHNIK
DRAWN BY DATE
BPW
CHECKED BY DATE

UNION HILL WATER ASSOCIATION

NE REDMOND RD / NE 106TH PLACE
IMPROVEMENTS, PHASE 2
WATER MAIN & PRV STATION
WATER MAIN PLAN STA. 10+00 - 12+45

SW 32-26-06 B-2 SHT 3 OF 7

PLOTTING DATE: 9/10/2025 USER: Johan Dejesasmita VERSION: 2006 FILE NAME: J:\Data\UH\W35-0002\1A10_Overlake School WM Ph 2\60 SDC\Record Drawings\WATER-PLAN-PH2R.dwg



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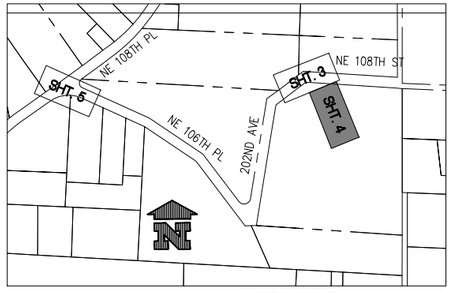

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BRIAN P. WOLF STATE OF WASHINGTON 47049 REGISTERED PROFESSIONAL ENGINEER

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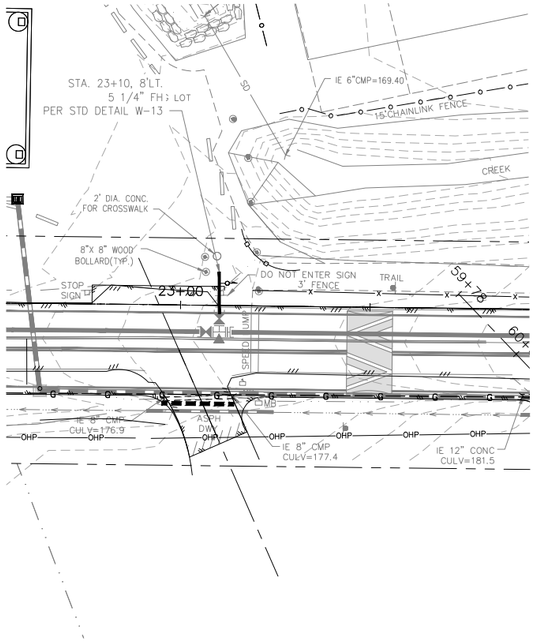
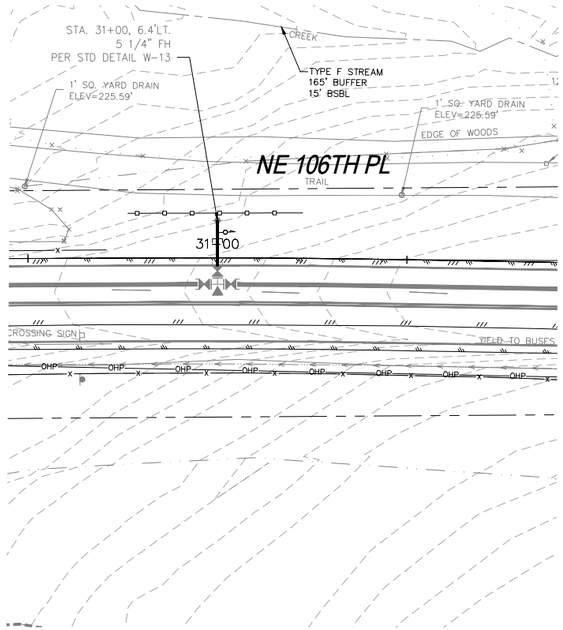
UNION HILL WATER ASSOCIATION

NE REDMOND RD / NE 106TH PLACE IMPROVEMENTS, PHASE 2
WATER MAIN & PRV STATION
WATER MAIN PLAN STA. 12+45 - END

SW 32-26-06 B-2 SHT 4 OF 7

PLOTTING DATE: 9/10/2025 USER: Johan.Digiacomo VERSION: 2206 FILE NAME: J:\Data\UHW\25-0002\TA10_Overlake School WM Ph 2\60_SDC\Record Drawings\WATER-PLAN-PH2R.dwg





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PLOTTING DATE: 8/5/2025 USER: Johan.Digiacomo VERSION: 2006 FILE NAME: J:\Data\UHWA\25-0002\TA10_Overlake School WM Ph 2\SDC\Record Drawings\WATER_PLAN_FH.dwg

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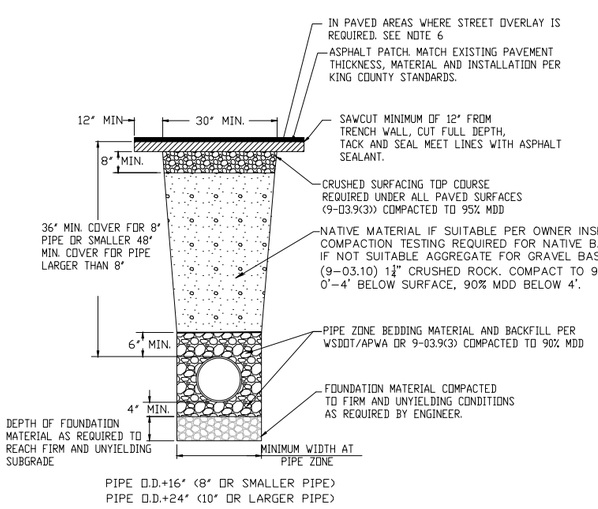
UNION HILL WATER ASSOCIATION

NE REDMOND RD / NE 106TH PLACE
IMPROVEMENTS, PHASE 2
WATER MAIN & PRV STATION
WATER MAIN PLAN FH INSTALLATION

SW 32-26-06 B-2 SHT 5 OF 7



PIPE O.D.+16" (8" OR SMALLER PIPE)
PIPE O.D.+24" (10" OR LARGER PIPE)

NOTES:

1. TRENCH EXCAVATION AND BACKFILL AND PIPE INSTALLATION SHALL CONFORM TO WSDOT STANDARD SPECIFICATIONS SECTION 7-09.3.
2. ALL WORK WITHIN KING COUNTY OR CITY OF REDMOND PUBLIC RIGHTS OF WAY SHALL CONFORM TO CONDITIONS OF PERMITS AND TO COUNTY OR CITY ROAD STANDARDS - REMOVE AND REPLACE NON-CONFORMING WORK.
3. EXCAVATIONS OVER 4' DEEP SHALL COMPLY WITH THE SAFETY STANDARD DESCRIBED IN CHAPTER 296-155-PART N OF THE WAC.
4. BEDDING AND BACKFILL SHALL BE PLACED IN LIFTS AND EACH LIFT COMPACTED TO PRESCRIBED MAXIMUM DRY DENSITY (MDD) PER ASTM D-1557 (MODIFIED PROCTOR).
5. NO PIPE SHALL BE BURIED BEFORE OBSERVED IN PLACE, AND ACCEPTED BY THE UHWA FIELD REPRESENTATIVE.
6. HMA CLASS 1/2" PG 64-22. MATCH EXISTING PAVEMENT THICKNESS, BUT NOT LESS THAN 2" OVER 8.5" CSTC (COMPACTED THICKNESS) TACK & SEAL MEET LINES MINIMUM 1.5" COMPACTED HMA OVERLAY.

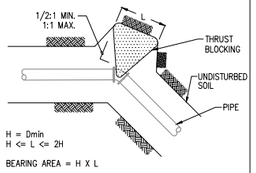
* DETAIL MODIFIED FOR STREET PAVEMENT OVERLAY

TYPICAL TRENCH - RIGID PIPE

WATER STANDARD DETAIL	UNION HILL WATER ASSOCIATION	SCALE: NTS	DATE: OCT 23, 2018
W-1		R:\CAD\DETAIL\AUTOCAD\UHWA\W-1 TR-RIGID	

CONSTRAINTS

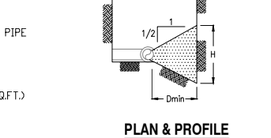
1. SOIL CONDITIONS AND BEARING CHARACTERISTICS ARE TO BE DETERMINED BY THE ASSOCIATION.
2. THIS STANDARD DETAIL IS FOR HORIZONTAL THRUST RESTRAINT ONLY.
3. CONCRETE BLOCKING SHALL BE PER APWA SPECIFICATION 7-11.3(13) 1984.
4. CONCRETE THRUST BLOCKING FOR FITTINGS LARGER THAN 16" SHALL BE AS SHOWN ON THE PROJECT PLANS.
5. MAINTAIN 18" MINIMUM GROUND COVER OVER THE TOP OF ALL CONCRETE BLOCKING.



PROCEDURE

1. DETERMINE BEARING FACTOR IN TABLE 1 CORRESPONDING TO APPROPRIATE PIPE SIZE AND TYPE OF FITTING.
2. MULTIPLY THE BEARING FACTOR DETERMINED IN TABLE 1 BY THE MULTIPLICATION FACTOR IN TABLE 2 FOR THE APPROPRIATE SOIL CLASSIFICATION. THE RESULT IS THE REQUIRED AREA OF CONCRETE (IN SQ.FT.) WHICH MUST BEAR AGAINST UNDISTURBED SOIL.
3. USING TABLE 3 LOCATE THE MINIMUM DEPTH OF CONCRETE (Dmin) CORRESPONDING TO THE REQUIRED BEARING AREA.
4. USING Dmin, THE HEIGHT AND LENGTH OF THE THRUST BLOCKING CAN BE DETERMINED FROM THE DIMENSION RELATIONSHIPS ILLUSTRATED IN PLAN & PROFILE DESCRIBED BELOW:

A. "H" EQUALS "D"
B. MAX. "L" EQUALS 2 X "H"
C. MIN. "L" EQUALS "H"

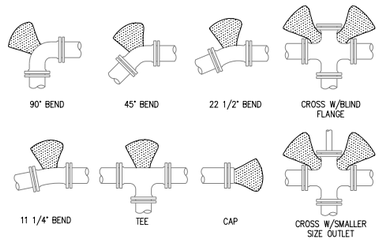


PLAN & PROFILE
NTS

SIZE	TEST PRESSURE	TEES DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
3	300	2.25	2.25	2.25	2.25	2.25
4	300	2.25	2.25	2.25	2.25	2.25
6	300	2.83	4.00	2.25	2.25	2.25
8	300	5.00	7.11	3.85	2.25	2.25
10	300	7.86	11.11	6.00	3.06	2.25
12	300	11.31	16.00	8.66	4.41	2.25
14	250	12.83	18.14	9.82	5.00	2.51
16	225	15.08	21.33	11.54	5.88	2.96

* 2.25 BASED ON GEOMETRIC FACTORS

BEARING FACTOR
TABLE 1



SOIL CONDITION	MULTIPLICATION FACTOR
*MUCK, PEAT, etc.	–
SOFT CLAY	3.0
SAND	1.5
SAND AND GRAVEL	1.0
SAND AND GRAVEL CEMENTED W/ CLAY	0.75
HARD SHALE	0.30

* THRUST BLOCKING SHALL BE DESIGNED BY ENGINEER

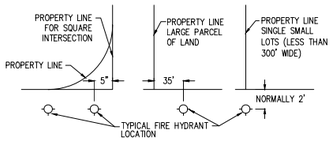
MULTIPLICATION FACTOR
TABLE 2

REQ'D BEARING AREA (SQ. FT.)	MINIMUM DEPTH Dmin
2.25 MIN.– 5.0	1.5'
5.01 – 10.0	2.25'
10.01 – 15.0	3.0'
15.01 – 30.0	4.0'
30.01 – 40.0	4.5'
40.01 – 50.0	5.0'
50.01 – 70.0	6.0'

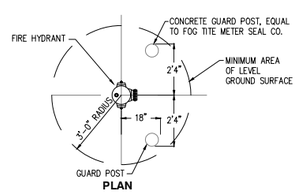
BLOCK SHAPE
TABLE 3

HORIZONTAL THRUST BLOCKING

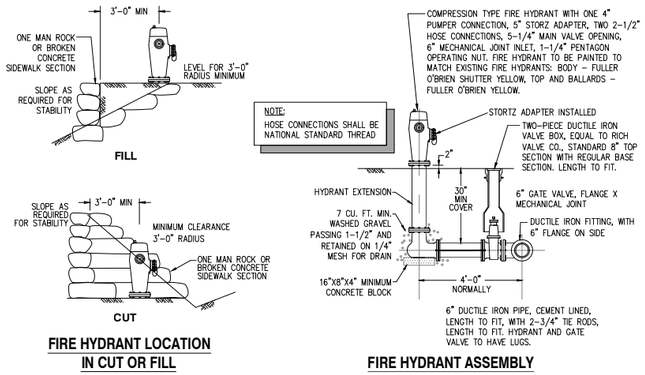
WATER STANDARD DETAIL	UNION HILL WATER ASSOCIATION	SCALE: NTS	DATE: OCT 11, 2018
W-5		R:\CAD\DETAIL\AUTOCAD\UHWA\W-5 HOR BLKG	



TYPICAL FIRE HYDRANT LOCATION



FIRE HYDRANT GUARD POSTS



FIRE HYDRANT LOCATION IN CUT OR FILL

FIRE HYDRANT ASSEMBLY

FIRE HYDRANT ASSEMBLY

WATER STANDARD DETAIL	UNION HILL WATER ASSOCIATION	SCALE: NTS	DATE: MAY 29, 2019
W-13		R:\CAD\DETAIL\AUTOCAD\UHWA\W-13 HYDRANT	

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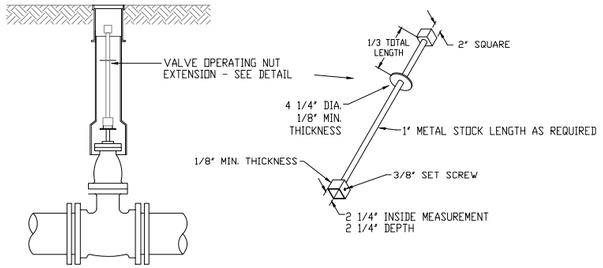
WATER MAIN & PRV STATION
STANDARD WATER DETAILS

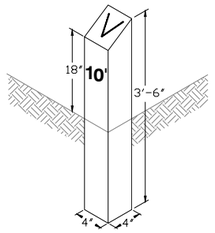
SW 32-26-06 B-2 SHT 6 OF 7

PLOTTING DATE: 9/10/2025 USER: Johan Dipasamite VERSION: 2006 FILE NAME: J:\Data\UHW\25-0002\TA10 Overlake School WM Ph 2\60 SDC\Record Drawings\003885-DTLS-Ph2-PRV.dwg



EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN THREE (3) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG, ONLY ONE EXTENSION PER VALVE. ALL EXTENSIONS ARE TO MADE OF STEEL SIZED AS NOTED, AND PAINTED WITH TWO COATS OF CARBON ELASTIC (ATCO NO. 221) AS SPECIFIED BY PRESERVATIVE PAINT CO. OR APPROVED EQUAL.

VALVE OPERATING NUT EXTENSION



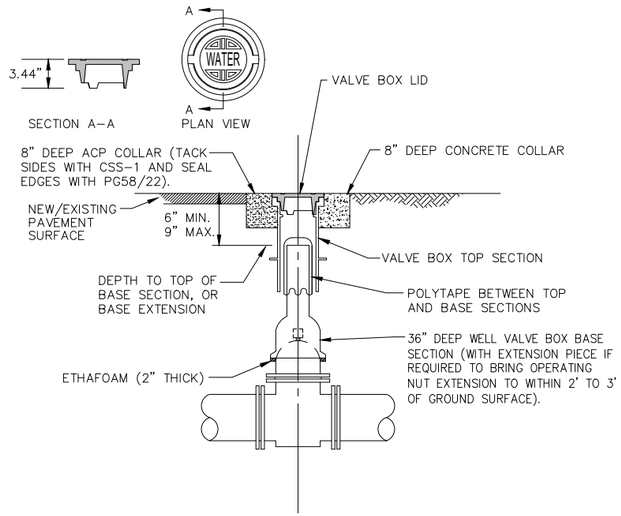
VALVE MARKER POST SHALL BE A RENTON CONCRETE PRODUCTS NO. VM-1 OR APPROVED EQUAL. VALVE MARKER SHALL BE PAINTED WITH TWO COATS OF ICI DEVOE 4308-1000 WHITE. THE POST SHALL BE SITUATED IN A SAFE AND REASONABLY CONSPICUOUS LOCATION AT A RIGHT ANGLE TO THE ROADWAY FROM THE VALVE. DISTANCE TO THE VALVE SHALL BE NEATLY STENCILED ON THE POST WITH TWO-INCH NUMBERS WITH NO. 43-102 (BLACK) PAINT AS SPECIFIED BY PRESERVATIVE PAINT CO. OR APPROVED EQUAL.

VALVE MARKERS ARE NOT REQUIRED WHEN VALVES ARE LOCATED WITHIN PAVED SURFACES.

VALVE MARKER POST

GATE VALVE EXTENSION & MARKER

WATER STANDARD DETAIL	UNION HILL WATER ASSOCIATION	SCALE: NTS	DATE: JUNE 10, 2019
W-19		R:\CAD\DETAIL\AUTOCAD\UHWA\W-19 VLV EXT MK	



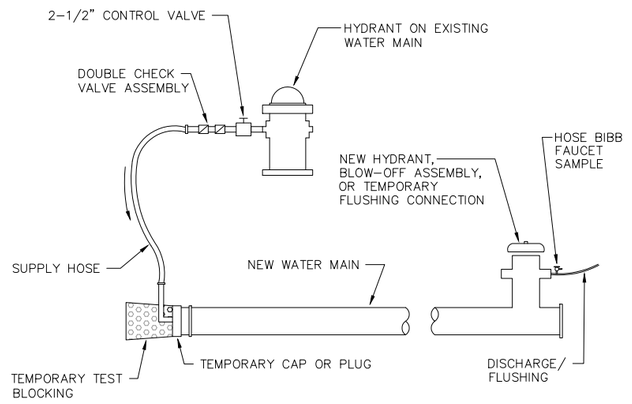
PAVED AREAS UNPAVED AREAS

NOTES:

1. ALL PARTS SHALL BE CAST OR DUCTILE IRON AND COATED WITH ASPHALTIC VARNISH.
2. STAR PIPE PRODUCTS 940 18" VALVE BOX WITH VBST940L WATER LID AND 36" VALVE BOX BOTTOM (BASE SECTION).

VALVE BOX INSTALLATION

WATER STANDARD DETAIL	UNION HILL WATER ASSOCIATION	SCALE: NTS	DATE: NOV 6, 2018
W-21		R:\CAD\DETAIL\AUTOCAD\UHWA\W-21 VLV BOX	



NOTES:

1. AN APPROVED BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED BETWEEN THE EXISTING AND NEW WATER LINES DURING DISINFECTION AND FLUSHING OF NEW WATERMAIN.
2. THE BACKFLOW PREVENTION ASSEMBLY AND SUPPLY HOSE MUST BE DISCONNECTED DURING HYDROSTATIC PRESSURE TESTING OF THE NEW MAIN.
3. THE NEW WATERMAIN SHALL BE CONNECTED TO THE EXISTING SYSTEM ONLY AFTER NEW MAIN IS FLUSHED, DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED.
4. THE INTERIORS OF ALL PIPES AND FITTINGS TO BE USED IN FINAL CONNECTION MUST BE SWABBED OR SPRAYED WITH A 1% AVAILABLE CHLORINE SOLUTION.

FILLING NEW WATER MAINS

WATER STANDARD DETAIL	UNION HILL WATER ASSOCIATION	SCALE: NTS	DATE: NOV 6, 2018
W-22		R:\CAD\DETAIL\AUTOCAD\UHWA\W-22 FILLING WM	

REVISED TO CONFORM TO CONSTRUCTION RECORDS
09/12/2025
RH2 ENGINEERING INC. DATE

NO.	DATE	BY	REVISIONS

Stantec
1687 114th Ave SE, Bellevue WA 98004
phone: (425) 869-9448 www.stantec.com

Approved By

DESIGN/CONSTRUCTION MANAGER	DATE
DESIGN SUPERVISOR	DATE
PROJECT MANAGER	DATE

BPW/JEG
DESIGNED BY DATE
I. MIROCHNIK
DRAWN BY DATE
BPW
CHECKED BY DATE

UNION HILL WATER ASSOCIATION

NE REDMOND RD / NE 106TH PLACE
IMPROVEMENTS, PHASE 2
WATER MAIN & PRV STATION
STANDARD WATER DETAILS

SW 32-26-06 B-2 SHT 7 OF 7

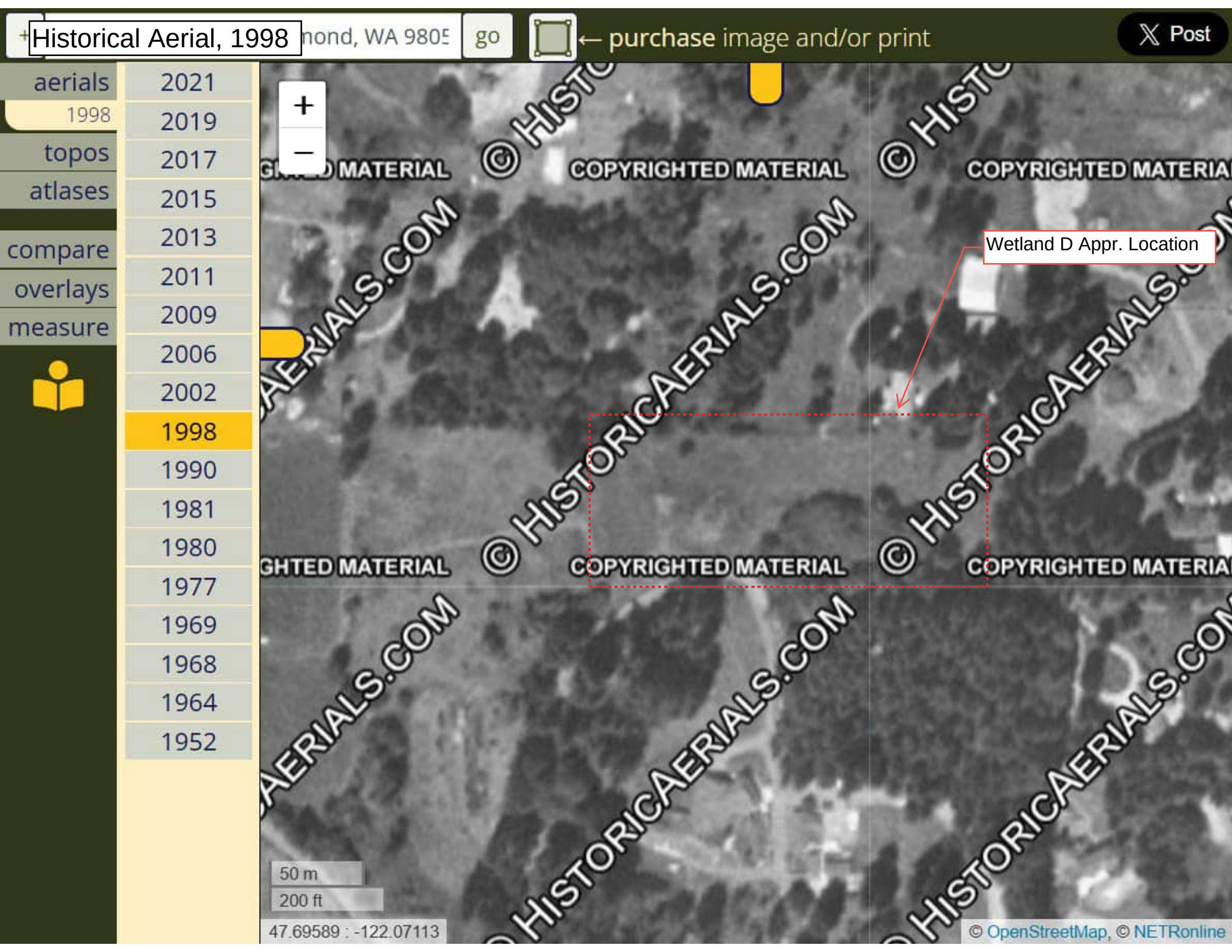
PLOTTING DATE: 9/10/2025 USER: Johon Dipiazamito VERSION: 2006 FILE NAME: J:\Data\UHWA\25-0002\TA10_Overlake School WM Ph. 2\60 SDC\Record Drawings\003865-DTLS-PH2-PRV.dwg

Appendix C

Background Maps and Data


King County Aerial, 2023
Wetland D Appr. Location
60
EagleView Technologies, Inc., King County


Google Earth Aerial, 2018
Wetland D Appr. Location
N
Google Earth


Historical Aerial, 1998
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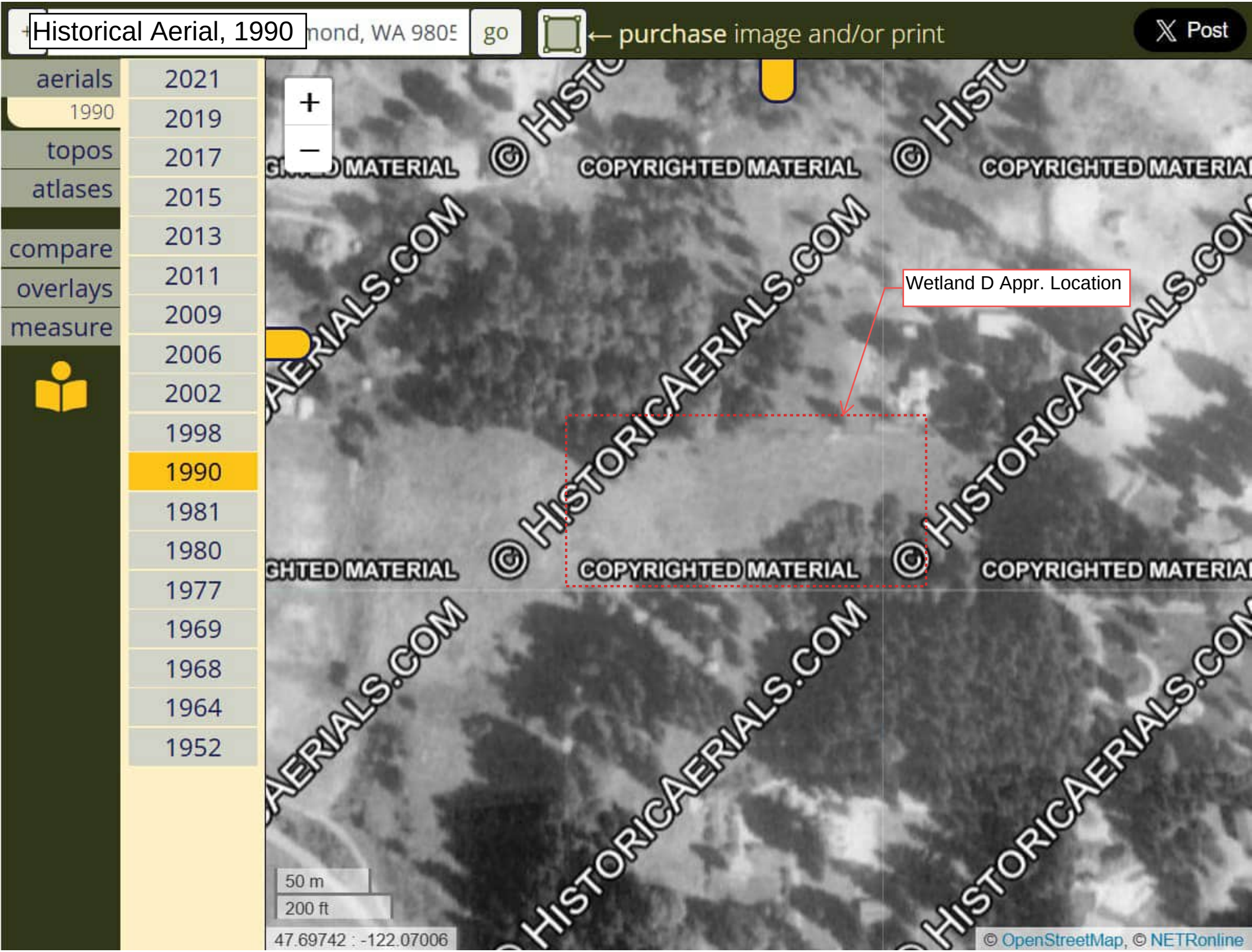
COPYRIGHTED MATERIAL
© HISTORICAERIALS.COM
Wetland D Appr. Location
50 m
200 ft
47.69589 : -122.07113
© OpenStreetMap, © NETRonline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COPYRIGHTED MATERIAL
© HISTORICAERIALS.COM
Wetland D Appr. Location
50 m
200 ft
47.69742 : -122.07006
© OpenStreetMap, © NETRonline


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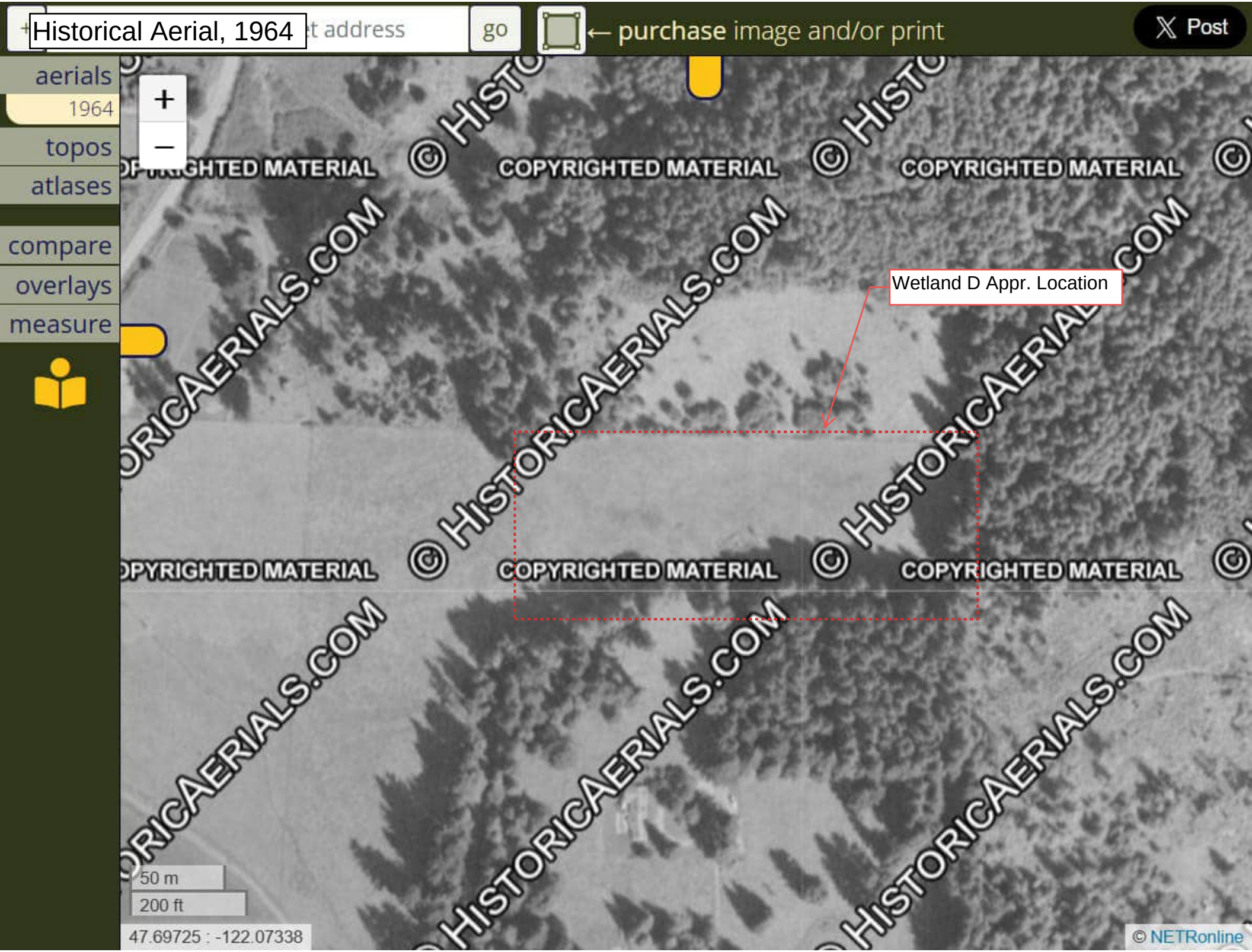
Wetland D Appr. Location
© HISTORICAERIALS.COM
COPYRIGHTED MATERIAL
30 m
100 ft
47.69442 : -122.06824
© OpenStreetMap, © NETRonline


Historical Aerial, 1964
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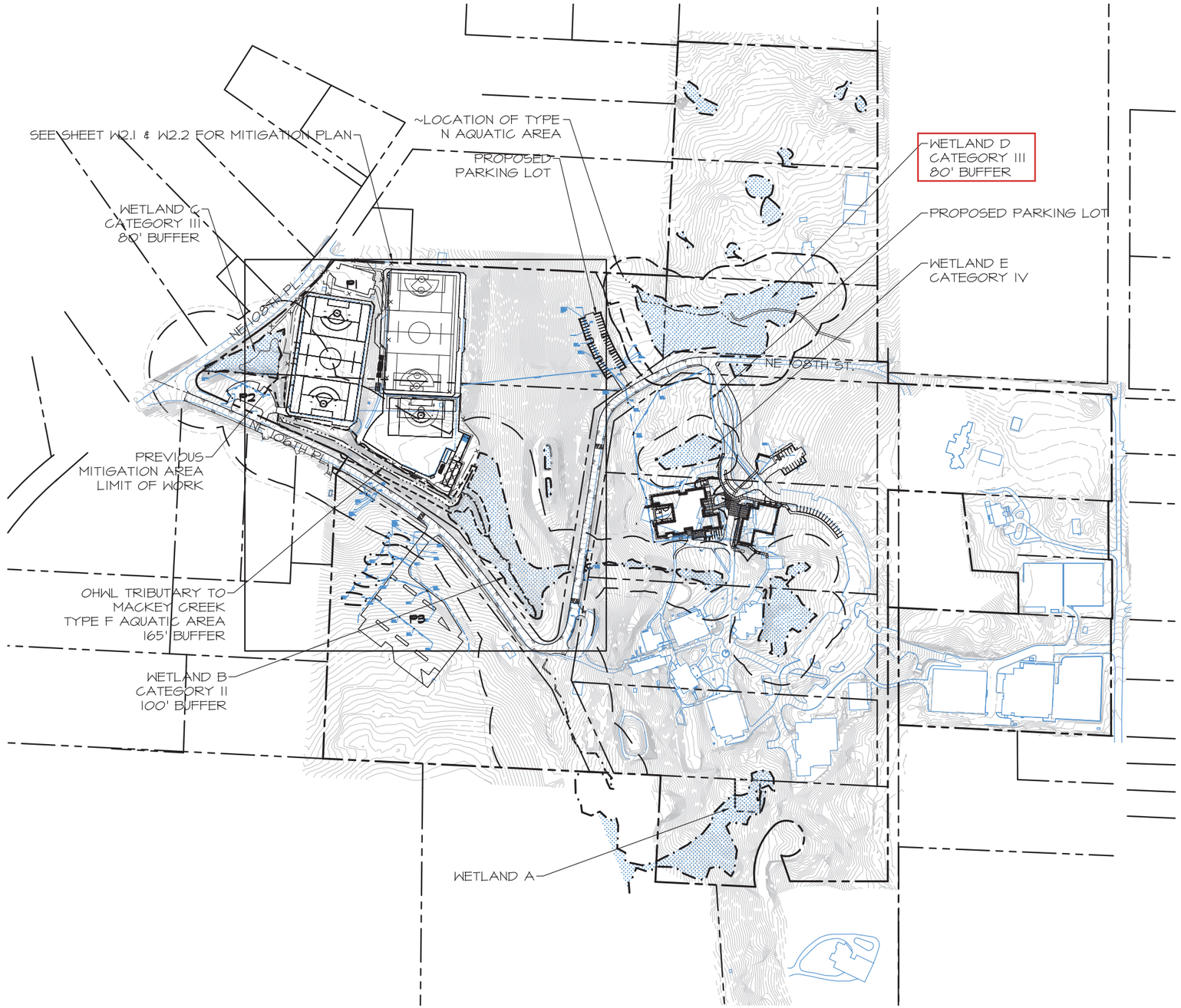
COPYRIGHTED MATERIAL
© HISTORICAERIALS.COM
Wetland D Appr. Location
50 m
200 ft
47.69725 : -122.07338
© NETRonline



GRAPHIC SCALE
(IN FEET)

0 75 150 225 300 450

SCALE: 1:150

N

SHEET INDEX

NOTES

1. BASE INFORMATION PROVIDED BY PACE, 11255 KIRKLAND WAY, SUITE 300, KIRKLAND, WA 98033, (425) 827-2014.
2. SOURCE DRAWING WAS MODIFIED BY AOA FOR VISUAL ENHANCEMENT.
3. GRADING, DRAINAGE AND PARKING LAYOUT DESIGN BY CPL, SEATTLE, WA, 206.343.0460.
4. GRADING AND DRAINAGE FOR FIELDS BY DA HOGAN AND ASSOCIATES, (206) 285-0400.
5. THIS IS THE FINAL MITIGATION PLAN PER THE 6/5/2015 CAEX 13-0009 REPORT AND DECISION - ITEMS 6.4 AND 6.5.

Altmann Oliver Associates, LLC | AOA
Environmental Planning & Landscape Architecture
PO Box 578 Carnation, WA 98014 Office: (425) 333-4535 Fax: (425) 333-4609

STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT

SIMONE CATHERINE OLIVER
CERIFICATE NO. 744
EXPIRES 6/25/2019

FINAL MITIGATION PLAN FOR THE LOWER FIELDS

SITE PLAN OVERVIEW

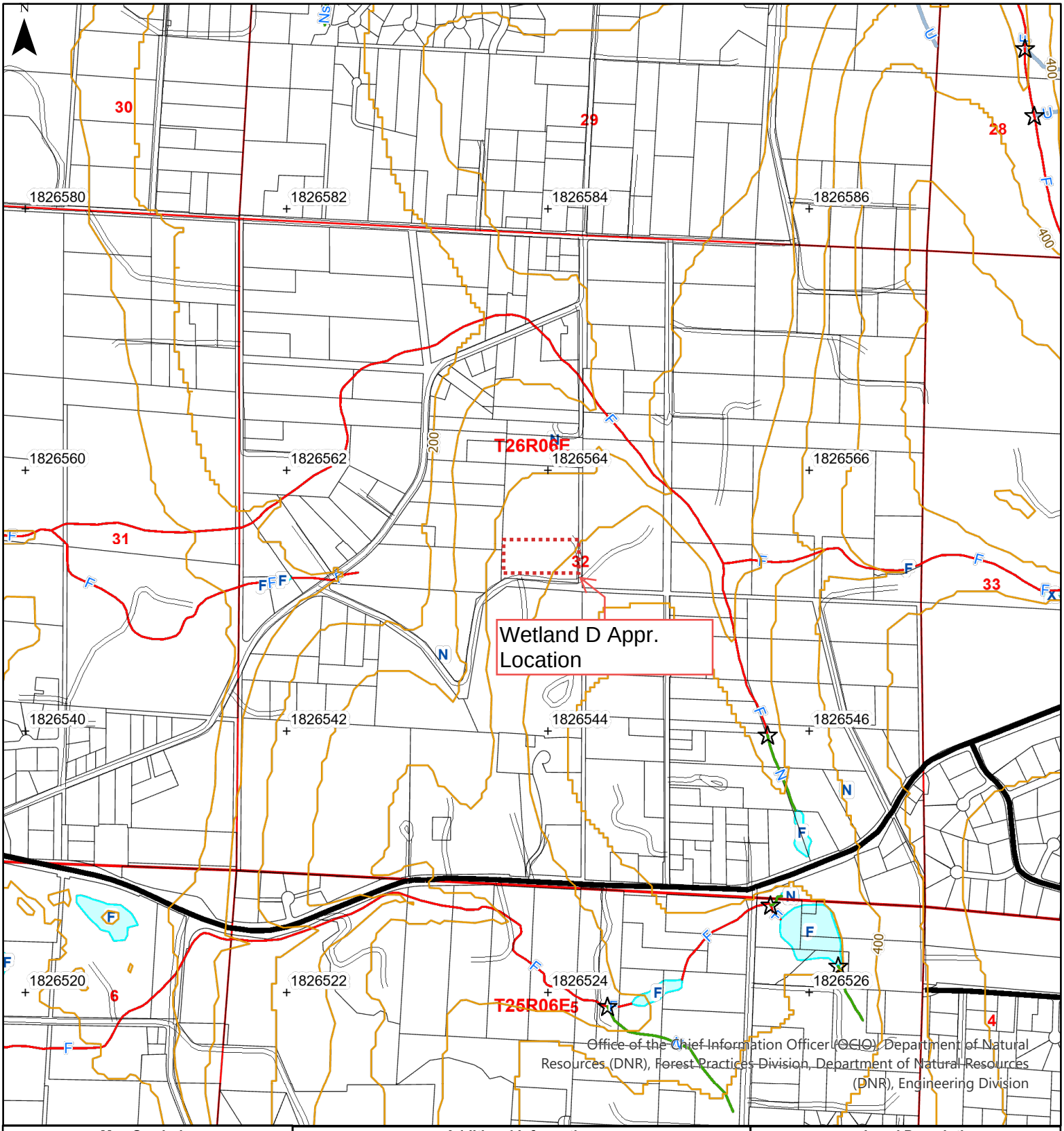
THE OVERLAKE SCHOOL CAMPUS
CAEX 13-0009, PROPOSED FIELD PLAN

Revisions	Date	By

Date 12-31-18
Scale AS NOTED
Project# 4117

Sheet # W1.1

Forest Practices Activity Map - Application #_____



Map Symbols

- Harvest Boundary
- Road Construction
- Stream
- RMZ / WMZ Buffers
- Rock Pit
- Landing
- Waste Area
- Clumped WRTS/GRTS
- Existing Structure

Additional Information

Legal Description

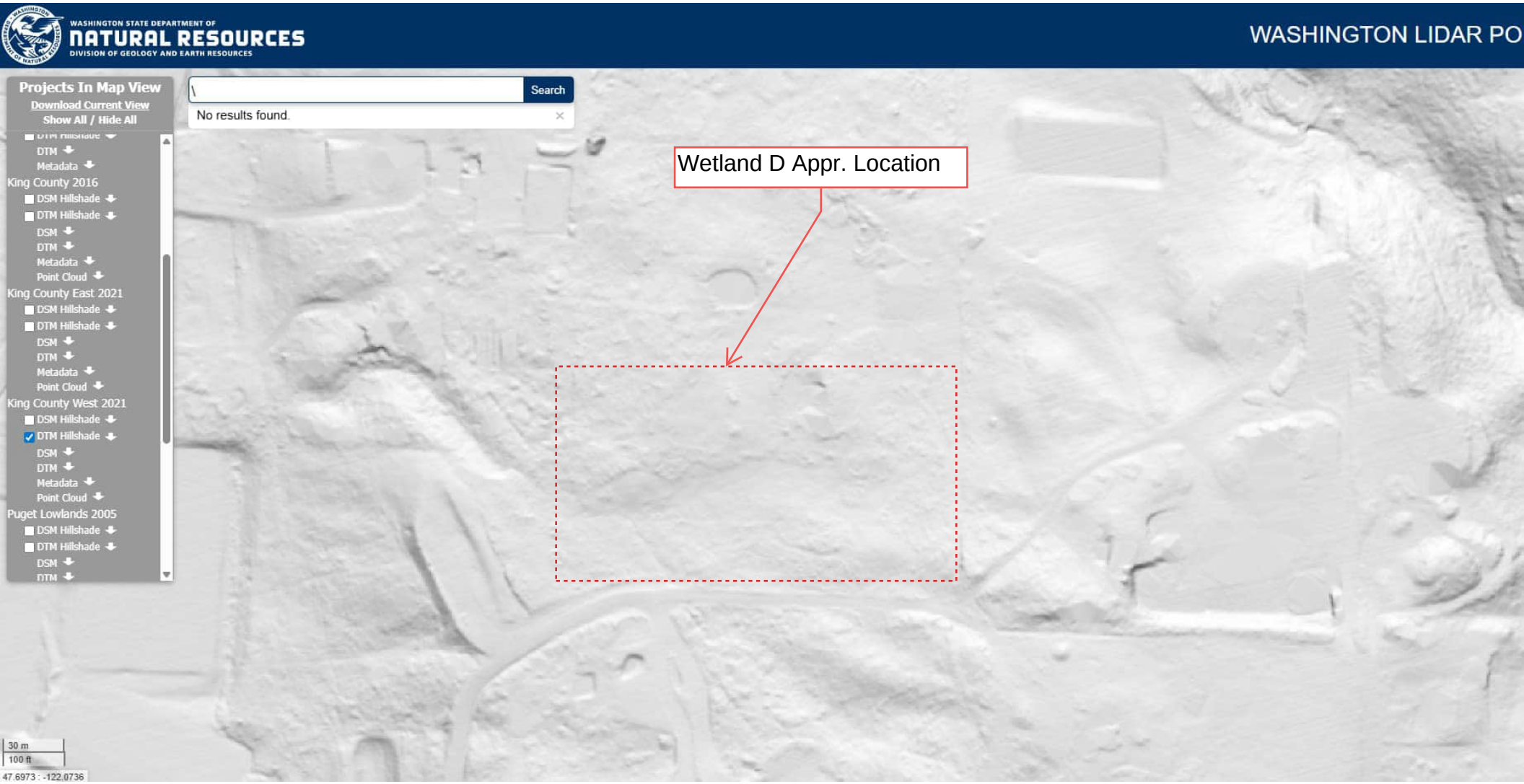
S06 T25.0N R06.0E, S31 T26.0N R06.0E, S30 T26.0N R06.0E, S05 T25.0N R06.0E, S32 T26.0N R06.0E, S29 T26.0N R06.0E, S33 T26.0N R06.0E, S04 T25.0N R06.0E, S28 T26.0N R06.0E

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Approximate Scale : 1:12,000

0 500 1,000 2,000 Feet

Date: 9/8/2025 Time: 11:27 AM


WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
DIVISION OF GEOLOGY AND EARTH RESOURCES
WASHINGTON LIDAR PO
Projects In Map View
Download Current View
Show All / Hide All
DTM
Metadata
King County 2016
DSM Hillshade
DTM Hillshade
DSM
DTM
Metadata
Point Cloud
King County East 2021
DSM Hillshade
DTM Hillshade
DSM
DTM
Metadata
Point Cloud
King County West 2021
DSM Hillshade
DTM Hillshade
DSM
DTM
Metadata
Point Cloud
Puget Lowlands 2005
DSM Hillshade
DTM Hillshade
DSM
DTM
Search
No results found.
Wetland D Appr. Location
30 m
100 ft
47.6973 : -122.0736

Known Rare Plants and Rare & High-quality Ecosystems

Rare Plant

Rare and/or High Quality Ecosystem

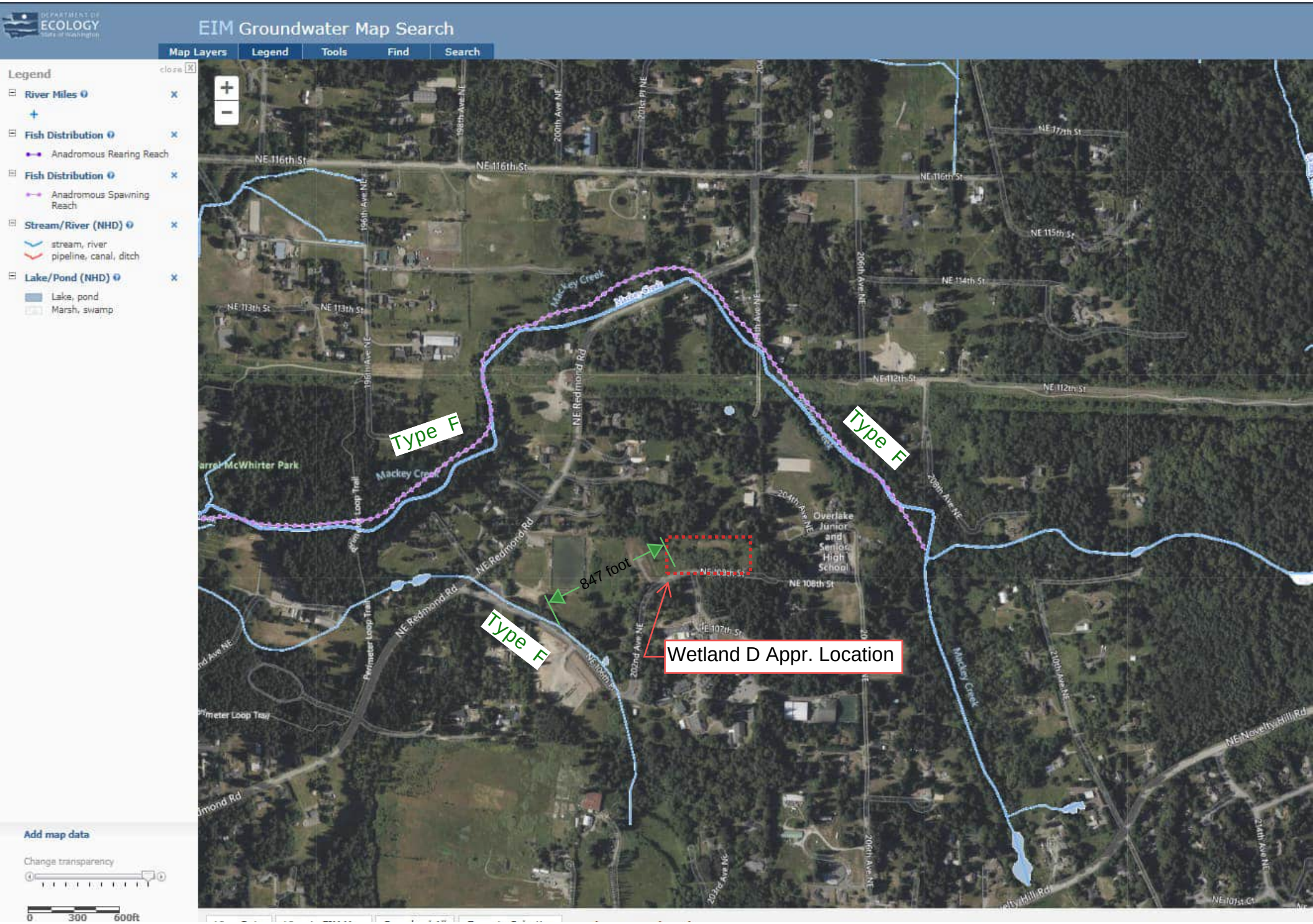
Historical Rare Plants and Rare & High-quality Ecosystems

TEST

Rare Plant

Rare and/or High Quality Ecosystem

DNR Natural Resources Conservation Areas (NRCA)


EIM Groundwater Map Search
Map Layers
Legend
Tools
Find
Search
Legend
River Miles
Fish Distribution
Anadromous Rearing Reach
Fish Distribution
Anadromous Spawning Reach
Stream/River (NHD)
stream, river
pipeline, canal, ditch
Lake/Pond (NHD)
Lake, pond
Marsh, swamp
Add map data
Change transparency
0 300 600ft
Type F
Type F
Type F
847 foot
Wetland D Appr. Location
Mackey Creek
NE 116th St
NE 113th St
NE 112th St
NE 114th St
NE 115th St
NE 108th St
NE 107th St
NE Redmond Rd
Overlake Junior and Senior High School
Perimeter Loop Trail
Carter McWhirter Park
196th Ave NE
198th Ave NE
200th Ave NE
201st Pl NE
202nd Ave NE
204th Ave NE
206th Ave NE
208th Ave NE
210th Ave NE
214th Ave NE
NE Novelty Hill Rd

King County iMap

Legend

Stream type

- S - Shoreline of the state
- F - Fish habitat,Biologi...
- F - Fish habitat,Physical
- F - Fish habitat,Presu...
- N - Non-fish bearing
- Unclassified

Potential steep slope hazard areas (2016, see explanation--->)

Erosion hazard (1990 SAO)

Date: 7/22/2025 Notes:

N

King County

King County iMap

Legend

- Potential landslide hazard areas (2016, see explanation--->)
- Potential steep slope hazard areas (2016, see explanation--->)
- Erosion hazard (1990 SAO)

Date: 7/23/2025 Notes:

N

King County

U.S. Fish and Wildlife Service

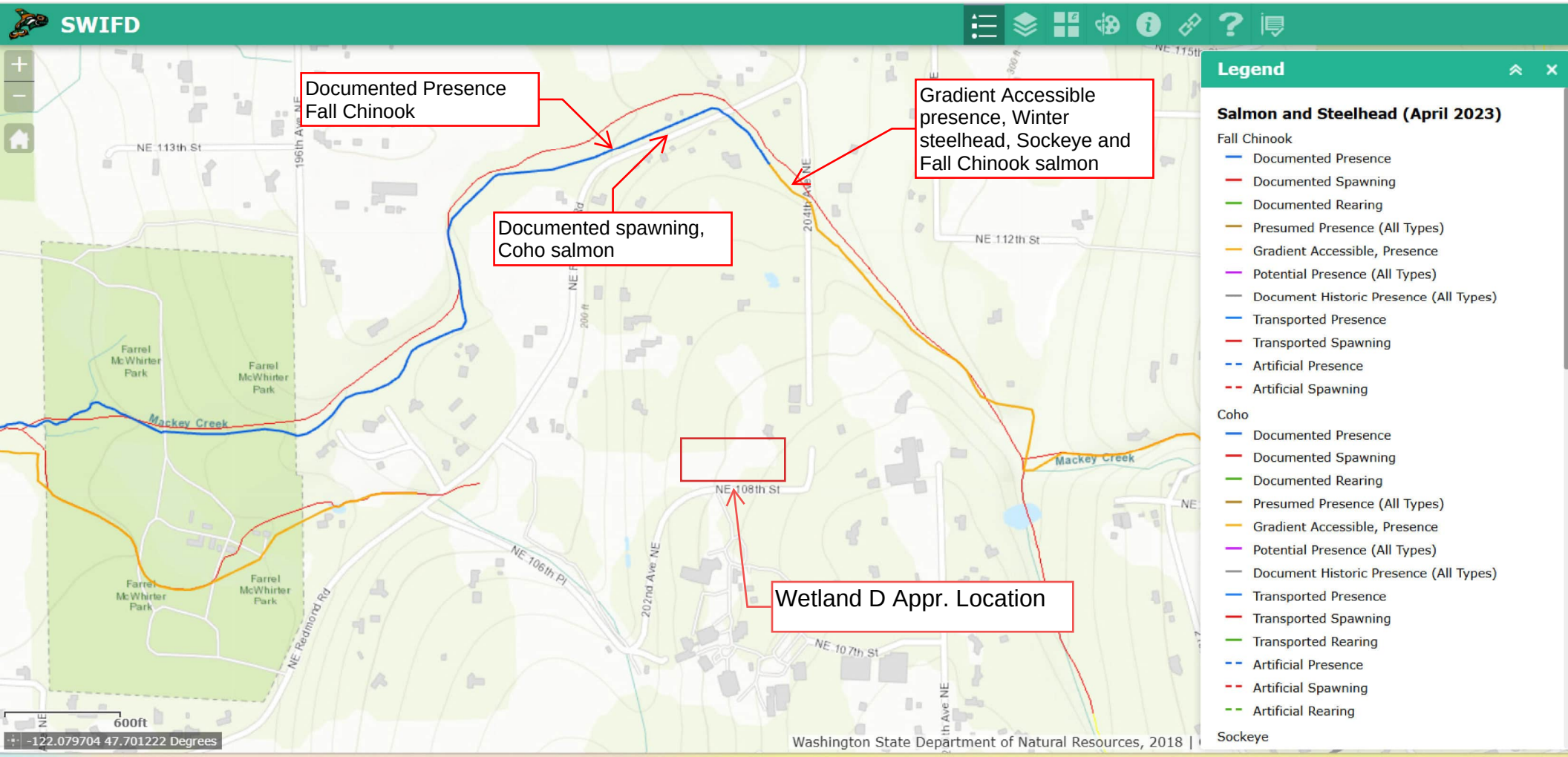
National Wetlands Inventory

Overlake School Disturbance

August 4, 2025

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine


SWIFD
Documented Presence
Fall Chinook
Documented spawning,
Coho salmon
Gradient Accessible
presence, Winter
steelhead, Sockeye and
Fall Chinook salmon
Wetland D Appr. Location
NE 113th St
NE 112th St
NE 108th St
NE 106th Pl
NE 107th St
196th Ave NE
204th Ave NE
202nd Ave NE
NE Redmond Rd
Farrel McWhirter Park
Mackey Creek
600ft
-122.079704 47.701222 Degrees
Washington State Department of Natural Resources, 2018 |
Legend
Salmon and Steelhead (April 2023)
Fall Chinook
Documented Presence
Documented Spawning
Documented Rearing
Presumed Presence (All Types)
Gradient Accessible, Presence
Potential Presence (All Types)
Document Historic Presence (All Types)
Transported Presence
Transported Spawning
Artificial Presence
Artificial Spawning
Coho
Documented Presence
Documented Spawning
Documented Rearing
Presumed Presence (All Types)
Gradient Accessible, Presence
Potential Presence (All Types)
Document Historic Presence (All Types)
Transported Presence
Transported Spawning
Transported Rearing
Artificial Presence
Artificial Spawning
Artificial Rearing
Sockeye

Hydric Rating by Map Unit—King County Area, Washington
(NRCS_SoilMap)

Map Scale: 1:1,910 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 20, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	5	14.1	82.6%
AgD	Alderwood gravelly sandy loam, 15 to 30 percent slopes	5	3.0	17.4%
Totals for Area of Interest			**17.1**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for King County Area, Washington

July 23, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,910 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 20, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	14.1	82.6%
AgD	Alderwood gravelly sandy loam, 15 to 30 percent slopes	3.0	17.4%
Totals for Area of Interest		**17.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

King County Area, Washington

AgC—Alderwood gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2t626
Elevation: 50 to 800 feet
Mean annual precipitation: 20 to 60 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: F002XA004WA - Puget Lowlands Forest
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XS301WA), Limited Depth Soils (G002XF303WA)

Other vegetative classification: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XS301WA), Limited Depth Soils (G002XF303WA)
Hydric soil rating: No

Minor Components

Indianola
Percent of map unit: 5 percent
Landform: Terraces, kames, eskers
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Everett
Percent of map unit: 5 percent
Landform: Kames, moraines, eskers
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Base slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Shalcar
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma
Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

AgD—Alderwood gravelly sandy loam, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: 2t627
Elevation: 0 to 1,000 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Alderwood and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F002XA004WA - Puget Lowlands Forest
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)
Other vegetative classification: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)
Hydric soil rating: No

Minor Components

Everett

Percent of map unit: 5 percent
Landform: Moraines, eskers, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Indianola

Percent of map unit: 5 percent

Landform: Terraces, kames, eskers
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Shalcar

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Soils (NRCS Soil Resrouce Report)

This table lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the

upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
    A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
    A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
    A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or

B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:
Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
Federal Register. September 18, 2002. Hydric soils of the United States.
Federal Register. July 13, 1994. Changes in hydric soils of the United States.
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
National Research Council. 1995. Wetlands: Characteristics and boundaries.
Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.
Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.
Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

Report—Hydric Soils (NRCS Soil Resrouce Report)

Hydric Soils–King County Area, Washington				
Map symbol and map unit name	**Component**	**Percent of map unit**	**Landform**	**Hydric criteria**
AgC—Alderwood gravelly sandy loam, 8 to 15 percent slopes				
	Shalcar	3	Depressions	1, 3
	Norma	2	Drainageways, depressions	2, 3
AgD—Alderwood gravelly sandy loam, 15 to 30 percent slopes				
	Shalcar	3	Depressions	1, 3
	Norma	2	Drainageways, depressions	2, 3

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

King County, Washington

Local office

Washington Fish And Wildlife Office

(360) 753-9440
(360) 753-9405

510 Desmond Drive Se, Suite 102

Lacey, WA 98503-1263

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Marbled Murrelet Brachyramphus marmoratus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4467	Threatened
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Northwestern Pond Turtle Actinemys marmorata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Fishes

NAME	STATUS
Bull Trout Salvelinus confluentus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

Suckley's Cuckoo Bumble Bee Bombus suckleyi Proposed Endangered

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/10885

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete

If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Mar 1 to Aug 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Mar 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

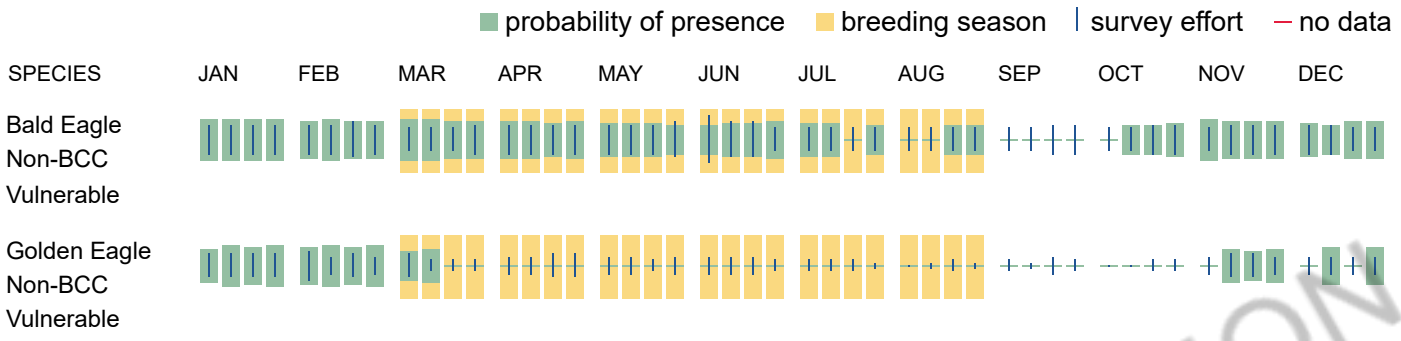
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Measures for Proactively Minimizing Migratory Bird Impacts

Your IPaC Migratory Bird list showcases birds of concern, including Birds of Conservation Concern (BCC), in your project location. This is not a comprehensive list of all birds found in your project area. However, you can help proactively minimize significant impacts to all birds at your project location by implementing the measures in the Nationwide avoidance and minimization measures for birds document, and any other project-specific avoidance and minimization measures suggested at the link Measures for avoiding and minimizing impacts to birds for the birds of concern on your list below.

Ensure Your Migratory Bird List is Accurate and Complete

If your project area is in a poorly surveyed area, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles document, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

Review the FAQs

The FAQs below provide important additional information and resources.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Mar 1 to Aug 31
Black Swift Cypseloides niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
California Gull Larus californicus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31

Chestnut-backed Chickadee Poecile rufescens rufescens — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds Mar 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Rufous Hummingbird Selasphorus rufus — Breeds Apr 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds Jun 1 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Western Grebe aechmophorus occidentalis — Breeds Jun 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/6743

Western Gull Larus occidentalis — Breeds Apr 21 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Western Screech-owl Megascops kennicottii cardonensis — Breeds Mar 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

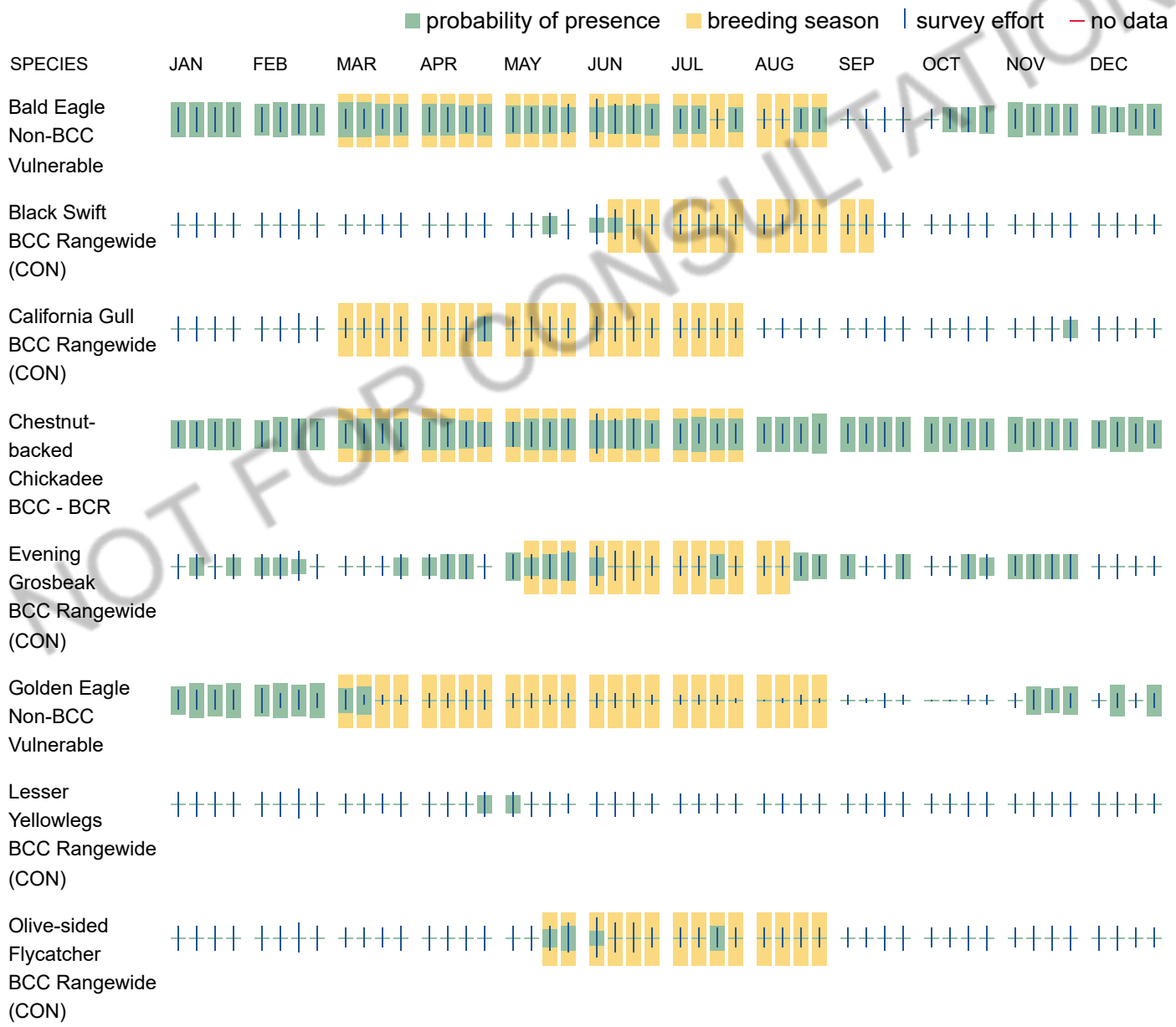
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

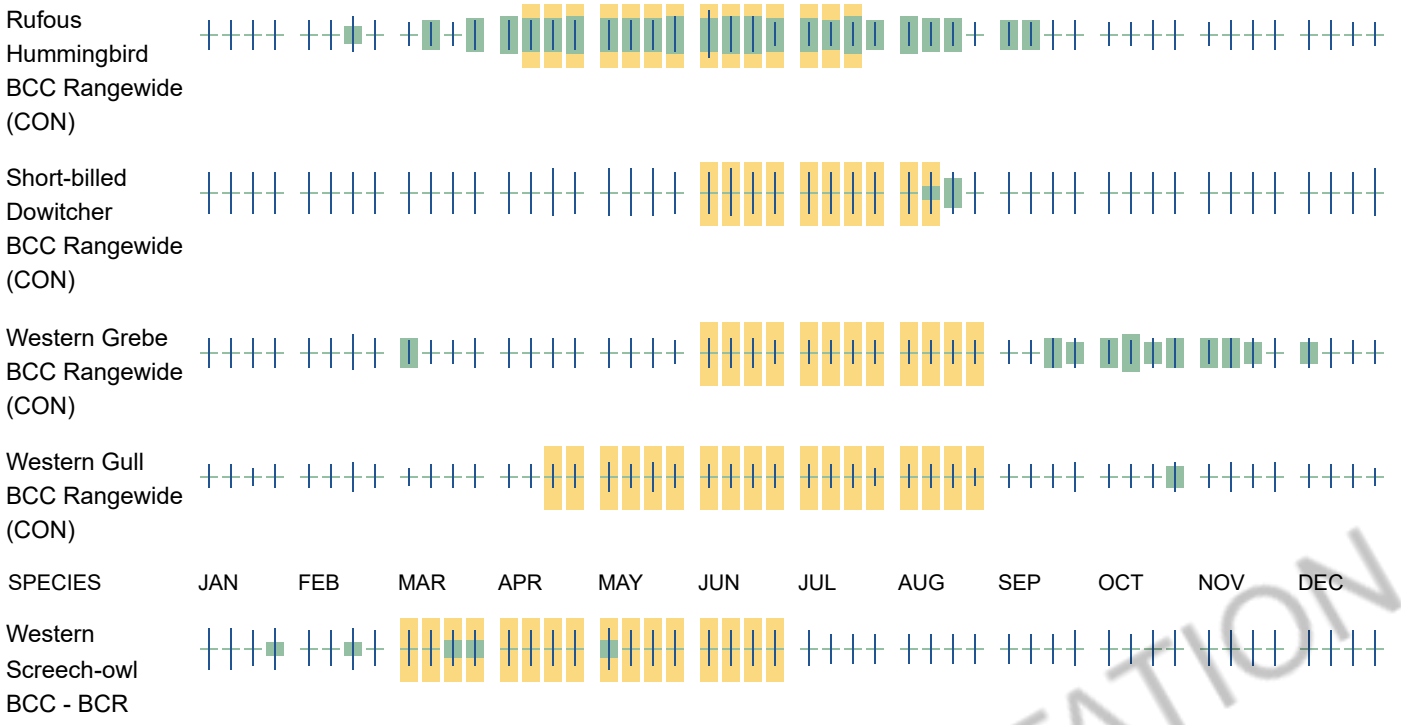
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as “Vulnerable”. See the FAQ “What are the levels of concern for migratory birds?” for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information

Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs
Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix D

Site Photographs

Site Photographs — Overlake School Water Main — Union Hill Water Association

Critical Areas Site Investigation

July 25 & 28, 2025

Groundwater tightline installed in Wetland D with daylight surface water flow in foreground. Facing south.

Groundwater tightline installed in Wetland D; daylight surface water flow point in foreground. Facing north.

Cleared trail within eastern portion of Wetland D. Facing northwest.

Cleared trail within eastern portion of Wetland D. Facing southeast.

Cleared area along northwestern edge of Wetland D. Entrance to cleared trail is located in midground. Facing southeast.

Central portion of northern border of Wetland D along cleared area. Facing south.

Site Photographs — Overlake School Water Main — Union Hill Water Association

Critical Areas Site Investigation

July 25 & 28, 2025

Forested (background), emergent (mid-ground) and scrub-shrub, (foreground) areas of Wetland A. Facing east.

Southern fenced border of Wetland A with 202nd Avenue NE in the background. Facing south.

Wetland A drainage outlet beyond northwestern corner of Wetland A. Facing northwest.

Southern portion of western border of Wetland A. Facing west.

Stunted Skunk cabbage (*Lysichiton americanus*) within Himalayan blackberry (*Rubus armeniacus*) patch. Located near southeast border of Wetland A along NE 108th Street.

Location of Test Pit 3 within saturated soils in the western portion of Wetland A. Facing east.

Appendix E

Site Investigation Data

King County - Severe Drought as of 7/23/2025 (US. Drought monitor)

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

Project/Site: Overlake School Wetland D City/County: Redmond/King County Sampling Date: 7/25/25

Applicant/Owner: Overlake School Inc. State: WA Sampling Point: TP-1

Investigator(s): RH2 Engineering, Alicia Pettitow, Kyle Wisner Section, Township, Range: 32, 26N, 06E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): LRR A - WMVC Lat: 47.695376 Long: -122.069753 Datum: WGS 84

Soil Map Unit Name: Alderwood Gravelly Sandy Loam NWI classification: none

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

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

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

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

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

Remarks:
Drought per KC.

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: 15')			
1. Rhus rubra	10%	Y	FAC
2.			
3.			
4.			
5.		10% = Total Cover	
Herb Stratum (Plot size: 5')			
1. Juncus effusus	70%	Y	FACW
2. Phalaris arundinacea	10%	N	FACW
3. Rubus ursinus	60%	Y	FACU
4. Lotus corniculatus	10%	N	FAC
5. Ranunculus repens	50%	Y	FAC
6.			
7.			
8.			
9.			
10.			
11.		= Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. Rubus laciniatus	20%	Y	FAC
2.			
		20% = Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: TP-1

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
0-7"	10YR 3/2	100%	—	—	—	—	clay loam	fine fibrous roots
7-11"	10YR 4/2	95%	7.5YR 5/8	5%	C	M	sandy CL	some roots & rocks, medium, prom., common Redox
11-16"	2.5Y 5/2	80%	7.5YR 4/6	10%	C	M	Sandy CL	medium, prominent, common redox.
			7.5YR 2.5/2	<1%	C	M		fine, prominent, few redox.
			7.5YR 6/8	10%	C	M		coarse, prominent, common redox.

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

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

Project/Site: Overlake School Wetland D | City/County: Redmond/King County | Sampling Date: 7/25/25

Applicant/Owner: Overlake School Inc. | State: WA | Sampling Point: TP-2

Investigator(s): RH2, AP, KW | Section, Township, Range: 32, 26N, 06E

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): Concave | Slope (%): 3%

Subregion (LRR): LRR A - WMVC | Lat: 47.695376 | Long: -122.069753 | Datum: WGS 84

Soil Map Unit Name: Alderwood Gravelly Sandy Loam | NWI classification: none

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

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

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

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

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

Remarks:
Drought per KC.

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: 5')			
1. Muhlenbergia mexicana	10%	N	FACW
2. Dactylis glomerata	5%	N	FACU
3. Juncus effusus	15%	N	FACW
4. Ranunculus repens	45%	Y	FAC
5. Anthoxanthum odoratum	10%	N	FACU
6. Agrostis gigantea	35%	Y	FACW
7. Vicia hirsuta	5%	N	UPL
8.			
9.			
10.			
11.			
	120% = Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. Rubus bifrons *	25%	Y	FAC
2. Rubus laciniatus	30%	Y	FAC
	55% = Total Cover		

% Bare Ground in Herb Stratum ✓

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: TP-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
0-16"	10YR 4/3	100%	—	—	—	—	Loam	Fibrous Roots

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

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

Project/Site: Overlake School Wetland D City/County: Redmond / King County Sampling Date: 7/25

Applicant/Owner: Overlake School Inc. State: WA Sampling Point: TP-3

Investigator(s): RHZ, AP, KW Section, Township, Range: 32, 26N, 06E

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): concave Slope (%): 1%

Subregion (LRR): LRR A - WMVC Lat: 47.695376 Long: -122.069753 Datum: WGS 84

Soil Map Unit Name: Alderwood Gravelly Sandy Loam NWI classification: N/A

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	30%	N	FAC
2.			
3.			
4.			
	30%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Alnus rubra	10%	N	FAC
2.			
3.			
4.			
5.			
	10%	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Rubus ursinus	40%	Y	FACU
2. Cirsium arvense	25%	N	FAC
3. Equisetum arvense	2%	N	FAC
4. Carex stipata	5%	N	OBL
5. Athyrium filix-femina	5%	N	FAC
6. Carex obnupta	20%	N	OBL
7. Juncus effusus	35%	Y	FACW
8.			
9.			
10.			
11.			
	137%	= Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. Rubus bifrons	35%	Y	FAC
2. Rubus laciniatus	10%	N	FACU
	45%	= Total Cover	

% Bare Ground in Herb Stratum ____

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:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Heavily disturbed site

SOIL

Sampling Point: TP-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
0-8	10yr 2/1	100%	✓	✓	✓	✓	Clay loam	Large roots in upper profile, Gravels
8-16	2.5y 5/2	87%	7.5yr 4/6	3%	C	PL	S. Clay Loam	Gravels, fine, Prominent, Few redox
			10yr 5/6	10%	C	M		medium, Prominent, Common Redox

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

Hydrogen sulfide smell in upper layer

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 6 inches

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

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

Project/Site: Overlake School Wetland D City/County: Redmond / King County Sampling Date: 7/25

Applicant/Owner: Overlake School Inc. State: WA Sampling Point: TP-4

Investigator(s): RH2 Engineering, AP, KW Section, Township, Range: 32, 26N, 06E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 5%

Subregion (LRR): LRR A – WMVC Lat: 47.695376 Long: -122.069753 Datum: WGS 84

Soil Map Unit Name: Alderwood Gravelly Sandy Loam NWI classification: N/A

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:
Drought per KC.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. alnus rubra	30%	Y	FAC
2.			
3.			
4.			
	30%	= Total Cover	
Sapling/Shrub Stratum (Plot size: ✓)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5')			
1. phalaris arundinacea	70%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70%	= Total Cover	
Woody Vine Stratum (Plot size: 15')			
1. rubus armeniacus	80%	Y	FAC
2.			
	80%	= Total Cover	

% Bare Ground in Herb Stratum 0

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:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:
pit excavated just downslope of cleared area for pipeline

SOIL

Sampling Point: TP-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-11"	10YR 3/1	100%	—	—	—	—	Sandy loam	large gravels & roots/rhizomes
11-16"	2.5Y 4/1	55%	2.5Y 5/1	40%	D	M	Sandy CL	very course, faint, many depletions
			10YR 5/4	5%	C	M		medium, prominent, common redox

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

pit did contain start of depleted matrix but not in sufficient qty/composition to key as depleted below dark surface. likely this is right on WL edge.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

hydrology weakly present w/ only secondary indicators

Wetland name or number D

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Overlake Wetland D Date of site visit: 7/25 & 7/28

Rated by Alicia Pettibone Trained by Ecology? ✓ Yes ___ No Date of training 03/2023

HGM Class used for rating Slope Wetland has multiple HGM classes? ___ Y ✓ N

NOTE: Form is not complete without the required figures (figures can be combined).

Source of base aerial photo/map King County & Google

OVERALL WETLAND CATEGORY III (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 23 - 27

___ **Category II** – Total score = 20 - 22

✓ **Category III** – Total score = 16 - 19

___ **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	TOTAL
Score Based on Ratings	7	5	7	19

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	✓

Wetland name or number D

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(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	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	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 area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	2
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	3
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	3
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	6

Wetland name or number 1

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. 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 sheet flow, or in a swale without distinct banks,
   ✓ The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES** – The wetland class is **Slope**

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

Wetland name or number 1)

5. 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 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. 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 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 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 the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the 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 along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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

Wetland name or number D

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) Slope is 1% or less — points = 3 Slope is > 1%-2% — points = 2 Slope is > 2%-5% — points = 1 Slope is greater than 5% — points = 0	0
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	6
Total for S 1 — Add the points in the boxes above	6

Rating of Site Potential If score is: __**12 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	0
Total for S 2 — Add the points in the boxes above	1

Rating of Landscape Potential If score is: ✓**1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) Yes = 1 No = 0	1
S 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 in development or in effect for the basin in which unit is found.) Yes = 2 No = 0	2
Total for S 3 — Add the points in the boxes above	4

Rating of Value If score is: ✓**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number D

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland — points = 1 All other conditions — points = 0	0

Rating of Site Potential If score is: __**1 = M** ✓**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? — Yes = 1 No = 0	1

Rating of Landscape Potential If score is: ✓**1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2 Surface flooding problems are in a sub-basin farther downgradient — points = 1 No flooding problems anywhere downstream — points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? — Yes = 2 No = 0	0
Total for S 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*

NOTES and FIELD OBSERVATIONS:

Wetland name or number D

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

___ Aquatic bed	4 structures or more: points = 4
✓ Emergent	3 structures: points = 2
✓ Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
✓ Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

✓ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

4

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

___ Permanently flooded or inundated	4 or more types present: points = 3
✓ Seasonally flooded or inundated	3 types present: points = 2
✓ Occasionally flooded or inundated	2 types present: points = 1
✓ Saturated only	1 type present: points = 0
___ Permanently flowing stream or river in, or adjacent to, the wetland	
___ Intermittently or seasonally flowing stream in, or adjacent to, the wetland	
___ **Lake Fringe wetland**	**2 points**
___ **Freshwater tidal wetland**	**2 points**

2

H 1.3. 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 and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

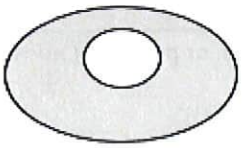
If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

2

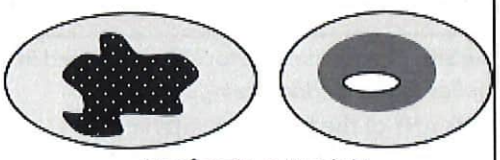
H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.

None = 0 points

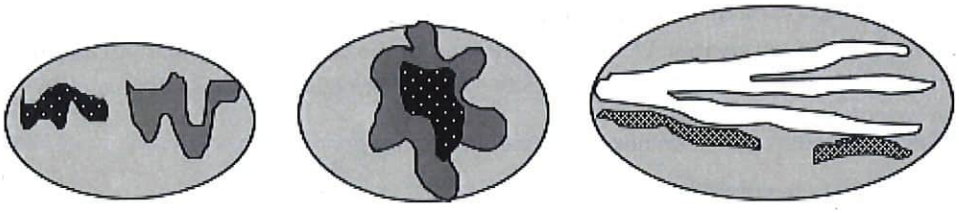


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



3

Wetland name or number D

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✓ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✓ Standing snags (dbh > 4 in.) within the wetland ___ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ✓ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	3
Total for H 1 — Add the points in the boxes above	14

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 5 = 5 % Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1 km Polygon — points = 2 10-19% of 1 km Polygon — points = 1 < 10% of 1 km Polygon — points = 0	0
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 40 = 40 % Total habitat > 50% of Polygon — points = 3 Total habitat 10-50% and in 1-3 patches — points = 2 Total habitat 10-50% and > 3 patches — points = 1 Total habitat < 10% of 1 km Polygon — points = 0	2
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use — points = (- 2) ≤ 50% of 1 km Polygon is high intensity — points = 0	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?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: — points = 2 ✓ It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — 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 (listed on next page) within 100 m — 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 D

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

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

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **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. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

✓ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number D

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

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

✓ **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 > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number D

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** (No=) **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes = **Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No = **Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. 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 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **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 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** (No = **Not a bog**)	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number D

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** (No) = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** (No) = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^1/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** (No) = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A


UHW OVERLAKE SCHOOL WM
RHZ FIELDS MAP
7/25 - 7/28/25
TP3
CLEARED AREA
ML-1
1
TP-1
2
TP2
3
4
5
6
7
60 Feet
EagleView Technologies, Inc., King


UHW OVERLAKE SCHOOL WET
RHZ FIELD MAP
7/25-7/30/25
COWARDIN
& HYDROPERIODS
SAT ONLY
SEAS. IN.
OCC. IN.
SAT ONLY
SEAS. IN.
SAT ONLY
SEAS IN.
SAT ONLY
FO
SS
60 Feet
EagleView Technologies, Inc., King


OVERLAKE SCHOOL WM – DHW
RHZ FIELD MAP
7/25 & 7/28/25
not dense
dR
dR
dR
not dense
PLANT COVER – NOT COWARDIN
not dense
not dR
TP-3
TP-1
TP-2
TP-4
WL-A 1
WL-A 2
WL-A 3
WL-A 4
WL-A 5
WL-A 6
WL-7
not dense
60 Feet
EagleView Technologies, Inc., King

This map is a graphic representation derived from the King County Geographic Information System. It was designed and intended for Union Hill Water Association (Association) staff use only; it is not guaranteed to survey accuracy. This map is based on the best information available on the date shown on this map.

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Vicinity Map

Figure 1
Cowardin Class
Union Hill Water Association Overlake School Water Main Phase 2

UNION HILL WATER ASSOCIATION

1 inch = 50 feet

0 12.5 25 50 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

RH2

NORTH

J:\DATA\UHW\25-0002\TA10_OVERLAKE SCHOOL WM PH 2\GIS\ENV\ROVOVERLAKESCHOOL.APRX BY: KWISNER PLOT DATE: OCT 23, 2025 COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

J:\DATA\UHW\25-0002\TA10_OVERLAKE SCHOOL WM PH 2\GIS\ENVIRO\OVERLAKESCHOOL.APRX BY: KWISNER PLOT DATE: OCT 23, 2025 COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

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Vicinity Map

Figure 2
Hydroperiods
Union Hill Water District
Overlake School Water Main
Phase 2

UNION HILL WATER ASSOCIATION

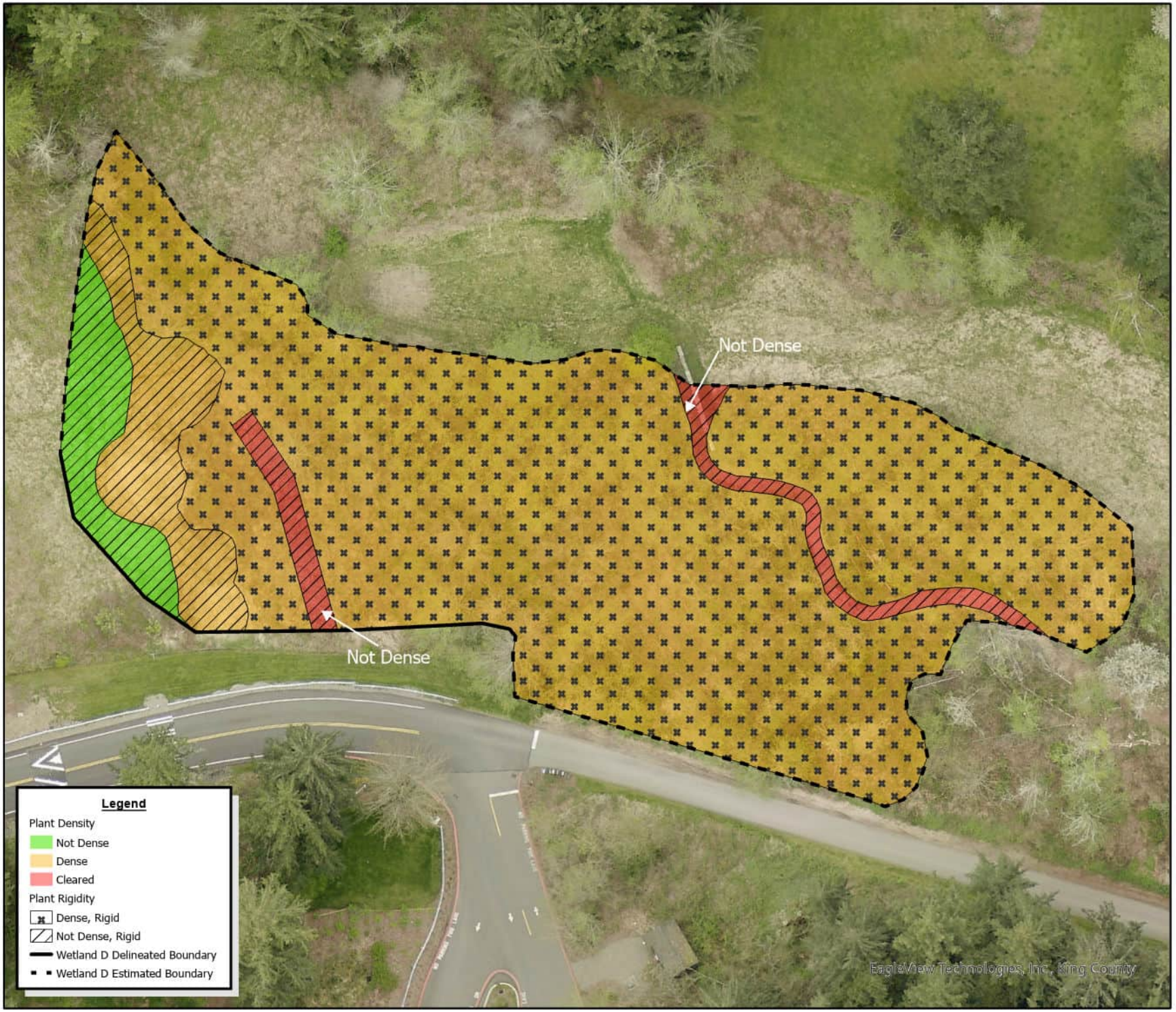
1 inch = 80 feet

0 20 40 80 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

RH2

NORTH



Vicinity Map

Figure 3
Plant Cover and Density
Union Hill Water Association Overlake School Water Main Phase 2

UNION HILL WATER ASSOCIATION

1 inch = 50 feet

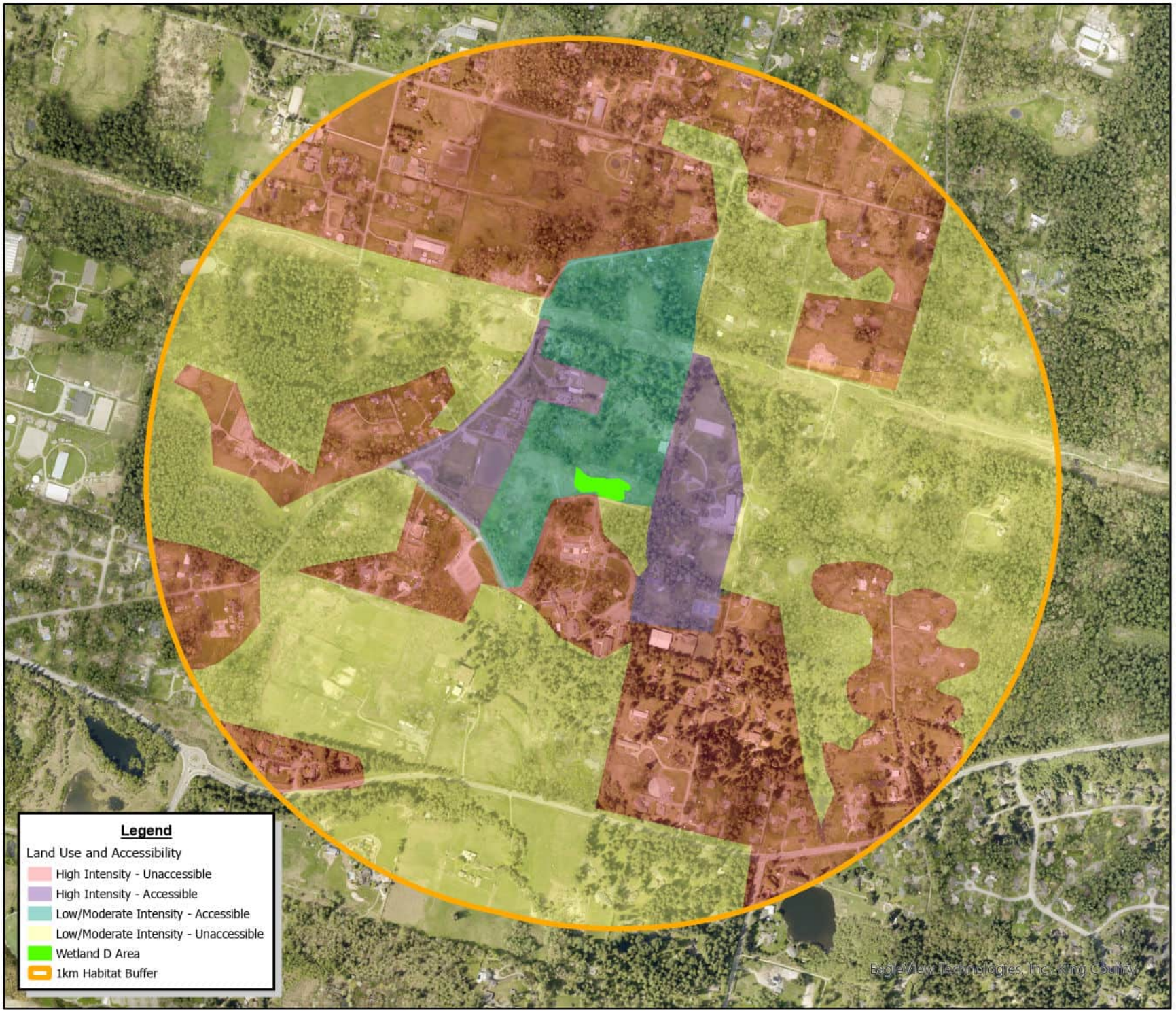
0 12.5 25 50 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

RH2

NORTH

J:\DATA\UHW\25-0002\TA10_OVERLAKE SCHOOL WM PH 2\GIS\ENVIRO\OVERLAKESCHOOL.APRX BY: KWISNER PLOT DATE: OCT 23, 2025 COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE



Vicinity Map

Figure 4
1km Land use Polygon
Union Hill Water Association Overlake School Water Main Phase 2

UNION HILL WATER ASSOCIATION

1 inch = 1,000 feet

0 250 500 1,000 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

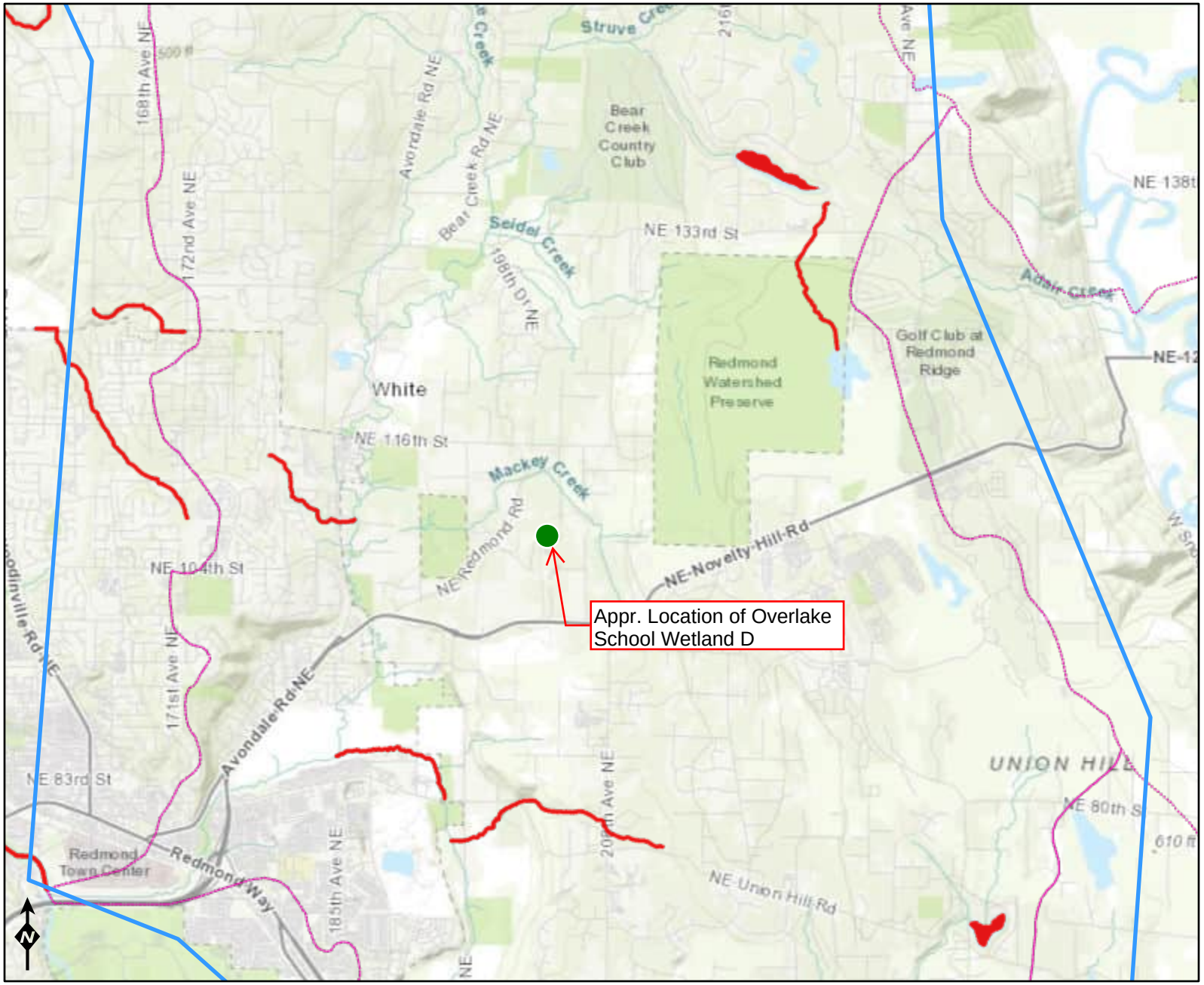
RH2

NORTH

J:\DATA\UHW\25-0002\TA10_OVERLAKE SCHOOL WM PH 2\GIS\ENV\ROVOVERLAKESCHOOL.APRX BY: KWISNER PLOT DATE: OCT 23, 2025 COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

July 29, 2025

Figure 5. Bear Creek Subwatershed 303(d) Waters



Assessed Water/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Subbasins (12 digit HUCs)
- HUC boundary

Miles
0 0.5 1 2

Esri, NASA, NGA, USGS, FEMA
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

DEPARTMENT OF ECOLOGY State of Washington

King County

Figure 6. WRIA 8 TMDLs

Water quality improvement projects

Select the waterbody or pollutant name to find more information about the specific project.

Waterbody Name(s)	Pollutant(s)	Status	Project Lead(s)
Bear-Evans Creek Basin	Fecal Coliform	EPA approved	Cleo Neculae 425-389-2685
Bear-Evans Creek Basin	Dissolved Oxygen Temperature	EPA approved	Cleo Neculae 425-389-2685
Cottage Lake	Total Phosphorus	EPA approved	Tricia Shoblom 206-594-0177
Duwamish and Lower Green River	Ammonia-N	EPA approved	Cleo Neculae 425-389-2685
Duwamish and Green River	Pollutant loading	Working with technical advisory group	Cleo Neculae 425-389-2685
Fauntleroy Creek	Fecal Coliform	EPA approved	Cleo Neculae 425-389-2685
Fenwick Lake	Total Phosphorus	EPA approved	Tricia Shoblom 206-594-0177
Green River and Newaukum Creek	Dissolved Oxygen Temperature	EPA approved	Cleo Neculae 425-389-2685
Issaquah Creek Basin	Fecal Coliform	EPA approved	Cleo Neculae 425-389-2685
Lake Sawyer	Total Phosphorus	EPA approved	Tricia Shoblom 206-594-0177
Little Bear Creek	Fecal Coliform	EPA approved	Cleo Neculae 425-389-2685
Newaukum Creek	Bacteria	Under development	Cleo Neculae 425-389-2685

North Creek	Fecal Coliform	EPA approved and Has an implementation plan	Cleo Neculae 425-389-2685
Pipers Creek	Fecal Coliform	EPA approved	Cleo Neculae 425-389-2685
Sammamish River	Dissolved Oxygen Temperature	Under development	Cleo Neculae 425-389-2685
Snoqualmie River	Ammonia-N BOD (5-day) Fecal Coliform	EPA approved	Sarah Yepez 206-594-0171
Snoqualmie River	Temperature	EPA approved and Has an implementation plan	Sarah Yepez 206-594-0171
Soos Creek	Fecal Coliform	Under Development	Cleo Neculae 425-389-2685
Soos Creek	Aquatic Habitat Dissolved Oxygen Temperature	Under Development	Cleo Neculae 425-389-2685

To request ADA accommodation, call Ecology at 360-407-7668, 711 (relay service), or 877-833-6341 (TTY). More about our accessibility services.