

PNNL-37250

Wetlands Delineation Report and Classification

PNNL – Sequim (formerly MSL) Estuary
Wetland Delineation

October 2024

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Prepared for
Department of Energy

Pacific Northwest National Laboratory
Richland, Washington 99354

Acronyms and Abbreviations

Ac	Acres
CWA	Clean Water Act
Ecology	Washington Department of Ecology
E2EM	Estuary Intertidal Emergent
E2US	Estuary Intertidal Unconsolidated Shore
Ft	Feet
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
GPS	Global Positioning System
HGM	Hydrogeomorphic
In	Inches
LULC	land use/land cover
NRCS	Natural Resources Conservation Service
NWPL	National Wetland Plant List
NWI	National Wetlands Inventory
MLLW	Mean Lower Low Water
OHWM	Ordinary High Water Mark
PNNL	Pacific Northwest National Laboratory
TF	Tidal Flat
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
US EPA	United States Environmental Protection Agency
USFS	US Forest Service
WETS	Wetlands Climate Tables
WOTUS	Waters of the United States

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1.0 Introduction

1.1 Purpose

The Pacific Northwest National Laboratory (PNNL) – Sequim, historically known as the Marine Sciences Laboratory (MSL) in Sequim, Washington, is managed and operated by Battelle on behalf of the U.S. Department of Energy (DOE) Pacific Northwest Site Office (PNSO). The site provides capabilities for future energy research, climate change effects analyses, wetland and coastal ecosystem restoration, other environmental research involving marine resources and hosts the only marine research facilities in the Department of Energy National Laboratory Complex. In order to support campus development, maintenance, and potential research activities, a wetland delineation was conducted on the northern portion of campus in accordance with state and federal wetland regulations.

The project area is located at 1286 Washington Harbor Road in Sequim, Washington. The Lagoon borders this area to the north and Sequim Bay borders Bugge Spit on the eastern extent of this area.

Within the project area, an estuary wetland complex was found, totaling approximately 2.71 acres (ac) within the project area. Vegetated portions of the wetland are best classified as estuarine intertidal emergent (E2EM) with persistent vegetation under the Cowardin system (Cowardin et al. 1979). The persistent vegetation transitions to an estuarine intertidal unconsolidated shore (E2US). The Ordinary High-Water Mark (OHWM) was delineated at the time of the site visit as well.

1.2 Property Location

The delineation occurred on parcels 033022230150 and lower portion of 033022420000 on Washington Harbor Road, as shown in Figure 1-1. Parcel 033022230150 is 16.84 ac, and the lower portion of 033022420000 is approximately 1.62 ac. These parcels are part of the PNNL Sequim Campus and are currently owned by Battelle Memorial Institute. A land transfer to the Department of Energy may occur in the near future. The parcels consist of Washington Harbor Road, Bugge Spit, Marine Science Office spaces, a parking lot, forested areas, beach and tidelands by the dock and boat launch.

PNNL staff performed a delineation within the project area, which stretched from the property's western edge, east to Bugge Spit. The study area covered three-quarters of Bugge Spit and the waterfront area, to the southern end of the seawall. The upper portion of campus and undisturbed areas south of the seawall were not included within this study area. Wetland field staff noted if any resource areas identified continued outside of the study area.

This map displays the PNNL Sequim Campus Parcel Boundaries and Project Area Boundaries. The map includes the following information:

- Legend:**
 - Project Area Boundaries (Red outline)
 - PNNL Sequim Campus Parcel Boundaries (Black outline)
- Map Features:**
 - Water Bodies:** Bell Creek, Washington Harbor.
 - Roads:** Junco Rd, Tanager Ln, Big Foot Ln, Washington Harbor Rd, N/A.
 - Buildings:** Marine Sci Lab 7 Office, Tower, N/A.
 - Parcel Numbers:** 033022230150, 033022420000, 033022420000.
 - Labels:** Washington Harbor, Sequim, N/A, 5-5A-5B-5C.
 - Topography:** 4 ft, 138 ft.

The map shows the project area boundaries in red and the campus parcel boundaries in black. The project area is located in the northern part of the campus, adjacent to Washington Harbor. The campus parcel boundaries are located in the southern part of the campus, adjacent to Sequim. The map also shows the location of the Marine Sci Lab 7 Office, Tower, and N/A. The map includes a legend, a scale bar, and a north arrow.

The project area is entirely within the Level III Puget Lowland ecoregion and the Olympic Rainshadow Level IV ecoregion (EPA 2024). Mild maritime climate characterizes the Puget Lowland ecoregion and the distribution of forest species is affected by the rainshadow from the Olympic Mountains. The rolling lowlands occurs on a continental glacial trough and consist of many islands, peninsulas, and bays in the Puget Sound area. The Puget Lowland ecoregion extends from the base of the Cascades to the areas surrounding Puget Sound.

Introduction

2.0 Methodology

2.1 Preliminary Investigation

The following data sources were reviewed for information on topography, drainage patterns, soils, vegetation, and potential or known wetlands and streams in the project vicinity:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) Map
- National Wetlands Inventory (NWI) maps (USFWS 2024; FGDC 2013)
- USACE *Western Mountains, Valleys, and Coast Regional Supplement (Version 2.0, May 2010)* coverage
- Natural Resources Conservation Service (NRCS), Web Soil Survey maps of Clallam County (NRCS 2024)
- United States Geological Survey, National Hydrography Dataset Plus (2024)

Scientific plant names were from the USACE National Wetland Plant List (NWPL), version 3.5 (USACE 2020). The hydric soils indicators were based on *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils Version 8.2* (NRCS 2018).

As part of the preliminary investigation, PNNL reviewed soil data. Four soils occur within the project area, but none are hydric (Table 2-1, Appendix A).

Table 2-1 Soils within the Project Area (NRCS 2024)

Symbol	Soil Name	Hydric Rating
63	Sequim very gravelly sandy loam	No
25	Hoypus gravelly loamy sand, 30 to 65 percent slopes	No
3	Beaches	No
10	Catla gravelly sandy loam, 2 to 15 percent slopes	No

2.2 Wetland Delineation and Classification

The ordinary high water mark (OHWM) delineation was conducted in accordance with federal and state guidance. The Regulatory Guidance Letter No. 05-05 from the USACE dated December 7, 2005. The OHWM is defined as “the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

Washington Department of Ecology (Ecology) further defines the OHWM in the WAC (173-22-030(5)(a)(i)), in “...high energy environments, where the action of waves or currents is sufficient to

prevent vegetation establishment below mean higher high tide, the ordinary high water mark is coincident with the line of vegetation. Where there is no vegetative cover for less than one hundred feet parallel to the shoreline, the ordinary high water mark is the average tidal elevation of the adjacent lines of vegetation. Where the ordinary high water mark cannot be found, it is the elevation of mean higher high tide.” WAC 173-22030(11)(a)(ii) describes the OHWM in low-energy tidal environments as “*where the action of waves and currents is not sufficient to prevent vegetation establishment below mean higher high tide, the ordinary high water mark is coincident with the landward limit of salt tolerant vegetation.*” Ecology describes these indicators further in *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (2016).

The wetland delineation was completed in accordance with the *1987 United States Army Corps Wetlands Delineation Manual*, and the *USACE Western Mountains, Valleys, and Coast Regional Supplement (Version 2.0, May 2010)*. The entire project area was within areas covered by the USACE Regional Western Mountains, Valleys, and Coast Supplement. According to the USACE Wetland Delineation Manual (1987), a wetland delineation is based on a three-indicator approach evaluating the presence or absence of hydrophytic vegetation, hydric soil, and wetland hydrology. Data was collected for these characteristics during the delineation with USACE data forms. Classification of all resources used the Cowardin (Cowardin et al. 1979) and the hydrogeomorphic (HGM; NRCS 2008) systems.

The wetlands delineation team consists of Dana Vesty and Ioana Bociu. The lead wetland delineator, Dana Vesty, is a certified Professional Wetland Scientist (PWS) with over eight years of experience with wetland delineations in the Northeast and Pacific Northwest. In addition, she has completed Grass, Sedge, and Rush Identification for Western WA Puget Lowland Habitats, How to Determine the Ordinary High Water Mark in Eastern WA, and Using the Revised Washington State Wetland Rating System (2014) in Western Washington coastal training program classes offered by Ecology. Ioana Bociu has over five years of wetland delineation experience, specifically in Oregon and Washington, as well as over nine years in wetland research. She has completed How to Determine the Ordinary High Water Mark in Western WA, Winter Tree and Shrub Identification for Western WA Puget Lowland Habitats, Grass, Sedge, and Rush Identification for Western WA Puget Lowland Habitats, and Using the Revised Washington State Wetland Rating System (2014) in Western Washington

2.2.1 Wetland Delineation Methodology

On October 30 and 31, 2024, wetland field staff conducted a field survey of the project area to identify resources. When a resource area was found within the project area, a delineation was performed in accordance with the USACE manual, USACE regional supplements, and 2014 Western Washington Rating Form (version 2). Data collection involved completing the associated data form and taking representative photos to document the current conditions of the area. Wetland Determination Data forms are in Appendix B, and ground level plot photos are in Appendix C.

In accordance with the USACE manual, the wetland crew established a minimum of two plots per wetland: one within the upland and one within the wetland. Where there was a sharp wetland boundary, paired plots were positioned as close as possible (≤ 10 feet) to document the wetland boundary. Where the boundaries between wetlands and uplands were more gradual, plots were located as close together to demonstrate distinct differences between the wetland and upland. When plots could not be paired close together, the data sheets noted why this was done. Wherever possible, more than one paired plot was collected for each wetland feature, especially large or complex wetlands. At

each plot, the crew determined the presence or absence of hydrophytic vegetation, hydric soils, and wetland hydrology indicators.

Vegetation at each delineated wetland was examined within four strata: trees, shrubs/saplings, herbaceous plants, and woody vines. The crew visually estimated the percent cover of each stratum in circular plots as follows:

- Tree plots had a 30-foot radius. Trees are woody plants three inches or more in diameter at breast height (DBH), regardless of height (USACE *Western Mountains, Valleys, and Coast Regional Supplement*, 2010).
- Shrub/sapling plots had a 15-foot radius. Shrubs and saplings are woody plants less than three inches in DBH (USACE *Western Mountains, Valleys, and Coast Regional Supplement*, 2010).
- Herbaceous plant plots had a 5-foot radius. Herbs are all herbaceous (non-woody) plants, including herbaceous vines, regardless of size (USACE *Western Mountains, Valleys, and Coast Regional Supplement*, 2010).
- Woody vines plots had a 15-foot radius. Woody vines are woody climbing or twining plants (USACE *Western Mountains, Valleys, and Coast Regional Supplement*, 2010).

Plants were identified using Flora of the Pacific Northwest (Hitchcock et al. 2018), Turner's field guides to Pacific Northwest trees, shrubs, and wildflowers (Turner and Gustafson 2006, Turner and Kuhlman 2014), and regional guides to graminoid species (Hitchcock et al. 1969, Roché et al. 2018). Regional keys were supplemented with online information (Oregon Flora 2024, University of Washington Herbarium 2024). Additional guides were used as needed. To the extent possible, plants were identified to species level. If vegetation identification was not possible in the field, multiple pictures and measurements were taken of the distinct plant characteristics. Scientific names follow current nomenclature of the USACE 2020 National Wetland Plant List (NWPL). All species were assigned the appropriate wetland indicator status from the appropriate Regional Supplement. Presence or absence of hydrophytic vegetation was determined using the rapid test for hydrophytic vegetation, dominance test, and/or prevalence index, as appropriate.

The wetland crew used a trenching shovel or auger to excavate soil test pits within wetland and upland areas to collect soil profile data. Soil test pits were excavated to a minimum of 16 in, unless hydric soils were confirmed at shallower depths or refusal due to rocks and restrictive layers. Deeper test pits were needed to meet thickness requirements for certain hydric soil types. Soil profile characteristics were evaluated using hydric soils manual (USDA *Field Indicators of Hydric Soils in the United States*, 2016). If a profile met one or more hydric soil indicators, these were denoted on the wetland determination form.

The hydrologic indicators were assessed visually in the field during the growing season, in accordance with the USACE Wetlands Delineation Manual. These indicators may include watermarks, drift lines, sediment deposits, saturation, inundation, drainage patterns within wetlands, and dry cracked surface. Additional field indicators can be found in the regional supplemental form. Any further observations were noted on the wetland determination data form.

Pink flagging tape was placed on either wooden stakes or woody vegetation, as applicable, to mark water OHWM and wetland resource boundaries. The spacing of the flagging tape allowed a direct line of sight from one flag to the next and less than 50 feet apart. Flagging tape was labeled with a sequential

wetland complex number and letter, and the flag number. The letter designates resource area connectivity. Within each complex, labeling started from the inner most resource area outwards. For example, the OHWM would be labelled 1 and the first flag would be marked 1A-1. Flagging continues until the staff reached the project area boundaries. The OHWM extended outside of the project area boundaries and connects around the spit to the other side, where it is back inside the project boundaries. The first flag would be 1B-1, to indicate it is the same resource and is connected to the original line.

A Trimble handheld GPS unit with submeter accuracy collected each flag point, soil test pit, and transect location. Data plots for wetlands were labelled by the feature identifier, plot number, and plot type (wetland or upland).

2.3 Mapping Method

During the field delineation, points, polygons, and polylines were surveyed using a sub-meter Trimble global positioning system (GPS) unit and differential correction software. The GPS data was post-corrected to an average of 92.91% accurate within one meter and 98.32% accurate within 2 meters. The data was originally collected in NAD 1983 State Plane Washington North (meters).

2.4 Field Conditions

The delineation occurred on October 30 and October 31, 2024, on clear days. The week prior to the delineation (October 23rd-October 29th) there was a total of 0.49 inches (in) of precipitation. Most of the precipitation (0.29 in) occurred on October 27th and another small storm event occurred on October 29th with 0.10 in of precipitation.

The delineation started at approximately 8:30 AM, as the tide was going out. Low tide of 4 ft mean lower low water (MLLW) occurred at 9:10 AM, and highest high tide of 7 ft 6 in MLLW occurred at 2:49 PM. The lowest low tide of the day occurred at 9:52 PM, after the sun had set and was approximately 0.8 ft MLLW. The delineation was concluded at 5:00 PM, and the wetland field staff saw the highest high and a mid-day low of the mixed semidiurnal tidal cycle. OHWM was delineated during low tide.

2.4.1 Precipitation Data and Analysis

A precipitation analysis was completed to determine if normal circumstances were present climatically. PNWL obtained monthly summary data and Wetlands Climate Tables (WETS) data from the nearest weather station to the project area. Comparing the historical data from the past 30 years to what was observed during the month of the field visit, the precipitation was within the normal range as shown in Tables 2-2 and 2-3.

Table 2-2 Overview of weather station used in precipitation analysis. All data accessed from AgACIS (<https://agacis.rcc-acis.org/>).

Station Name	Latitude	Longitude	Elevation (ft)	Growing Season	County
Sequim 2E	48.0850	-123.0638	50	3/27-11/12 * (230 days)	Clallam
**WETs table dates for each of the weather stations for the years 1993-2024, using the 70% chance for growing season (days 28°F or higher).					

Table 2-3 Percent of normal rainfall for Sequim 2E in October. Data accessed and compiled from AgACIS (<https://agacis.rcc-acis.org/>).

Sampling Month	Actual Precipitation (in)	Average Precipitation WETS 30 Year* (in)	Comparison to Normal (%)	Precipitation Normal Range WETS 30 Year* (in)	Precipitation Outside WETS 30 Year Range*
October 2024	1.55	1.68	92.26%	1.21-1.99	No
* The 30-year period is from 1993-2024					

Table 2-4 Monthly precipitation analysis for Sequim 2E, Clallam County, with historic precipitation 1993-2023. Data accessed and compiled from AgACIS (<https://agacis.rcc-acis.org/>).

Sample Month	Previous Months	Precipitation (in)				Condition	Analysis		
		Historic Average	30% Chance will have (Min-Max)		Observed at Station		Value (1 = dry; 2 = normal; 3 = wet)	Month Weight	Value * Month Weight
Oct. 2024	Sept. 2024	0.87	0.50	1.05	0.73	Normal	2	3	6
	Aug. 2024	0.57	0.21	0.69	1.42	Wet	3	2	6
	July 2024	0.45	0.20	0.52	0.1	Dry	1	1	1
								Sum	13
								Result	Normal

*Rainfall of prior period was *drier* than normal (product sum 6-9); *normal* (product sum 10-14); or *wetter* than normal (product sum 15-18).

3.0 Description of All Wetlands and Other Non-Wetland Waters

Within the project area, field staff located wetlands and waterways. Resources are defined above in Section 2.2 and summarized below and in Section 6.0. Delineated wetlands, waterways, and sample plot locations are shown on figures in Appendix A. Appendix B contains USACE wetland delineation forms, and ground-level color photographs of the areas of investigation are provided in Appendix C. Wetland sizes were based off the delineated area within the project area and may be part of a larger complex.

3.1 Non-wetland Waters

Within the project area, wetland survey crew delineated the Lagoon and Sequim Bay OHHM using the marine indicators. The landward edge of the salt tolerant vegetation demarked the OHHM within the low-energy tidal Lagoon. In areas where persistent vegetation was not present, water marks on the bank (e.g. rocks and seawall) were used to determine the OHHM. Within the high energy environment of Sequim Bay, the seaward edge of persistent vegetation marked the OHHM, as well as water marks on structures.

Tidal channels within the wetland complex were collected as hydraulic connections above the centerline with a handheld Trimble GPS unit then digitized if the channel was less than six feet wide. For channels more than six feet wide, the channel was delineated on each side and then a polygon was digitized. These channels were included in the wetland total acreage and considered part of the wetland complex.

3.2 Roadside Ditches

During the field investigation, survey crew investigated a depression that runs parallel to the south side of Washington Harbor Road. This depression is located between the toe of a steep slope and edge of fill associated with the roadway. The depression varies in depth from 1 in to approximately 2 ft and occasionally conveys water. At the time of the site visit, the vegetation within the depression was recently mowed, though *Petasites frigidus* (FACW) and *Poa annua* (FAC) could be identified. A previous vegetation survey on May 16, 2024 further identified other dominant species: *Tellima grandiflora* (FACU) and *Rubus parviflorus* (FACU) within the depression. A utility line is buried within the depression, which prevented soil sampling. No culvert or surface water connection to the Lagoon or Sequim Bay was found. It is very likely that the depression does discharge groundwater into these resource areas, since the depression is located on top of a steep slope above these other resource areas.

3.3 Wetlands

A wetland complex was identified during the delineation, as shown on the maps in Appendix A, and is described below.

Located below the OHHM and below the line of persistent vegetation of the tidal Lagoon, Wetland 1 consists of the unconsolidated shore. Wetland 1 totals approximately 0.85 ac within the project area, but it continues outside to cover an extensive area. During low tide, the mucky substrate was exposed, but high tide covered the area. No vegetation was located within this portion of the wetland complex. The best Cowardian classification is an intertidal estuarian wetland with unconsolidated shore, while the HGM classification would be tidal flats.

Wetland 2 is a 1.86-ac wetland located on the fringe of the tidal Lagoon and above Wetland 1. The wetland consists of two portions, 2A and 2B. 2A is located on the western edge of the property line and 2B is located on the western edge of Bugge spit. These portions are approximately 650 ft apart, consist of the same dominant vegetation, hydrology source, and similar hydric soil. Plots were taken in both portions of the wetland. The upland boundary was located at a consistent elevation and was associated with the toe of various slopes. Algal mats and wrack lines marked the seaward edge of the wetland. Vegetation predominately consisted of emergent species with *Sarcocornia pacifica* (OBL) and *Distichlis spicata* (FACW) as the two dominant species. Shrubs were observed on the edge of the wetland, primarily within upland areas. The best Cowardin classification of Wetland 2 is Estuarine intertidal emergent wetland with persistent vegetation, and tidal fringe is the best HGM classification. Soils contained hydrogen sulfide, which were especially evident in portion 2A wet soil. Tidal channels and puddles of open water were present throughout 2B. For both portions, the wetland continues outside of the project area.

3.4 Deviation from NWI

NWI-mapped wetlands occur throughout the project's study area and somewhat match those identified in the field. The mapping method used during the field survey is more precise for wetland delineation than are those used for mapping with NWI. In addition, the NWI classifies based on the entire wetland complex, and the classifications in this report were for the specific delineated areas within the study area.

The delineated extent of Wetland 2 is greater than what is mapped with NWI. A portion of the Wetland 2A was classified as intertidal estuarian wetland with unconsolidated shore under NWI.

In addition, NWI depicts a seasonally flooded intermittent stream on the western edge of the property that discharges into the Lagoon. Field investigations revealed a depression in the landscape between two steep slopes that water would likely travel due to gravity, but no defined stream banks were visible within that area. Photograph 24 shows the area in Appendix C.

3.5 Summary Table

Within the project area there was approximately 2.71 ac of wetlands (Table 3-1). Using the Cowardin classification, the E2EM was the dominant type, while tidal flat was the dominate HGM classification.

Table 3-1 Summary of the water and wetland resources within the survey area by wetland ID, size, classification, and wetland indicators.

Wetland ID	Wetland Size (Acres) within Project Area ^(a)	Wetland Classification		Wetland Indicators			
		Cowardin ^(b)	HGM ^(c)	Soils	Vegetation	Hydrology	Extends outside of Study Area
1	0.85	E2US	TF	✓	N/A	✓	✓
2	1.86	E2EM	TF	✓	✓	✓	✓

(a) Wetland size is based on the delineated portion of the resource area. Resource areas may be larger outside of the survey area.

(b) NWI Class based on vegetation: E2EM= Estuary intertidal emergent, E2US= Estuary intertidal unconsolidated shore (Cowardin et al. 1979).

(c) The hydrogeomorphic characterization of wetlands. This classification system does not classify water bodies. TF= Tidal Flat

4.0 Regulatory Considerations

4.1 Federal Water Pollution Control Act

Federal law (Section 404 of the Federal Water Pollution Control Act, hereby referenced as the Clean Water Act or CWA) generally prohibits the discharge of dredged or fill material into waters of the United States (WOTUS), including certain wetlands and streams, without a permit from the USACE (2021). WOTUS encompasses traditional navigable waters, territorial seas, interstate waters, impoundments, tributaries, adjacent wetlands, and additional waters. Conforming to the U.S. Supreme Court's May 25, 2023 decision in the case of *Sackett v. Environmental Protection Agency*, the significant nexus standard was removed from the tributaries and adjacent wetlands and waters definition. The definition of "adjacent" was revised to "having a continuous surface connection" to a WOTUS. No changes were made to the definition of a wetland, high tide line, OHWM, or tidal waters.

WOTUS excludes certain categories of waters including but not limited to ditches excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water, waterfilled depressions created in dry land incidental to construction activity, and swales and erosion features that are characterized by low volume, infrequent or short duration flow.

4.2 Washington State

Ecology is authorized to review and approve Section 401 of the federal CWA. Additionally, Washington State regulates wetlands through two state laws: the state Water Pollution Control Act and the Shoreline Management Act; with the state preferring a local approach to regulation of wetlands within city and county jurisdictions, through the Growth Management Act (GMA) (RCW 36.0A). The Water Pollution Control Act (RCW 90.48) focuses on water quality protection by regulating discharges and enforcing water quality standards. The Shoreline Management Act (RCW 90.58) regulates marine waters, streams and rivers, lakes, shorelands, wetlands, and 100-year floodplains. As this is a preliminary delineation for jurisdictional purposes, the main focus of Washington jurisdiction will be on the Shoreline Management Act.

4.2.1 Shoreline Management Act Implementation

The Shoreline Management Act and Growth Management Act (GMA) requires all counties and most towns or cities with shorelines to develop and implement Shoreline Master Programs to fulfill Shoreline Management Act criteria. These programs are meant to establish preferred shoreline uses, protect natural resources against environmental effects, and include public accessibility.

Shorelines include:

- All marine waters.
- Streams and rivers with greater than 20 cubic feet per second mean annual flow.
- Lakes 20 acres or larger.
- Upland areas called shorelands that extend 200 feet landward from the edge of these waters.
- Biological wetlands and river deltas connected to these water bodies.
- Some or all of the 100-year floodplain, including all wetlands.

Based on these definitions, the Shoreline Management Act would apply to Wetlands 1 and 2, Sequim Bay, and the Lagoon. The roadside depression would not be considered a shoreline as it is not connected to a water body nor does it have continuous flow. In addition, upland areas 200 ft from Sequim Bay and the Lagoon will be jurisdictional to this act as shorelands.

4.3 Clallam County

Under the GMA and SMA, city and county governments regulate wetlands within their jurisdiction. As, PNNL-Sequim is within Clallam County jurisdiction, county critical areas ordinances (CAO) apply to wetlands found on PNNL – Sequim Campus. State regulated wetlands are assigned an additional buffer or distance for protection. Certain protection buffers outlined by Clallam County Code 27.12 must be followed based on development type and landscape wetland class determined through functional assessment (Table 4-1).

Table 4-1 Clallam County Wetland Landscape Classification (Clallam County Code 27.12, Table 4) and buffer distances (Clallam County Code 27.12.215).

Wetland Class	Definition	Major New Development Buffer	Minor New Development Buffer
Class I	• Estuarine wetland habitat types; • Greater than or equal to twenty (20) acres, connected to a significant wildlife habitat movement corridor, and contain at least one significant habitat feature; • Greater than or equal to three (3) acres, dominated by ninety (90) percent native vegetation (excluding contiguous stands of cattails, soft rush, hard hack, and horse tail), containing a forested or scrub-shrub habitat type, containing at least one significant habitat feature, and connected to a significant wildlife habitat movement corridor; and/or • Wetlands of local significance.	200 ft	100 ft
Class II	• Greater than or equal to twenty (20) acres and not meeting Class I criteria; or • Less than twenty (20) acres, dominated by fifty (50) percent native vegetation (excluding contiguous stands of cattails, soft rush, hard hack, and horse tail), containing a forested or scrub-shrub habitat type; containing at least one significant habitat feature, and connected to a significant wildlife habitat movement corridor.	150 ft	75 ft
Class III	• Wetlands less than twenty (20) acres which do not satisfy Class I, II, or IV criteria.	75 ft	50 ft
Class IV	Hydrologically isolated, less than one acre but greater than 10,000 square feet, and dominated by plant cover composed of one of the following native plant species: soft rush, hard hack, horse tail, or cattail, or less than two (2) acres, and dominated by plant cover composed of non-native plant species.	50 ft	25 ft

4.4 Summary of Jurisdiction Assessment

Below is a summary table of the jurisdiction of each of the resources identified during the wetlands delineation.

Table 4-2 Summary of the water and wetland resources jurisdiction

Resource ID	Jurisdictional Assessment		
	Federal (CWA)	Washington State	Clallam County
Wetland 1	Yes	Yes	Yes
Wetland 2	Yes	Yes	Yes
Roadside Ditch	No	No	No
Sequim Bay	Yes	Yes	Yes
The Lagoon	Yes	Yes	Yes

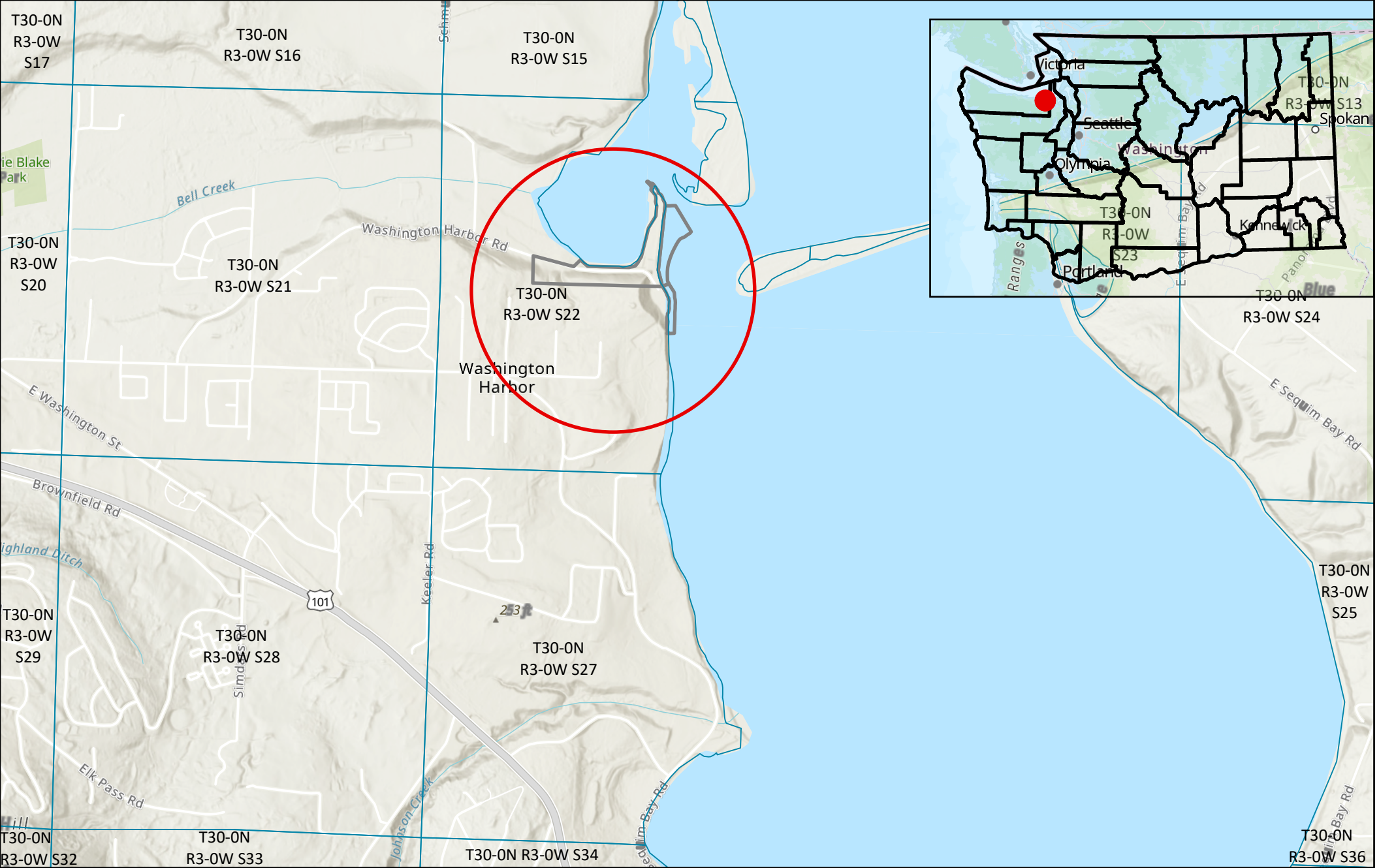
5.0 Wetland Rating and Buffer

The Washington State Wetland Rating System (Hruby and Yahnke 2023) categorizes wetlands based on specific attributes such as rarity, sensitivity to disturbance, functionality, and replaceability. This “rating” categorizes wetlands into four categories with 1 being the highest and 4 being the lowest. Category 1 wetlands should represent unique wetland types, those highly sensitive to disturbance, impossible to replace with a human lifetime, or high functionality. Category 4 have the lowest levels of functions and are usually heavily disturbed.

Undisturbed Estuarine wetlands larger than 1-ac with tidal channels and depressions with open water are considered Category 1 wetlands. In addition, undisturbed wetlands in coastal lagoons larger than 1/10 ac are considered Category 1. Indicators used to characterize freshwater functions cannot be applied to assess estuarine wetlands. Washington has not developed rapid methods of functionality at the time of the 2014 update to the rating system. Therefore, guidance for wetlands with special characteristics from Hruby and Yahnke 2023 was used.

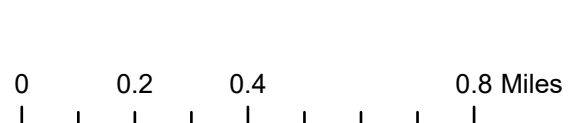
Wetlands 1 and 2 are located within a coastal lagoon. Wetland 1 is the unconsolidated shore, and Wetland 2 is the persistent vegetation. Wetland 1 was 0.85 ac within the project area, which is above the 1/10 ac threshold. Wetland 2 was over 1-ac in total and had tidal channels and open water depressions throughout the wetland. It was relatively undisturbed with no diking, filling, cultivating, or grazing occurring within it. The vegetation was primarily native species. The buffer zone has some disturbance within it as Washington Harbor Road and a gravel parking lot are located within 100 feet of the boundary. Based on these factors and guidance in “SC 1.0 Estuarine wetlands”, both wetlands are classified as Category 1. Within Clallam County, Class 1 (Category I) wetlands are given buffers of 200 ft for major new development and 100 ft for minor new development (Table 4-1).

Appendix A - Figures



Section Township Range Map

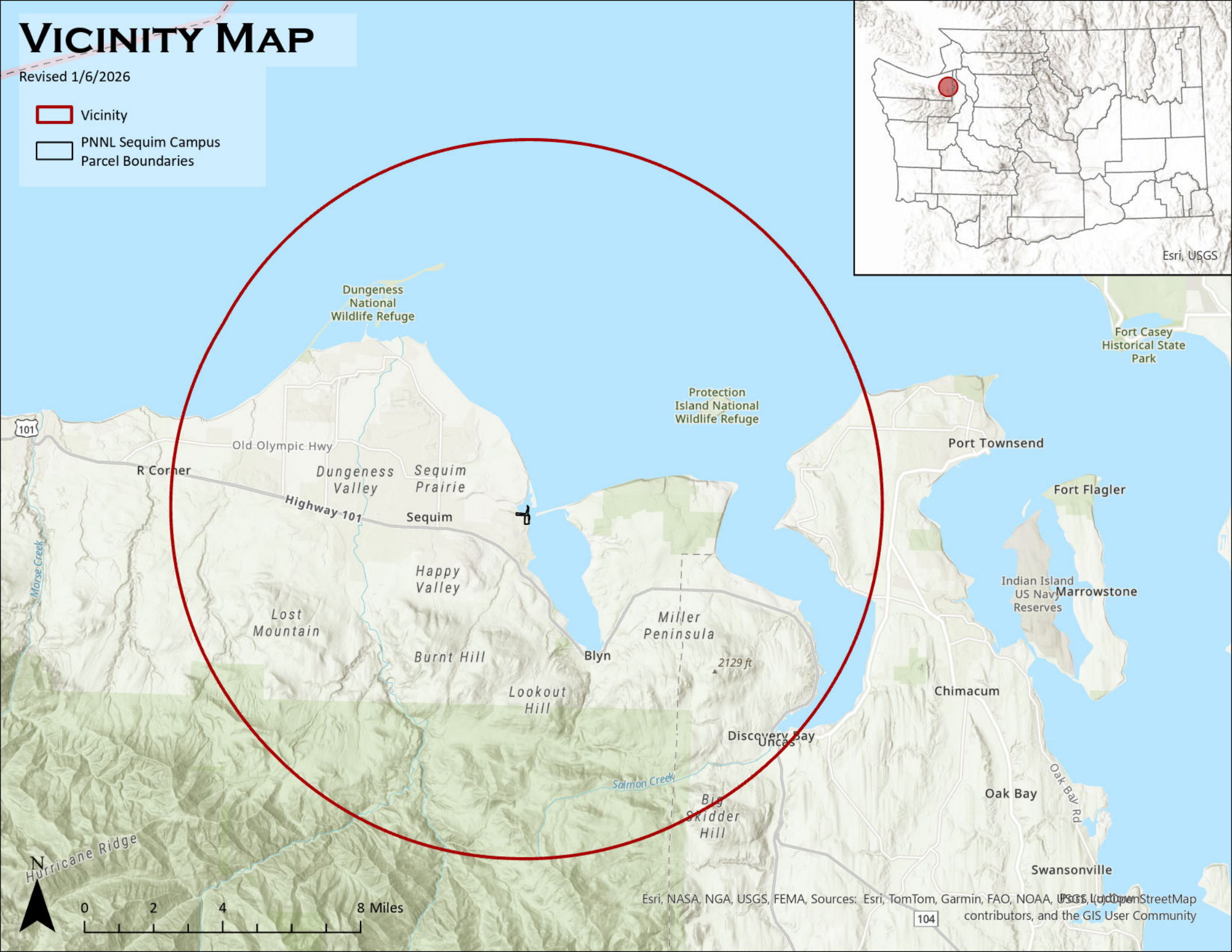
-  PNNL Sequim Campus
-  Parcel Boundaries
-  Public Land Survey Sections



VICINITY MAP

Revised 1/6/2026

-  Vicinity
-  PNNL Sequim Campus
-  Parcel Boundaries





Site Overview

1286 Washington Harbor Road
Sequim, Washington

Revised 5/18/2026

- Project Area Boundaries
- PNNL Sequim
- Campus Parcel Boundaries

Wetland boundaries

Unique_ID

- 1A
- 2A
- 2B

- OHWM/MHW
- Ditch
- Soil Plots
- Tidal Channels
- HTL

Port Townsend tide station

MHW: 7.84 ft

HAT: 10.09 ft

10 year highest predicted average: 9.9 ft

N

0 0.04 0.09 0.17 Miles



Clallam County GIS

Wetland 2A

Scale: 1:308

0 15 30 60 Feet



- Soil Plots
- PNNL Sequim Campus Parcel Boundaries

- Project Area Boundaries
- OHWM

- Wetland boundaries
- Unique_ID
- 1A
- 2A



Wetland 2B

Revised: 5/18/2026

Scale: 1:1,673

0 105 210 420 Feet



- PNNL Sequim Campus Parcel Boundaries
- Project Area Boundaries

- Tidal Channels
- OHWM/MHW
- HTL
- Ditch
- Soil Plots

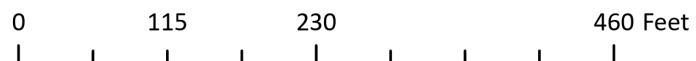
- Wetland boundaries
- 1A
- 2A
- 2B



Ditch Overview

Revised: 5/18/2026

Scale: 1:1,780



- Project Area Boundaries
- PNNL Sequim Campus Parcel Boundaries

*Average ditch width is 1-2 ft

- Soil Plots
- OHWM/MHW
- HTL
- Ditch

- Wetland boundaries
- Unique_ID
- 1A
- 2A
- 2B

Appendix B - USACE Wetland Date Forms

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

Project/Site: MSL Sequim Campus Estuary City/County: Sequim, Clallam Sampling Date: 10/30/2024
 Applicant/Owner: Battelle Memorial Institute (BMI) State: WA Sampling Point: 2A-UP
 Investigator(s): Dana Vesty and Ioana Bociu Section, Township, Range: S22 T30-0N R3-0W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR): LRR A Lat: 48.080423 Long: -123.050736 Datum: WGS 84
 Soil Map Unit Name: 63- Sequim very 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: The site was located on the northern portion of the Sequim campus. The plot was taken on the northwestern edge of the property, near the wetland boundary. There was a distinct transition between wetland and upland vegetation. The plot was on a gentle hillslope. Hydrophytic vegetation was present, however, hydric soils, and wetland hydrology indicators were not present at the time of the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Thuja plicata</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
<u>2</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>35</u> x 2 = <u>70</u> FAC species <u>63</u> x 3 = <u>189</u> FACU species <u>33</u> x 4 = <u>132</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>131</u> (A) <u>391</u> (B) Prevalence Index = B/A = <u>2.98</u>
1. <u>Rosa nutkana</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Salix scouleriana</u>	<u>12</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Sambucus racemosa</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
4. _____				
5. _____				
<u>29</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	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.
1. <u>Phalaris arundinacea</u>	<u>35</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Festuca rubra</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Dactylis glomerata</u>	<u>14</u>	<u>N</u>	<u>FACU</u>	
4. <u>Circaea alpina</u>	<u>12</u>	<u>N</u>	<u>FAC</u>	
5. <u>Equisetum arvense</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
6. <u>Galium boreale</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
7. <u>Stellaria media</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
8. <u>Hypochaeris radicata</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
9. <u>Urtica dioica</u>	<u>1</u>	<u>N</u>	<u>FAC</u>	
10. _____				
11. _____				
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes ☒ No ☐
1. _____				
2. _____				
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks: The vegetation was above 50% for the dominance test; however, the prevalence index was slightly less than 3.0, indicating vegetation tended to be FAC.

SOIL

Sampling Point: 2A-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7"	10 YR 2/2	100					Sand	
7-19"	10 YR 4/2	100					Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: 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 Soils³: ☐ 2 cm Muck (A10) ☐ Red Parent Material (TF2) ☐ Very Shallow Dark Surface (TF12) ☐ Other (Explain in Remarks)
---	---

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

Restrictive Layer (if present): Type: <u>N/A</u> Depth (inches): <u>N/A</u>	Hydric Soil Present? Yes ☐ No ☒
--	---

Remarks: The soil plot was taken within the upland, near the boundary. The soil almost meets the criteria for depleted below a dark surface; however, the dark sandy material does not have a chroma of 1. In addition, though the second layer is depleted and meets the chroma and value requirements, it does not have redoximorphic concentrations. No hydrogen sulfide smell was present when the plot was taken.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)			
☐ 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)	☐ 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): <u>N/A</u> Water Table Present? Yes ☐ No ☒ Depth (inches): <u>N/A</u> Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): <u>0</u>	Wetland Hydrology Present? Yes ☐ No ☒
---	---

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

Remarks: The plot was taken upslope of the wetland boundary, at a higher elevation than the wetland. There was no water table present; however, the soil was saturated. This could be due to the hydrology of the wetland or the recent rainfall.

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

Project/Site: MSL Sequim Campus Estuary City/County: Sequim, Clallam Sampling Date: 10/30/2024
 Applicant/Owner: Battelle Memorial Institute (BMI) State: WA Sampling Point: 2A-WET
 Investigator(s): Dana Vesty and Ioana Bociu Section, Township, Range: S22 T30-0N R3-0W
 Landform (hillslope, terrace, etc.): Tidal Flat Local relief (concave, convex, none): None Slope (%): 2
 Subregion (LRR): LRR A Lat: 48.080463 Long: -123.050677 Datum: WGS 84
 Soil Map Unit Name: 63- Sequim very gravelly sandy loam NWI classification: E2USN
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			

Remarks: The site was located on the northern portion of the Sequim campus. The plot was taken on the northwestern edge of the property, on the edge of the tidal Lagoon. There was a distinct transition between wetland and upland vegetation, and algae and lack of vegetation marked the seaward edge of the persistent vegetation wetland. The wetland boundary coincided with the toe of a gentle slope. Hydrophytic vegetation, hydric soils, and wetland hydrology indicators were present at the time of the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u> </u>					
2. <u> </u>					
3. <u> </u>					
4. <u> </u>					
		<u>0</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>35</u> x 1 = <u>35</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species <u>2</u> x 4 = <u>8</u> UPL species <u> </u> x 5 = <u> </u> Column Totals: <u>107</u> (A) <u>193</u> (B) Prevalence Index = B/A = <u>1.80</u>
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)				
1. <u>Salix scouleriana</u>		<u>10</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Sambucus racemosa</u>		<u>2</u>	<u>N</u>	<u>FACU</u>	
3. <u> </u>					
4. <u> </u>					
5. <u> </u>					
		<u>12</u>	= Total Cover		
Herb Stratum	(Plot size: <u>5'</u>)				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.
1. <u>Distichlis spicata</u>		<u>50</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Sarcocornia pacifica</u>		<u>30</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Atriplex patula</u>		<u>10</u>	<u>N</u>	<u>FACW</u>	
4. <u>Triglochin maritima</u>		<u>5</u>	<u>N</u>	<u>OBL</u>	
5. <u> </u>					
6. <u> </u>					
7. <u> </u>					
8. <u> </u>					
9. <u> </u>					
10. <u> </u>					
11. <u> </u>					
		<u>95</u>	= Total Cover		
Woody Vine Stratum	(Plot size: <u>15'</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. <u> </u>					
2. <u> </u>					
		<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>5</u>					

Remarks: The vegetation was above 50% for the dominance test; and the prevalence index was below 3.0, indicating vegetation tended to be OBL and FACW. The plot was taken in an undisturbed area and consisted of native species. The vegetation was mostly emergent, but shrubs were located on the southern edge of the plot, within the upland.

SOIL

Sampling Point: 2A-WET

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3"	10 YR 2/2	100					Mucky loam	
3-9"	5 Y 4/1	90	10 YR 3/3	10	C	PL	Loam	
9-12"							Organic- fibric	Root Mass
12-22"	10 YR 2/2	100					Mucky loam	

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

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

Indicators for Problematic Hydric Soils³:

☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☒ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

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

Restrictive Layer (if present):

Type: N/A
Depth (inches): N/A

Hydric Soil Present? Yes ☒ No ☐

Remarks: The soil plot was taken within the wetland, near the boundary. There was a hydrogen sulfide smell present when the plot was taken, which qualifies the soil as a hydrogen sulfide. In addition, the second layer has a depleted matrix as it has thickness of 6 inches with a chroma of 1 and a value of 4 and redox concentrations. Below the depleted matrix there was a thick layer of the roots with not a lot of soil material.

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

☒ Surface Water (A1)	☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
☒ High Water Table (A2)	☐ Salt Crust (B11)	☐ Drainage Patterns (B10)
☒ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Dry-Season Water Table (C2)
☐ Water Marks (B1)	☒ Hydrogen Sulfide Odor (C1)	☐ Saturation Visible on Aerial Imagery (C9)
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☒ Geomorphic Position (D2)
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Shallow Aquitard (D3)
☒ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ FAC-Neutral Test (D5)
☐ Iron Deposits (B5)	☐ Stunted or Stressed Plants (D1) (LRR A)	☐ Raised Ant Mounds (D6) (LRR A)
☐ Surface Soil Cracks (B6)	☐ Other (Explain in Remarks)	☐ Frost-Heave Hummocks (D7)
☐ Inundation Visible on Aerial Imagery (B7)		
☐ Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): N/A
Water Table Present? Yes ☒ No ☐ Depth (inches): 10
Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks: The plot was taken within a fringe wetland that is tidally influenced.

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

Project/Site: MSL Sequim Campus Estuary City/County: Sequim, Clallam Sampling Date: 10/30/2024
 Applicant/Owner: Battelle Memorial Institute (BMI) State: WA Sampling Point: 2B-UP
 Investigator(s): Dana Vesty and Ioana Bociu Section, Township, Range: S22 T30-0N R3-0W
 Landform (hillslope, terrace, etc.): Mound Local relief (concave, convex, none): Convex Slope (%): 4
 Subregion (LRR): LRR A Lat: 48.080688 Long: -123.046948 Datum: WGS 84
 Soil Map Unit Name: 03- Beaches 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: The site was located on the northern portion of the Sequim campus. The plot was taken on the northwestern edge of the property, near the wetland boundary. There was a distinct transition between wetland and upland vegetation. The plot was on top of an upland mound that was likely from previous disturbance. Hydrophytic vegetation, hydric soils, and wetland hydrology indicators were not present at the time of the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1.					
2.					
3.					
4.					
		<u>0</u>	= Total Cover		
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>28</u> x 3 = <u>84</u> FACU species <u>13</u> x 4 = <u>52</u> UPL species <u>59</u> x 5 = <u>295</u> Column Totals: <u>100</u> (A) <u>431</u> (B) Prevalence Index = B/A = <u>4.31</u>
1.					
2.					
3.					
4.					
5.					
		<u>0</u>	= Total Cover		
Herb Stratum	(Plot size: <u>5'</u>)				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.
1.	<u>Anthriscus caucalis</u>	<u>57</u>	<u>Y</u>	<u>UPL</u>	
2.	<u>Elymus repens</u>	<u>15</u>	<u>N</u>	<u>FAC</u>	
3.	<u>Amsinckia spectabilis</u>	<u>7</u>	<u>N</u>	<u>FACU</u>	
4.	<u>Festuca rubra</u>	<u>6</u>	<u>N</u>	<u>FAC</u>	
5.	<u>Conium maculatum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
6.	<u>Stellaria media</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
7.	<u>Lamium purpureum</u>	<u>2</u>	<u>N</u>	<u>UPL</u>	
8.	<u>Circaea alpina</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
9.	<u>Galium boreale</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
10.					
11.					
		<u>100</u>	= Total Cover		
Woody Vine Stratum	(Plot size: <u>15'</u>)				
1.					
2.					
		<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>0</u>					
Hydrophytic Vegetation Present? Yes ☐ No ☒					

Remarks: The vegetation was below 50% for the dominance test; and the prevalence index was above 3.0, indicating vegetation tended to be FAC and FACU. *Anthriscus caucalis* and *Lamium purpureum* have no indicator statuses on the latest National Wetlands Plant List (version 3.5). According to the Western Mountains, Valleys, and Coast Regional supplement, unlisted species are assumed to have an upland status, thus both of these are assumed to have an indicator status of UPL.

SOIL

Sampling Point: 2B-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4.8"	10 YR 2/2	100					Sandy loam	
4.8-13.2"	10 YR 3/1	100					Sandy loam	
13.2-16.8"	10 YR 2/2	100					Sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

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

Restrictive Layer (if present):	Hydric Soil Present?	Yes	No	X
Type: <u>N/A</u>				
Depth (inches): <u>N/A</u>				

Remarks: The soil plot was taken within the upland, near the boundary. The soil almost meets the criteria for depleted below a dark surface; however, the depleted matrix does not have a value equal or higher than 4 and does not contain redoximorphic features. The soil was dry and needed water in order to properly color.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
☐ High Water Table (A2)	☐ Salt Crust (B11)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☐ Geomorphic Position (D2)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Shallow Aquitard (D3)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ FAC-Neutral Test (D5)	
☐ Iron Deposits (B5)	☐ Stunted or Stressed Plants (D1) (LRR A)	☐ Raised Ant Mounds (D6) (LRR A)	
☐ Surface Soil Cracks (B6)	☐ Other (Explain in Remarks)	☐ Frost-Heave Hummocks (D7)	
☐ Inundation Visible on Aerial Imagery (B7)			
☐ Sparsely Vegetated Concave Surface (B8)			

Field Observations:				Wetland Hydrology Present?	
Surface Water Present?	Yes	No	X	Yes	No
Water Table Present?	Yes	No	X	Yes	No
Saturation Present?	Yes	No	X	Yes	No
(includes capillary fringe)	Yes	No	X	Yes	No

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

Remarks: The plot was taken upslope of the wetland boundary, at a higher elevation than the wetland. There were no hydrology indicators present in the upland areas.

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

Project/Site: MSL Sequim Campus Estuary City/County: Sequim, Clallam Sampling Date: 10/30/2024
 Applicant/Owner: Battelle Memorial Institute (BMI) State: WA Sampling Point: 2B-WET
 Investigator(s): Dana Vesty and Ioana Bociu Section, Township, Range: S22 T30-0N R3-0W
 Landform (hillslope, terrace, etc.): Tidal Flat Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): LRR A Lat: 48.080705 Long: -123.04686 Datum: WGS 84
 Soil Map Unit Name: 03- Beaches NWI classification: E2USN

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: The site was located on the northern portion of the Sequim campus. The plot was taken on the northern edge of the property, on the eastern edge of the tidally influenced Lagoon. There was a distinct transition between wetland and upland vegetation, and algae and lack of vegetation marked the seaward edge of the wetland. The plot was taken approximately six feet from upland mound. The wetland had drainage channels and puddles throughout. Hydrophytic vegetation, hydric soils, and wetland hydrology indicators were present at the time of the site visit.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or <u>100</u> (A/B)
1.					
2.					
3.					
4.					
		<u>0</u>	= Total Cover		Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>59</u> x 1 = <u>59</u> FACW species <u>41</u> x 2 = <u>82</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>100</u> (A) <u>141</u> (B) Prevalence Index = B/A = <u>1.41</u>
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)				
1.					
2.					
3.					
4.					
5.					
			= Total Cover		
Herb Stratum	(Plot size: <u>5'</u>)				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.
1.	<u>Sarcocornia pacifica</u>	<u>59</u>	<u>Y</u>	<u>OBL</u>	
2.	<u>Distichlis spicata</u>	<u>40</u>	<u>Y</u>	<u>FACW</u>	
3.	<u>Atriplex patula</u>	<u>1</u>	<u>N</u>	<u>FACW</u>	
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
		<u>100</u>	= Total Cover		
Woody Vine Stratum	(Plot size: <u>15'</u>)				Hydrophytic Vegetation Present? Yes ☒ No ☐
1.					
2.					
		<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum		<u>0</u>			

Remarks: The vegetation was above 50% for the dominance test; and the prevalence index was below 3.0, indicating vegetation tended to be OBL and FACW. The plot was taken in an undisturbed area and consisted of native species.

SOIL

Sampling Point: 2B-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of the indicator.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
+16-0"	10 YR 3/3	100					Organic Material- fibric	
0-4"	2.5Y 3/2	100					Clay loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)				Indicators for Problematic Hydric Soils³:	
☒ Histosol (A1)	☐	Sandy Redox (S5)	☐	2 cm Muck (A10)	
☐ Histic Epipedon (A2)	☐	Stripped Matrix (S6)	☐	Red Parent Material (TF2)	
☐ Black Histic (A3)	☐	Loamy Mucky Mineral (F1) (except MLRA 1)	☐	Very Shallow Dark Surface (TF12)	
☒ Hydrogen Sulfide (A4)	☐	Loamy Gleyed Matrix (F2)	☐	Other (Explain in Remarks)	
☐ Depleted Below Dark Surface (A11)	☒	Depleted Matrix (F3)	☐		
☐ Thick Dark Surface (A12)	☐	Redox Dark Surface (F6)	☐		
☐ Sandy Mucky Mineral (S1)	☐	Depleted Dark Surface (F7)	☐		
☐ Sandy Gleyed Matrix (S4)	☐	Redox Depressions (F8)	☐		

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

Restrictive Layer (if present): Type: N/A Depth (inches): N/A	Hydric Soil Present? Yes X No
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Remarks: The soil plot was taken within the wetland, near the boundary. There was a hydrogen sulfide smell present when the plot was taken, which qualifies the soil as a hydrogen sulfide. In addition, the soil qualifies as a histosol with a thick layer of organic material.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
☒ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
☒ High Water Table (A2)	☐ Salt Crust (B11)	☒ Drainage Patterns (B10)	
☒ Saturation (A3)	☐ Aquatic Invertebrates (B13)	☐ Dry-Season Water Table (C2)	
☒ Water Marks (B1)	☒ Hydrogen Sulfide Odor (C1)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres along Living Roots (C3)	☒ Geomorphic Position (D2)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Shallow Aquitard (D3)	
☒ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ FAC-Neutral Test (D5)	
☐ Iron Deposits (B5)	☐ Stunted or Stressed Plants (D1)	☐ Raised Ant Mounds (D6) (LRR A)	
☐ Surface Soil Cracks (B6)	☐ Other (Explain in Remarks)	☐ Frost-Heave Hummocks (D7)	
☒ Inundation Visible on Aerial Imagery (B7)			
☐ Sparsely Vegetated Concave Surface (B8)			

Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): <u>N/A</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>6</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)				Wetland Hydrology Present? Yes ☒ No ☐
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks: The plot was taken within a fringe wetland that is tidally influenced. Channels and standing water are present in depressions throughout the wetland even at low tide.				

Appendix C - Ground Level Color Photographs

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 1	Direction: North	Date: 10/30/2024
		
Overview of The Lagoon, from existing parking area near PNNL-Sequim gate, looking towards Bugge Spit.		

Photo No. 2	Direction: West	Date: 10/30/2024
		
A view of the tidal flats in wetland 1A within the Lagoon. No persistent vegetation extends past the existing bank, aside from tree branches.		

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 3	Direction: Southeast	Date: 10/30/2024
		
A view of Wetland 2A on the fringe of the tidal Lagoon.		

Photo No. 4	Direction: East	Date: 10/30/2024
		
A view of the OHWM , which coincided with eroded toe of a steep slope. The tidal flats are within Wetland 1A.		

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 5	Direction: North	Date: 10/30/2024
		
River otters were spotted within Wetland 2B during the delineation. This indicates that wildlife utilizes this wetland.		

Photo No. 6	Direction: North	Date: 10/30/2024
		
A view of raccoon prints present within The Lagoon and Wetland 1A. Wildlife, including deer and river otters, consistently utilize the area for foraging and habitat.		

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 7	Direction: Southeast	Date: 10/30/2024
		
A view of the wetland 2A near the parcel boundary looking towards PNNL-Sequim.		

Photo No. 8	Direction: North	Date: 10/30/2024
		
A view of the wetland 2B on the eastern bank of The Lagoon. Persistent emergent vegetation transitions to a <i>Sarcocornia pacifica</i> (OBL) dominant area. Since this is a low-energy marine environment, the OHWM is located landward of the salt-tolerant persistent vegetation.		

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 9	Direction: North	Date: 10/30/2024
 Wetland 2B had puddles of open water during low tide and tidal channel present. The OHWM is located landward of the salt-tolerant persistent vegetation since this is a low-energy marine environment.		

Photo No. 10	Direction: Northwest	Date: 10/30/2024
 A view of Bugge Spit, while standing on an upland portion of the spit. Tidal channels meander through Wetland 2B.		

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 11	Direction: Northeast	Date: 10/30/2024
 A view of eastern edge of Bugge Spit upland area with view of beach, Sequim Bay, and OHWM. Sequim Bay is a high energy marine environment so the OHWM is consistent with the line of persistent vegetation and the wrack line.		

Photo No. 12	Direction: Southeast	Date: 10/30/2024
 A view of the PNNL-Sequim shoreline from Bugge Spit to the dock.		

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 13	Direction: South	Date: 10/30/2024
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A view of the OHWM to the PNNL Sequim dock, starting at the concrete stormwater outlet with dominant vegetation being *Leymus mollis* (FACU).

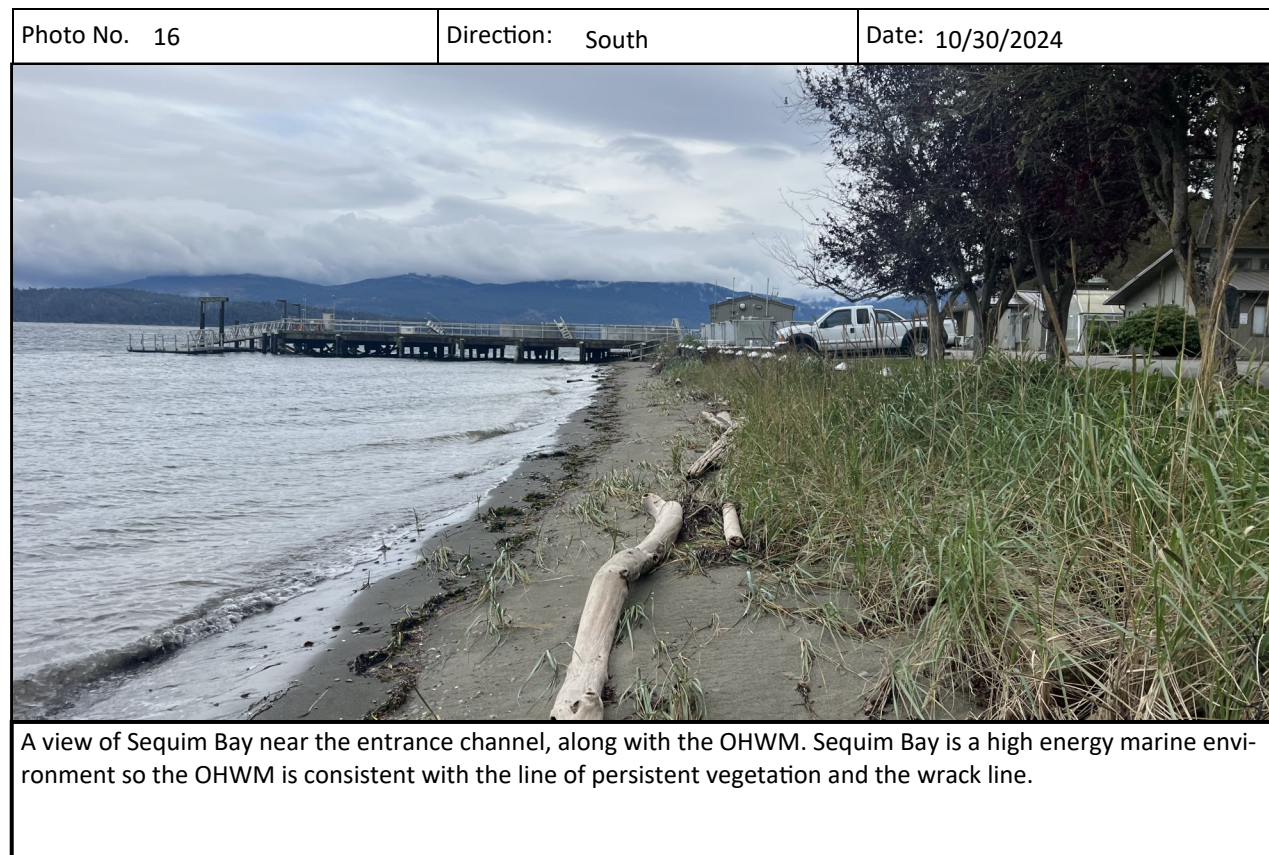
Photo No. 14	Direction: North	Date: 10/25/2021
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A view of vegetation *Leymus mollis* (FACU) and sea wall on the eastern edge of the PNNL Sequim campus.

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA



Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 17	Direction: Southeast	Date: 10/30/2024
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A view of the underside of the PNNL-Sequim dock. Log jam present from storms.

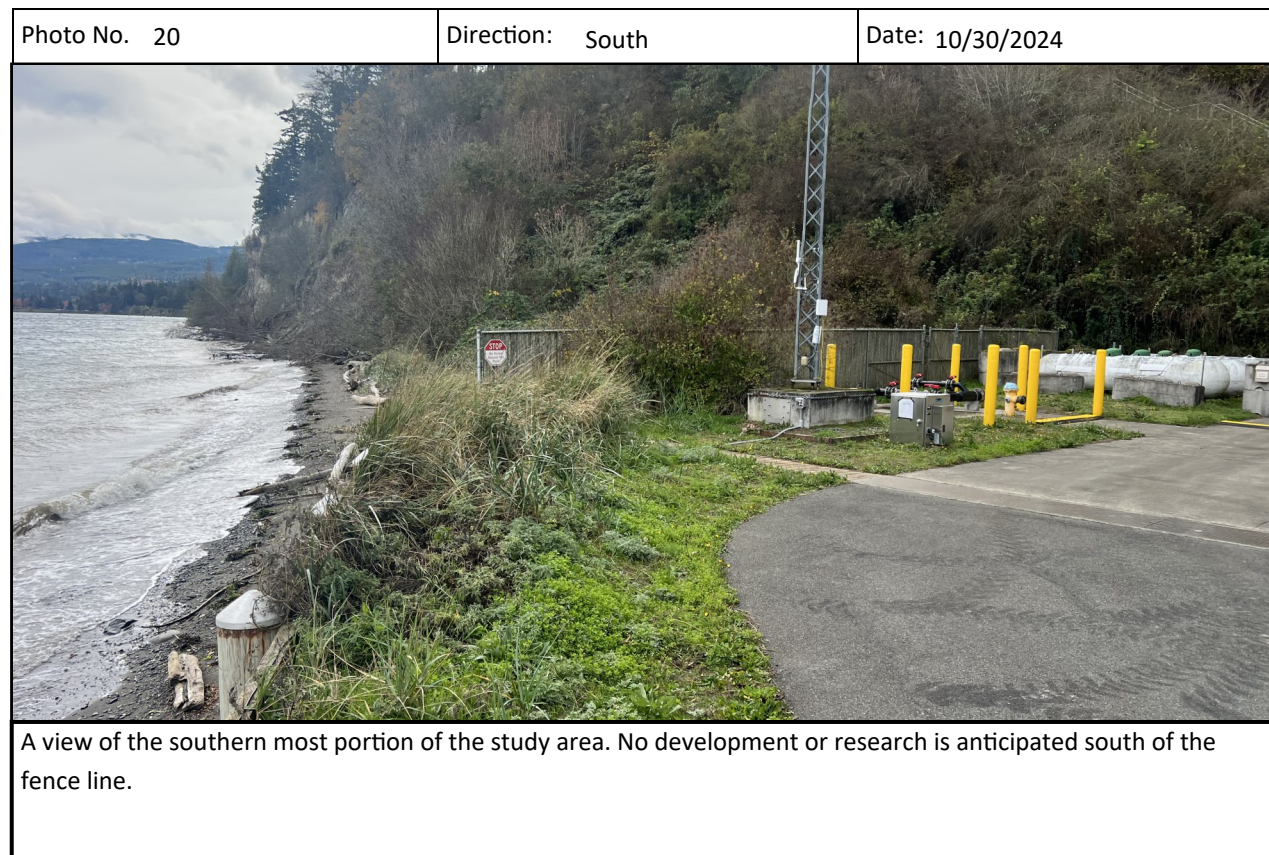
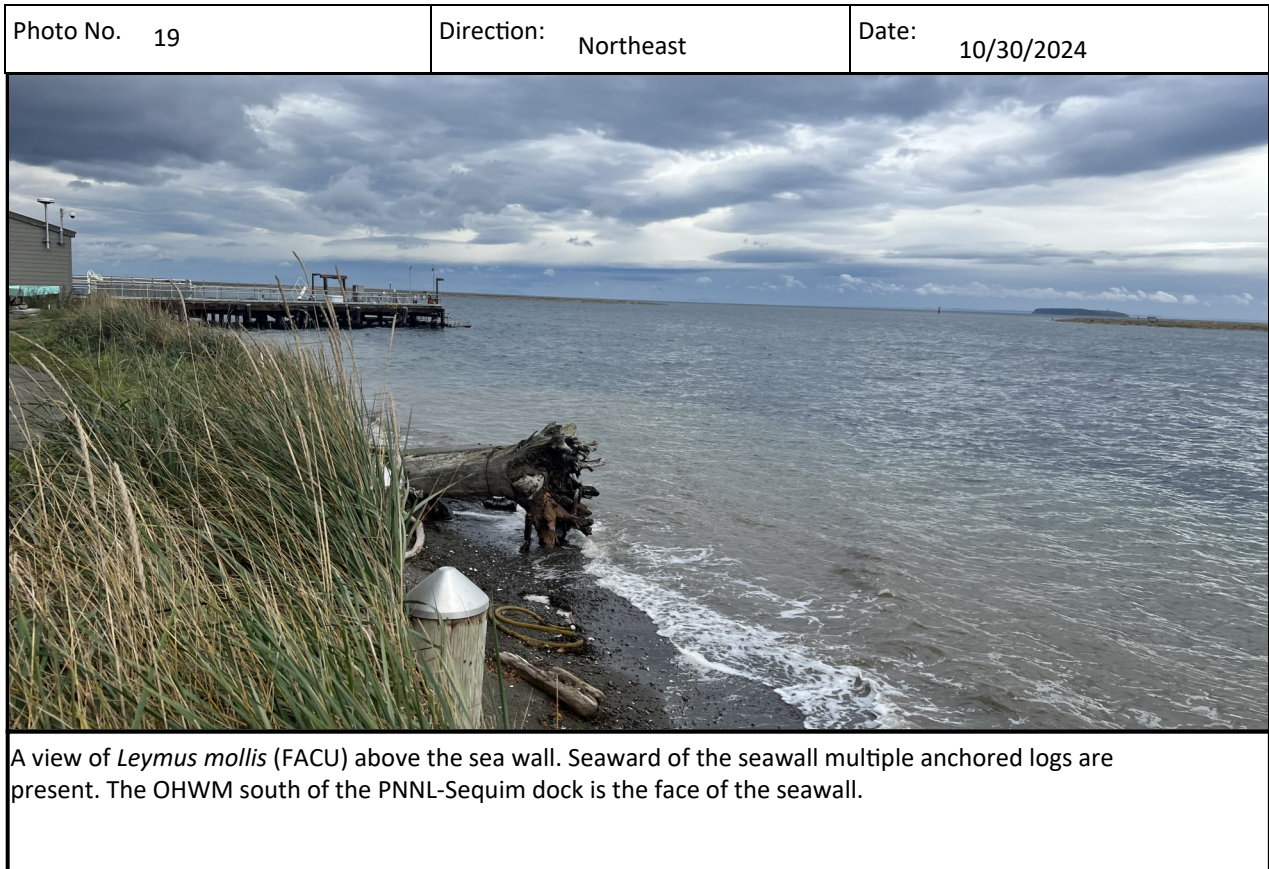
Photo No. 18	Direction: Northeast	Date: 10/30/2024
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A view of the anchored log to the south of the PNNL-Sequim dock.

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA



Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 21	Direction: Northeast	Date: 10/30/2024
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A view of wetland soil core from 2B—WET. Rhizomes from *Distichlis spicata* (FACW) were present throughout.

Photo No. 22	Direction: South	Date: 10/30/2024
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A view of the upland soil core from 2B-UP. Full saturation of the soil was not present throughout the core, even with a rain event present within 48 hours.

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 23	Direction: Northeast	Date: 10/30/2024
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A view of the wetland soil core from 2A-WET. Soil was fully saturated, with visible fibrous material.

Photo No. 24	Direction: South	Date: 10/30/2024
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A view of the upland soil core 2A-UP.

Project: PNNL-Sequim Estuary Wetland Delineation and Classification

Location: Sequim, Clallam County, WA

Photo No. 23	Direction: Northeast	Date: 10/30/2024
		
A view of the drainage ditch to the south of Washington Harbor Road. Though recently mowed, thimbleberry and grasses dominate the depression. No culvert or surface water connection to the Lagoon or Sequim Bay was found.		

Photo No. 24	Direction: South	Date: 10/30/2024
		
NWI classified this area as a seasonally flooded riverine intermittent streambed (R4SBC). There were no evident stream banks or discharge points found during the wetlands delineation. See Section 3.4 for discussion of deviation from NWI.		

Appendix D - Literature Cited

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