SUB-BASIN 46A.3 WATERCOURSE STABILIZATION CRITICAL AREAS STUDY – REVISED

Prepared for the City of Mercer Island

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NHC Project: 2008561.01

RH2 Project: 0240025.00

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City of Mercer Island
Sub-Basin 46a.3 Watercourse Stabilization
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City of Mercer Island
Sub-Basin 46a.3 Watercourse Stabilization
Critical Areas Study

Responsible Parties

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Preface

This report has been prepared for use by the City of Mercer Island (City). In preparing this report, RH2 Engineering, Inc., (RH2) used site information from the following project efforts: 1) geologically hazardous areas and geologic data review and site investigation completed by RH2 in February 2024; 2) hydraulic, hydrologic, and geomorphic analysis completed by Northwest Hydraulic Consultants, Inc., (NHC) in early 2024; 3) biological critical areas data review, site investigations, and critical areas mapping completed by RH2 in April 2024; 4) site meeting and email follow up with the Washington Department of Fish and Wildlife (WDFW) Area Habitat Biologist in April 2024, and a virtual meeting in September 2024 with WDFW; 5) limited site survey completed by NHC in September 2024; and 6) a virtual meeting with the City's Building Department staff and the project team in September 2024. Background data, reports, and maps used to prepare this report were obtained from the City, NHC, King County (County), WDFW, the Washington State Department of Natural Resources (DNR), and the Washington State Department of Ecology (Ecology), among others. Findings detailed in this report are based on site conditions observed by RH2, as well as our understanding of federal, state, and local regulations governing critical areas. The critical areas boundaries, classifications, buffers, and report content reflect the City's Critical Areas Regulations (Chapter 19.07 Mercer Island City Code (MICC)) at the time of this report preparation. These designations may change pending review by the appropriate jurisdictional agencies.

General Information

1. Project Name: Sub-Basin 46a.3 Watercourse Stabilization
2. Name of applicant: City of Mercer Island
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: October 30, 2025. This report replaces a November 2024 version. Changes made reflect final design and local permitting reviews.
6. Location of the Proposal: The project site is located within the 53rd Place Open Space, a City-designated natural area accessed along SE 53rd Place between Island Crest Way and E Mercer Way. A Type F stream flows from west to east within this open space area. The City refers to this drainage as Watercourse 46a.3 and the larger drainage basin as Sub-Basin 46a.3. The project involves ravine grade control improvements within approximately 500 linear feet (lf) of Watercourse 46a.3.
7. Identification of the Proposal: The project aims to reduce streambank erosion to improve water quality and stream habitat and reduce City maintenance requirements within Watercourse 46a.3. To this end, proposed improvements will augment existing channel bed structures and install new bed control and toe structures to limit downcutting and bank erosion and increase overall bank stability in Watercourse 46a.3.
8. Description of Existing Site: The 53rd Place Open Space is a natural area containing mixed deciduous-coniferous forests and a steep ravine that conveys the riparian corridor of Watercourse 46a.3 drainage. The riparian corridor includes the Type F stream, tributary drainages, associated groundwater seeps, and wetlands. The open space area is bounded to the north by SE 53rd Place and to the south by a gravel and earthen walking trail within the open space area, and then upslope, single-family residences. Urban development, primarily single- and multi-family residential uses, is prevalent outside of the immediate project footprint.
9. Report Accuracy: This report was prepared to reflect the current project site conditions and proposed improvements, as well as to meet critical area reporting requirements specified in MICC 19.07.110. It also is anticipated this report will be submitted along with state and federal permit submittals. If project conditions and/or project design plans change such that the project would have substantially different effects on critical areas, an addendum to this report and/or an additional critical areas report may be necessary.
10. Site Design and Easements: Design plans are included in **Appendix B**. The 53rd Place Open Space is a City-owned parcel; therefore, no easements are needed for this work.
11. Bibliography: Sources cited are listed in the **References** section.
12. Mitigation Sequencing: Sequencing to demonstrate avoidance and minimization of impacts to regulated critical areas has been conducted per MICC 19.07.100. Additionally, project compliance with MICC 19.07.160 for geological hazards is demonstrated in this report. Project objectives necessitate minor permanent fill in Watercourse 46a.3 and temporary impacts to stream and buffer habitat. Refer to the **Project Impacts and Mitigation** section.

Introduction

Project Background and Description

Watercourse 46a.3 is situated within a steep ravine primarily bounded by the 53rd Place Open Space, in an area that has experienced pre-historic and historic landslide activity. Ongoing

erosion of the watercourse results in frequent City maintenance and dredging of the sediment pond on the west side of E Mercer Way, causing adverse impacts to downstream water quality and aquatic habitat. Consequently, the City prioritized the Sub-Basin 46a.3 Watercourse Stabilization project in its Capital Improvement Program (CIP). The City's goals for the project include reducing streambank erosion in Watercourse 46a.3 to improve water quality and stream habitat and to reduce maintenance requirements. The City retained NHC and its subconsultant, RH2, to prepare design plans and construction documents, and support permitting efforts for the project.

The City has implemented various measures to stabilize Watercourse 46a.3 within the past 25 years. In 2000, the City installed numerous rock check dams between Stations 0+00 and 9+50[1] (City of Mercer Island, 2000). In 2008, the City installed storm pipe to divert flows from the contributing drainage north of SE 53rd Place (Tributary 1) and tightline flows to downstream of E Mercer Way, effectively reducing base flow of the watercourse. Since completion of these stabilization measures, the City completed two assessments of the watercourse in 2011 and 2014 as part of its Comprehensive Basin Review and Watercourse Monitoring Program. Both assessments indicated erosion of landslide deposits in the central portion of the watercourse (between Stations 5+00 and 7+00) is a likely source of sediment. These assessments recommended flow bypass and stream stabilization measures in the reach of the stream with active erosion. The 2011 and 2014 assessments led to development of the City's CIP project that is the subject of this report.

To address ongoing erosion and reduce maintenance needs, thereby improving water quality and stream habitat, the project proposes ravine grade control measures. These include augmentation of existing natural channel bed structures, installation of new bed control structures, and installation of toe structures, all aimed at reducing downcutting of the watercourse and increasing overall bank stability. Control structures will be constructed of large woody debris (LWD) (10- to 12-inch logs), racking (4- to 8-inch logs), slash material, coir fabric, burlap sacks, streambed cobble and boulders, and riparian plantings. Proposed improvements are shown in the design plans (**Appendix B**).

Project Location

The project involves work in an approximately 500 lf reach of Watercourse 46a.3 between Stations 4+50 and 9+50. Construction is anticipated within an area covering approximately 12,000 square feet (sf) (0.28 acres (ac)) in and adjacent to the SE 53rd Place Open Space (parcel no. 1924059186). Equipment staging is proposed along SE 53rd Place at the top of the ravine slope and within designated upland benches adjacent to the watercourse. The project is in Section 19, Township 24N, Range 05E.

[1] Stream stationing begins at E Mercer Way and progresses in the upstream direction (west) along the watercourse (**Figure 1**).

Previous Work

Prior work and studies relevant to Sub-Basin 46a.3 and/or directly related to this project include the following:

- Drainage Basin Improvements, Drainage Basins 48 and 46A – Design Drawings (City of Mercer Island, Public Works Department, 2000).
- Basin Drainage Improvements, Wd524C – Design Drawings (City of Mercer Island, Public Works Department, 2008).
- Comprehensive Basin Review and Watercourse Monitoring, Project Summary Sheet (City of Mercer Island, Public Works Department, 2011).
- *Subbasin 46.3 Watercourse Stabilization Design Project Preliminary Basis of Design Report* (Preliminary BODR) (NHC, 2024).
- *Subbasin 46.3 Watercourse Stabilization Design Report* (Design Report) (NHC, 2025).

Regulatory Requirements

This report has been prepared to meet the requirements of Chapter 19.07 MICC; however, this report also will facilitate review/compliance with applicable state and federal regulations. The following approvals are expected for this project.

- State Environmental Policy Act – City
- Building Permit – City
- Grading Permit – City
- Stormwater Permit – City
- Critical Areas Code (CAC) compliance – City
- Hydraulic Project Approval – WDFW
- Clean Water Act Water Quality Certification (Section 401 Nationwide) – Ecology
- Clean Water Act Fill/Dredge Permit (Section 404 Nationwide) – U.S. Army Corps of Engineers (USACE)

The City has indicated it considers this bank stabilization and stream restoration project to be exempt from the City's CAC per MICC 19.07.120(D). Although exempt, the City requires the preparation of a report that describes on-site critical areas from site investigations and demonstrates reasonable methods to avoid and minimize impacts to critical areas and buffers consistent with MICC 19.07.100. Included in critical areas are geological hazards, which were assessed by RH2, as well as biological critical areas. Impacts and risks associated with the on-site geological hazards are addressed in this report in accordance with MICC 19.07.160(B)(3).

Methods

Background Review

Prior to environmental field investigations, the following background information was reviewed:

- Project area specific and surrounding area data and reports (various sources).
- Existing and historical aerial photography (Google Earth).
- Stream and wetland mapping (City, County, Ecology, WDFW, and U.S. Fish and Wildlife Service (USFWS)).
- Topography and LiDAR (City, County, DNR, U.S. Geological Survey (USGS), and the Puget Sound LiDAR Consortium).
- Floodplain mapping (City, County, and Federal Emergency Management Agency (FEMA)).
- Geologic hazards (DNR and City).
- Fish and wildlife occurrence data (WDFW, National Oceanic and Atmospheric Administration (NOAA) Fisheries, and USFWS).
- Soils data (U.S. Department of Agriculture National Resources Conservation Service (NRCS) Soil Conservation Service).

Field Investigations

Field investigations were completed by the RH2 team as follows:

- Biological critical areas investigation and delineations were completed April 23, and April 24, 2024, by Ms. Alicia Pettibone of RH2 and Mr. Noah Bloxton, formally of RH2.
- Geologic and geologically hazardous areas site investigation was completed February 9, 2024, by Mr. Steve Nelson of RH2.

Information from hydraulic, hydrologic, and geomorphic analysis and site investigations completed by NHC in January and February 2024 also informed RH2 field investigations. The results of these investigations are summarized in the Preliminary BODR (NHC, 2024).

Methodology

Methodology used to delineate and characterize wetlands, streams, and fish and wildlife habitat conservation areas (FWHCAs) is as follows:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE Publication ERDC/EL TR-10-3, 2010).
- *Corps of Engineers Wetlands Delineation Manual* (USACE Publication Y-87-1, 1987).
- *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, L., Carter, V., Golet, F., & LaRoe, E., USFWS Publication FWS/OBS-79/31, 1979).
- *A Hydrogeomorphic Classification for Wetlands* (Brinson, USACE Publication WRP-DE-4, 1993).
- Water Typing System (Washington Administrative Code (WAC) 222-16-030).
- *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson P., Meyer S., Olson P., & Stockdale, E., Ecology Publication 16-06-029, 2016).
- Chapter 19.07 MICC.

Wetlands

Wetland delineations followed the USACE *Corps of Engineers Wetland Delineation Manual – Routine Determination Methods, Subsection 2 – On-Site Inspection Necessary* (USACE, 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2)* (USACE, 2010). Delineation of on-site wetlands also was guided by WAC 173-22-035 per MICC 19.07.190.

Wetland test pits were installed in areas within and adjacent to wetlands to determine if wetland parameters had been met. Vegetation, hydrology, and soils were characterized for each test pit and data was recorded on Wetland Determination Data forms. Test pits were staked, labeled, and flagged with neon pink flagging. Wetland boundaries were flagged and labeled with neon pink "Wetland Delineation" flagging.

The following information influenced and/or was considered during wetland delineations:

- The 3-month period prior to field work experienced drier than normal rainfall conditions per calculations using the USACE Antecedent Precipitation Tool and U.S. Drought Index.
- American beaver (*Castor canadensis*) was captured and relocated from the site by the City in the previous 12 months.
- Bank stabilization and habitat restoration efforts were completed on Watercourse 46a.3 in the last 25 years; these activities have the potential to affect riparian habitat and can influence wetland indicators.

Identified wetlands were classified using Ecology's *Washington State Wetland Rating System for Western Washington* (Hruby, 2014). Wetlands were rated using the Ecology system and classified as Category I through IV based on this rapid functional assessment.

Streams

Streams were typed according to the Washington State Water Typing System (WAC 222-16-030). The stream types described in this report are based on the stream reaches within the study area; downstream reaches may be rated higher.

Ordinary high water mark (OHWM) delineations were completed using Ecology guidance (Anderson, et al., 2016) and the definitions in WAC 173-22-030. Ecology's OHWM guidance presumes there are three physical criteria within the OHWM definition that apply to all shoreline types (italics added for emphasis): "Presence and action of *waters*… mark upon the

soil…distinct from that of the abutting upland, in respect to *vegetation*…" Ecology states the OHWM is the dynamic boundary between the aquatic and terrestrial environments and, in most cases, is not a static elevation. Regular (ordinary) inundation produces visible abiotic (change in topography or substrate) and biotic (change in vegetation) signs on the landscape. In those cases where an OHWM determination is required, Ecology guidance recommends a systematic approach that involves reviewing available information prior to a site visit (desktop study) and visiting the site to locate the OHWM based on field indicators (field assessment).

Desktop Hydrology Study

Resources, including gage data and aerial photographs, can corroborate field findings but are only tools to help focus the on-site field evaluation of geomorphic and vegetative indicators. An assessment of hydrologic data also can improve the effectiveness of the field assessment.

A desktop hydrologic assessment was conducted by NHC using flow estimates established by a Hydrologic Simulation Program – FORTRAN (HSPF). The peak flows also were reviewed through the USGS StreamStats software but were found to be appreciably lower than the values returned by HSPF; therefore, the HSPF flows were used in design.

The 2-year peak flow, or 50 -percent probability flood, is more frequently cited as the upper limit of the OHWM (Anderson, et al., 2016). In Washington, the 2-year peak flow recurrence interval (or the peak flow that has a 50-percent probability of occurring in any given year; also called "median peak flow" or "50-percent probability peak flow") provides a reliable upper limit of the OHWM flow range. The HSPF calculated 1.01- and 2-year peak flow estimates for the stream are 0.6 cubic feet per second (cfs) and 1.1 cfs, respectively. These flow estimates correlate to 0.2 and 2.9 feet in elevation. These peak flow estimates and corresponding elevations were generally used to guide OHWM delineations by RH2. The 1.01-year peak flow informed the lower limit of the on-site OHWM, whereas the 2-year peak flow was used as the upper limit for the OHWM delineation.

Field Delineation Methodology

The OHWM is not a static line or elevation and may change over time due to natural events or permitted anthropogenic actions. OHWM determinations for waterways rely on the use of geomorphic and vegetative field indicators, and Ecology protocol requires that the OHWM be based on the physical and biological indicators present at the site. The following key physical and biological indicators and channel features were used to delineate the OHWM:

- A change in prevalent vegetation (especially the lower limit of perennial species and upper limit of inundation-tolerant shrub or tree species).
- The presence or absence of wetlands and hydrophytic (inundation or high flow tolerant) vegetation.
- A change in geomorphic indicators, such as slope or topographic breaks, along the stream banks.
- A change in soils and/or a change in the particle size of bank material, such as the boundary between coarse cobble or gravel with fine-grained sand or silt.
- Undercuts in the bank, which usually reach interior elevation slightly below the bankfull stage.

RH2 delineated the OHWM of Watercourse 46a.3, as well as accessory tributaries, if OHWM indicators were present, from Station 10+00 to Station 4+00. Blue and white stripe flagging was labeled and placed along the OHWM boundary onsite. The OHWM flags were collected with a GPS unit by RH2 for inclusion in the base map.

Fish and Wildlife Habitat Conservation Areas

Designation and typing of FWHCAs is defined in MICC 19.07.170(A). Designated FWHCAs include areas where local, state, or federally protected species have a primary association, areas containing WDFW priority habitats or species occurrences, bald eagle habitat, watercourses, wetlands, and their respective buffers, and biodiversity areas.

RH2 conducted a survey for FWHCAs in proximity to Watercourse 46a.3 and the proposed improvements within the 53rd Place Open Space. During site investigations, RH2 biologists generally surveyed the area, observing, listening for, and recording vegetation communities, wildlife, and evidence of wildlife usage (i.e., nests, tracks, burrows, scat, calls, etc.). Additionally, any observed special habitat features (i.e., LWD, riparian vegetation shading, nesting cavity trees, etc.) that may support FWHCAs were recorded.

The City requires preparation of a Fish and Wildlife Report, including a Habitat Assessment, that characterizes habitats on the site (MICC 19.07.170) unless exempt under MICC 19.07.120. Per MICC 19.07.120 (D)(4), watercourse restoration installed by a public agency is considered exempt, provided compliance with mitigation sequencing (MICC 19.07.100) is demonstrated. This report summarizes existing conditions with respect to FWHCAs, as well as compliance with mitigation sequencing.

Geologically Hazardous Areas

MICC 19.07.160 defines geologically hazardous areas as lands that are susceptible to erosion, landslides, seismic events, or other factors as identified by WAC 365-190-120. These areas may not be suited for development activities because they may pose a threat to public health and safety. Areas susceptible to one or more of the following types of hazards shall be designated as geologically hazardous areas: landslide hazard areas, seismic hazard areas, and erosion hazard areas.

The geohazard assessment was conducted using available geologic and soil maps, available soil boring logs, and LiDAR imagery to indicate topographic and underlying subsurface conditions of the project site. Available geohazard maps prepared by the City and DNR were reviewed in preparation of a geologically hazardous areas site reconnaissance. The site reconnaissance was completed using these available references to observe current, actual field conditions for confirmation of mapped features, and to assess the stability of soil and topographic features.

Per MICC 19.07.120(D)(4), the proposed restoration efforts are exempt, provided mitigation sequencing is (MICC 19.07.100) is demonstrated. This report summarizes existing conditions with respect to geologic hazards in the project reach, as well as compliance with mitigation sequencing. Additionally, this report provides a statement of risk assessment per MICC 19.07.160(B)(3).

Results

Existing Environmental Data

National Wetland Inventory data shows a riverine wetland where the stream is mapped in the study area. City mapping data shows an un-piped watercourse, the 46a.3 watercourse. County wetland mapping data does not depict any wetlands or streams in the project reach.

DNR's Forest Practices Application and Mapping Tool data shows Watercourse 46a.3 is a Type N water. The City's GIS data shows the stream as a Type Np watercourse with a 60-foot stream buffer. In communications with WDFW's Area Habitat Biologist, typing of the stream was reviewed and WDFW determined the stream meets the criteria of a Type F (fish bearing) stream.

The County shows the project is not within a Critical Aquifer Recharge Area.

The City has mapped the SE 53rd Place Open Space for geohazard conditions and identified areas within the open space exhibiting landslide features (e.g., scarps, mass wasting deposits, etc.), steep slopes, and streams with deep incision channels. Areas upslope of SE 53rd Place are mapped as potential slide hazard areas.

DNR has mapped the SE 53rd Place Open Space as containing areas of landslide deposits on both sides and along Watercourse 46a.3, internal scarps south of the watercourse and flanking scarps on the upper slope above the open space south of the watercourse.

The project reach is not within a mapped FEMA floodway or 100-year floodplain.

The NRCS Soil Survey data shows the entire study area is underlain by the Alderwood gravelly sandy loam soil map unit, which is a moderately well drained soil comprised of gravelly sandy loam atop very gravelly sandy loam. It contains hydric soil components but is not classified as hydric itself. Alderwood gravelly sandy loam soil derives from weathered glacial till geologic units.

The USFWS Information for Planning and Consultation database suggests the following species of conservation concern may utilize the site: North American wolverine (*Gulo gulo luscus*), marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), northwestern pond turtle (*Actinemys marmorata*), monarch butterfly (*Danaus plexippus*) and bull trout (*Salvelinus confluentus*). No suitable habitat for the listed species of the area was documented during the site investigation conducted by RH2.

The DNR Natural Heritage Program database does not show any rare or imperiled species or plant communities at the project site. Four species are listed nearby, including branching montia (*Montia diffusa*), Roll's golden log moss (*Brotherella roelloii*), kaernefeltia lichen (*Kaernefeltia californica*), and weak thistle (*Cirsium remotifolium var. remotifolium*). None of these species were observed onsite by RH2.

The WDFW Priority Habitats and Species (PHS) database shows the 53rd Place Open Space as a biodiversity area and corridor but does not list any other PHS species or habitats. The Statewide Integrated Fisheries Distribution (SWIFD) mapper does not show any fish species in Watercourse 46a.3. The stream drains to Lake Washington approximately 2,000 feet

downstream of the project reach, which is shown on SWIFD to support coho salmon (*Oncorhynchus kisutch*), cutthroat trout (*O. clarkii*), Chinook salmon (*O. tshawytscha*), bull trout, sockeye, kokanee salmon (*O. nerka*), and steelhead trout (*O. mykiss*). The NOAA Fisheries Species and Habitat mapper shows Lake Washington is critical habitat for Chinook salmon and Essential Fish Habitat (EFH) for Chinook and coho salmon and groundfish.

Community science data retrieved from online sources, including eBird and iNaturalist, shows the following vegetation and wildlife observations in the 53rd Place Open Space: Columbian black-tailed deer (*Odocoileus hemionus columbianus*), song sparrow (*Melospiza melodia*), brown creeper (*Certhia americana*), spotted towhee (*Pipilo maculatus*), hairy woodpecker (*Leuconotopicus villosus*), dark-eyed junco (*Junco hyemalis*), Steller's jay (*Cyanocitta stelleri*), chestnut-backed chickadee (*Poecile rufescens*), red-breasted nuthatch (*Sitta canadensis*), Bewick's wren (*Thryomanes bewickii*), American robin (*Turdus migratorius*), house finch (*Haemorhous mexicanus*), black-throated gray warbler (*Setophaga nigrescens*), Wilson's warbler (*Cardellina pusilla*), western tanager (*Piranga ludoviciana*), licorice fern (*Polypodium glycyrrhiza*), Pacific waterleaf (*Hydrophyllum tenuipes*), Pacific bleeding heart (*Dicentra formosa*), whitebark raspberry (*Rubus leucodermis*), as well as many other fungi, macroinvertebrates, and others (eBird, 2024; iNaturalist, 2024).

Relevant background data and maps are contained in **Appendix C**.

General Site Conditions

The 53rd Place Open Space contains mixed deciduous-coniferous forests and a steep ravine that conveys the riparian corridor of the Watercourse 46a.3 drainage. The riparian corridor is relatively intact and pristine (i.e., prevalence of native plant species and habitat), and includes the Type F stream, tributary drainages, associated groundwater seeps, and wetlands. The open space area is bounded to the north by SE 53rd Place and to the south by a gravel and earthen walking trail within the open space area, and then single-family residences further south. Urban development, primarily single- and multi-family residential uses, is prevalent outside of the immediate project footprint.

In addition to stream stabilization efforts (e.g., rock check dams and pipe bypass), the City has completed invasive species removal and native plantings in the 53rd Place Open Space, which was observed by RH2 during site investigations.

Critical areas observed during site investigations include the Watercourse 46a.3 stream, two tributary streams from drainages that cross SE 53rd Place, three seeps along the southern riparian corridor, and two slope wetlands along the northern riparian corridor. The geohazard site reconnaissance observed relict landslide features including hummocky ground, weathered low scarps, and variably dense soil ranging from loose sandy silt slopes to stiff silt.

Site photographs are included in **Appendix D**.

Vegetation

Vegetation communities in the study area include upland forest, the riparian corridor, and two slope wetlands. Vegetation observed in these communities is a combination of native and invasive plant species.

The emergent vegetation strata within the wetland and riparian areas are dominated by field horsetail (*Equisetum arvense*), western skunk cabbage (*Lysichiton amercanus*), and creeping buttercup (*Ranunculus repens*). Non-native species were present in the wetland, including non-native blackberries (*Rubus laciniatus* and *R. armeniacus*). The emergent vegetation stratum is the most widespread and representative layer in the wetland plant community. Scrub-shrub vegetation classes are dominated by salmonberry (*Rubus spectabilis*) and forested vegetation classes are dominated by red alder (*Alnus rubra*).

The riparian community also is composed of more woody species that are less adapted to inundated soil conditions, such as Western hemlock (*Tsuga heterophylla*) and bigleaf maple (*Acer macrophyllum*). Vine maple (*Acer circinatum*) and black cottonwood (*Populus balsamifera)* also are present within the riparian community. The composition of the vegetation community in the riparian zone is not strongly indicative of wetland predominance. That is, there is a prevalence of facultative (FAC)[2] species throughout this vegetation community.

The adjacent upland forest located upslope of the stream corridor is dominated by Western redcedar (*Thuja plicata*), bigleaf maple, sword fern (*Polystichum minutum*), and stinging nettle (*Urtica dioica*). Wild strawberry (*Fragaria vesca*), Western hemlock, and red alder are also widespread throughout the upland forest area. Herb robert (*Geranium robertianum*), a County Class B non-regulated noxious weed, was also found to be prevalent in the upland stratum.

Native shrub and tree restoration plantings, such as Douglas fir (*Pseudotsuga menziesii*) and Western red cedar, are present on the streambanks both north and south of the project area.

Hydrology

Hydrology in the study area originates primarily from surface water flow associated with Watercourse 46a.3, with contributions from tributary streams flowing from north of SE 53rd Place, groundwater flows (seeps), and precipitation. The project is within the Lake Washington sub-basin of the Cedar-Sammamish watershed (HUC 171100120400) and Watercourse 46a.3 flows to Lake Washington. The headwaters of the stream originate near the intersection of Island Crest Way and SE 53rd Place, approximately 700 feet upstream of the project reach. At the west intersection of E Mercer Way, the stream enters a sediment pond with a beehive structure, which allows for settling of sediment conveyed by the stream and

[2] The USACE maintains a National Wetland Plant List (NWPL) categorizing common hydrophytic plant species based on their affinity for inundated habitats and probability of occurrence within wetlands. The following categories are used:

Indicator Status	Abbreviation	Definitions – Short Version
Obligate	OBL	Almost always occurs in wetlands
Facultative Wetland	FACW	Usually occurs in wetlands, but may occur in non-wetlands
Facultative	FAC	Occurs in wetlands and non-wetlands
Facultative Upland	FACU	Usually occurs in non-wetlands, but may occur in wetlands
Upland	UPL	Almost never occurs in wetlands

Table obtained from USACE. (2023). 2022 National Wetland Plant List, Version 3.6. USACE Engineer Research and Development Center, Vicksburg, MS. Retrieved from http://wetland-plants.usace.army.mil/.

transport of flows downstream. Watercourse 46a.3 crosses E Mercer Way via a corrugated metal pipe culvert, outfalling into the ravine downstream. This outfall has a significant water surface drop and is consequently considered a fish passage barrier by WDFW (site ID 920822; **Appendix C**). From E Mercer Way, the stream flows approximately 1,650 feet downstream to outfall into Lake Washington on parcel no. 8661400050.

Soils

Soils encountered through wetland test pits generally displayed fine sand to sandy loam textures. Within wetland areas, silty clay loam and muck textures also were encountered. Substrates in Watercourse 46a.3 were fine sands to sandy loams intermixed with gravels. Soils encountered generally coincided with the Alderwood gravelly loam soil map unit.

Wetlands

Two wetlands were identified and delineated in the project reach, as summarized in **Table 1**. **Figure 1** shows aquatic critical areas delineated by RH2 on the site, including wetland and stream resources. Site investigation data is contained in **Appendix E**.

Table 1

Classification Overview of Delineated Wetlands in the Project Reach

Wetland Name	Size in sf (ac)	Cowardin Classification Code[1]	Hydrogeomorphic Class[2], Subclass	Category	Habitat Score[3]
Wetland A	555 (0.01)	PFO1	SLOPE	III	7
Wetland B	3,448 (0.09)	PFO1/PSS6		III	8

[1] Cowardin classification includes class and subclass. PFO1 is palustrine forested broad-leaved deciduous, and PSS6 is palustrine scrub-shrub deciduous.
[2] Hydrogeomorphic classification based on Brinson (1996) used in the Ecology rating.
[3] Habitat score is based on ratings completed by RH2 and summarized in this report.

Wetland A

Wetland A is an approximately 555 (sf) Category III wetland upgradient of the stream and outside the stream's floodplain. The hydrogeomorphic classification used for categorization is slope, as it is on a slope where water flows through the wetland in one direction and generally leaves without being impounded.

Wetland A is dominated by a broad-leaf deciduous forested vegetation class (Cowardin, et al., 1979). The wetland's forest cover contained red alder, a scrub-shrub class of salmonberry, and an emergent class dominated by creeping buttercup, field horsetail, and small enchanter's-nightshade (*Circaea alpina*).

Test pits dug in the wetland displayed sandy loam to sandy clayey loam textures. The soil matrix color was dark grayish brown (10YR 4/2) from the surface to a depth of 16 inches. Faint and distinct redoximorphic concentrations in contrast to the matrix were observed both as concentrations in the matrix and along pore linings. Redox concentrations were common (2 to 20 percent), and fine to very course (less than 2 to less than 76 millimeters) in size. The hydric soil indicator Depleted Matrix (F3) was met. All wetland test pits (TP) met primary soil indicators.

The hydroperiod for Wetland A is saturated only and seasonally flooded or inundated. The primary sources of hydrology are high water table and groundwater seeps, as evidenced by the observed Saturation (A3) and Surface Water (A1) hydrology indicators. All wetland test pits met primary hydrology indicators. **Table 2** provides a summary of Wetland A.

Table 2

Wetland A Overview

Wetland Evaluation Summary		
Wetland Name	Wetland A	
Location	Parcel no. 1924059186 On north slope of stream near Station 6+00	
Local Jurisdiction	King County	
WRIA	8 – Cedar-Sammamish	
Sub-Watershed	Lake Washington	
Ecology Rating (Hruby, 2014)	Category III	
Habitat Score	7	
City Buffer Width	40 feet	
Wetland Size	555 sf	
Cowardin Classification	PFO1	
HGM Classification	Slope	
Associated Waterbody	Watercourse 46a.3	
Data Sheet(s)	TP-1 (in), TP-2 (out)	
Boundary Flag Color	Pink “WETLAND DELINEATION” flagging	
Dominant Vegetation	Red alder and salmonberry	
Soil Indicators	Depleted Matrix (F3)	
Hydrology Indicators	Surface Water (A1) and Saturation (A3)	
Rationale for Delineation	Positive vegetation, soil, and hydrology indicators	
Rationale for Local Rating	Ecology wetland rating results cross-referenced with MICC 19.07.190	

Wetland B

Wetland B is an approximately 3,448 sf Category III wetland located along the north bank of the stream. The hydrogeomorphic classification used for categorization is slope, as it is on a slope and does not impound or impede the water moving through it.

Wetland B is dominated by a scrub-shrub and forested vegetation class (Cowardin, et al., 1979), primarily consisting of salmonberry, red alder, and vine maple. Emergent vegetation in the canopy or in emergent only areas of the wetland includes stinging nettle, field horsetail, lady fern (*Athyrium felix-femina*), skunk cabbage, and piggyback plant (*Tolmiea menziesii*).

Test pits dug in Wetland B displayed silty muck texture. The soil matrix color was black (10YR 2/1) from the surface to 16 inches. A distinct hydrogen sulfide odor was present when installing the soil test pit. No redoximorphic concentrations were observed. The hydric soil indicators Black Histic (A3) and Hydrogen Sulfide (A4) were met.

The hydroperiods for Wetland B are saturated only, seasonally flooded or inundated, and seasonally flowing stream adjacent to the wetland (i.e., Watercourse 46a.3 and Tributary 2). The primary sources of hydrology are groundwater seeps upgradient and within the wetland and high water table and overbank flooding from the stream (Tributary 2 primarily), as evidenced by the observed Surface Water (A1), High Water Table (A2,) and Saturation (A3) hydrology indicators. **Table 3** provides a summary of Wetland B.

Table 3

Wetland B Overview

Wetland Evaluation Summary		
Wetland Name	Wetland B	
Location	Parcel no. 1924059186 On north slope of stream near station 5+00	
Local Jurisdiction	King County	
WRIA	8 – Cedar-Sammamish	
Sub-Watershed	Lake Washington	
Ecology Rating (Hruby, 2014)	Category III	
Habitat Score	8	
City Buffer Width	110 feet	
Wetland Size	3,448 sf	
Cowardin Classification	PFO1/PSS6	
HGM Classification	Slope	
Associated Waterbody	Watercourse 46a.3 and Tributary 2	
Data Sheet(s)	TP-3 (in), TP-4 (out)	
Boundary Flag Color	Pink “WETLAND DELINEATION” flagging	
Dominant Vegetation	Salmonberry, vine maple, red alder, skunk cabbage	
Soil Indicators	Black Histic (A3) and Hydrogen Sulfide (A4) were met	
Hydrology Indicators	Surface Water (A1), High Water Table (A2), and Saturation (A3)	
Rationale for Delineation	Positive vegetation, soil, and hydrology indicators	
Rationale for Local Rating	Ecology wetland rating results cross-referenced with MICC 19.07.190	

Wetland Characterization and Functional Assessment

The characterization of wetlands identified on the site is based on wetland ratings completed using Ecology’s *Washington State Wetland Rating System for Western Washington* (Hruby,

2014). 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 functions. Site potential, landscape potential, and value are assessed for each of these functions. **Table 4** provides a summary of the wetland functions based on the Ecology rating.

Table 4

Qualitative Rating of Identified Wetlands

Function	Qualitative Rating of Wetland Function	
	A	B
Water Quality Functions		
Site Potential to Improve Water Quality	L	L
Landscape Potential to Support Water Quality Functions	M	M
Value Rating for Water Quality Improvement	H	H
Hydrologic Functions		
Site Potential to Perform Hydrologic Functions	L	L
Landscape Potential to Support Hydrologic Functions	L	M
Value Rating for Hydrologic Functions	L	L
Habitat Functions		
Site Potential to Provide Habitat	L	M
Landscape Potential to Support Habitat Functions	H	H
Value Rating for Habitat Functions	H	H
Total Rating Score	**16**	**18**
Wetland Category	**III**	**III**

Wetland A

Wetland A has a moderate potential to improve water quality. Wetland A's site potential to improve water quality is low due to steep slopes and sparse vegetative cover that limit detention and infiltration of surface water. Wetland A also has moderate landscape potential to support water quality because of its proximity to uphill land uses that generate pollutants, including nearby roadways. The value to society of water quality improvements provided by Wetland A is high given that it flows into Lake Washington, which is on the 303(d) list.

The hydrologic functions of Wetland A are low, primarily due to the sparse vegetation structure that provides little flood and erosion control. In addition, much of the area upslope of Wetland A is undeveloped and does not rely on the wetland for natural filtration of excess surface runoff. Furthermore, there are no upstream flood control devices, and no flooding issues are known to occur downstream of the wetland.

Wetland A functions moderately high for providing general habitat since it is within a relatively intact riparian corridor that contains priority habitats and supports urban wildlife. Three different priority habitats are in the 53rd Place Open Space area or within 330 feet of the wetland, including biodiversity areas and corridors, riparian habitat, and snag and log habitats.

Wetland B

Wetland B has a moderate potential to improve water quality. Like Wetland A, Wetland B's steep slopes and sparse vegetative cover limit detention and infiltration of surface water at the site. Wetland B also has moderate landscape potential to support water quality due to its proximity to uphill land uses that generate pollutants. The value to society of water quality improvements provided by Wetland B is high since it, like Wetland A, flows into Sub-Basin 46a.3 which drains to Lake Washington, a 303(d) listed waterbody.

The hydrologic functions of Wetland B are low to moderate, as the emergent vegetation present within the wetland is of low enough density that it does not provide much potential for aiding in flood control and erosion along the stream or downstream. However, greater than 25 percent of the area upslope of the wetland has the potential to be in uses that generate excess runoff; therefore, the water storage and filtration that is provided by the wetland is of moderate value.

Although Wetland B has simple hydrologic regimes and vegetation communities, it has moderate to high habitat functions because of its ability to provide multiple habitats and habitat features with multiple strata and moderate interspersion of habitat. The wetland supports multiple hydroperiods since the wetland borders Tributary 2 and Watercourse 46a.3. Because the surrounding area of the wetland is low to moderate intensity land uses, Wetland B has a high potential to support habitat functions. Like Wetland A, several priority habitats are in proximity to and directly within the wetland.

Streams

Within the project reach, Watercourse 46a.3 meanders in the 53rd Place Open Space riparian corridor within a well-defined channel. The wetted channel width of the stream in the project reach at the time of site investigations ranged from 2.5 to 6 feet wide, averaging 3.88 feet, and water depths ranged from 1 to 2 inches deep, with 4-inch depths observed in pools. Tributary 2 averages 2.85 feet wide, with a trickle of flow less than 1 inch deep. Similarly, Tributary 3 averaged less than 1 foot wide with water depths of less than 1 inch deep. Tributary drainages originate from upstream of SE 53rd Place SE and flow south-southeast towards Watercourse 46a.3. Tributary 1, which is downstream of the project reach, enters the mainstem stream at about Station 3+00, and was the subject of prior City stormwater infrastructure work. Flows were tightlined to outfall at E Mercer Way, effectively bypassing flows to Tributary 1 significantly. Groundwater seeps (Seep 1 through 3) ranged from 1 to 2 feet wide with water depths less than 1 inch deep.

Below the OHWM of both Watercourse 46a.3 and Tributary 2, sparse vegetation was observed and limited to skunk cabbage. The streambank below the OHWM generally was characterized by the presence of clean gravel and sands, exposed roots, scour lines, and wrack accumulation – all indicators of flowing water. Drainage patterns evidenced by sediment sorting and silt point bars were additional indicators observed below the OHWM.

At the OHWM, prevalent vegetation observed included lady fern, salmonberry, creeping buttercup, English ivy (*Hedera helix*), vine maple, and sword fern. Drainage patterns evidenced by scour also were observed at the OHWM.

Above the OHWM, prevalent vegetation included Western hemlock, Western red cedar, vine maple and red alder, wild strawberry, and stinging nettle. Soil and geomorphic indicators observed above the OHWM included the presence of a hillslope toe. No staining was observed on fixed objects above the OHWM.

Tributary 3 and Seeps 1 through 3 lacked a defined bed and banks; therefore, RH2 collected the stream centerline, instead of delineating the OHWM.

Table 5 provides a summary of stream characteristics observed on the site. **Figure 1** shows the streams delineated in the project reach, and site investigation data is in **Appendix E**.

Table 5

Classification Overview of Delineated Streams in the Project Reach

Stream	Stream Type[2]	Stream Length (ft)[3]	Shoreline Designation	Required Buffer (ft)[3]
Watercourse 46a.3	Type F	1,600	Not designated as shoreline	120
Tributary 2[1]		110		
Tributary 3	Type Np	85		60
Seep 1	Type Ns	35		
Seep 2		35		
Seep 3		70		

[1] Tributary 1, like Tributary 2, has a defined bed and banks, although the channel has been bypassed for over 15 years. Tributary 1 is conservatively considered a Type F with a 120-foot corresponding buffer.
[2] Streams were typed in consultation with WDFW as described in this report. It is important to note, these classifications differ from those shown on the City's GIS data.
[3] Reflects approximate stream length within the 53rd Place Open Space area.
[4] Per MICC 19.07.180(C).

Water Quality

Watercourse 46a.3 and the project reach are not listed as impaired under the Ecology 303(d) list (Ecology, 2016). Sedimentation issues resulting from historic landslide activity contribute to impaired turbidity in the lower reaches (downstream of Station 4+00) of the project reach, which was observed by RH2 during site investigations.

Physical Barriers

Two fish passage barriers are shown by WDFW on the Watercourse 46a.3 system, including the culvert at E Mercer Way (WDFW Site ID 920822) and another impassable culvert at the outlet of Tributary 3 (WDFW site ID 920825). No fish were observed within the watercourse during RH2 site investigations. Although the passage barrier at E Mercer Way presently prevents fish access from entering the project reach, WDFW does not recognize human-made barriers in stream typing (Douglas, J., 2024). Consequently, WDFW considers the watercourse a Type F stream with potential salmonid use by steelhead, sea run cutthroat, and resident trout.

Riparian Corridor

Sub-Basin 46a.3 covers approximately 45 acres to the north and south of SE 53rd Place. Watercourse 46a.3 is a narrow, shallow stream with a high gradient. The riparian corridor is primarily native green belt with single-family residences north and south. The existence of the

mature riparian vegetation provides LWD recruitment to the stream, organic inputs, shade, and microclimate cooling. Additionally, the riparian corridor provides habitat for myriad wildlife species.

Fish and Wildlife Habitat Conservation Areas

During site investigations, the following wildlife species, or evidence thereof, were observed in the riparian corridor: beaver (removed by the City in 2023), Columbian black-tailed deer, Northern flicker (*Colaptes auratus*), hairy woodpecker, dark-eyed junco, song sparrow, Stellar's jay, spotted towhee, golden-crowned kinglet (*Regulus satrapa*), purple finch (*Haemorhous purpureus*), orange-crowned warbler (*Vermivora celata*), chestnut-backed chickadee, red-breasted nuthatch, barred owl (*Strix varia*), American robin, Wilson's warbler, and brown creeper. Fish were not observed in the watercourse. Although not observed, RH2 anticipates this open space area, particularly the wetland habitat, supports amphibians, such as Pacific tree frogs (*Pseudacris regilla*), newts, and salamanders.

In addition to the wildlife species observed during field investigations, Mercer Island is known to host the following wildlife species: American black bear (*Ursus americanus*), cougar (*Puma noncolor*), muskrat, nutria, racoon, rabbit, and multiple species of owl, coyote, and bobcat.

Habitat in and around the proposed project area consists of relatively old second growth upland and riparian forest associated with Watercourse 46a.3 and the 53rd Place Open Space. Due to the City's designation of the area as an open space, human disturbance near the site is minimal. The 53rd Place Open Space represents a contiguous forested corridor, in proximity to aquatic resources, that provides complex, intact habitat capable of supporting native biodiversity. The overstory is dominated by broadleaved deciduous trees mixed with conifers. Some large trees in the area are impacted by English ivy infestations. Several planted conifer saplings were observed near the site. Large trees provide shading that helps regulate the temperature of Watercourse 46a.3 and benefits instream habitat. The stream system has substantial inputs of organic matter, including plentiful woody debris provided by the surrounding riparian and upland forests. The proposed project site and surrounding area contains a high interspersion of upland and aquatic habitats that are utilized by various birds, mammals, amphibians, and other wildlife.

Listed Species and Habitats

The 53rd Place Open Space, which contains the Watercourse 46a.3 riparian corridor, is a WDFW PHS-listed biodiversity area and corridor. Priority habitats listed by WDFW, biodiversity areas, and wetlands and watercourses are all regulated by the City as FWHCA. MICC 19.07.170(B) states that any development proposed within a FWHCA requires submittal of a wildlife habitat study unless the proposal is specifically exempt per MICC 19.07.120. Demonstration of exemption status for this project is included in this report; therefore, this report summarizes FWHCAs as observed by RH2 and in keeping with the best available science for these habitats.

Table 6 includes a summary of Endangered Species Act (ESA) and state-listed species and sensitive habitats potentially present in the project area. Project minimization measures, impacts, and proposed mitigation are discussed later in this report.

Table 6

Summary of Listed Species and Sensitive Habitats

Common Name	Scientific Name	Listing Agency	ESA Status and Critical Habitat (CH)	State Status
Bull trout	*Salvelinus confluentus*	USFWS	Threatened; no CH present	Candidate
North American wolverine	*Gulo gulo luscus*		Threatened; no CH present	Candidate
Marbled murrelet	*Brachyramphus marmoratus*		Threatened; no CH present	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*		Threatened; no CH present	Endangered
Northwestern pond turtle	*Actinemys marmorata*		Proposed Threatened; no CH designated	Candidate
Monarch butterfly	*Danaus plexippus*		Candidate	Candidate
Chinook salmon (Puget Sound ESU[1])	*Oncorhynchus tshawytscha*	NOAA Fisheries	Threatened; CH present in Lake Washington	–
Instream	–	WDFW and City	–	WDFW Priority Habitat
Wetland	–		–	
Riparian	–		–	
Biodiversity Areas and Corridor	–		–	

[1] Under the Endangered Species Act, an evolutionarily significant unit—or ESU— is a Pacific salmon population or group of populations that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species (NOAA Fisheries, 2022).

USFWS lists the following threatened, proposed threatened, or candidate species as potentially present near the proposed project site: North American wolverine, marbled murrelet, yellow-billed cuckoo, northwestern pond turtle, bull trout, and monarch butterfly. No presence, suitable habitat, or critical habitat exists for any of the listed species within the Sub-Basin 46a.3 Watercourse Stabilization project area. The project will have no effect on these species. The USFWS Critical Habitat mapper shows Lake Washington is critical habitat for bull trout (USFWS, 2024); however, due to the distance from project activities to listed species waterbodies, existing fish passage barriers on Watercourse 46a.3, and implementation of appropriate minimization measures, project activities will not affect this species or its habitat.

Critical habitat for Chinook salmon (Puget Sound ESU), a NOAA Fisheries ESA-listed species, is present in Lake Washington approximately 2,000 feet downstream of the project reach. Due to the distance from project activities to listed species waterbodies, existing fish passage barriers on Watercourse 46a.3, and implementation of appropriate minimization measures, project activities will not affect this species or its habitat. Additionally, NOAA Fisheries lists Lake Washington as EFH for Chinook and coho salmon and groundfish. No EFH for groundfish or Pacific salmon is located in Watercourse 46a.3.

Erosion control best management practices will be utilized during all ground-disturbing activities to prevent erosion, water runoff, and sedimentation from entering waterbodies, thereby preventing project impacts to Pacific salmon that are present lower in the Watercourse

46a.3 stream profile or that utilize Lake Washington. The project will, through stabilization of the Sub-Basin 46a.3 watercourse, result in a net benefit to water quality at the site and downstream by mitigating sources of turbidity and sedimentation.

The project reach does not possess the qualities needed to support life history and habitat requirements of any USFWS or NOAA Fisheries ESA-listed species. No direct impacts or delayed consequences are anticipated because of the project. The proposed project will have no adverse effect on EFH for groundfish or Pacific salmon.

WDFW Management Recommendations

WDFW provides guidance for managing biodiversity areas and corridors in its *Landscape Planning for Washington's Wildlife: Managing for Biodiversity in Developing Areas* (WDFW, 2009). WDFW states that the most common effects of human land use changes on wildlife include loss of habitat, fragmentation of habitat, increased road mortality, reduced water quality, and increased competition between introduced and native species. These effects can result in loss of species from an area. WDFW's management recommendations aim to discuss land use planning tools to protect and preserve biodiversity areas and corridors for Washington's wildlife. These include the following general recommendations to protect wildlife in biodiversity areas and corridors:

- Keep large, connected patches of undeveloped native vegetation intact.
- Encourage and maintain low zoning densities within and immediately surrounding high-value habitat areas and encourage maintenance of native vegetation.
- Manage road systems to minimize the number of new roads and new barriers to important animal movement corridors.
- Plan open space to incorporate high-value habitat and corridors for animal movement.
- Zone for higher densities within urban and developed landscapes to avoid sprawl (WDFW, 2009).

The City's designation of the 53rd Place Open Space as a natural open space area is in concert with these WDFW management recommendations, as the wildlife habitat and riparian corridors, as well as the critical areas present in the open space area, are naturally protected from development. The proposed bank stabilization and stream restoration efforts for the Sub-Basin 46a.3 Watercourse Stabilization project also are consistent with preserving the natural character of this open space area, while also addressing ongoing landsliding and resulting water quality issues. Project design through bioengineered techniques and careful construction planning seeks to avoid and minimize temporary and permanent impacts to aquatic resources and habitats, effectively protecting these areas in their natural state. Improvements are proposed that augment the natural processes and habitat (e.g., addition of LWD for streambank protection, bolstering existing natural weirs, etc.). No additional access roads or trails are proposed for construction and design of improvements minimizes the construction footprint, including tree removal and access for equipment. In this way, the project supports WDFW's management recommendations for biodiversity areas and corridors.

Geologically Hazardous Areas

RH2 and NHC (2024) completed geologic and geotechnical assessments that included a compilation of available geologic, soil, and geologic hazard mapping and data, and a geologic hazard areas site reconnaissance to assess current conditions for comparison to mapped features. RH2 traversed the entire open space area and conducted limited shovel excavations and soil probing to inspect surficial soil characteristics and moisture conditions. In summary, the site is underlain by weathered glacial till units that are either intact or had historically mobilized and weathered in place. The glacial till consists of silt with sand and gravel and occasional cobbles or boulders with local silty sand layers or zones.

Areas of the shallow glacial till unit have been disrupted and covered by historical shallow mass wasting originating from steep slopes surrounding the watercourse. Both the City and DNR have mapped landslide deposits within much of the 53rd Place Open Space. RH2 observed staircase-like, hummocky ground with small, low, scarp-like features within the landslide mapping extents. The features upslope of the active stream corridor included: dry slopes, large diameter trees growing vertically, and absence of springs, all indicating little evidence of recent movement. Large trees were observed growing upon or next to scarp-like features and within hummocky ground, providing evidence of stable slope conditions.

Project Impacts and Mitigation

Project Footprint

The anticipated project footprint is shown on the design plans (**Appendix B**). Together with staging, stockpiling, and stream channel construction areas, the project footprint covers approximately 14,000 sf (0.32 ac), within the 53rd Place Open Space and the right-of-way for SE 53rd Place. Staging/stockpiling and a potential temporary access corridor shown on the design plans reflect the maximum impact anticipated. Exact means and methods for temporary access and staging/stockpiling areas will be determined by the selected contractor in accordance with the final design plans and specifications, approved permit documents, and City approval.

Project construction generally will include limited clearing to establish staging, stockpiling, and access corridors. Staging and stockpiling areas will be established in three designated locations along SE 53rd Place (within existing informal parking and cleared locations) and adjacent to Watercourse 46a.3, from which equipment and materials can be transported utilizing the potential temporary access corridor. The contractor shall operate heavy machinery from the SE 53rd Place staging areas, conveying materials to the temporary access corridor, which will transport LWD, rock, plant, hand tools, and other materials for installation of grade control and bank stabilization and bolstering of existing natural weirs in the channel. Six deciduous and coniferous trees (measuring 8-inch diameter at breast height or smaller) are slated for removal to accommodate the proposed temporary access corridor. It is anticipated these trees will be retained onsite and incorporated into bank stabilization improvements and/or transplanted.

Design plans show a plan with planting areas, planting schedule, notes, and details. Native shrubs and trees are proposed for bank stabilization improvements and restoration of

temporarily disturbed areas. Restoration with native species also will replace trees proposed for removal by these construction improvements.

Project design avoids construction in delineated wetlands onsite. Work will occur within the channel of Watercourse 46a.3 but is anticipated to be completed during a low flow work window (generally July 1st to September 30th) and utilizing a stream bypass to allow for work in dry stream segments, thereby minimizing water quality and erosion impacts. Improvements to the watercourse involve bioengineered stream and bank stabilization techniques that utilize LWD and streambed rock; by their nature these types of improvements provide a functional uplift to riparian habitat and are self-mitigating. Work also will occur within City-regulated critical areas stream and wetland buffers; however, buffer impacts are temporary as areas will be restored following construction. Buffer impacts will result from limited clearing to establish staging and stockpiling areas and to install the temporary access corridors.

Geological Hazards Risk Assessment

Proposed locations for staging materials will be in areas of level ground upslope of the stream channel and will not create excessive soil loads that would destabilize soil or slopes. Likewise, the volume and mass of imported material (e.g., boulders, coarse sediment, logs, woody material, etc.) are small relative to the work area and will not create excessive loads or significantly alter surface or subsurface hydrology to a degree that would destabilize soil or slopes. Measures to mitigate erosion risk have been included in the project design and general construction practices; these measures are included in the project design plans (**Appendix B**) and have been further detailed in the **Mitigation Sequencing** section.

Alteration of the mapped landslide areas of the proposed stabilization project is sufficiently local and mitigated such that the proposed stabilization improvements will not adversely impact other critical areas, the subject property, or adjacent properties. The proposed construction practices for stabilization will maintain the current soil and slope stability during construction. Consequently, the proposed alterations may occur as they meet the criteria listed in MICC 19.07.160(B)(2). In accordance with MICC 19.07.160(3)(c), and as proposed, the project will be designed and constructed in a manner that renders the development as safe as if it were not located in a geologically hazardous area. The project will not adversely impact adjacent properties.

Project Impacts

The following critical areas impacts are anticipated to result from this project (**Table 7**):

- Approximately 500 lf (approximately 8,000 sf) of Watercourse 46a.3 will be temporarily impacted to install grade control LWD, bank stabilization LWD, and bolster existing natural weirs. This work involves the import of streambed sediment, cobbles and boulders, various sizes and lengths of logs, log stakes, slash material, coir logs, and log pins. Rock placed in Watercourse 46a.3 to augment existing weirs, approximately 15 cubic yards (cy) of streambed boulders and sediment, will be permanent fill, and this work will be permitted through WDFW and USACE.
- Approximately 3,500 sf of stream/wetland buffer will be temporarily cleared to accommodate staging/stockpiling areas. One 8-inch conifer tree will be removed in these

buffer areas of the site. Temporary impact areas will be restored with native plantings following construction.

Table 7

Summary of Project Impacts

Impact Category	Project Actions	Type	Total Impact (sf)	Wetland Impact (sf)	Stream Impact (sf)	Buffer Impact (sf)
Clearing	Staging / stockpiling areas	Temporary	3,500	-	-	3,500
Work in watercourse	Bank stabilization LWD and existing log weir bolstering	Temporary	8,000	-	8,000	-
Fill	Log weir stabilization	Permanent	240[1]	-	240	-
		Total	**11,500[2]**	-	-	-

[1] The area of weir impact is counted in the 8,000 sf reported for work within the watercourse, so it is not double counted in the total area reported. Fifteen (15) cy of fill is proposed within the 240 sf footprint for the augmentation of existing weirs.
[2] The Total Impact area in Table 7 is less than the total impact area for the project as portions of the access corridor and staging area are outside the watercourse and stream/wetland buffers.

Mitigation Sequencing

The project has been designed and implemented in accordance with the City's mitigation sequencing measures, which are outlined in MICC 19.07.100. The mitigation sequencing sections from the MICC are shown in *italics*, followed by a discussion of how the project complies with the requirements in normal font.

A. *Avoiding the impact altogether by not taking a certain action or parts of an action. The applicant shall consider reasonable, affirmative steps and make best efforts to avoid critical area impacts. However, avoidance shall not be construed to mean mandatory withdrawal or denial of the development proposal or activity if the proposal or activity is an allowed, permitted, or conditional use in this title. In determining the extent to which the proposal should be redesigned to avoid the impact, the code official may consider the purpose, effectiveness, engineering feasibility, commercial availability of technology, best management practices, safety and cost of the proposal and identified changes to the proposal. Development proposals should seek to avoid, minimize and mitigate overall impacts based on the functions and values of all of the relevant critical areas and based on the recommendations of a critical area study. If impacts cannot be avoided through redesign, use of a setback deviation pursuant to section 19.06.110(C), or because of site conditions or project requirements, the applicant shall then proceed with the sequence of steps in subsections B through E of this section;*

   Complete avoidance of work in designated stream, geologic hazards, and stream/wetland buffer areas is not possible to accomplish the proposed stream stabilization project goals. Work in these areas is necessary to stabilize active erosion and sedimentation issues in this watercourse; however, improvements are being carefully designed to minimize impacts through targeted access, timing restrictions,

staging/stockpiling, and applied bioengineering techniques. Work will avoid impacts to on-site delineated wetlands and minimize impacts to associated wetland/stream buffers and tree removal in the 53rd Place Open Space to the maximum extent practicable.

B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, using a setback deviation pursuant to section 19.06.110*(C), using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;*

Project design and planning is being completed to minimize impacts to the 53rd Place Open Space, and the geologic hazards and aquatic resources it supports. This is being accomplished by the following specific measures:

- Restricting construction during the wet season (April through October generally).
- Utilizing bioengineered techniques and natural materials (i.e., LWD, native plants, streambed rock, etc.) to the maximum extent practicable.
- Limiting the bank stabilization project reach to address primarily the areas of active erosion and sedimentation issues. The City, and consultant design team, aim to design improvements to address ongoing erosion, but to do so using a "light touch" approach.
- Limiting staging/stockpiling and temporary construction access locations and approach to minimize clearing, tree and shrub removal, grading, and movement of construction materials, personnel, and equipment.
- Limiting the use of rock to stabilize portions of the stream channel to only that amount necessary to accomplish the project goals.

Construction best management practices will be implemented to minimize impacts to critical areas, including the general construction and temporary erosion, sediment control, and water management notes included on design plans (**Appendix B**).

C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

Erosion control blanket and coir fabric logs are shown on the design plans to stabilize construction areas. Coir logs will be planted with live stakes adjacent to bank and toe stabilization LWD to restore temporarily impacted streambank areas. Temporary access corridors and staging/stockpiling areas also will be restored to pre-construction condition through native plantings.

D. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

The City presently monitors and maintains the sediment pond at the E Mercer Way intersection, as well as the SE 53rd Place Open Space area. This maintenance and monitoring is expected to continue following this project; however, sediment pond maintenance may be reduced over time following the proposed watercourse stabilization improvements (NHC, 2025). It is anticipated that as part of the City's existing monitoring and maintenance activities, the City will monitor the LWD improvements, as well as the progress of native plantings, completed as part of this project. Maintenance and monitoring is discussed further in this report. Plantings and

LWD structures are not expected to require regular maintenance or monitoring once established.

E. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or

Proposed improvements seek to install natural materials to augment the Watercourse 46a.3 riparian corridor and reduce existing erosion and sedimentation issues resulting from landslide activities. Improvements are intended to enhance the stream corridor while also providing stabilization and opportunities for settling of sediment. By nature, these improvements are not considered an adverse, permanent impact to these aquatic areas. Permanent rock placement has been minimized. The stream channel improvements will be stabilized, and streambanks replanted, to re-establish native vegetation in disturbed areas. Temporary staging/stockpiling and access corridors will be restored with native vegetation. Formal mitigation to compensate for adverse, permanent impacts is not warranted.

F. Monitoring the impact and taking appropriate corrective measures to maintain the integrity of compensating measures.

City maintenance and monitoring of the watercourse and 53rd Place Open Space area is expected to continue following this project. Maintenance and monitoring is discussed further in this report.

Through demonstration of mitigation sequencing, the proposed project is anticipated to qualify as an exempt activity per the City's Critical Areas Code. The project will stabilize a natural watercourse, which conveys drainage from Sub-Basin 46a.3 to Lake Washington (i.e., part of the City's stormwater conveyance in addition to being a natural area). The project is anticipated to meet the "watercourse restoration project to be installed by a public agency" category, meeting MICC 19.07.120(D)(4). Ultimate determination of project compliance will be made by the City's Community Planning and Development Department. This report has documented the results of critical areas investigations to identify and characterize wetlands, streams, FWHCAs, and geologic hazards in the project vicinity, as well as demonstrate project compliance with the City's CAC, including exemptions, risk assessment, and mitigation sequencing.

Mitigation

Proposed stream bank stabilization improvements are intended to address erosion occurring in Watercourse 46a.3 resulting from pre-historic and historic landslide activity. The project reach has been limited to a 500 lf section of the stream that is experiencing most of the erosion in this system. Project construction areas have been further minimized to a narrow work corridor with specific parameters for construction; this is intended to minimize the project footprint and work in the Open Space area. Areas disturbed by construction, as well as the areas adjacent to bank stabilization improvements, will be restored and replanted with native shrubs and trees. With bioengineered design techniques and augmentation of stream habitat, limitation of the project footprint, and proposed restoration of work areas, the project is intended to be self-mitigating.

Mitigation Goals and Objectives

The goal of project activities is to reduce streambank erosion in Watercourse 46a.3 to improve water quality and stream habitat and to reduce maintenance requirements.

To this end, the objectives of restoration activities are to:

- Establish approximately 500 lf of bed control and toe LWD structures to reduce streambank erosion, thereby lessening sediment loading and improving water quality and erosion in Watercourse 46a.3; and
- Replant the affected project construction corridor (approximately 7,000 sf and 1,050 lf of streambank) with native trees and shrubs.

Performance Measures and Standards for Native Plants

Performance measures and standards are used to quantify whether the mitigation goals and objectives are being met. Performance of the site, in accordance with the established measures and standards, will be assessed annually or biennially (after 3 years, monitoring can be performed at this frequency) in permanent monitoring plots for the duration of monitoring efforts. Monitoring shall be performed by a City or City-contracted qualified professional biologist or wetland ecologist with reports prepared documenting site progress in Years 1, 2, 3, 5, 7, and 10. The following performance measures and standards are proposed for this 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 Measure (Years 3 and 5): There will be at least 80-percent survival of installed plants.
- Performance Standard (Year 10): There will be at least 75-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 Measure (Year 5): Aerial cover of native emergent, shrub, and tree species (planted and volunteer) will be at least 50 percent.
- Performance Measure (Year 7): Aerial cover of native emergent, shrub, and tree species (planted and volunteer) will be at least 60 percent.
- Performance Standard (Year 10): Aerial cover of native emergent, shrub, and tree species will be at least 65 percent.

Non-Native and Invasive Species

- Performance Measure (All years): County-listed Class A, B, and C noxious weeds and non-listed weeds (e.g., cut-leaf and Himalayan blackberry, English ivy, reed canary grass, and Herb robert) will not exceed 20-percent aerial cover at the mitigation site.
- Performance Standard (Year 10): County-listed Class A, B, and C noxious weeds and non-listed weeds will not exceed 20-percent aerial cover at the mitigation site.

Monitoring

The City has a robust restoration and maintenance and monitoring program for its Open Space areas, focused on removal of invasives, revegetation with native species, and long-term health of these important urban spaces. These activities are guided in part by the City's *Open Space Vegetation Plan 10-year Evaluation and Update* (March 2015). Weed removal, replanting, and maintenance and monitoring of revegetated areas has been ongoing in the 53rd Place Open Space area for more than 15 years. **Appendix F** includes a summary of the restoration actions that have occurred in this Open Space area.

Monitoring of the mitigation area is the responsibility of the City or its assigns and is expected to be completed in concert with the City's existing 53rd Place Open Space area restoration and revegetation actions. The City's Natural Resources team will be involved in directing replanting efforts following project construction. It is anticipated this team will also perform monitoring and maintenance activities, utilizing other City teams or independent contractors, as needed, depending on the site's needs. Monitoring will begin the first growing season following mitigation installation and shall continue for a period of 10 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 or biennially, preferably in the spring or summer, to facilitate site maintenance by the fall season. The results of monitoring activities will be summarized in reports for Years 1, 2, 3, 5, 7, and 10. Reports shall be provided to the City for review (if warranted by approved permits, monitoring reports may be provided to other regulatory agencies for documentation of site success).

Plantings

- During final inspection of construction activities, flag installed plantings and label one in five species for future identification. Record post-installation activities for summary in the Year 1 monitoring report.
- Establish five to ten 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 to be included with the 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 5 permanent 50-foot linear transects that will adequately assess the percent cover of plants in the restoration 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 them with monitoring reports.
- 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 wildlife use, nests, or evidence of use at the restoration site.
- Document and include 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.

Erosion and Sediment Transport

The Design Report (NHC, 2025) provides anticipated sediment and erosion monitoring and maintenance activities for the project. With respect to reduction of sediment loading, which is reflective of water quality, as reduced sediment loading positively improves turbidity and water temperatures, the report states:

> The project design is expected to reduce sediment loading to the collection pool through both reduction in fine sediment supply from within the proposed work extents and storage of sediment inputs from upstream of it. Assuming an approximate 50% reduction in annual fine sediment loading and structure trapping efficiency of 70%, the proposed design is anticipated to result in no sediment maintenance for a period of about 6 years post-construction. After this period, benefits are expected to be more limited, as sediment loading within the upstream and project action reaches is likely to continue, and once the available storage within the structures is filled, material would continue to be transported downstream, with sediment maintenance likely similar to current average annual maintenance.

It is recommended that the City maintain records of sediment removal (cubic yardage and general sediment composition) from the sediment pond at the E Mercer Way intersection annually over the 10-year monitoring period for documentation of reduced sediment loading, summarized in monitoring reports. During monitoring visits, qualitative observation and photographic documentation of erosion or sediment loading in the project footprint areas and reporting in monitoring reports are recommended.

LWD Structures

The Design Report (NHC, 2025) provides recommended frequency of LWD structure monitoring:

> Inspection of large wood structures is recommended at a frequency of 5 years or less. Structure maintenance is expected to be minimal over the assumed project service life of 50 years. Repairs are likely to be limited to replacement of manilla rope lashing over this period.

Recording of as-built conditions is recommended, with inspection of LWD structures and comparison to as-built conditions conducted at Years 1, 5, and 10. Qualitative observations and photographic documentation of the LWD structures during monitoring are recommended, with the general condition of each structure, performance, and identification of maintenance needs summarized in those years' monitoring reports.

Maintenance

Maintenance of the proposed improvements is expected to be completed by the City in concert with its existing 53rd Place Open Space area restoration and revegetation actions. The City's Natural Resources team will perform monitoring and maintenance activities, utilizing other City teams or independent contractors, as needed, depending on the site's needs.

To achieve performance standards and ensure the success of the mitigation site, maintenance activities will continue for the duration of the 10-year monitoring period.

Maintenance activities shall be performed annually, depending on the needs of the site (i.e., LWD structure maintenance is not an activity that will be needed annually). Maintenance needs shall be identified during monitoring activities and included in the monitoring reports.

Maintenance activities for restoration plantings shall follow the City's existing Restoration Specifications (**Appendix F**), including the following general activities:

- Remove all noxious weeds, including non-native blackberries, English ivy, reed canary grass, Herb robert, 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.
- Replace/augment wood chips to maintain a minimum 4-inch height in the watering basins. Apply additional chips 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 in sufficient quantities to establish them in the first few years following planting.

The City's Public Works team currently performs sediment removals at the sediment pond at E Mercer Way on the Watercourse 46a.3 system (refer to the Design Report (NHC, 2025) for quantification of these activities). The project is expected to reduce the sediment loading presently occurring at this system, such that no sediment maintenance is anticipated to be needed for a period of approximately 6 years post-construction. It is recommended that the City maintain records of any sediment removals performed during the 10-year monitoring period, with this information included in monitoring reports. Reduction of sediment removal correlates to improvements in water quality within this system, which is an overarching goal of this project. Additionally, from qualitative reports of erosion and/or sediment loading in the project footprint during monitoring activities, the City shall perform any needed simple maintenance activities. More complex maintenance would need to be treated as a contingency.

LWD structure maintenance is anticipated to be minimal over the assumed project service life of 50 years. Repairs are likely to be limited to replacement of manila rope lashing over this period. The need for repairs identified during monitoring activities shall be incorporated into annual maintenance activities performed by the City, as needed.

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 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 ensure that problems do not arise. Should any part of the mitigation site fail to meet the criteria for success, a contingency plan 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 City. 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 it with a similar native species that would be better suited to site conditions.
- 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 City and conducted using environmentally conscious methods.

- If monitoring activities identify larger-scale maintenance needs related to erosion or sediment loading, or LWD structures (e.g., larger-scale erosion areas in the project footprint, failure of LWD structures, etc.), implement a contingency plan to address issues. Contingency actions could include specific maintenance actions planned during a specific window, or larger-scale capital projects, and will be dependent on the site conditions encountered.

Conclusion

This report has been supplied to the City to document conditions associated with critical areas present at and adjacent to the Sub-Basin 46a.3 Watercourse Stabilization project site. It is anticipated this report will be finalized with subsequent City review and design efforts, and then provided to WDFW and USACE to facilitate permit approvals for work in the watercourse. This report was prepared to comply with the current laws regulating wetlands, streams, FWHCAs, and geologic hazards. 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

Steve Nelson, LHG, LG, LEG
Senior Engineering Geologist

Kyle Wisner
Environmental Staff Scientist

State of Washington
Engineering Geologist
1402
Licensed Geologist
STEPHEN ERIC NELSON

Dated: 10/30/2025

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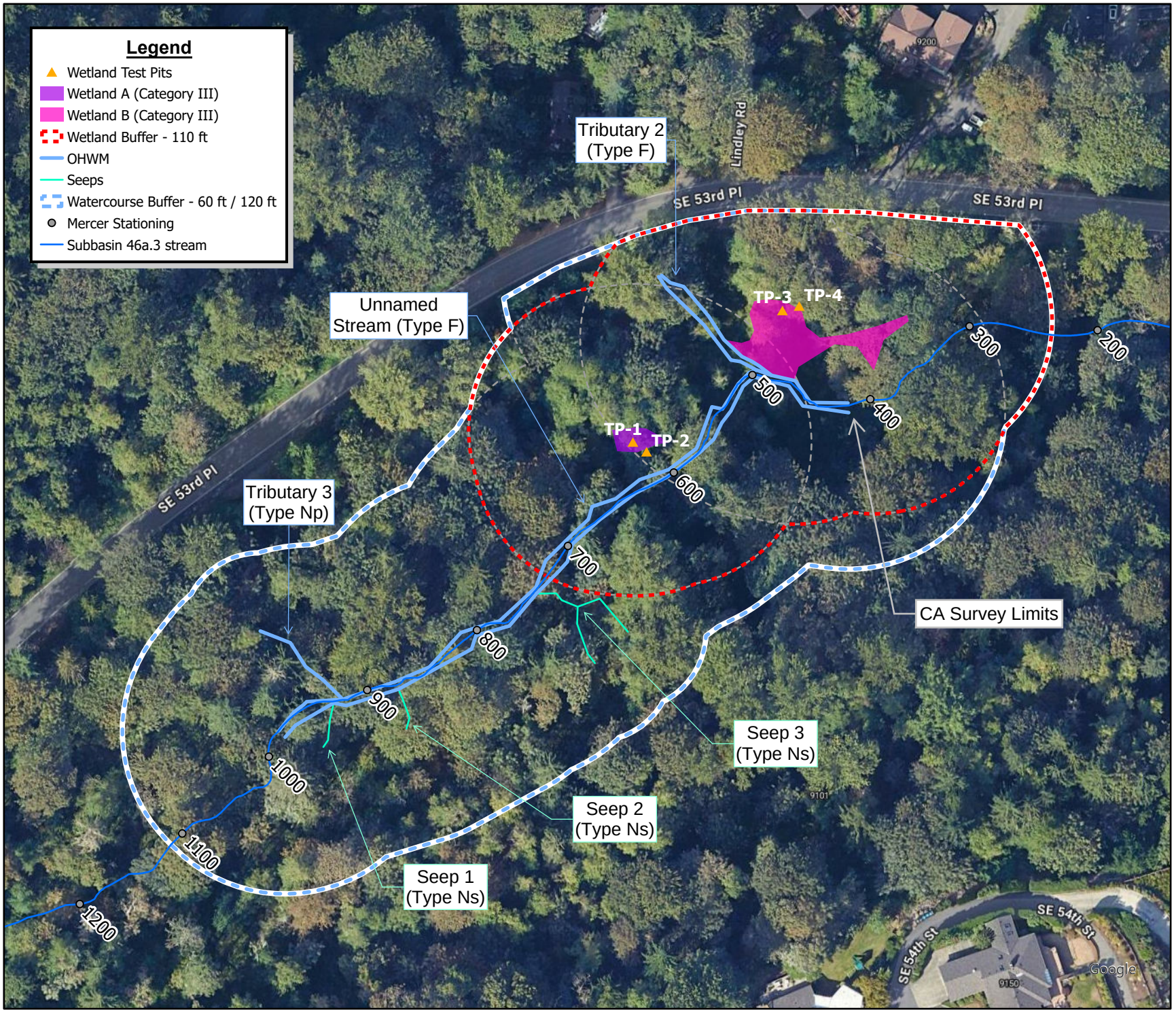
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Figures



This map is a graphic representation derived from the City of Mercer Island Geographic Information System. It was designed and intended for City of Mercer Island 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



Critical Areas Overview Map

City of Mercer Island Subbasin 46a.3 Watercourse Stabilization

J:\DATA\NHC\24-0025\GIS\NHC_23-0025_SUB-BASIN_46-3A\NHC_23-0025_SUB-BASIN_46-3A.APRX BY: NBLOXTON PLOT DATE: JUN 25, 2024 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

1 inch : 100 Feet

0 25 50 100 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 2”

RH2

NORTH

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

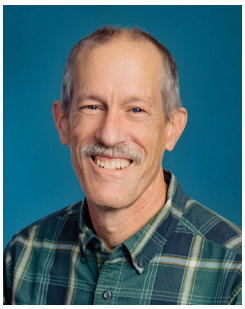
Washington Native Plant Society

Northwest Association of Environmental Professionals

Society of Wetland Scientists

Experience

24 years of experience
24 years at RH2



Steve Nelson LG, LHG, LEG

Hydrogeologist/Engineering Geologist

Steve is a licensed hydrogeologist and engineering geologist with technical and project management experience involving infrastructure siting investigations, geologic hazards, foundation studies, dewatering, watershed planning, hydrology, and infiltration studies. He works with our design teams to contribute his knowledge and expertise of the soil, rock, groundwater, and watershed conditions that will affect the design, construction, and operation of water infrastructure.

Steve participates in analysis and design decisions involving siting, geohazards, constructability, resilience, and integration of infrastructure with the environment to minimize risk and cost and maximize reliability and performance of water and sewer systems. His project expertise includes: geologic and geotechnical characterization of sites for infrastructure development; assessment of geologic hazards and development of mitigation strategies; design, construction and operation of construction dewatering systems; foundation and retaining wall evaluation; feasibility and design of reclaimed water and stormwater infiltration systems; assessment and remediation of contaminated sites; characterization of local and regional groundwater systems for groundwater supply; water supply well design and rehabilitation, construction and testing; wellhead protection analysis and water rights evaluation; and watershed planning, restoration, and improvements.

Representative Project Experience

- On-Call Engineering Services, Grant Public Utility District No. 2
- General Engineering Services, Northeast Sammamish Sewer and Water District
- General Engineering Services, Port of Chelan County
- Hydrogeologic and Water Rights Evaluation, Peterson & Marquis
- Lake Chelan WRIA 47 Long-Term Monitoring Plan and Water Rights Processing, Chelan County Natural Resources Department
- Groundwater Supply Development, City of Fife
- Lake Chelan Long-term Monitoring Plan Completion, Chelan County Natural Resources Department
- Water System Consolidation and Well No. 2 Relocation, City of College Place
- WRIA 47 Watershed Planning Phase 2 Water Quantity, Chelan County Natural Resources Department
- Evans Creek Water Quality and Quantity Monitoring, Union Hill Water Association/ Northeast Sammamish Sewer and Water District
- Well No. 8 Design, Nob Hill Water Association
- WRIA 40A Planning Unit Storage Feasibility Assessment, Chelan County Natural Resources Department
- Development Review Services, City of Issaquah
- Black Diamond Springs Rehabilitation, City of Black Diamond
- Red Mountain LID South Project, Kennewick Irrigation District
- Enclosed Conduit System—Phase II, Sunnyside Division Board of Control

Education

MS Geology
University of Arizona, 1986

BS Geology
California State University, 1981

Licenses

Licensed Hydrogeologist and Engineering Geologist
1402 (WA)

Registered Geologist
G2386 (OR)

Certified Engineering Geologist
E2386 (OR)

Professional Geologist
PGL-1733 (ID)

Affiliations

Association of Ground Water Scientists and Engineers

American Water Resources Association

American Water Works Association

National Ground Water Association

Experience

39 years of experience
20 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



Noah Bloxton

Environmental Scientist

As a dedicated environmental scientist, Noah supports a variety of RH2's projects through conducting field investigations, preparing technical reports, and drafting permit applications. Having completed the University of Washington Wetland Science and Management Certificate, he has a background in wetland ecology and policy that makes him a great asset for projects requiring critical areas compliance. Prior to joining RH2, Noah conducted field work for local, state, and federal agencies, including restoration monitoring and wildlife surveys. His work at RH2 has included facilitating compliance with SEPA, NEPA, FEMA Floodplain Regulations, Critical Areas Ordinance, Shoreline Management Act, Washington Hydraulic Code, and more.

Representative Project Experience

- SEPA, Wetland Delineation, Wetland Rating, Critical Areas Study, and Public Participation and Communication Plan for Boulevard Park Sewer Extension and Drainage Improvements, Valley View Sewer District
- Wetland and OHWM Delineation, Wetland Rating, and Critical Areas Compliance Assistance for Water Pipeline Relocation at Alger I-5 Interchange, Public Utility District No. 1 of Skagit County
- Wetland and OHWM Delineation, Wetland Rating, and Critical Areas Compliance Assistance for Wellfield 440 Zone Booster Pump Station, City of Blaine
- Water System Locating and Inventory using Trimble GPS for Point Defiance Park Water System, Metropolitan Park District of Tacoma
- SEPA, Shoreline Permitting, FEMA Habitat Assessment, and Special Use Permit for Old Port Lift Station, City of Olympia
- Wetland and OHWM Delineation, Wetland Rating, and Critical Areas Technical Memorandum for Grainger Springs Pump House Replacement, City of Bonney Lake
- SEPA, Shoreline Permitting, OHWM Delineation of the Wenatchee River, and Critical Areas Report for Waterfront Restroom Force Main Relocation, City of Leavenworth
- Wetland Delineation, Wetland Rating, and Critical Areas Compliance Assistance for US 2 and Icicle Road Roundabout, LINK Transit
- SEPA, CUP, Biological Survey, Migratory Bird Treaty Act Compliance, and NEPA Support for Process Water Reuse Facility Improvements Winter Storage, City of Pasco
- SEPA, Wetland Delineation, Wetland Rating, HPA, and Sensitive Areas Compliance Assistance for State Route 169 Water Main Improvements, City of Black Diamond
- SEPA, HPA, Wetland Delineation, Wetland Rating, OHWM Delineation, and Critical Areas Report for Beacon Hill to Skyline View Terrace Water Main, Beacon Hill Water and Sewer District
- Floodplain and Shoreline Permitting Assistance for River Intake Pump Station Discharge Manifold Replacement, Badger Mountain Irrigation District
- Environmental Report for Mosier City Center NEPA Compliance, City of Mosier
- Land Use review and Landscaping Plan Assistance for Southeast Reservoir, City of Yelm
- Wetland Mitigation Monitoring and Report for Hawks Prairie Sister Standpipe, City of Lacey
- Wetland Mitigation Monitoring and Report for Bothell Way NE and NE 195th Circle Rockery Repair, City of Bothell

Education

BS Environmental Science and Natural Resource Management, School of Environmental and Forest Sciences, University of Washington 2021

Trainings/Certifications

Using Field Indicators for Hydric Soils, CTP (10/2023)

Using the Washington Wetland State Wetland Rating System (2014) in Western WA, CTP (03/2023)

Grass, Sedge, and Rush Identification for Western WA Puget Lowland Habitats, CTP (03/2023)

How to Determine the Ordinary High Water Mark, CTP (07/2022)

Wetland Science and Management Certificate, UW (06/2022)

Biological Assessment Author Training, WSDOT H&LP (Certified Junior Author 03/2022)

Affiliations

Society of Wetland Scientists

Experience

4 years of experience
2 years at RH2

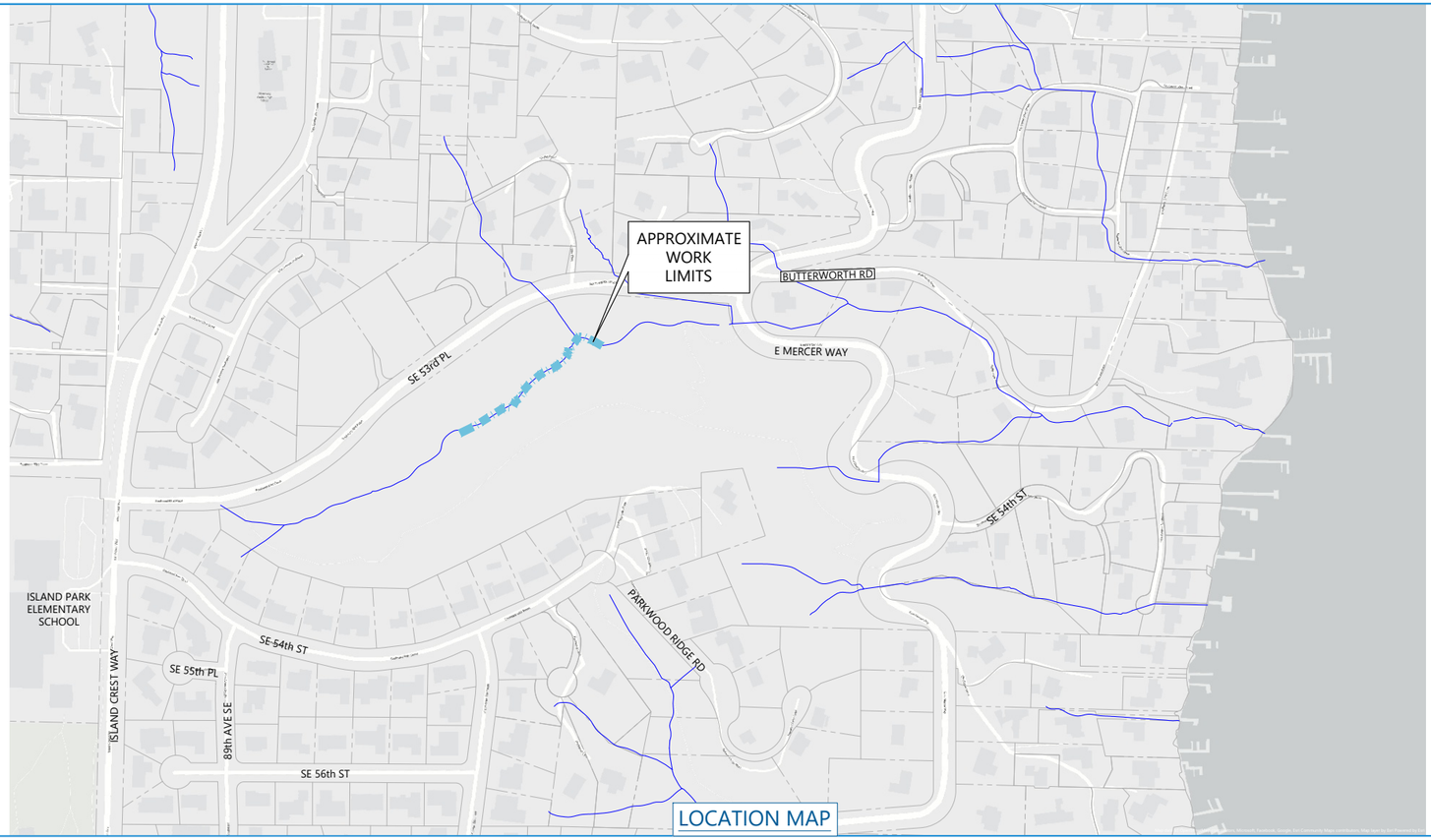
Appendix B

Design Plans

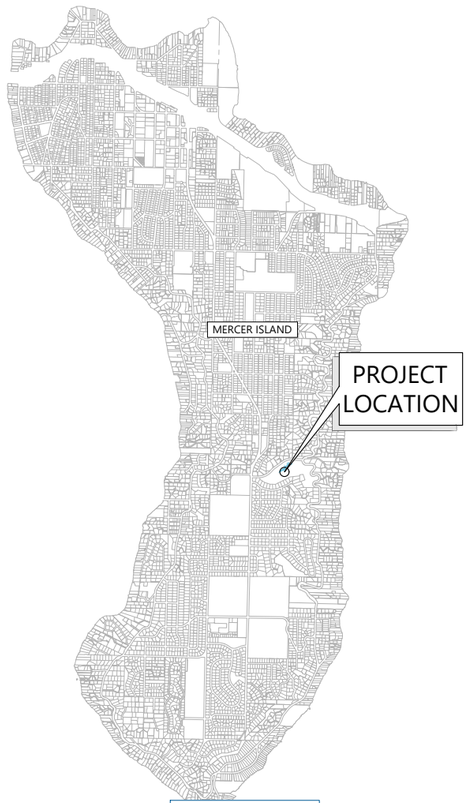
SUBBASIN 46.3 WATER COURSE STABILIZATION PROJECT

90% SUBMITTAL, OCTOBER 2025

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G001	TITLE
G002	GENERAL NOTES
G003	ABBREVIATIONS & LEGEND
G100	EXISTING CONDITIONS, ACCESS, STAGING, & TESC
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C201	PROFILES
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D601	DETAILS - TYPE 1 ELJ
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D603	MISC WATERCOURSE STABILIZATION DETAILS
D604	TESC DETAILS
L100	PLANTING PLAN
L101	PLANTING SCHEDULE AND NOTES
L102	PLANTING DETAILS



LOCATION MAP



VICINITY MAP

Xxxxxxxxxx X. Xxxxxxxxxxxxx (date)
XXXXXXXXX Registered
Professional Engineer #1234567890

CITY OF MERCER ISLAND
MERCER ISLAND PUBLIC WORKS
9601 SE 36TH STREET
MERCER ISLAND, WA 98040
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12787 Gateway Drive South Tukwila, Washington 98168
Phone: (206) 241-6000 www.nhcweb.com

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS		
##	DATE	DESCRIPTION

DRAWING INFORMATION	
DATE	09:31:33 20251028
STATUS	90% SUBMITTAL
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FILE NAME	SUBBASIN 46a3 - COVER_R0
PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

TITLE

JOB NUMBER 2008561

SHEET NUMBER G001

SHEET 1 OF 13

LAST SAVED BY:dheckendorf LAST DATE SAVED:10/28/2025 09:31
FILE LOCATION:C:\2008561_SUBBASIN_46_3A_WATERCOURSE_STABILIZATION_DESIGN\96_CAD\02 DESIGNPRODUCTION\0100_CURRENT\100-DESIGN\SUBBASIN 46A3 - COVER_R0.DWG

GENERAL NOTES:

1. THESE DRAWINGS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF CITY OF MERCER ISLAND, HEREAFTER REFERRED TO AS "CONTRACTING AGENCY" AND THEIR AUTHORIZED AGENTS.
2. NORTHWEST HYDRAULIC CONSULTANTS, INC. (NHC) IS RESPONSIBLE FOR PREPARATION OF THESE ORIGINAL DRAWINGS AND ASSOCIATED CONTRACT SPECIFICATIONS. NHC WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGE, OR USE, OF THESE DRAWINGS WHICH INCLUDES ALTERATION, DELETION, OR EDITING OF THIS DOCUMENT WITHOUT EXPLICIT WRITTEN PERMISSION FROM THE ENGINEER OF RECORD. ANY OTHER UNAUTHORIZED USE OF THIS DOCUMENT IS PROHIBITED.
3. CONTRACTOR TO WORK WITHIN HOURS ALLOWED BY CITY ORDINANCES.
4. CONTRACTOR SHALL VERIFY EXISTING SITE FEATURES AND DISCUSS POSSIBLE CONSTRUCTION CONFLICTS WITH CONTRACTING AGENCY REPRESENTATIVE PRIOR TO START OF WORK. ANY FAILURE BY THE CONTRACTOR AND SUBCONTRACTOR(S) TO ACQUAINT THEMSELVES WITH ALL THE AVAILABLE INFORMATION WILL NOT RELIEVE THE CONTRACTOR AND SUBCONTRACTOR(S) FROM RESPONSIBILITY FOR PROPERLY ESTIMATING THE DIFFICULTY AND COST OF SUCCESSFULLY PERFORMING THE WORK.
5. UTILITY INFORMATION MAY BE INCOMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL UTILITIES PRIOR TO PERFORMING ANY WORK.
6. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; AND FURTHER AGREES THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS IN ACCORDANCE WITH THE PROVISIONS OUTLINED BY THE PROJECT CONTRACT AND SPECIFICATIONS.
7. THE LOCATION OF ALL FEATURES SHOWN IS APPROXIMATE. FIELD VERIFY WITH CITY'S REPRESENTATIVE ALL STRUCTURE LOCATIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO EXCAVATION, ASSEMBLY, AND INSTALLATION OF STRUCTURES.
8. CONTRACTOR SHALL PROVIDE 48 HOURS ADVANCE NOTICE TO THE CONTRACTING AGENCY PRIOR TO ANY REQUIRED INSPECTION.
9. MINOR MODIFICATIONS ARE EXPECTED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS. SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. THE CONTRACTING AGENCY, ENGINEER AND APPROPRIATE REGULATORY AGENCIES SHALL BE NOTIFIED OF ANY CONTRACTING AGENCY–AUTHORIZED CHANGE RESULTING IN MORE THAN A 10% DESIGN CHANGE OF PROPOSED FOOTPRINT OR THAT SIGNIFICANTLY AFFECTS THE INTENDED BENEFIT OR FUNCTION OF A PROJECT ELEMENT.
10. ALL IMPROVEMENTS SHALL BE ACCOMPLISHED UNDER THE APPROVAL, INSPECTION, AND TO THE SATISFACTION OF THE CONTRACTING AGENCY. IMPROVEMENT CONSTRUCTION SHALL COMPLY WITH THESE PLANS AND THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD PLANS FOR CONSTRUCTION OF ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, CURRENT EDITION UNLESS NOTED OTHERWISE. ALL REFERENCES TO THE "STANDARD SPECIFICATIONS" SHALL MEAN THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSOOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION OF LOCAL STREETS AND ROADS, CURRENT EDITION. CONSTRUCTION NOT SPECIFIED ON THESE PLANS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR IS OBLIGATED TO BE FAMILIAR WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS NOT DISCUSSED IN THE GENERAL NOTES. THE CONTRACT SPECIAL PROVISIONS SHALL SUPERSEDE THOSE OF THE STANDARD SPECIFICATIONS WHERE DISCREPANCIES OCCUR.
11. ALL EXISTING SITE FEATURES NOT SPECIFIED FOR REMOVAL SHALL BE PROTECTED DURING CONSTRUCTION. ANY DAMAGE TO EXISTING STRUCTURES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.

SURVEY NOTES:

1. THE CONTRACTOR WILL BE PROVIDED WITH AN AUTOCAD 2023 DRAWING FILE, WHICH WILL CONTAIN THE EXISTING WATERCOURSE ALIGNMENT TO BE USED FOR CONSTRUCTION STAKING AND LAYOUT.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION.
3. THE CONTRACTOR SHALL MAINTAIN A SET OF PLANS ON THE JOB SHOWING "AS–BUILT" CHANGES MADE TO DATE. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUPPLY TO CONTRACTING AGENCY A SET OF PLANS, MARKED UP TO THE SATISFACTION OF THE CONTRACTING AGENCY, REFLECTING 'AS–BUILT' CONDITIONS. SITE TOPOGRAPHY AND BATHYMETRY MAY DIFFER AT TIME OF CONSTRUCTION.
4. TOPOGRAPHIC CONTOURS BASED ON 2021 KING COUNTY LIDAR. BATHYMETRIC SURVEY WAS COLLECTED BY NHC AND IS REPRESENTATIVE OF 2024 CHANNEL CONDITIONS.
5. HORIZONTAL DATUM: NAD83(11) (WASHINGTON STATE PLANE, NORTH ZONE), U.S. SURVEY FEET. VERTICAL DATUM: NAVD88.

PERMIT NOTES:

1. ALL WORK SHALL BE DONE IN COMPLIANCE WITH THE PERMIT CONDITIONS ISSUED BY APPLICABLE REGULATORY AGENCIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE HARD COPIES OF ALL PERMITS AT THE JOB SITE, AND TO UNDERSTAND AND COMPLY WITH PERMIT CONDITIONS AND PROVISIONS.
2. ALL WORK SHALL COMPLY WITH THE WDFW HPA CONDITIONS AND OTHER PERMIT CONDITIONS. THE CONTRACTOR SHALL MAINTAIN WATER QUALITY STANDARDS AT ALL TIMES.
3. ALL ACTIVITIES THAT INVOLVE WORK ADJACENT TO, OR WITHIN THE WETTED CHANNEL SHALL, AT ALL TIMES, REMAIN CONSISTENT WITH ALL APPLICABLE WATER QUALITY STANDARDS; EFFLUENT LIMITATION; AND STANDARDS OF PERFORMANCE, PROHIBITIONS, PRETREATMENT STANDARDS, AND MANAGEMENT PRACTICES ESTABLISHED PURSUANT TO THE CLEAN WATER ACT OR PURSUANT TO APPLICABLE STATE AND LOCAL LAW.
4. IF, DURING CONSTRUCTION, ARCHAEOLOGICAL REMAINS ARE ENCOUNTERED, CONSTRUCTION IN THE VICINITY SHALL BE HALTED, AND THE STATE OFFICE OF HISTORIC PRESERVATION AND CONTRACTING AGENCY NOTIFIED IMMEDIATELY.
5. IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE CONTRACTING AGENCY REPRESENTATIVE NOTIFIED IMMEDIATELY. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND WASHINGTON DEPARTMENT OF ECOLOGY WILL BE CONTACTED IMMEDIATELY BY THE CONTRACTING AGENCY REPRESENTATIVE. WORK SHALL NOT RESUME UNTIL FURTHER APPROVAL BY THE CONTRACTING AGENCY.

EROSION, SEDIMENT CONTROL, AND WATER MANAGEMENT NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION CONTROL MEASURES. THE EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, LOCAL REQUIREMENTS, AND APPROVED EROSION CONTROL PLAN.. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PERFORMANCE OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
2. A SEDIMENT AND EROSION CONTROL PLAN WILL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL BY CONTRACTING AGENCY BEFORE ANY CONSTRUCTION MAY BEGIN. THE SEDIMENT AND EROSION CONTROL PLAN WILL IDENTIFY BEST MANAGEMENT PRACTICES TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
3. ACTIVITIES SHALL BE DESIGNED AND CONSTRUCTED TO AVOID AND MINIMIZE ADVERSE IMPACTS TO WATERS OF THE UNITED STATES TO THE MAXIMUM EXTENT PRACTICAL THROUGH THE USE OF PRACTICAL ALTERNATIVES. ALTERNATIVES THAT SHALL BE CONSIDERED INCLUDE THOSE THAT MINIMIZE THE NUMBER AND EXTENT OF IN–WATER WORK AND EQUIPMENT CROSSINGS OF WETTED CHANNELS.
4. THE TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) FACILITIES SHOWN ON THESE PLANS MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING, GRUBBING, AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
5. NO TREES OR WETLAND VEGETATION SHALL BE REMOVED UNLESS THEY ARE SHOWN AND NOTIED TO BE REMOVED ON THE PLANS OR AS DIRECTLY SPECIFIED ON–SITE BY THE CONTRACTING AGENCY. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED BY THE CONTRACTING AGENCY.
6. STABILIZED CONSTRUCTION ENTRANCES AND ROADS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT. WASH PADS ARE NOT PERMITTED TO DISCHARGE TO WETLANDS OR STREAMS.
7. EQUIPMENT USED FOR THE PROJECT SHALL BE FREE OF EXTERNAL PETROLEUM–BASED PRODUCTS WHILE WORKING NEAR ANY SURFACE WATER OR WETLANDS. ACCUMULATION OF SOILS OR DEBRIS SHALL BE REMOVED FROM THE DRIVE MECHANISMS (WHEELS, TRACKS, TIRES, ETC.) AND UNDERCARRIAGE OR EQUIPMENT PRIOR TO ITS WORKING BELOW THE ORDINARY HIGH WATER (OHW) ELEVATION.
8. EQUIPMENT SHALL BE CHECKED DAILY FOR LEAKS, AND ANY NECESSARY REPAIRS SHALL BE COMPLETED PRIOR TO COMMENCING WORK ACTIVITIES. SPILL KITS SHALL BE ACCESSIBLE AT ALL TIMES TO EQUIPMENT OPERATORS.
9. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT–LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE RIVER, GROUNDWATER, OR WETLANDS.
10. COVER, CONTAINMENT, AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON–INERT WASTE PRESENT ON THE SITE (SEE CHAPTER 173–304 WAC FOR DEFINITION OF INERT WASTE). ONSITE FUELING TANKS SHALL INCLUDE SECONDARY CONTAINMENT.
11. ALTERATION OR DISTURBANCE OF THE BANK AND BANK VEGETATION SHALL BE MINIMIZED TO THAT NECESSARY FOR THE PROJECT.
12. AT NO TIME SHALL SEDIMENT –LADEN WATER BE DISCHARGED OR PUMPED DIRECTLY INTO THE SUBJECT RIVER, STREAM, OR WETLAND. WATER SHALL BE DISCHARGED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE PROJECT PERMITS AND / OR SPECIFICATIONS.
13. PERMIT CONDITIONS CONTAIN SPECIFIC REQUIREMENTS FOR THE CONTROL OF EROSION AND TURBIDITY FROM PROJECT OPERATIONS. TURBIDITY WILL BE MONITORED ON A FREQUENT BASIS BY THE PROJECT MANAGEMENT AND INSPECTION STAFF ON–SITE. TURBIDITY AMOUNTS IN EXCESS OF THE PERMITTED CONCENTRATIONS AND/OR DURATIONS WILL CAUSE WORK TO BE STOPPED UNTIL IMPROVED PRACTICES ARE IN EFFECT AND THE PROBLEMS CONTROLLED. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR ANY PROJECT DELAYS THAT OCCUR BY NATURE OF THIS FAILURE TO ADEQUATELY CONTAIN SEDIMENT ON–SITE.
14. IF HIGH WATER LEVEL CONDITIONS THAT MAY CAUSE SILTATION OR EROSION ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE FLOW SUBSIDES.
15. FOLLOWING CONSTRUCTION, CONTRACTOR SHALL RESTORE ALL GRADES AND STABILIZE DISTURBED AREAS. SITE RESTORATION WILL INCLUDE ESTABLISHING LONG–TERM EROSION PROTECTION MEASURES. THESE MEASURES WILL INCLUDE PLANTINGS, EROSION CONTROL FABRIC, SEED, AND MULCH. EQUIPMENT AND EXCESS SUPPLIES WILL BE REMOVED AND THE WORK AREA WILL BE CLEANED. MAINTENANCE ACTIVITIES FOR THE NEWLY CONSTRUCTED RESTORATION PROJECTS ARE ANTICIPATED TO OCCUR PERIODICALLY.
16. ALL STOCKPILED MATERIAL SHALL BE STAGED AND MAINTAINED WITH THE CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS.
17. EXPOSED SOILS THAT WILL NOT BE DISTURBED FOR TWO CONSECUTIVE DAYS DURING THE WET SEASON (OCTOBER 1 TO APRIL 30) OR SEVEN CONSECUTIVE DAYS IN THE DRY SEASON (MAY 1 TO SEPTEMBER 30) SHALL BE IMMEDIATELY STABILIZED WITH ESC MEASURES (E.G. SEEDING, MULCHING, PLASTIC COVERING).
18. PRIOR TO THE BEGINNING OF THE WET SEASON (OCT. 1), ALL DISTURBED AREAS SHALL BE REVIEWED TO IDENTIFY WHICH AREAS CAN BE SEEDED IN PREPARATION FOR WINTER RAINS.

CONSTRUCTION NOTES:

1. THE DRAWINGS REPRESENT THE INTENDED OUTCOME OF THE WORK. THEY DO NOT INDICATE THE CONSTRUCTION METHODS TO BE USED. CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES, WORKS, AND THE PUBLIC DURING CONSTRUCTION.
2. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
3. CONTRACTOR SHALL INSTALL ALL MATERIALS IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THE CONTRACTING AGENCY OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
4. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE CONTRACTING AGENCY PRIOR TO PROCEEDING WITH THE WORK.
5. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
6. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, ROADWAY, DRAINAGE WAYS, PRIVATE BRIDGE, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL KEEP THE JOB SITE CLEAN AND HAZARD FREE. CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR THE DURATION OF THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY.
8. SOILS AT THE SITE CONTAIN SOFT SILT, CLAY AND HIGH GROUNDWATER AND MAY REQUIRE EQUIPMENT MATS TO SUPPORT CONSTRUCTION EQUIPMENT. CONSOLIDATION OF THE GROUND SURFACE SHOULD BE EXPECTED. CONTRACTOR IS RESPONSIBLE FOR DETERMINING NEED FOR, DESIGNING, PROCURING, INSTALLING, USING AND REMOVING ANY EQUIPMENT MATS NEEDED TO ALLOW FOR EQUIPMENT OPERATION SUFFICIENT TO CONSTRUCT THE PROJECT.
9. NOTES AND DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES HEREIN.
10. DIMENSIONS CALLOUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE DRAWINGS.
11. ACCESS AND STAGING AREAS SHOWN ON DRAWINGS ARE POTENTIAL AND ARE REPRESENTATIVE OF THE MAXIMUM AREA TO BE DISTURBED. CONTRACTOR SHALL SUBMIT FOR APPROVAL A CONSTRUCTION ACCESS AND STAGING PLAN 10 DAYS PRIOR TO SITE WORK. CONTRACTOR SHALL STAKE PROPOSED ACCESS AND STAGING AREAS FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY PRIOR TO CLEARING. EQUIPMENT AND MATERIAL SHALL NOT BE STORED OUTSIDE THE APPROVED STAGING AREA EXTENTS, UNLESS APPROVED BY THE CONTRACTING AGENCY.
12. CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT AND DISTURBANCE TO STAGING AREAS, AS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE CONTRACTING AGENCY REPRESENTATIVE. CONTRACTOR SHALL MINIMIZE GROUND VIBRATIONS AND DAMAGE TO SLOPES BY UTILIZING APPROPRIATE CONSTRUCTION EQUIPMENT.
13. ALL AREAS WITHIN THE CLEARING LIMITS SHALL BE CLEARED AND GRUBBED OF INVASIVE PLANTS ONLY AND HAULED OFFSITE. ROOTS OF INVASIVE PLANTS (EXCLUDING CHERRY LAUREL) SHALL BE GRUBBED FROM THE SOIL AND HAULED OFFSITE. CHERRY LAUREL ROOTS SHALL REMAIN INTACT AND IN THE GROUND FOR EROSION CONTROL PURPOSES. INVASIVE SPECIES INCLUDE BUT ARE NOT LIMITED TO HIMALAYAN BLACKBERRY AND ENGLISH IVY.
14. MULCH WILL BE STOCKPILED ALONG ACCESS PATHS BY THE CONTRACTOR AS APPROVED/IDENTIFIED BY THE CITY'S REPRESENTATIVE. THE STOCKPILING OF MULCH SHALL OCCUR AFTER CONSTRUCTION OF ALL THE IN–STREAM STRUCTURES BUT PRIOR TO RESTORATION OF THE ACCESS PATHS AND PROJECT CLOSE OUT.
15. CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS AS INDICATED ON DRAWINGS OR AS DIRECTED BY CONTRACTING AGENCY.
16. THE CONTRACTOR SHALL PROVIDE THE TEMPORARY ACCESS PLAN TO THE CONTRACTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

CITY OF MERCER ISLAND
MERCER ISLAND PUBLIC WORKS
9601 SE 36TH STREET
MERCER ISLAND, WA 98040
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PRELIMINARY
NOT FOR
CONSTRUCTION

REVISIONS

##	DATE	DESCRIPTION

DRAWING INFORMATION

DATE	14:34:28 20250815
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DESIGNER/DRAFTER	DGH / TS
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COORDINATE	WA83-NF
FILE NAME	SUBBASIN 46a3 - COVER_R0
PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

NOTES

JOB NUMBER 2008561
SHEET NUMBER G002
SHEET 2 OF 13

LAST SAVED BY:dheckendorf LAST DATE SAVED:08/15/2025 14:34
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LEGEND

- CONTROL POINTS
- EXISTING TREES
- EXISTING PAVED ROAD
- EXISTING GRAVEL ROAD
- EXISTING CONTOURS (MAJOR) — 6230
- EXISTING CONTOURS (MINOR) — 6231
- EXISTING EDGE OF WATER (00/00/00)
- EXISTING BUILDINGS & STRUCTURES
- EXISTING RIGHT-OF-WAY
- EXISTING STORM DRAIN
- EXISTING GAS LINE
- EXISTING ORDINARY HIGH WATER MARK
- EXISTING SANITARY SEWER LINE
- EXISTING WATER LINE
- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING CATCH BASIN
- EXISTING SANITARY SEWER MANHOLE
- EXISTING WETLAND (APPROX BOUNDARY) — WL
- EXISTING TREE
- EXISTING LARGE DOWNED WOOD
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EXISTING TREE TO BE REMOVED

LEGEND

- CONSTRUCTION BASELINE — 10+00
- CONSTRUCTION FENCE
- PRESERVATION FENCE WITH SILT BARRIER
- PROPOSED CONTOUR — 6230
- PROPOSED GRADING
- CONSTRUCTION WORK LIMIT
- POTENTIAL TEMPORARY ACCESS ROUTE
- TEMPORARY ROCK CHUTE LOCATION
- PROPOSED TYPE 1 ELJ
- PROPOSED TYPE 2 ELJ
- PROPOSED EXISTING WEIR STABILIZATION
- APPROXIMATE TREE SURVEY EXTENTS
- MAPPED LANDSLIDE

PROPOSED HATCHES

- STRUCTURAL BACKFILL
- LOCAL SOIL BACKFILL
- BOULDER/SEDIMENT MIX
- COBBLE/SEDIMENT MIX
- TEMPORARY STAGING AREA
- SLASH
- ROCK CHUTE

DETAIL AND SECTION REFERENCING:

(1) NOTE REFERENCING NUMBER

A / G003 — DETAIL REFERENCE NUMBER; SHEET ON WHICH DETAIL APPEARS

(TYP) SPECIFIES THAT DETAIL IS UNIFORMLY TYPICAL THROUGHOUT PROJECT EXCEPT WHERE OTHERWISE NOTED

A / C301 — SECTION REFERENCE LETTER; SHEET ON WHICH SECTION IS SHOWN

A / G003 ELJ - TYPE 2 SCALE: 1"=5' — SECTION/DETAIL REFERENCE LETTER; SHEET FROM WHICH SECTION/DETAIL WAS TAKEN

ABBREVIATIONS:

AVE	AVENUE
B	BORING LOCATION
BLDG	BUILDING
BFM	BONDED FIBER MATRIX
BMP(S)	BEST MANAGEMENT PRACTICE(S)
BP	TEMPORARY BYPASS ROAD
C	CURVE, CUT
CF	CUBIC FOOT
CFS	CUBIC FOOT PER SECOND
CLV	CULVERT
CPE	CORRUGATED POLYETHYLENE
CSBC	CRUSHED SURFACING BASE COURSE
CSS	CHANNEL SPANNING STRUCTURE
CSWPPP	CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN
CY	CUBIC YARD
DBH	DIAMETER BREAST HEIGHT
DIA(M)	DIAMETER
DWG	DRAWING
E	EAST / EASTING
EG	EXISTING GROUND
ELEV	ELEVATION
ELJ	ENGINEERED LOG JAM
ESC	EROSION SEDIMENT CONTROL
EXST	EXISTING
FG	FINISHED GRADE
F	FILL
FT	FEET
GAL	GALLON
GWSE	GROUNDWATER SURFACE ELEVATION
H	HORIZONTAL
HPA	HYDRAULIC PROJECT APPROVAL
ID	IDENTIFIER
IE	INVERT ELEVATION
IN	INCH
INC	INCORPORATED
L	LINE
LAT	LATITUDE
LF	LINEAR FEET
LE	LEVEE EXCAVATION
LONG	LONGITUDE
LS	LEVEE SETBACK
MC	MAIN CHANNEL
MEG	MATCH EXISTING GRADE
MW	MONITORING WELL
MUTCD	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
N	NORTH / NORTHING
NAD83	NORTH AMERICAN DATUM, 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM, 1988
NE	NORTHEAST
NTS	NOT TO SCALE
NW	NORTHWEST
O.C.	ON CENTER
OHW	ORDINARY HIGH WATER
OHWM	ORDINARY HIGH WATER MARK
PL	PROPERTY LINE/ PLACE
PWS	PROFESSIONAL WETLAND SCIENTIST
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RM	RIVER MILE
R/W	RIGHT OF WAY
S.R.	STATE ROUTE
SB	SUBBASIN
SC	SIDE CHANNEL
SE	SOUTHEAST
STA	STATION
STD	STANDARD
SW	SOUTHWEST
SWDM	SURFACE WATER DESIGN MANUAL
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
TBD	TO BE DETERMINED
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TP	TEST PIT
TYP	TYP
U.S.	UNITED STATES
UNT	UNNAMED TRIBUTARY
V	VERTICAL
WAC	WASHINGTON ADMINISTRATIVE CODE
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WQMP	WATER QUALITY MANAGEMENT PLAN
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSEL	WATER SURFACE ELEVATION
YR	YEAR

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SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

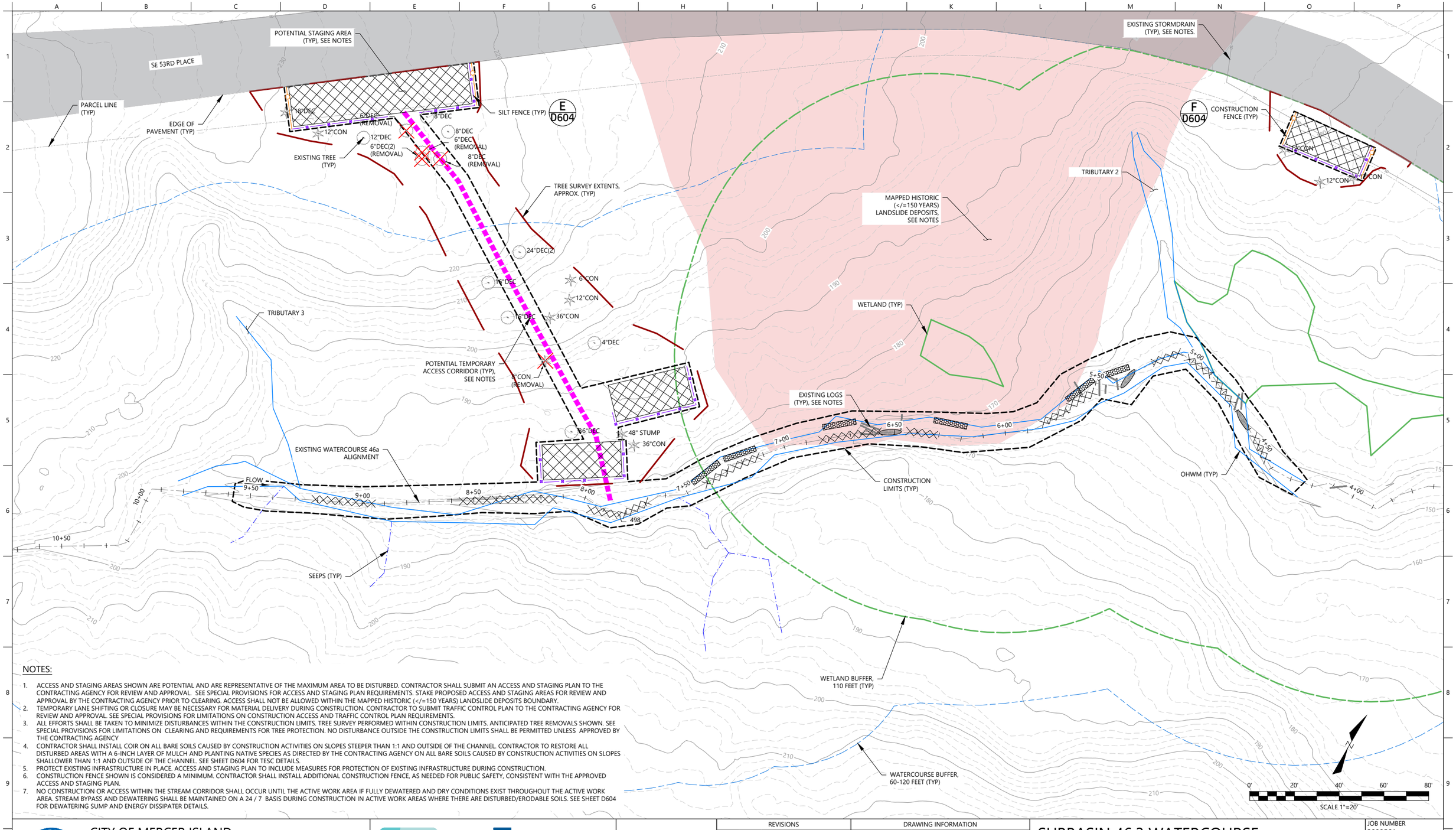
ABBREVIATIONS & LEGEND

JOB NUMBER 2008561

SHEET NUMBER G003

SHEET 3 OF 13

LAST SAVED BY:dheckendorf LAST DATE SAVED:08/15/2025 14:34
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NOTES:

1. ACCESS AND STAGING AREAS SHOWN ARE POTENTIAL AND ARE REPRESENTATIVE OF THE MAXIMUM AREA TO BE DISTURBED. CONTRACTOR SHALL SUBMIT AN ACCESS AND STAGING PLAN TO THE CONTRACTING AGENCY FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS FOR ACCESS AND STAGING PLAN REQUIREMENTS. STAKE PROPOSED ACCESS AND STAGING AREAS FOR REVIEW AND APPROVAL BY THE CONTRACTING AGENCY PRIOR TO CLEARING. ACCESS SHALL NOT BE ALLOWED WITHIN THE MAPPED HISTORIC (</=150 YEARS) LANDSLIDE DEPOSITS BOUNDARY.
2. TEMPORARY LANE SHIFTING OR CLOSURE MAY BE NECESSARY FOR MATERIAL DELIVERY DURING CONSTRUCTION. CONTRACTOR TO SUBMIT TRAFFIC CONTROL PLAN TO THE CONTRACTING AGENCY FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS FOR LIMITATIONS ON CONSTRUCTION ACCESS AND TRAFFIC CONTROL PLAN REQUIREMENTS.
3. ALL EFFORTS SHALL BE TAKEN TO MINIMIZE DISTURBANCES WITHIN THE CONSTRUCTION LIMITS. TREE SURVEY PERFORMED WITHIN CONSTRUCTION LIMITS. ANTICIPATED TREE REMOVALS SHOWN. SEE SPECIAL PROVISIONS FOR LIMITATIONS ON CLEARING AND REQUIREMENTS FOR TREE PROTECTION. NO DISTURBANCE OUTSIDE THE CONSTRUCTION LIMITS SHALL BE PERMITTED UNLESS APPROVED BY THE CONTRACTING AGENCY
4. CONTRACTOR SHALL INSTALL COIR ON ALL BARE SOILS CAUSED BY CONSTRUCTION ACTIVITIES ON SLOPES STEEPER THAN 1:1 AND OUTSIDE OF THE CHANNEL. CONTRACTOR TO RESTORE ALL DISTURBED AREAS WITH A 6-INCH LAYER OF MULCH AND PLANTING NATIVE SPECIES AS DIRECTED BY THE CONTRACTING AGENCY ON ALL BARE SOILS CAUSED BY CONSTRUCTION ACTIVITIES ON SLOPES SHALLOWER THAN 1:1 AND OUTSIDE OF THE CHANNEL. SEE SHEET D604 FOR TESC DETAILS.
5. PROTECT EXISTING INFRASTRUCTURE IN PLACE. ACCESS AND STAGING PLAN TO INCLUDE MEASURES FOR PROTECTION OF EXISTING INFRASTRUCTURE DURING CONSTRUCTION.
6. CONSTRUCTION FENCE SHOWN IS CONSIDERED A MINIMUM. CONTRACTOR SHALL INSTALL ADDITIONAL CONSTRUCTION FENCE, AS NEEDED FOR PUBLIC SAFETY, CONSISTENT WITH THE APPROVED ACCESS AND STAGING PLAN.
7. NO CONSTRUCTION OR ACCESS WITHIN THE STREAM CORRIDOR SHALL OCCUR UNTIL THE ACTIVE WORK AREA IF FULLY DEWATERED AND DRY CONDITIONS EXIST THROUGHOUT THE ACTIVE WORK AREA. STREAM BYPASS AND DEWATERING SHALL BE MAINTAINED ON A 24 / 7 BASIS DURING CONSTRUCTION IN ACTIVE WORK AREAS WHERE THERE ARE DISTURBED/ERODABLE SOILS. SEE SHEET D604 FOR DEWATERING SUMP AND ENERGY DISSIPATER DETAILS.

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PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

EXISTING CONDITIONS, ACCESS, STAGING, & TESC

JOB NUMBER 2008561

SHEET NUMBER G100

SHEET 4 OF 13

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STRUCTURE SCHEDULE		
Point	Northing/Easting	Description
425	205794.9177,1298907.2246	EXISTING LOG WEIR STABILIZATION
426	205777.7684,1298857.3149	EXISTING LOG WEIR STABILIZATION
427	205706.7618,1298773.4865	EXISTING LOG WEIR STABILIZATION
428	205787.5385,1298855.6604	TYPE 2 ELJ
432	205728.4001,1298806.2295	TYPE 2 ELJ
434	205705.4447,1298761.9933	TYPE 2 ELJ
436	205672.6058,1298729.3137	TYPE 2 ELJ
437	205658.9436,1298718.2041	TYPE 2 ELJ
439	205795.7139,1298904.5735	TYPE 1 ELJ
440	205804.7565,1298872.9332	TYPE 1 ELJ
441	205802.6966,1298889.7625	TYPE 1 ELJ
443	205774.6519,1298844.7626	TYPE 2 ELJ
444	205770.3826,1298847.8430	TYPE 1 ELJ
445	205756.2103,1298840.5716	TYPE 1 ELJ
448	205718.4845,1298796.7159	TYPE 1 ELJ
450	205706.3293,1298773.4262	TYPE 1 ELJ
451	205699.0686,1298762.7374	TYPE 1 ELJ
454	205670.6447,1298733.2769	TYPE 1 ELJ
458	205608.3339,1298663.5862	TYPE 1 ELJ
459	205601.4316,1298651.1408	TYPE 1 ELJ

STRUCTURE SCHEDULE		
Point	Northing/Easting	Description
460	205593.8103,1298638.3134	TYPE 1 ELJ
465	205559.6677,1298581.6744	TYPE 1 ELJ
466	205659.0613,1298724.2471	TYPE 1 ELJ
467	205566.1358,1298594.5466	TYPE 1 ELJ
469	205781.3444,1298930.5193	TYPE 1 ELJ
471	205628.1675,1298699.7516	TYPE 1 ELJ
472	205616.2325,1298691.0158	TYPE 1 ELJ
498	205616.3253,1298691.2355	TYPE 1 ELJ

SE 53RD PLACE

EDGE OF PAVEMENT (TYP)

PARCEL LINE (TYP)

EXISTING STORM DRAIN (TYP), SEE NOTES

CONSTRUCTION LIMITS (TYP)

TYPE 1 ELJ (TYP) A C601

TYPE 2 ELJ (TYP) A C602

EXISTING LOG WEIR STABILIZATION (TYP) A C603

OHWM (TYP)

FLOW

B C301

C C301

D C301

NOTES:

1. STATIONING OF STRUCTURE LOCATIONS PROVIDED IN STRUCTURE SCHEDULE ARE APPROXIMATE . CONTRACTOR SHALL STAKE STRUCTURE START AND END STATIONING IN THE FIELD FOR REVIEW AND APPROVAL BY THE CITY'S REPRESENTATIVE PRIOR TO STRUCTURE CONSTRUCTION.
2. EXISTING DOWNED LOGS AND STUMPS AND VEGETATION CLEARED DURING CONSTRUCTION SHALL BE INCORPORATED INTO THE STRUCTURES PER THE DIRECTION OF THE CITY'S REPRESENTATIVE. EXISTING LOGS CURRENTLY LOCATED WITHIN PROPOSED STRUCTURE EXTENTS SHALL BE INCORPORATED INTO THE PROPOSED STRUCTURES. CONTRACTOR SHALL ADJUST ORIENTATIONS OF LOGS IN PROPOSED STRUCTURE AND/OR EXISTING LOGS PER THE DIRECTION OF THE CITY'S REPRESENTATIVE. IN SOME INSTANCES, EXISTING LOGS MAY NEED TO BE CUT TO ACCOMMODATE INSTALLATION OF PROPOSED STRUCTURE. SEE SPECIAL PROVISIONS FOR REQUIREMENTS FOR CLEARED VEGETATION AND EXISTING LOGS.
3. PROTECT ALL INFRASTRUCTURE DURING CONSTRUCTION.

0' 20' 40' 60' 80'

SCALE 1"=20'

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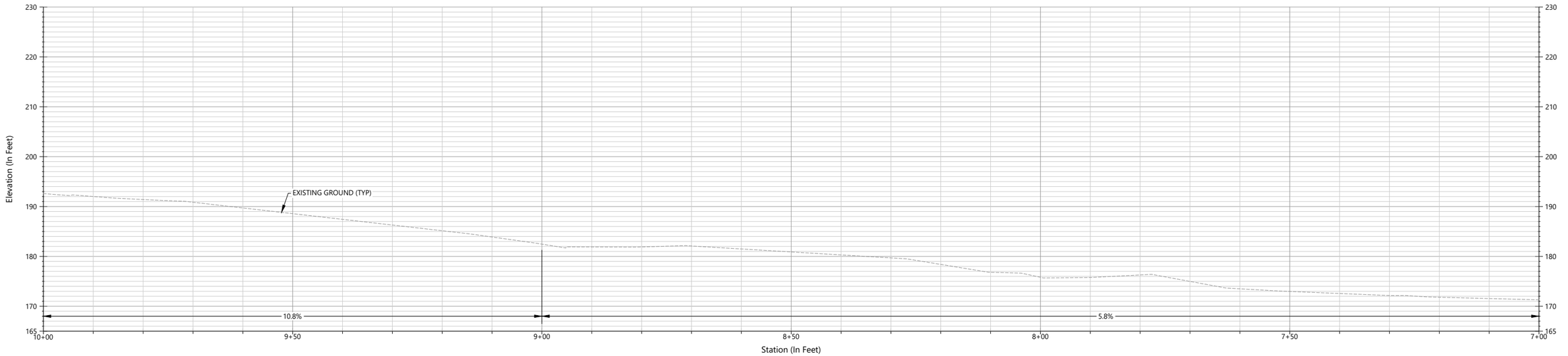
WATERCOURSE STABILIZATION PLAN

JOB NUMBER 2008561

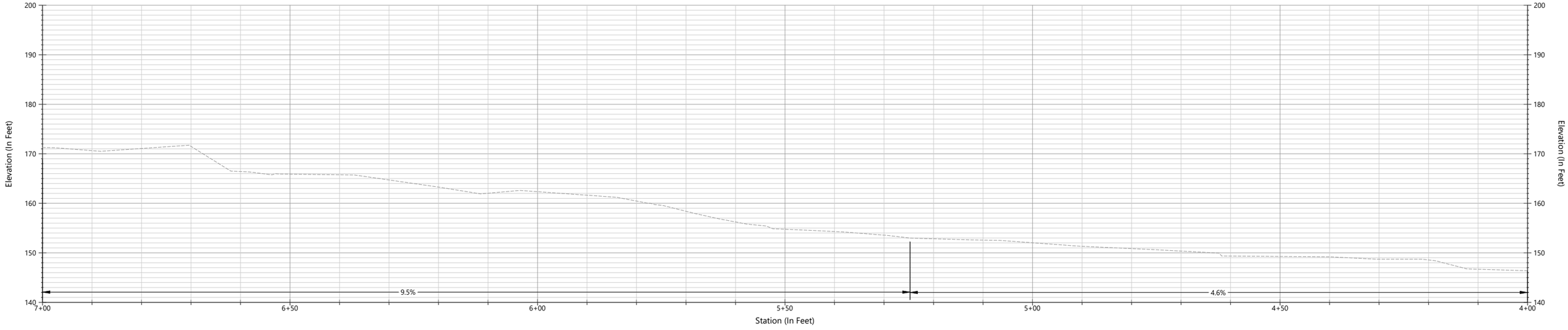
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CHANNEL PROFILE
SCALE: 1"=10'



CHANNEL PROFILE
SCALE: 1"=10'

NOTES:

1. REACH-AVERAGED EXISTING GRADE SLOPES SHOWN.

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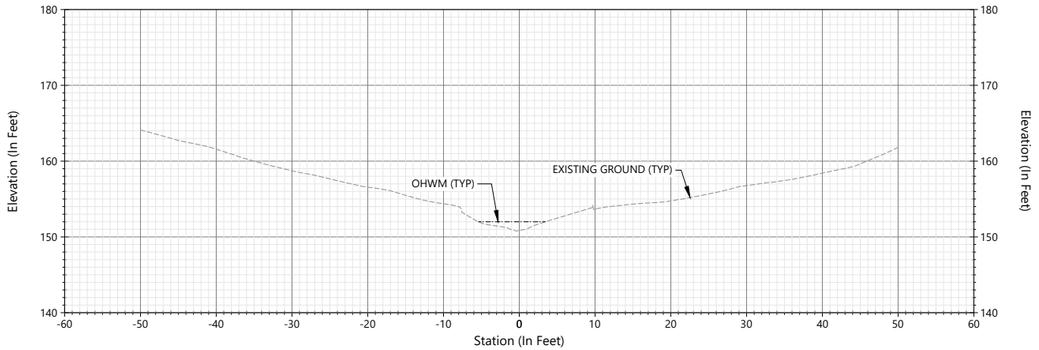
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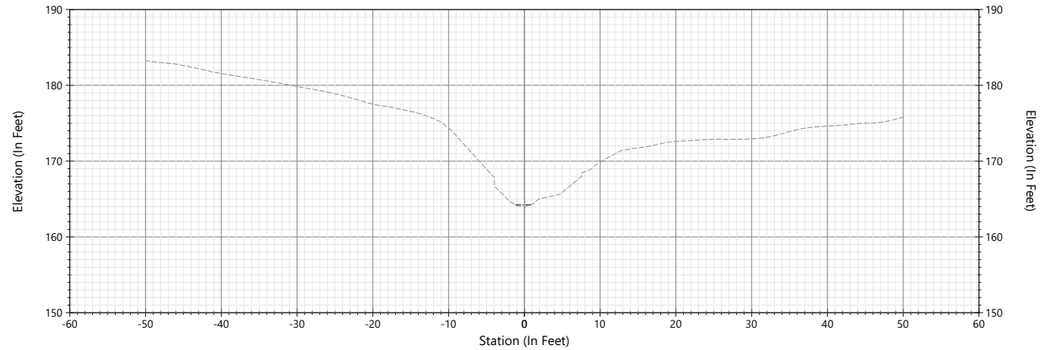
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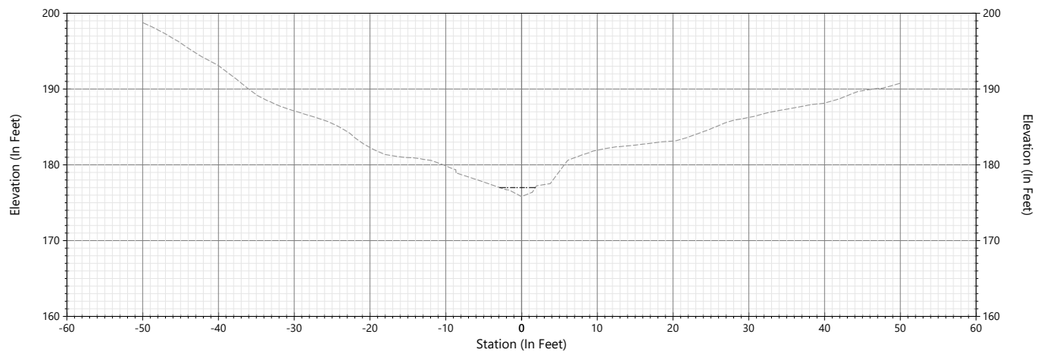
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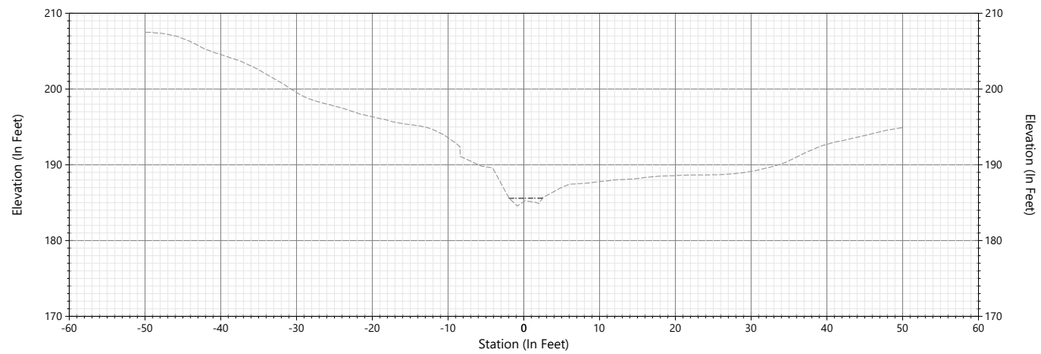
A C301 **STA 4+80**
SCALE: 1"=10'



B C301 **STA 6+25**
SCALE: 1"=10'



C C301 **STA 8+00**
SCALE: 1"=10'



D C301 **STA 9+20**
SCALE: 1"=10'

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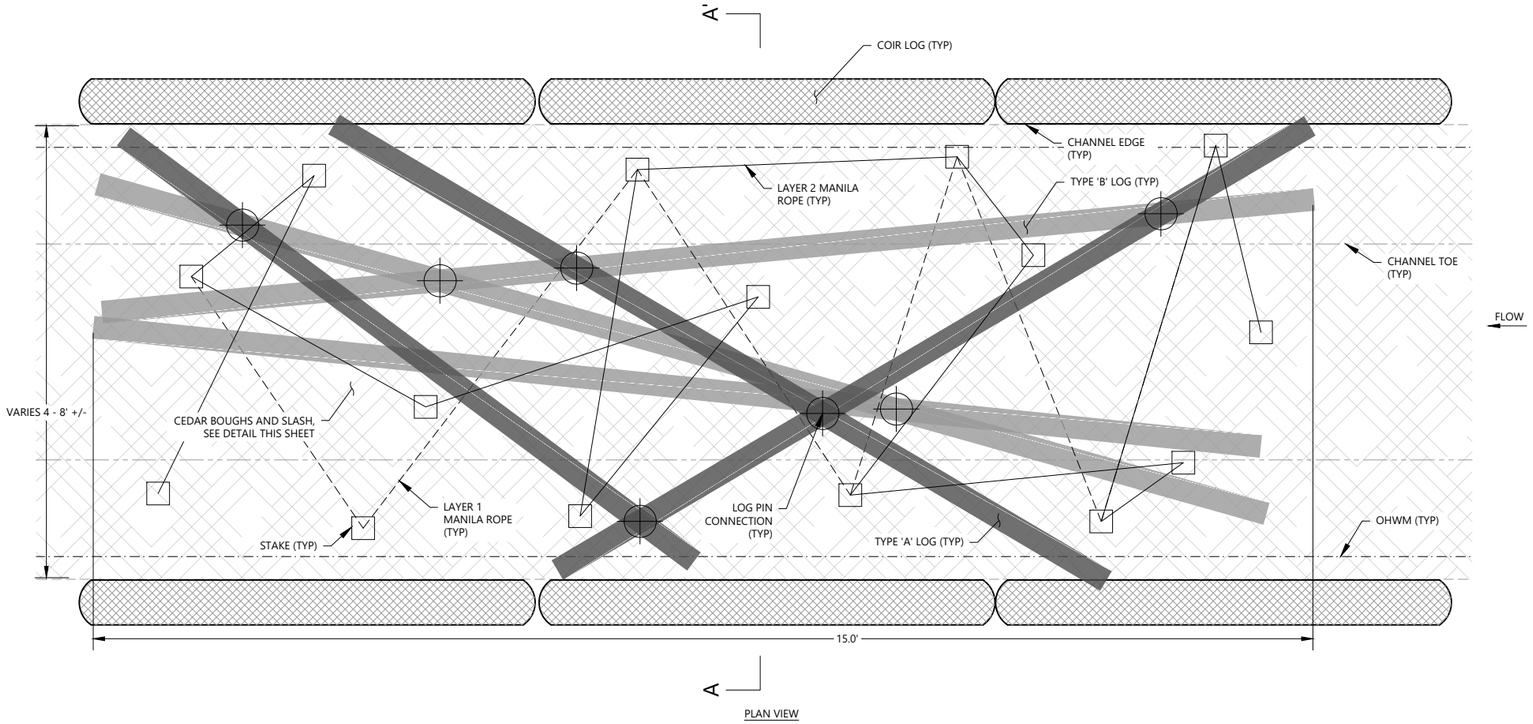
CROSS SECTIONS

JOB NUMBER 2008561

SHEET NUMBER C301

SHEET 7 OF 13

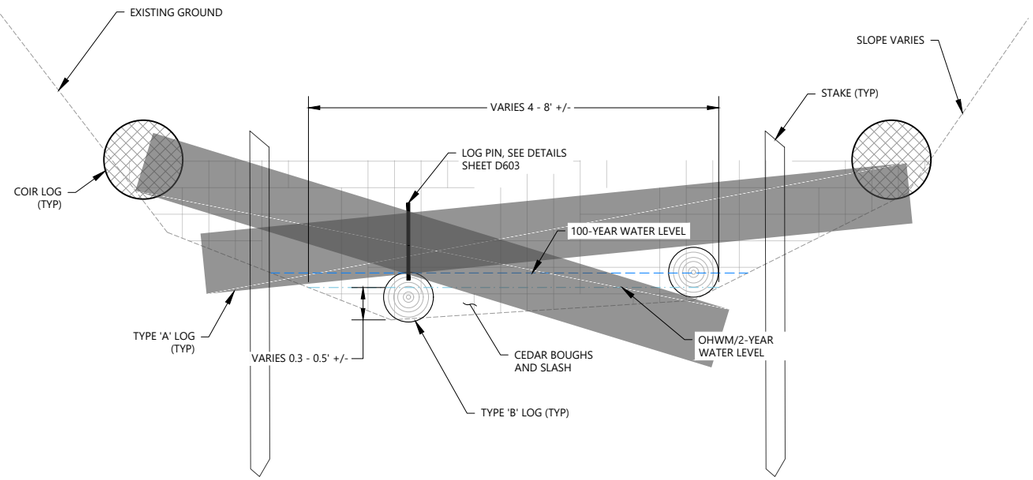
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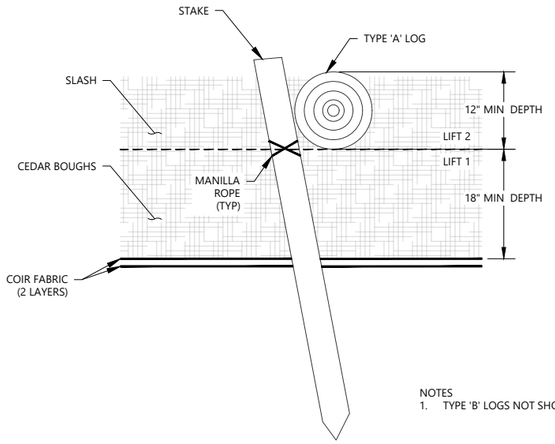
PLAN VIEW

TYPE 1 ELJ MATERIALS SCHEDULE (PER EACH)			
LOG ID	MATERIAL	UNITS	QTY
A	15' LONG, 12"Ø LOGS	EA	3
B	10' LONG, 10"Ø LOGS	EA	3
	CEDAR BOUGHS	CY	7
	SLASH	CY	5
	COIR 900 (INC 1" WOOD STAKES & U-STAPLES)	SY	34
	LOG PINS	EA	7
	2"x2"x48" DOUGLAS FIR STAKES	EA	14
	MANILA ROPE - 5/8"	LF	260
	COIR LOG	LF	30

CONSTRUCTION NOTES
1. CEDAR BOUGHS TO BE MINIMUM 10' LONG AND ¾" TO 2½" Ø MEASURED AT CUT END.
2. CONSTRUCTION SEQUENCE:
   - 2.1. STAKE STRUCTURE DOWNSTREAM EXTENT, PER CONTROL POINT TABLE SHEET C101. PLACEMENT AND LOCATIONS OF ALL ELEMENTS ARE APPROXIMATE AND MAY VARY AS DIRECTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE CONDITIONS AT THE TIME OF CONSTRUCTION.
   - 2.2. LAY 2 LAYERS OF COIR FABRIC ON CHANNEL BED (15'x10' NOMINAL). SHINGLE IN UPSTREAM DIRECTION, OVERLAP MIN. 5 FEET.
   - 2.3. PLACE 'TYPE B' LOGS, ADJUSTING ORIENTATION AS DIRECTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE SITE CONDITIONS AND INSTALL ALL LOG-LOG CONNECTIONS.
   - 2.4. LAY LIFT 1 OF BOUGHS ON COIR FABRIC AND WITHIN 'TYPE B' LOGS. STARTING AT DOWNSTREAM END AND WORKING UPSTREAM. VARY BOUGH ORIENTATION TO ENTANGLE BOUGHS IN 18" THICK LAYER.
   - 2.5. INSTALL STAKES AND FASTEN LAYER 1 MANILA ROPE, INTERWEAVING BETWEEN LOGS AND BOUGHS AS SHOWN.
   - 2.6. PLACE 12'-THICK COMPRESSED LAYER OF SLASH OVER LAYER 1 LOGS AND BOUGHS AND FILL VOIDS WITHIN LAYER 1.
   - 2.7. PLACE 'TYPE A' LOGS, ADJUSTING ORIENTATION AS DIRECTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE SITE CONDITIONS.
   - 2.8. INSTALL ALL LAYER 2 LOG-LOG CONNECTIONS TO TIGHTLY ANCHOR LOGS.
   - 2.9. FASTEN LAYER 2 MANILA ROPE, INTERWEAVING BETWEEN LOGS AS SHOWN.
3. STRUCTURE LENGTH 15'. SEE SCHEDULE OF STRUCTURES FOR STRUCTURAL LOCATIONS.
4. DOUGLAS FIR 2"x2"x36" STAKE EMBEDDED IN 18" (MIN) IN CHANNEL BED. STAKES PLACED AT NOMINAL 4 FOOT IN IRREGULAR LAYOUT AS DIRECTED BY CITY'S REPRESENTATIVE.
5. MANILLA ROPE ⅝"Ø. WIND TIGHT TWO TIMES AROUND EACH STAKE. TIE OFF WITH DOUBLE HALF-KNOT ON A STAKE APPROXIMATELY EVERY 20' OF ROPE. ENSURE ROPE IS SNUG TO CEDAR BOUGHS AND SLASH LAYERS. WEAVE BACK AND FORTH BETWEEN STAKES TO CREATE IRREGULAR GRID.
6. COIR LOG SHALL BE INSTALLED OVERLAPPING SLASH AND EXISTING BANK SLOPE SOIL SO THAT AT LEAST 50% OF LOG IS IN CONTACT WITH EXISTING SOIL. INSTALL LIVE DOGWOOD AND WILLOW STAKES INTO COIR LOG. SEE DETAILS SHEET L102.



SECTION A-A'



NOTES
1. TYPE 'B' LOGS NOT SHOWN FOR CLARITY.

LAYERING PROFILE

A / D601 ELJ - TYPE 1
SCALE: 1"=5'

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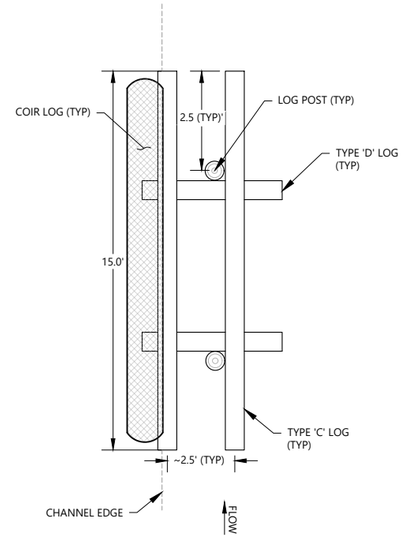
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SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

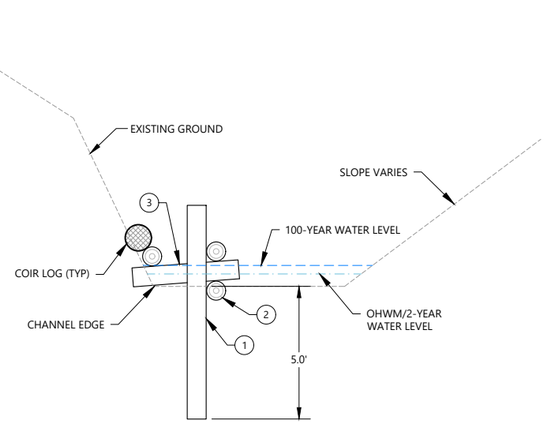
DETAILS - TYPE 1 ELJ

JOB NUMBER 2008561
SHEET NUMBER D601
SHEET 8 OF 13

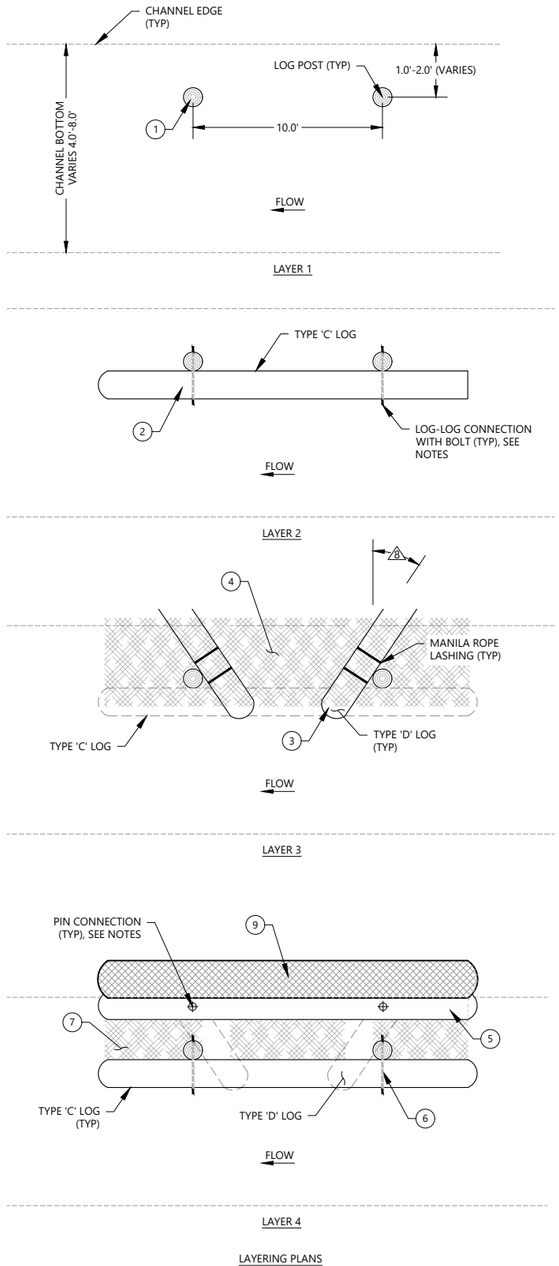
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PLAN VIEW



SECTION A-A'



LAYERING PLANS

TYPE 2 ELJ MATERIALS SCHEDULE (PER EACH)			
LOG ID	MATERIAL	QUANITY	UNITS
	12"x10' LOG POST	2	EA
C	12"x15' LOG	3	EA
D	12"x5' LOG	2	EA
	SLASH	7	CY
	LOG PIN (#5 REBAR 3.5')	2	EA
	LOG PIN (#5 REBAR 2.5')	4	EA
	MANILA ROPE - 5/8"	4	EA
	COIR LOG	15	LF

NOTES

1. POSTS MAY BE EMBEDDED BY AUGERING OR OTHER METHOD APPROVED BY CITY'S REPRESENTATIVE THAT MAINTAINS STABLE SUBSOILS, EXCAVATION AND BACKFILL SHALL NOT BE ALLOWED. ALL POSTS LOCATIONS TO BE STAKED BY CONTRACTOR PRIOR TO INSTALLATION FOR REVIEW AND APPROVAL, BY CITY'S REPRESENTATIVE, LOCATIONS MAY BE ADJUSTED BY CITY'S REPRESENTATIVE TO ACCOMMODATE CONDITIONS AT TIME OF CONSTRUCTION.
2. EMBED TYPE 'C' LOG 6" INTO STREAM CHANNEL AND FASTEN TO POSTS WITH LOG-LOG CONNECTION WITH BOLT (2.5' LENGTH) (SEE DETAILS, SHEET D603).
3. PLACE TYPE 'D' LOG AND VARY ANGLE TO SITE CONDITIONS AND DISTANCE FROM TOE OF SLOPE. LASH TYPE 'D' LOGS TO POST WITH MANILA ROPE $\frac{5}{8}$" DIA.
4. PLACE 2' LAYER OF SLASH AFTER TYPE 'D' LOG INSTALLED. TUCK INTO VOIDS UNDER TYPE 'D' LOG.
5. PLACE TYPE 'C' LOG AND MAKE LOG PIN CONNECTION (2.5' LENGTH) TO TYPE 'D' LOG (SEE DETAILS, SHEET D603).
6. PLACE TYPE 'C' LOG AND ADJUST TO REST ON TOP TYPE 'D' LOG. CONNECT WITH LOG-LOG CONNECTION WITH BOLT (2.5' LENGTH).
7. PLACE 12" LAYER OF SLASH BETWEEN HEADER AND REAR LOG.
8. LOGS CAN BE INSTALLED 0-45° FROM HORIZONTAL, AS DIRECTED BY CITY'S REPRESENTATIVE.
9. INSTALL COIR LOG OVERLAPPING SLASH AND EXISTING BANK SLOPE SOIL SO THAT AT LEAST 50% OF LOG IS IN CONTACT WITH EXISTING SOIL. INSTALL LIVE DOGWOOD AND WILLOW STAKES INTO COIR LOG. SEE DETAILS SHEET L102.
10. SLASH FILL ALL VOIDS IN STRUCTURE UP TO TOP OF TOP LOGS. SLASH SHALL BE COMPACTED TO ENSURE NO GAPS GREATER THAN 3 CUBIC INCHES.

NOTES:

1. SLASH AND CONNECTIONS NOT SHOWN ON PLAN AND SECTION FOR CLARITY.

A / D602 TYPE 2 ELJ
SCALE: 1"=4'

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REVISIONS		
##	DATE	DESCRIPTION

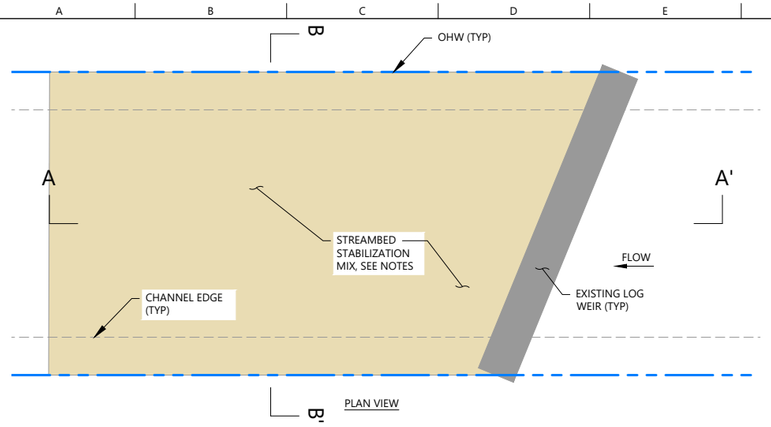
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SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

DETAILS - TYPE 2 ELJ

JOB NUMBER 2008561
SHEET NUMBER D602
SHEET 9 OF 13

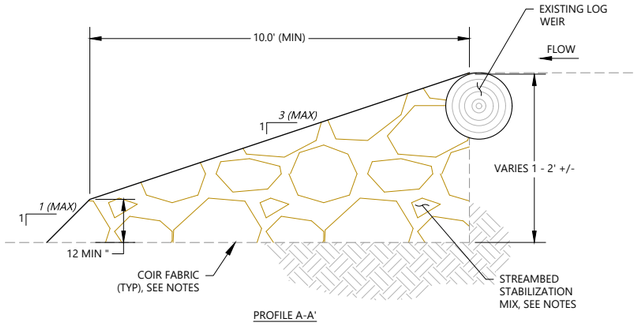
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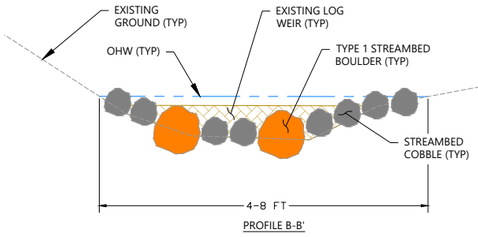
PLAN VIEW



EXAMPLE PHOTO (STA 5+45)



PROFILE A-A'

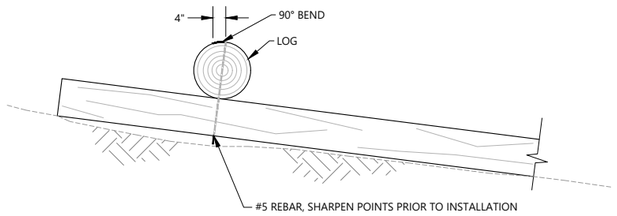


PROFILE B-B'

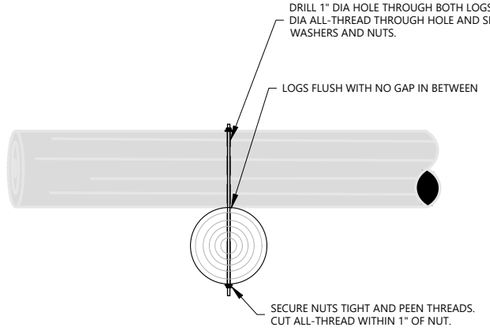
A D603 LOG WEIR STABILIZATION
SCALE: 1"=2'

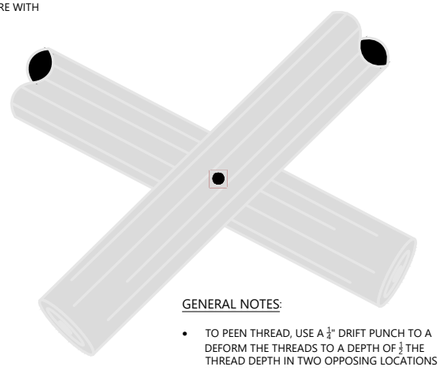
NOTES:
1. STABILIZE EXISTING LOG WEIR WITH STREAMBED STABILIZATION MIX. EXCAVATE CHANNEL BED AS NEEDED TO EMBED STREAMBED MATERIAL. PLACE TWO LAYERS UPON SUBGRADE PRIOR TO PLACING STREAMBED MATERIAL.
2. TIE INTO EXISTING GROUND AS SHOWN THIS SHEET. CONSTRUCT 'V' GEOMETRY TO CONCENTRATE FLOWS IN CENTER OF CHANNEL AT LOW FLOW, PER DIRECTION OF CITY'S REPRESENTATIVE.
3. STREAMBED STABILIZATION MIX PER CONTRACT SPECIFICATIONS.

LOG WEIR STABILIZATION SCHEDULE (PER EACH)		
MATERIAL	QUANTITY	UNITS
STREAMBED SEDIMENT	4	TN
STREAMBED COBBLE	3	TN
TYPE 1 STREAMBED BOULDER	6	EA



B D603 LOG PIN
SCALE: 1"=2'





GENERAL NOTES:

- TO PEEN THREAD, USE A $\frac{1}{4}$" DRIFT PUNCH TO A DEFORM THE THREADS TO A DEPTH OF $\frac{1}{2}$ THE THREAD DEPTH IN TWO OPPOSING LOCATIONS IMMEDIATELY AGAINST THE NUT.

C D603 LOG-LOG CONNECTION WITH BOLT DETAIL
SCALE: 1"=2'

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##	DATE	DESCRIPTION

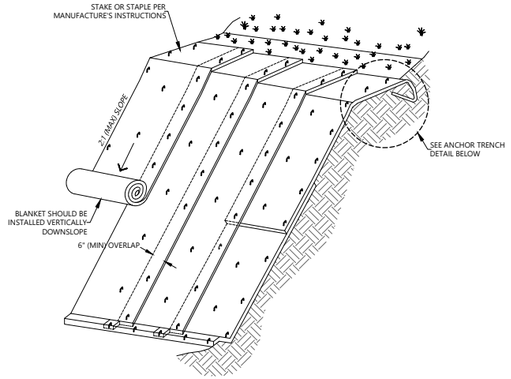
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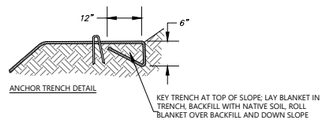
SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

MISC WATERCOURSE STABILIZATION DETAILS

JOB NUMBER 2008561
SHEET NUMBER D603
SHEET 10 OF 13

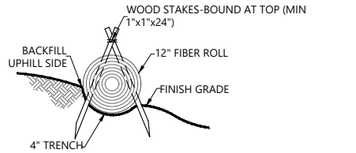
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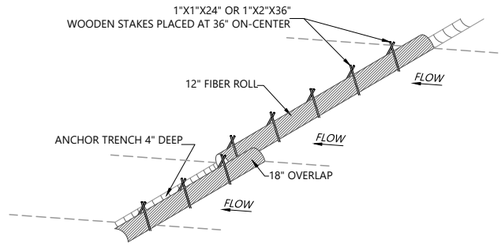




NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, VEGETATION, STICKS, AND DEBRIS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT. SCARIFY AND/OR TILL SLOPE SURFACE 12" DEEP BEFORE LAYING BLANKET.
2. LAY BLANKETS LOOSELY AND STAKE OR STAPLE AS NEEDED TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH OR TWIST.
3. EROSION CONTROL BLANKETS SHOULD BE USED IN CONJUNCTION WITH REVEGETATION (SEEDING OR PLUG PLANTING) TO SPECIFICATIONS OF REVEGETATION PLAN FOR PROJECT.
4. HAND WALK BLANKET DOWN SLOPE AS BLANKET IS STAKED OR STAPLED TO PREVENT STRETCHING
5. DO NOT WALK ON BLANKET ONCE IN PLACE.
6. ALL ANCHORS SHALL BE INSTALLED PERPENDICULAR TO SLOPE.
7. DRAWING ADAPTED FROM: CALIFORNIA STORMWATER QUALITY ASSOCIATION, 2003, STORMWATER BEST MANAGEMENT PRACTICE HANDBOOK EC-7 GEOTEXTILES AND MATS

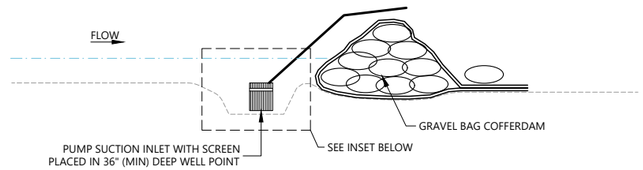
A EROSION CONTROL BLANKET
D604 SCALE: NOT TO SCALE



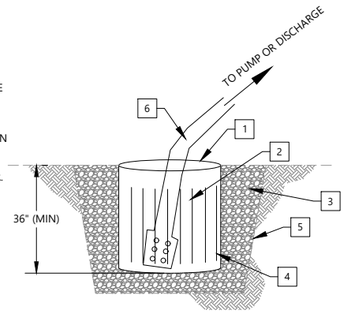


NOTES:
1. FIBER ROLL SHALL BE MADE FROM 100% MATTRESS GRADE COCONUT FIBER AND BOUND BY HIGH STRENGTH COIR NETTING, AND HAVE A MINIMUM WEIGHT OF 5 LBS PER LINEAL FOOT.
2. FIBER ROLLS ON SLOPES SHALL BE INSTALLED ON CONTOUR. SPACING BETWEEN FIBER ROLLS SHALL BE A MAXIMUM OF 10' FOR SLOPES GREATER THAN 2:1 AND 20' FOR SLOPES LESS THAN 2:1.
3. ABUTTING ENDS OF INDIVIDUAL FIBER ROLLS SHALL BE OVERLAPPED A MINIMUM OF 18".

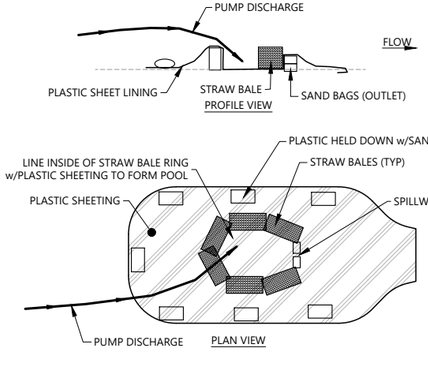
B COIR FABRIC LOGS
D604 SCALE: NOT TO SCALE



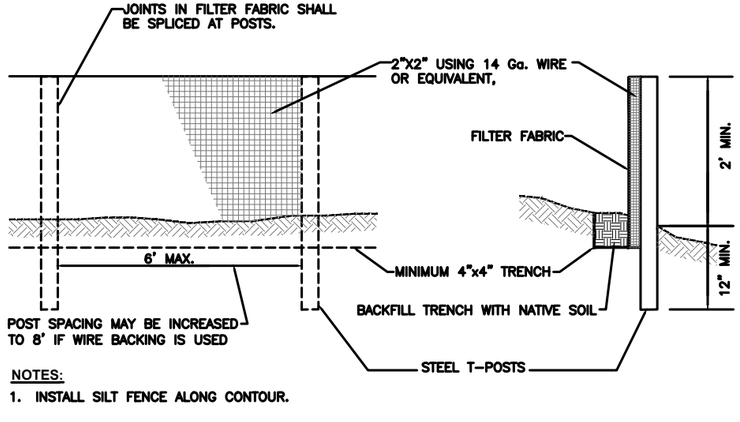
NOTES
1. CORRUGATED PLASTIC OR METAL PIPE 36"Φ (MIN), ONE PER EACH PUMP.
2. ¼" SLOTS, 24" LONG AT 4" SPACING ALL THE WAY AROUND PIPE.
3. STREAMBED SEDIMENT.
4. WIRE SCREEN ½" MESH COVERING PIPE BOTTOM, ANCHORED TO PIPE.
5. LIMIT OF EXCAVATION. INSTALL PIPE AND BACKFILL WITH STREAMBED MATERIAL.
6. PUMP SECTION INLET OR ELECTRIC SUBMERSIBLE PUMP WITH 1" SCREEN INSTALLED AT INLET OR PUMP SUCTION FACE, OR OTHER SIZE RECOMMENDED BY PUMP SUPPLIER.



C DEWATERING SUMP
D604 SCALE: NOT TO SCALE

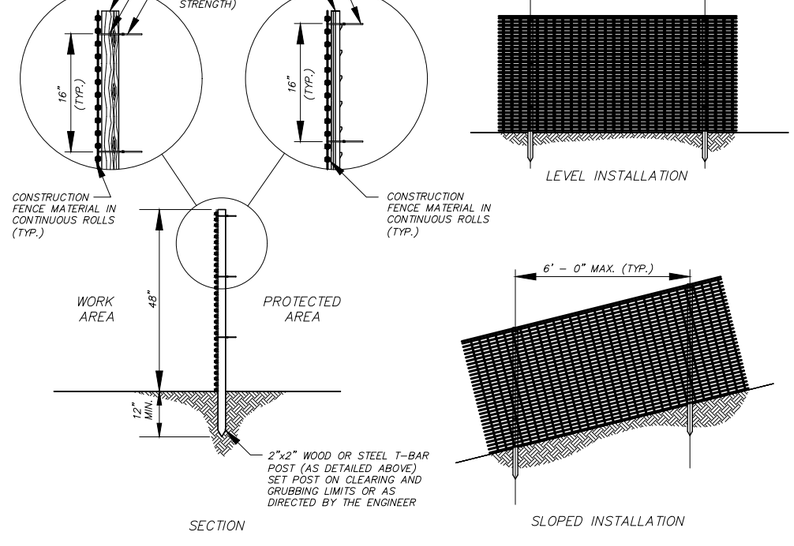


D ENERGY DISSIPATOR
D604 SCALE: NOT TO SCALE



NOTES:
1. **INSTALL SILT FENCE ALONG CONTOUR.**

E SILT FENCE
D604 SCALE: NOT TO SCALE



F CONSTRUCTION FENCE
D604 SCALE: NOT TO SCALE

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PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

TESC DETAILS

JOB NUMBER 2008561
SHEET NUMBER D604
SHEET 11 OF 13

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STAGING LOCATIONS ADJACENT TO SE 53RD PLACE ARE GRAVEL AND UNVEGETATED. THESE AREAS WILL BE RESTORED IN-KIND FOLLOWING CONSTRUCTION.

SE 53RD PLACE

EDGE OF PAVEMENT (TYP)

PARCEL LINE (TYP)

18"DEC

12"CON

12"DEC

8"DEC

8"DEC

EXISTING TREE (TYP)

TREE SURVEY EXTENT, APPROX. (TYP)

24"DEC(2)

16"DEC

6"CON

12"CON

16"DEC

36"CON

4"DEC

TRIBUTARY 3

PLANT DISTURBED TEMPORARY ACCESS CORRIDOR AND LOWER STAGING AREAS WITH UPPER ELEVATION TREES AND SHRUBS PER THE OWNER'S DIRECTION. SEE LEGEND AND NOTES ON DWG NO. L101

REPLACEMENT TREE, TYP. OF 5. SEE LEGEND ON DWG. L01

7,000 SF

36"DEC

48" STUMP

36"CON

EXISTING WATERCOURSE 46a ALIGNMENT

1,050 SF

PLANT AREAS ADJACENT TO BANK STABILIZATION ELJ STRUCTURES WITH LIVE STAKES. INFILL WITH LOWER ELEVATION TREES AND SHRUBS PER THE OWNER'S DIRECTION. SEE LEGEND AND NOTES ON DWG NO. L101

SEEPS (TYP)

EXISTING STORMDRAIN (TYP), SEE NOTES

EXISTING STORMDRAIN (TYP), SEE NOTES.

TRIBUTARY 2

STAGING LOCATIONS ADJACENT TO SE 53RD PLACE ARE GRAVEL AND UNVEGETATED. THESE AREAS WILL BE RESTORED IN-KIND FOLLOWING CONSTRUCTION.

WETLAND (TYP)

EXISTING LOGS (TYP), SEE NOTES

CONSTRUCTION LIMITS (TYP)

PLANT LOWER DISTURBED TEMPORARY ACCESS CORRIDOR AND STAGING AREAS WITH LOWER ELEVATION TREES AND SHRUBS PER THE OWNER'S DIRECTION. SEE LEGEND AND NOTES ON DWG NO. L101

OHWM (TYP)

WETLAND BUFFER, 110 FEET (TYP)

WATERCOURSE BUFFER, 60-120 FEET (TYP)

0' 20' 40' 60' 80'

SCALE 1"=20'

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SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

PLANTING PLAN

JOB NUMBER 2008561 (RH2 JOB NO. 24-0025)

SHEET NUMBER L100

SHEET 12 OF 14

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PLANTING AND TREE REPLACEMENT LEGEND

ESTIMATED AREA	COMMON NAME	SCIENTIFIC NAME	QTY	SIZE	SPACING DIAMETER	PLANT INDICATOR	HEIGHT AT MATURITY	PLANTING NOTES
TREE REPLACEMENT PLANTING[1]								
	TREES							
	WESTERN RED CEDAR	*THUJA PLICATA*	1	6 FT TALL	12 FT O.C.	FAC	180 FT	PLANT IN LOCATIONS SHOWN ADJUSTING FOR EXISTING VEGETATION AND CITY-DICTATED PREFERENCES
	CASCARA	*FRANGULA PURSHIANA*	4	1 ½" CALIPER		FAC	25 FT	
TEMPORARY CONSTRUCTION CORRIDOR REVEGETATION								
	TREES							
	GRAND FIR	*ABIES GRANDIS*	10	2 GALLON	12 FT O.C.	FACU	260 FT	PLANT INDIVIDUAL TREES IN THE AREAS DISTURBED BY CONSTRUCTION AND PER THE DIRECTION OF THE OWNER. GENERALLY, PLANT CEDAR, SPRUCE, AND PINE IN LOWER ELEVATIONS NEAR THE WATERCOURSE. PLANT FIRS, HEMLOCK, AND MAPLE IN UPPER ELEVATIONS OF THE OPEN SPACE AREA.[3]
	DOUGLAS FIR	*PSEUDOTSUGA MENZIESII*	10			FACU	220 FT	
	WESTERN HEMLOCK	*TSUGA HETEROPHYLLA*	10			FACU	200 FT	
	BIG-LEAF MAPLE	*ACER MACROPHYLLUM*	10			FACU	100 FT	
	WESTERN RED CEDAR	*THUJA PLICATA*	10			FAC	180 FT	
	SITKA SPRUCE	*PICEA SITCHENSIS*	10			FAC	100 FT	
7,000 SF[2]	SHORE PINE	*PINUS CONTORTA*	10			FAC	45 FT	
	SHRUBS/HERBACEOUS							
	BEAKED HAZELNUT	*CORYLUS CORNUTA*	20	1 GALLON	6 FT O.C.	FACU	20 FT	PLANT IN SINGLE SPECIES CLUSTERS OF 3 TO 6, INTERSPERSED AROUND TREES AND OTHER SHRUBS, IN THE AREAS DISTURBED BY CONSTRUCTION AND PER THE DIRECTION OF THE OWNER. PLANT CASCARA, HAWTHORN, MAPLE, SALMONBERRY AND LADY FERN IN LOWER ELEVATIONS NEAR THE WATERCOURSE. PLANT HAZELNUT, OSOBERRY, OREGON GRAPE AND SWORD FERN IN UPPER ELEVATIONS OF THE OPEN SPACE AREA.
	OSOBERRY	*OEMLERIA CERASIFORMIS*	20			FACU	16 FT	
	TALL OREGON GRAPE	*MAHONIA AQUIFOLIUM*	20			FACU	6 FT	
	SWORD FERN	*POLYSTICHUM MUNITUM*	20			FACU	5 FT	
	CASCARA	*FRANGULA PURSHIANA*	20			FAC	30 FT	
	VINE MAPLE	*ACER CIRCINATUM*	20			FAC	25 FT	
	BLACK HAWTHORN	*CRATAEGUS DOUGLASII*	20			FAC	20 FT	
	SALMONBERRY	*RUBUS SPECTABILIS*	20			FAC	10 FT	
	LADY FERN	*ATHYRIUM FILIX-FEMINA*	20			FAC	5 FT	
STREAM CORRIDOR REVEGETATION								
	LIVE STAKES							
1,050 LF	PACIFIC WILLOW	*SALIX LUCIDA-LASIANDRA*	50	LIVE STAKE	3 FT O.C.	FACW	45 FT	STAKE INTO COIR LOGS PLACED ADJACENT TO ELJ'S. ALTERNATE PLACEMENT OF STAKE SPECIES TO ENSURE WILLOW AND DOGWOOD ARE PLANTED THE ENTIRE LENGTH OF THE STREAM CORRIDOR.
	SITKA WILLOW	*SALIX SITCHENSIS*	50			FACW	24 FT	
	RED OSIER DOGWOOD	*CORNUS ALBA*	50			FACW	18 FT	

[1] REPLACEMENT TREES INTENDED TO COMPENSATE FOR REMOVAL OF FIVE (5) TREES SIZED 5-INCH DBH AND SMALLER PER MERCER ISLAND MUNICIPAL CODE 19.10.070.
[2] ESTIMATED AREA REFLECTS APPROXIMATE AREA OF TEMPORARY CONSTRUCTION CORRIDOR DISTURBANCE. THE OWNER WILL PROVIDE DIRECTION FOR ACTUAL PLACEMENT OF PLANTINGS TO RESTORE THE TEMPORARY CONSTRUCTION CORRIDOR AND REVEGETATE THE OPEN SPACE AREA.
[3] DOUGLAS FIR PREFER SUNNIER LOCATIONS, WHILE WESTERN HEMLOCK AND CEDAR CAN TOLERATE SHADE.
[4] RESEED ALL DISTURBED AREAS WITH NATIVE SEED MIX PER THE CITY'S DIRECTION.

PLANTING & TREE REPLACEMENT NOTES

GENERAL PLANTING NOTES:

THE CONTRACTOR SHALL COORDINATE PLANTING ACTIVITIES AND ULTIMATE LOCATIONS/AREAS WITH THE OWNER, INCLUDING SCHEDULING AND ATTENDING A PRE-PLANTING MEETING, SUCCESSFUL PLANT INSTALLATION, CITY ACCEPTANCE POST-PLANTING, AND CARE OF THE LANDSCAPED AREAS FOR A ONE-YEAR PLANT ESTABLISHMENT PERIOD. FOLLOWING THE PLANT ESTABLISHMENT PERIOD, THE CITY OR ITS ASSIGNS WILL ASSUME CARE OF THE SITE.

PLANT IN THE WET SEASON, AFTER OCTOBER 15. PLANTING DURING THE WET SEASON WILL MINIMIZE TRANSPLANT SHOCK AND SUPPLEMENTAL CARE FOR NEW 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, WATER PLANTINGS, WRAP / WET LIVE STAKES, AND PROTECT PLANTS FROM DAMAGE BY ELEMENTS, VANDALISM, ETC.

THE CONTRACTOR SHALL WARRANT ALL PLANT MATERIALS TO REMAIN HEALTHY AND ALIVE FOR A PERIOD OF ONE YEAR FOLLOWING SUCCESSFUL INSTALLATION ACCEPTANCE. DURING THIS PERIOD, THE CONTRACTOR SHALL GENERALLY CARE FOR PLANTINGS, MAINTAIN THE LANDSCAPED AREAS, AND ENSURE PLANTINGS RECEIVE ADEQUATE IRRIGATION. THE CITY WILL PROVIDE MAINTENANCE NEEDS FOR PLANTINGS PER IT'S OPEN SPACE MAINTENANCE PROGRAM.

THE CITY (I.E., OWNER) WILL PROVIDE ONSITE DIRECTION AT THE TIME OF PLANTING TO SHOW LOCATIONS FOR NEW PLANTS. PLANT PROCUREMENT, HANDLING AND STORAGE, AND INSTALLATION SHALL BE SUBJECT TO CITY REVIEW, DIRECTION, AND APPROVAL.

SEQUENCING:

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

1. THE CONTRACTOR SHALL SECURE ALL PLANT MATERIAL, SOILS, AND MULCH PRIOR TO BEGINNING WORK. SUBMIT NURSERY AVAILABILITY, TOPSOIL, AND MULCH SPECIFICATION SHEETS TO THE CITY FOR PRIOR APPROVAL. ALLOW 5 DAYS FOR CITY REVIEW AND APPROVAL.
2. NOTIFY THE CITY 72 HOURS IN ADVANCE OF ANTICIPATED PLANTING ACTIVITIES. MEET WITH CITY STAFF AND ITS ASSIGNS PRIOR TO THE START OF LANDSCAPING. ENSURE ALL PARTIES UNDERSTAND PREFERENCES FOR PLANTING, SOIL AMENDMENT, ETC.
3. PREPARE AREAS TO BE PLANTED PER PLANS AND PLANTING PLAN / DIRECTION PROVIDED BY THE CITY. CLEARING AND GRUBBING SHALL ONLY OCCUR IN AREAS TO BE PLANTED. RETAIN AND PROTECT EXISTING TREE AND SHRUB VEGETATION FROM TRAMPLING, ROOT DAMAGE, ETC. PLANTING SHALL BE COMPLETED BY HAND, UTILIZING HAND- AND LIGHT-DUTY EQUIPMENT.
4. HAND-EXCAVATE PLANTING PITS. GRUB ROOTS AND RHIZOMES TO ACCOMMODATE AN AREA OF TWO TIMES THE ROOTBALL. 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 PER THE DETAIL (DWG NO. L102). BACKFILL PLANTING PITS WITH NATIVE SOIL. IMPORTED TOPSOIL MAY BE USED TO SUPPLEMENT BACKFILL SOILS, IF NEEDED. HAND-FORM MULCH WATERING BASINS PER THE DETAILS (DWG NO. L102).
5. INSTALL LIVE STAKES PER LEGEND AND DETAILS (DWG NO. L102). ENSURE LIVE STAKES ARE INSTALLED THROUGH COIR LOGS INTO NATIVE SOIL.
6. THOROUGHLY WATER-IN ALL INSTALLED PLANT MATERIAL. CONTINUE WATERING AT A RATE SUFFICIENT TO ENSURE PLANTINGS BECOME ESTABLISHED.
7. INSTALL WILDLIFE PROTECTION CAGES AROUND ALL TREES AND WOODY SHRUBS PER DETAIL (DWG NO. L102).
8. NOTIFY THE CITY UPON COMPLETION OF PLANT INSTALLATION TO ARRANGE FOR INSPECTION AND POST-PLANTING ACCEPTANCE.

IRRIGATION:

THE LANDSCAPE CONTRACTOR SHALL PROVIDE TEMPORARY SEASONAL WATER TO PROPOSED PLANTINGS. WATER SHALL BE SUPPLIED VIA WATER TRUCK AND/OR TEMPORARY HOSES AND CONNECTION TO ONSITE HYDRANT. COORDINATE WITH THE CITY TO ESTABLISH THE PREFERRED METHOD, CONNECTION POINT, AND METERING NEEDS. AT THE TIME OF PLANTING, WITHIN THE 30-DAY PERIOD POST-PLANTING, AND THROUGHOUT THE SUMMER MONTHS (JULY 1 TO SEPTEMBER 30), THE CONTRACTOR SHALL PROVIDE SUPPLEMENTAL IRRIGATION FOR PLANTINGS TO AID IN ESTABLISHMENT AND REDUCTION OF TRANSPLANT SHOCK. SUPPLEMENTAL SEASONAL WATERING IS RECOMMENDED FOR A MINIMUM OF TWO YEARS POST-PLANTING. IT IS ASSUMED THAT THE CITY OR ITS ASSIGNS WILL PROVIDE SUPPLEMENTAL IRRIGATION FOLLOWING THE FIRST YEAR OF LANDSCAPE-CONTRACTOR PROVIDED PLANT ESTABLISHMENT.

CITY OF MERCER ISLAND
MERCER ISLAND PUBLIC WORKS
9601 SE 36TH STREET
MERCER ISLAND, WA 98040
206-275-7608
WWW.MERCERISLAND.GOV/PUBLICWORKS

PRELIMINARY
NOT FOR
CONSTRUCTION

REVISIONS		
##	DATE	DESCRIPTION

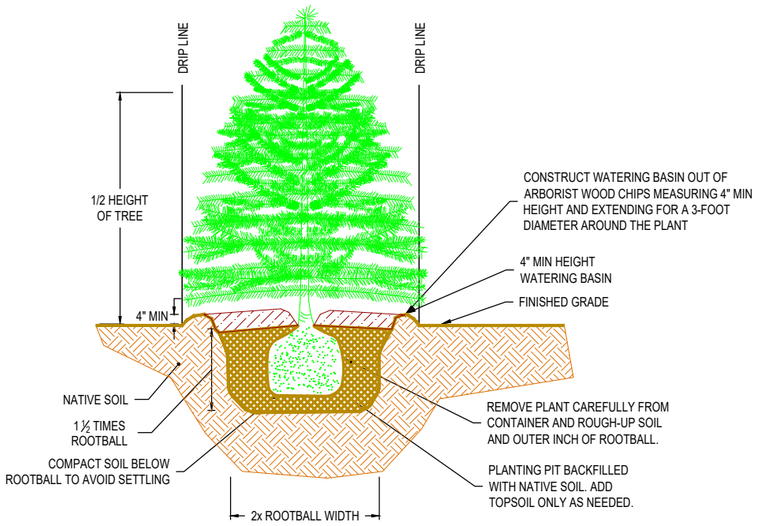
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CHECKED	ALP
COORDINATE	WA83-NF
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PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

PLANTING SCHEDULE AND NOTES

JOB NUMBER 2008561 (RH2 JOB NO. 24-0025)
SHEET NUMBER L101
SHEET 13 OF 14

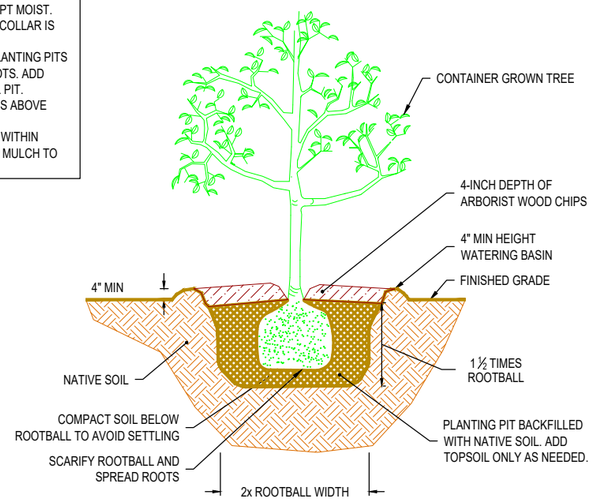
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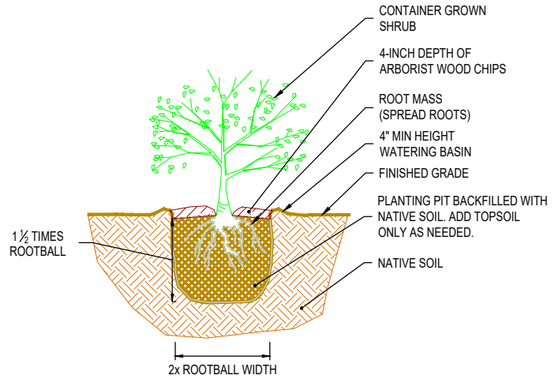


EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE

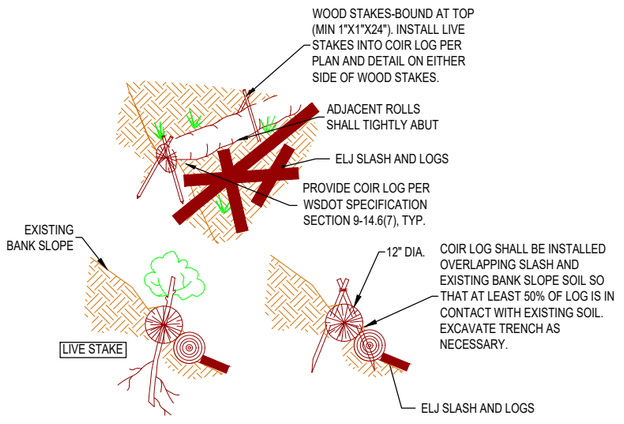
NOTES:
1. ALL PLANT MATERIAL MUST BE KEPT MOIST.
2. PLACE ALL PLANTS SO THE ROOT COLLAR IS LEVEL WITH FINISHED GRADE.
3. ENSURE NATIVE SOILS USED IN PLANTING PITS ARE FREE OF RHIZOMES AND ROOTS. ADD TOPSOIL AS NEEDED TO BACKFILL PIT.
4. FORM A WATERING BASIN 4 INCHES ABOVE FINISHED GRADE.
5. INSTALL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





DECIDUOUS TREE AND SHRUB PLANTING DETAIL

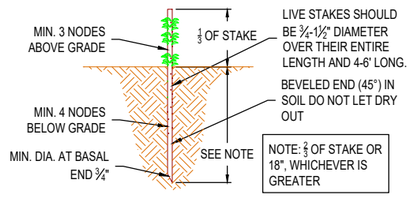
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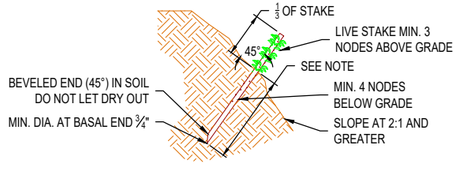
COIR LOG DETAIL

NOT TO SCALE

LIVE STAKE NOTES:
1. SOURCE LIVE STAKES FROM SITES NATIVE TO THE PACIFIC NORTHWEST.
2. KEEP LIVE STAKES MOIST AT ALL TIMES. LIVE STAKES ARE HIGHLY PERISHABLE AND MUST BE STORED PROPERLY BEFORE PLANTING. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. INSTALL LIVE STAKES IN GROWTH POSITION. IF BOTTOM END OF STAKE HAS DRIED OUT, CUT FRESH END PRIOR TO INSTALLING.
4. INSTALL LIVE STAKES AT 2' O.C. SPACING OFFSET ALTERNATE ROWS AT 18" (SEE DETAIL). MIN. EMBEDMENT OF ALL STAKES IS 18".
5. LIVE STAKES MAY BE POUNDED DIRECTLY INTO VERY SOFT SOIL. FOR COMPACT OR GRAVELLY SOILS, OR INSTALLATION THROUGH COIR LOGS, FORM HOLE IN SUBGRADE WITH REBAR OR STEEL BAR SIZED TO ACCOMMODATE THE DIAMETER OF THE LIVE STAKE. CAREFULLY PLANT STAKE IN HOLE. DO NOT BREAK LEAF NODES. INSTALL STAKES WITH A MINIMUM OF 4 NODES BELOW GRADE AND 3 NODES ABOVE GRADE. BACKFILL HOLE AND TAMP TO FILL VOID SPACES.



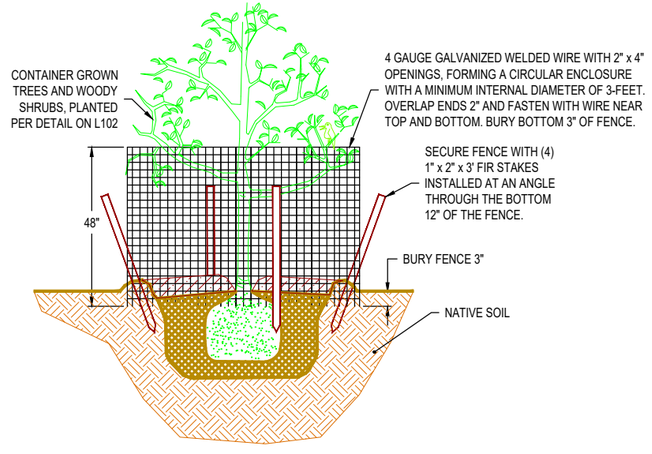
HORIZONTAL GRADIENT



SLOPE GRADIENT

LIVE STAKE PLANTING DETAIL

NOT TO SCALE



WILDLIFE PROTECTION DETAIL

NOT TO SCALE

CITY OF MERCER ISLAND
MERCER ISLAND PUBLIC WORKS
9601 SE 36TH STREET
MERCER ISLAND, WA 98040
206-275-7608
WWW.MERCERISLAND.GOV/PUBLICWORKS

RH2

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS		
##	DATE	DESCRIPTION

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CHECKED	ALP
COORDINATE	WA83-NF
FILE NAME	wcsd-d-mit
PLOTTED SCALE	0 1/2 1

SUBBASIN 46.3 WATERCOURSE STABILIZATION PROJECT

PLANTING DETAILS

JOB NUMBER 2008561 (RH2 JOB NO. 24-0025)

SHEET NUMBER L102

SHEET 14 OF 14

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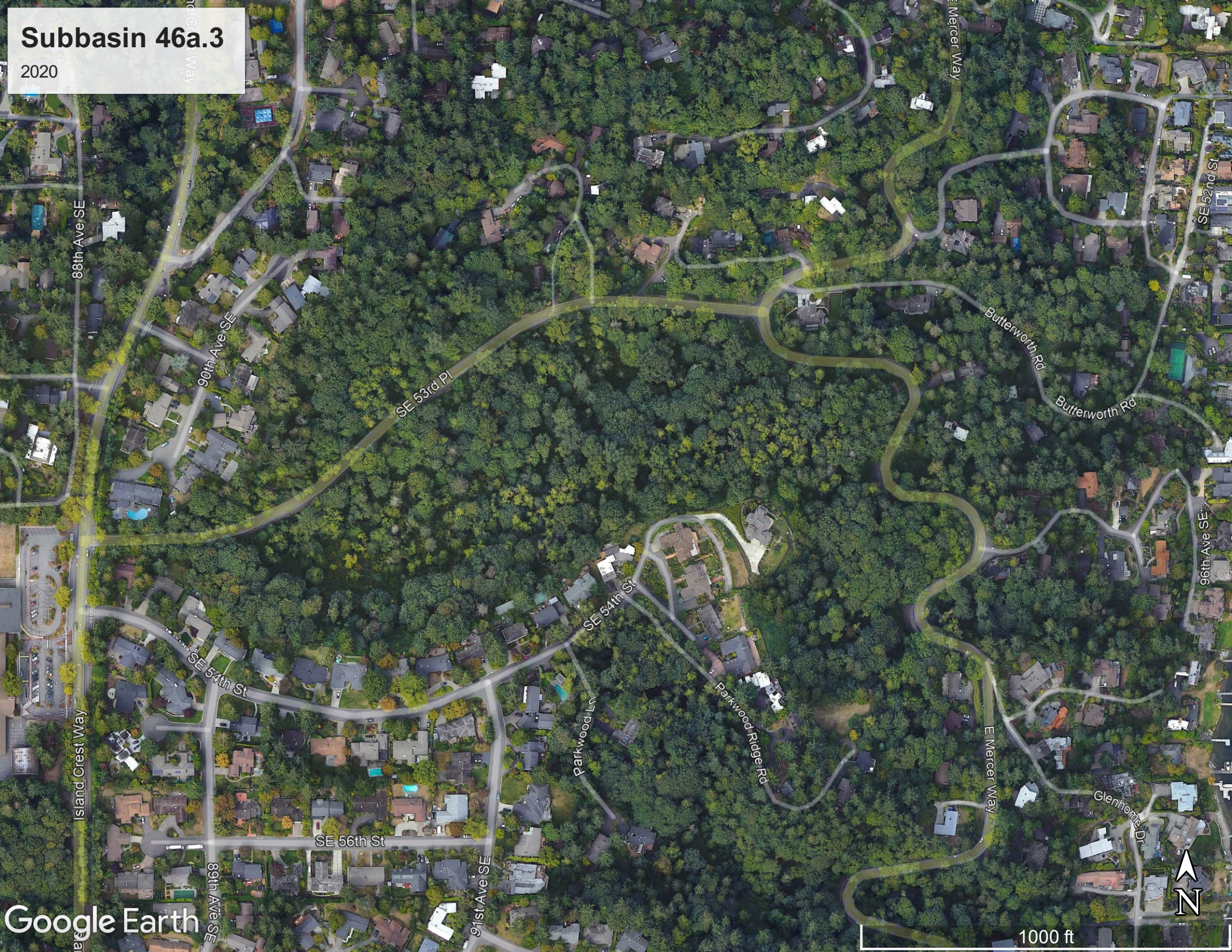
Appendix C

Background Maps and Data

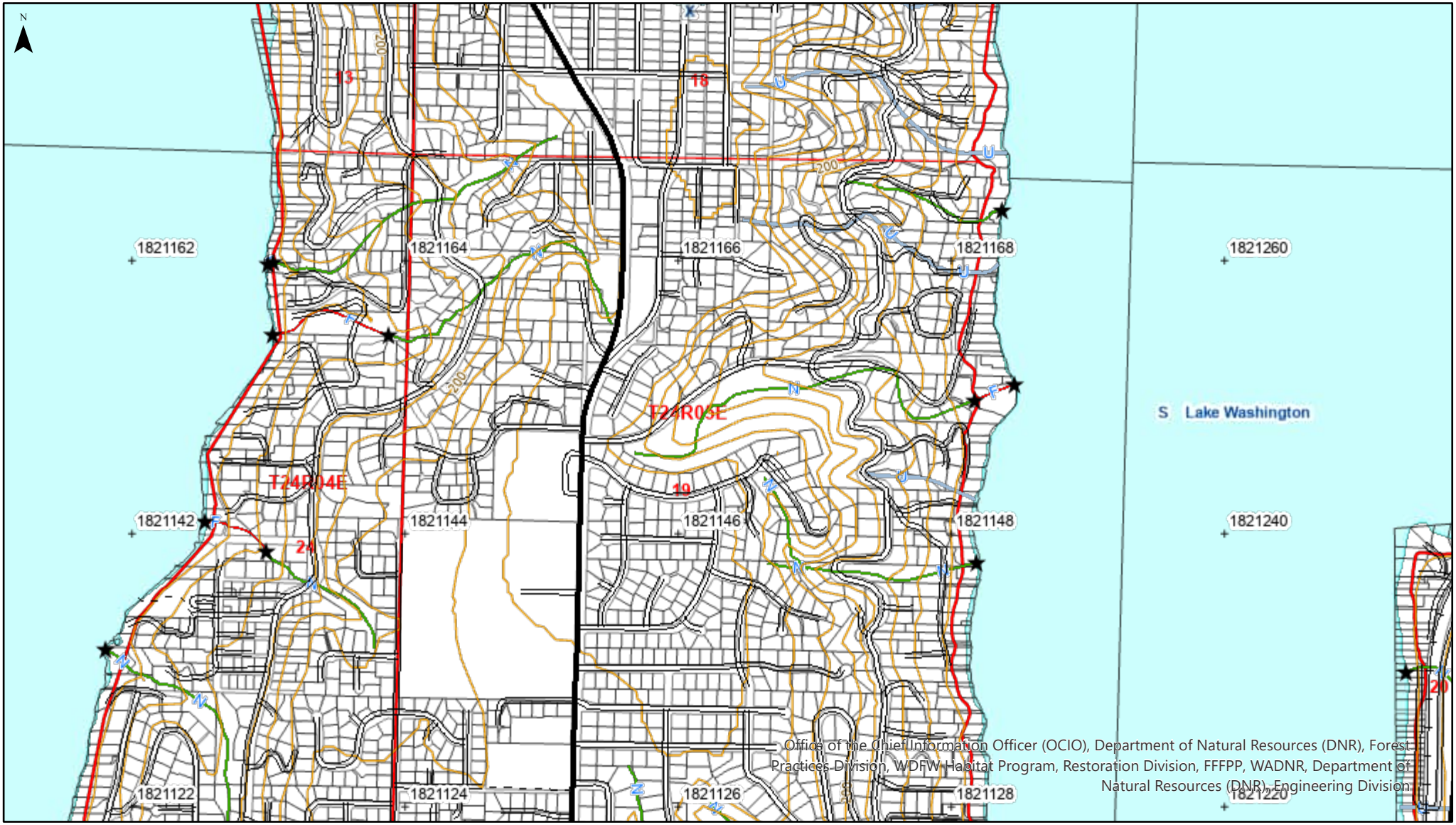

Subbasin 46a.3
1990
88th Ave SE
90th Ave SE
SE 53rd Pl
Butterworth Rd
Butterworth Rd
96th Ave SE
SE 54th St
SE 54th St
Parkwood Ln
Parkwood Ridge Rd
E Mercer Way
Glenhome Dr
SE 56th St
Island Crest Way
88th Ave SE
91st Ave SE
Google Earth
Image U.S. Geological Survey
N
1000 ft


Subbasin 46a.3
2002
88th Ave SE
90th Ave SE
SE 53rd Pl
Butterworth Rd
Butterworth Rd
SE 52nd St
96th Ave SE
SE 54th St
SE 54th St
Parkwood Ln
Parkwood Ridge Rd
E Mercer Way
Glenhome Dr
Island Crest Way
SE 56th St
88th Ave SE
91st Ave SE
N
1000 ft
Google Earth
Image U.S. Geological Survey


Subbasin 46a.3
2010
88th Ave SE
90th Ave SE
SE 53rd Pl
Butterworth Rd
Butterworth Rd
SE 52nd St
E Mercer Way
96th Ave SE
SE 54th St
SE 54th St
Parkwood Ridge Rd
Parkwood Ct
E Mercer Way
Glenhome Dr
Island Crest Way
SE 56th St
89th Ave SE
91st Ave SE
N
1000 ft
Google Earth


Subbasin 46a.3
2020
88th Ave SE
90th Ave SE
SE 53rd Pl
Butterworth Rd
Butterworth Rd
SE 52nd St
E Mercer Way
96th Ave SE
SE 54th St
SE 54th St
Parkwood Ln
Parkwood Ridge Rd
E Mercer Way
Glenhome Dr
Island Crest Way
SE 56th St
89th Ave SE
91st Ave SE
Google Earth
N
1000 ft

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

S20 T24.0N R05.0E, S13 T24.0N R04.0E, S19 T24.0N R05.0E, S18 T24.0N R05.0E, S24 T24.0N R04.0E

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Extreme care was used during the compilation of this map to ensure its accuracy. However, due to changes in data and the need to rely on outside information, the Department of Natural Resources cannot accept responsibility for errors or omissions, and therefore, there are no warranties that accompany this material.

Approximate Scale :1:12,000

0 500 1,000 2,000 Feet

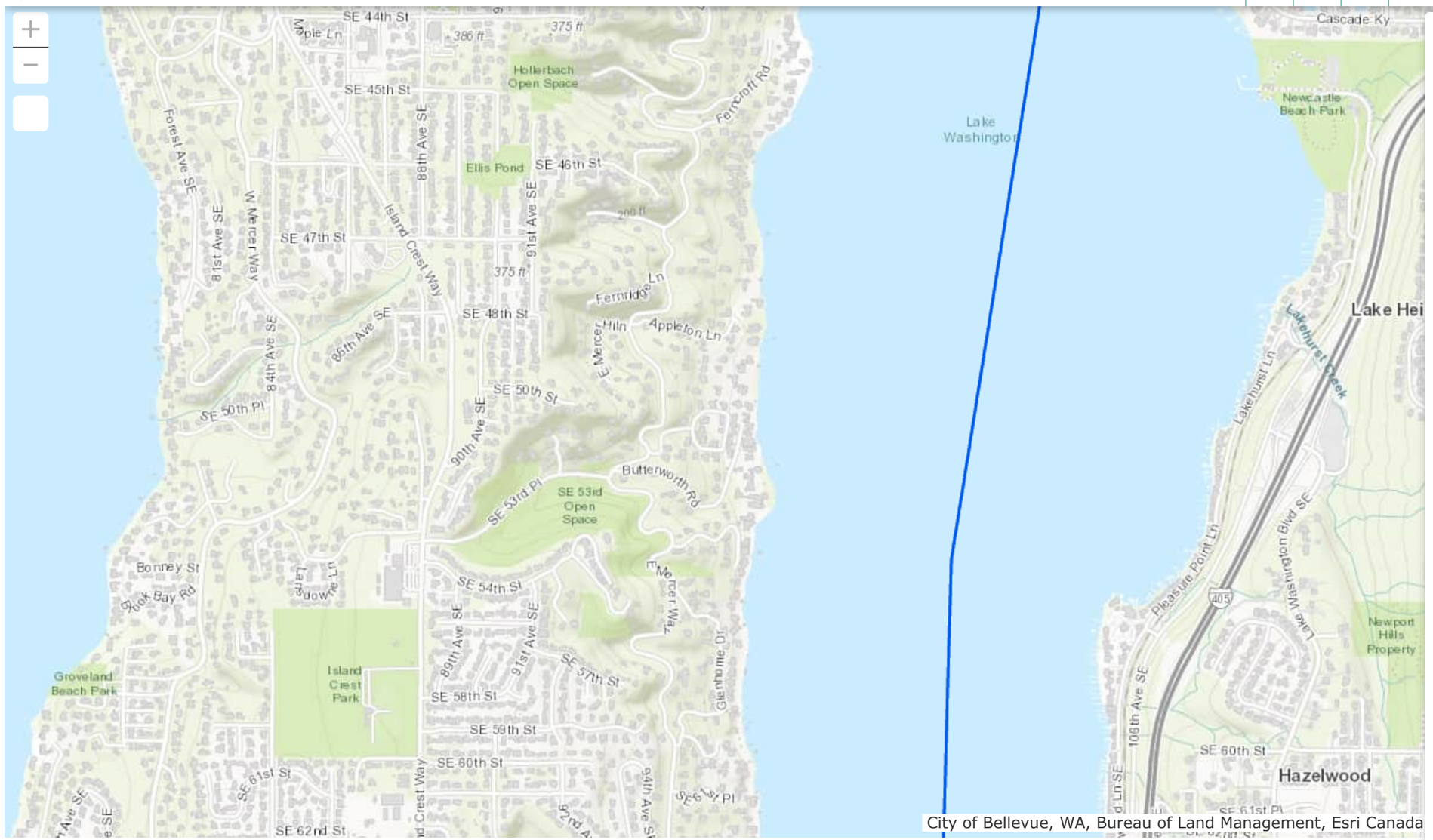
Date: 7/23/2024 Time: 9:48 AM

Legend

- Fish Passable
- Fish Barrier RMAP Obligation
- Fish Barrier Deferred or Not RMAP Obligation
- No Fish
- Fish Passable
- Fish Barrier
- No Fish
- Map Registration Tics
- Water Type Breaks (FP)
- Abandoned
- Orphaned
- Paved Road
- Unpaved Road/Surface Unknown
- Trail
- Railroad
- Railroad Grade
- 40 ft. Contours
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16
- Public Land Survey Sections
- Public Land Survey Townships
- Tribal Cultural Resource Contacts
- County Tax Parcels
- Other Impoundments
- Open Freshwater
- Subject to Inundation
- Glacier / Snowfield
- Wet Area
- Open Saltwater
- Artificial Feature
- County Boundaries

SWIFD

Search for a location



0.2mi

-122.211445 47.560026 Degrees

Legend

Salmon and Steelhead (April 2023)

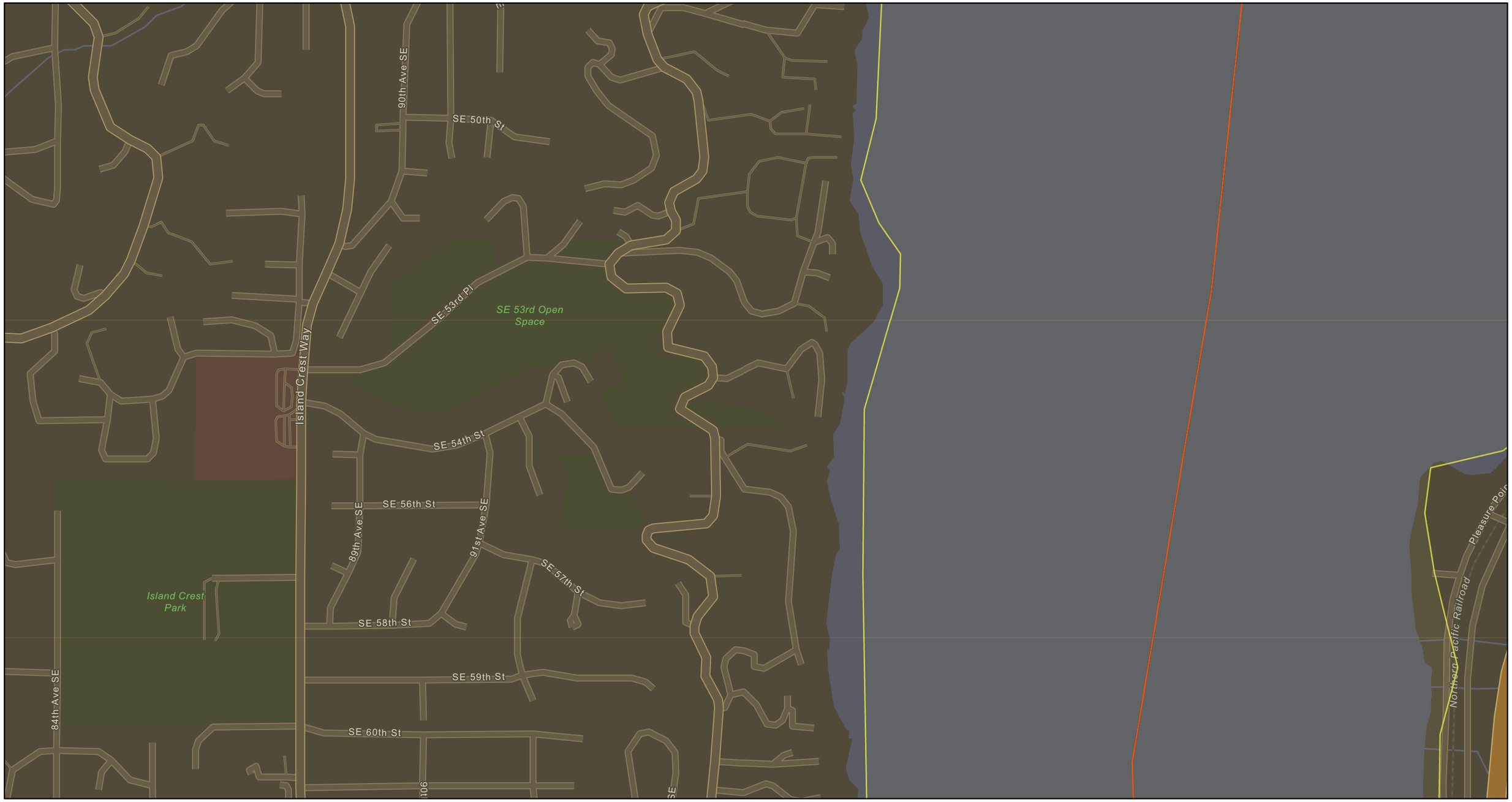
Fall Chinook
- Documented Presence
- Documented Spawning
- Documented Rearing
- Presumed Presence (All Types)
- Gradient Accessible, Presence
- Potential Presence (All Types)
- Document Historic Presence (All Types)
- Transported Presence
- Transported Spawning
- Artificial Presence
- Artificial Spawning

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

Kokanee
- Documented Presence
- Documented Spawning
- Presumed Presence (All Types)
- Potential: Blocked (All Types)

Sockeye
- Documented Presence
- Documented Spawning
- Documented Rearing
- Presumed Presence (All Types)
- Gradient Accessible, Presence

NMFS West Coast Region, Species and Habitat App - Map Export



7/19/2024, 3:34:48 PM

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0 420 840 1,680 ft

0 125 250 500 m

All WCR critical habitat line 20230717

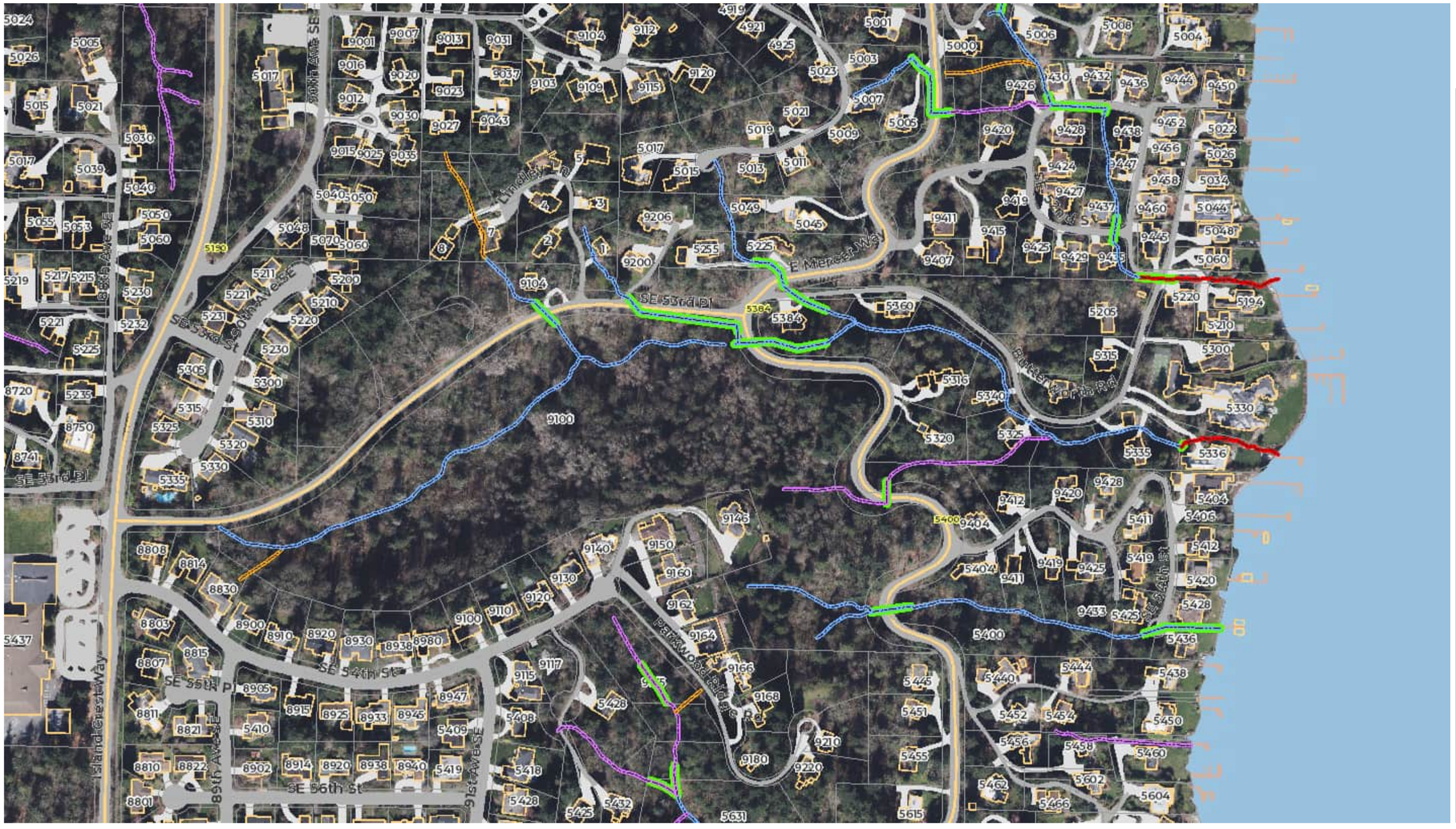
EFH - Highly Migratory Species, Coastal Pelagic Species, Groundfish

EFH - Salmon

Esri Community Maps Contributors, City of Bellevue, WA, King County, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, NOAA National Marine Fisheries Service, West Coast Region, NOAA

Species and Habitat App
NOAA, National Marine Fisheries Service (NMFS), West Coast Region (WCR)

Subbasin 46.3a WtrCrs Stabilization





Legend

- Unpiped Watercourse
  - Type "F" = Fish
  - Type "Np" = Non-Fish
  - Type "Ns" = Non-Fish
  - Type "Np" (Unverified)
  - Type "Ns" (Unverifed)
- Piped Watercourse
- Address
- Building
- Property Line
- Docks
- Freeway
- Major Street
- Street
- Paved Driveway
- Paved Road
- Paved Parking Area
- Lake Washington

March 2020

- Red: Band_1
- Green: Band_2
- Blue: Band_3

1: 3,088

393.7 0 196.85 393.7 Feet

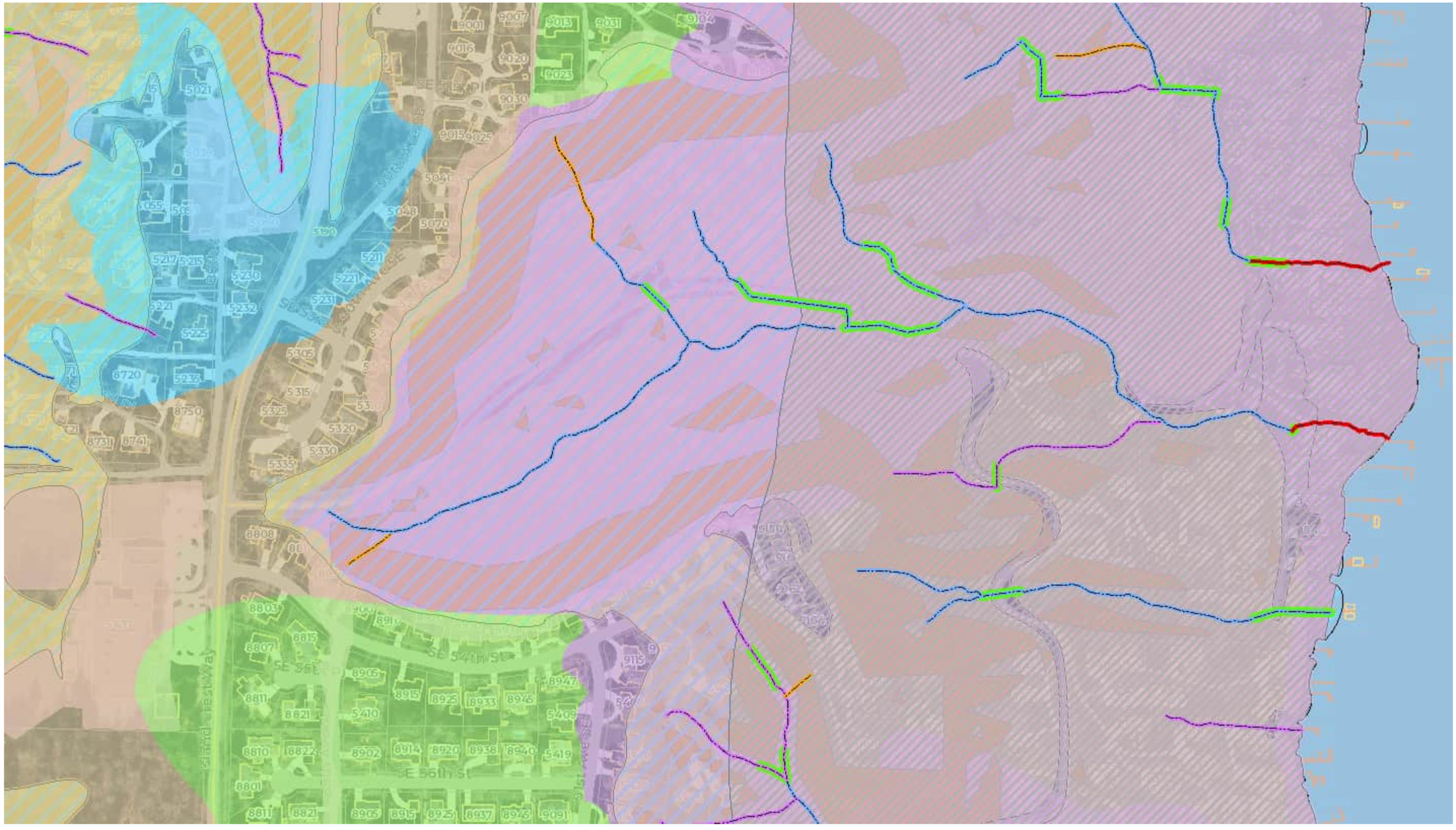
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Map Printed: September 12, 2023

Disclaimer: These maps were developed by the City of Mercer Island and are intended to be a general purpose digital reference tool. These maps are not an accepted legal instrument for describing, establishing, recording or maintaining descriptions for property concerns or boundaries. The City makes no representation or warranty with respect to the accuracy or currency of these data sets, especially in regard to labeling of surveyed dimensions, or agreement with official sources such as records of survey, or mapped locations of features.

Notes

Subbasin 46.3a WtrCrs Stabilization





Legend

- Unpiped Watercourse
  - Type "F" = Fish
  - Type "Np" = Non-Fish
  - Type "Ns" = Non-Fish
  - Type "Np" (Unverified)
  - Type "Ns" (Unverifed)
- Piped Watercourse
- Wind Exposure
- Wind Speed-Up
  - 1.0
  - 1.3
  - 1.6
  - 1.9
- Potential Slide
- Steep Slope
- Seismic
- Erosion
- Address
- Building
- Property Line
- Docks
- Freeway
- Major Street
- Street
- Paved Driveway
- Paved Road
- Paved Parking Area
- Lake Washington
- March 2020
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3

1: 3,088

393.7 0 196.85 393.7 Feet

© City of Mercer Island

Map Printed: September 12, 2023

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Notes

U.S. Fish and Wildlife Service
National Wetlands Inventory

Subbasin 46.3a WtrCrs Stabilization NWI



September 12, 2023

Wetlands

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

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

King County iMap: Sensitive Areas



Legend

- Parcels
- Erosion hazard (1990 SAO)

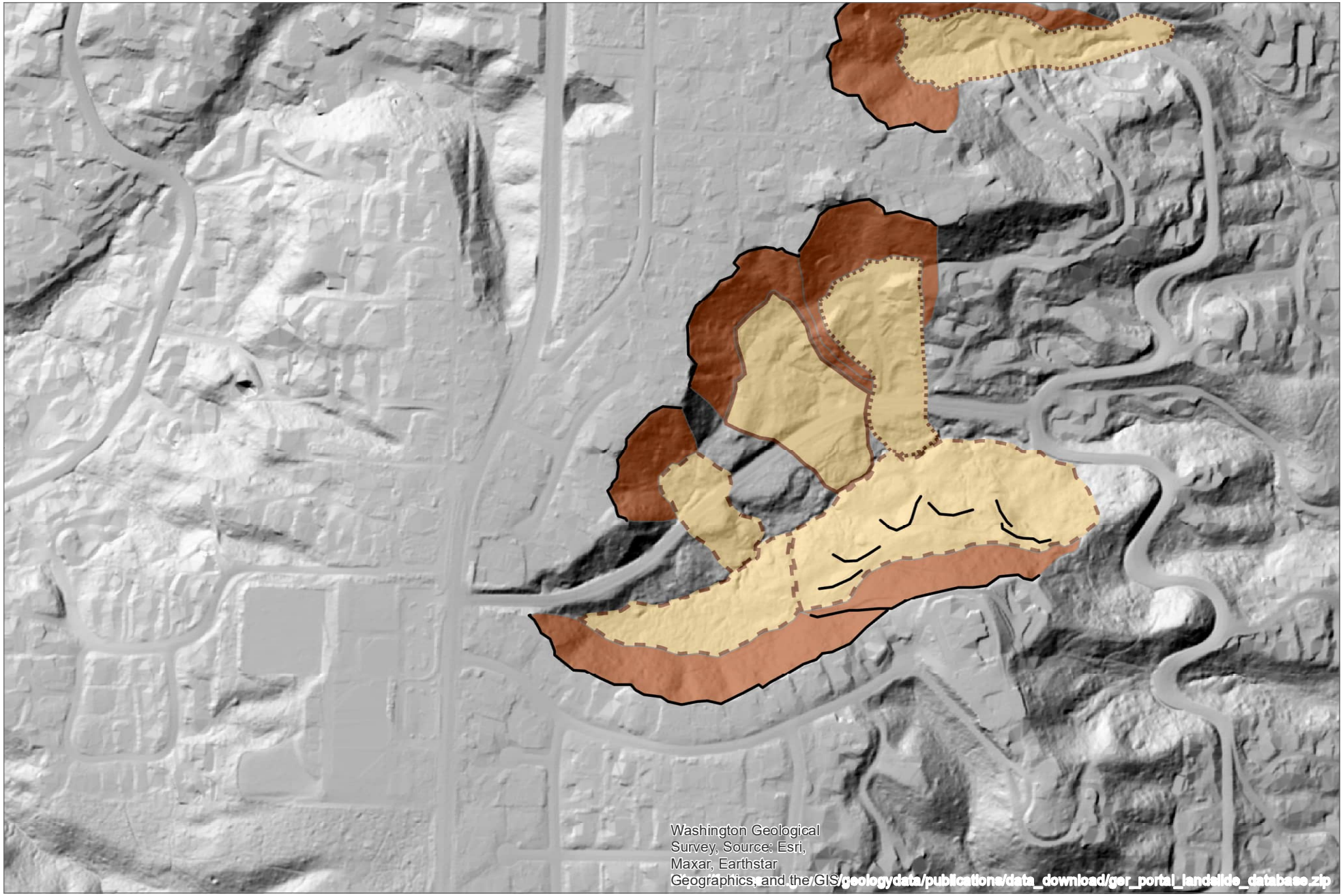
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Date: 7/15/2024 Notes:

N

King County

Mercer Island



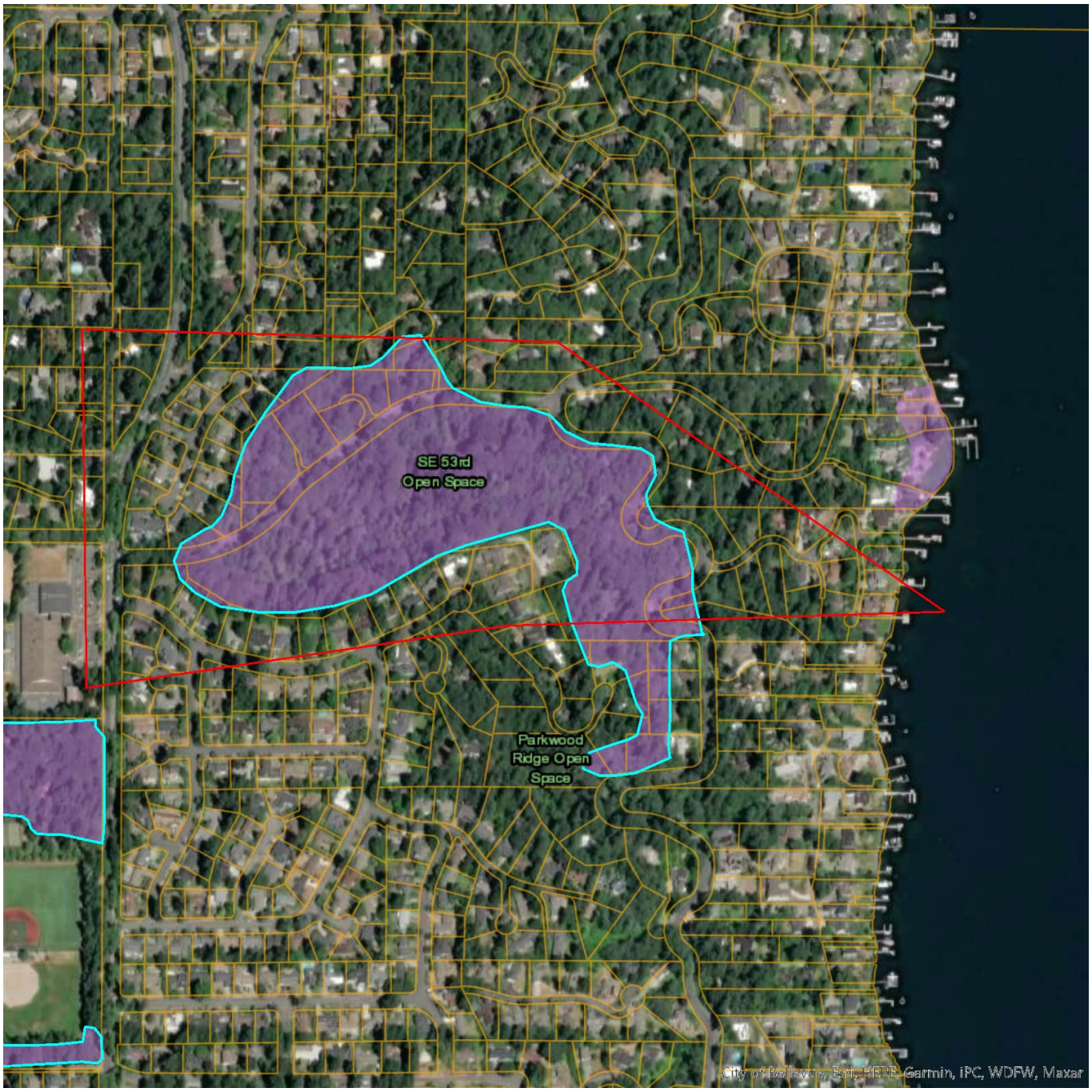
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N

WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
WASHINGTON GEOLOGICAL SURVEY

Geology Portal

Priority Habitats and Species on the Web



Report Date: 09/12/2023

User Comments/Notes:

Sub-basin 46.3a Watercourse Stabilization Design

PHS Species/Habitats Overview:

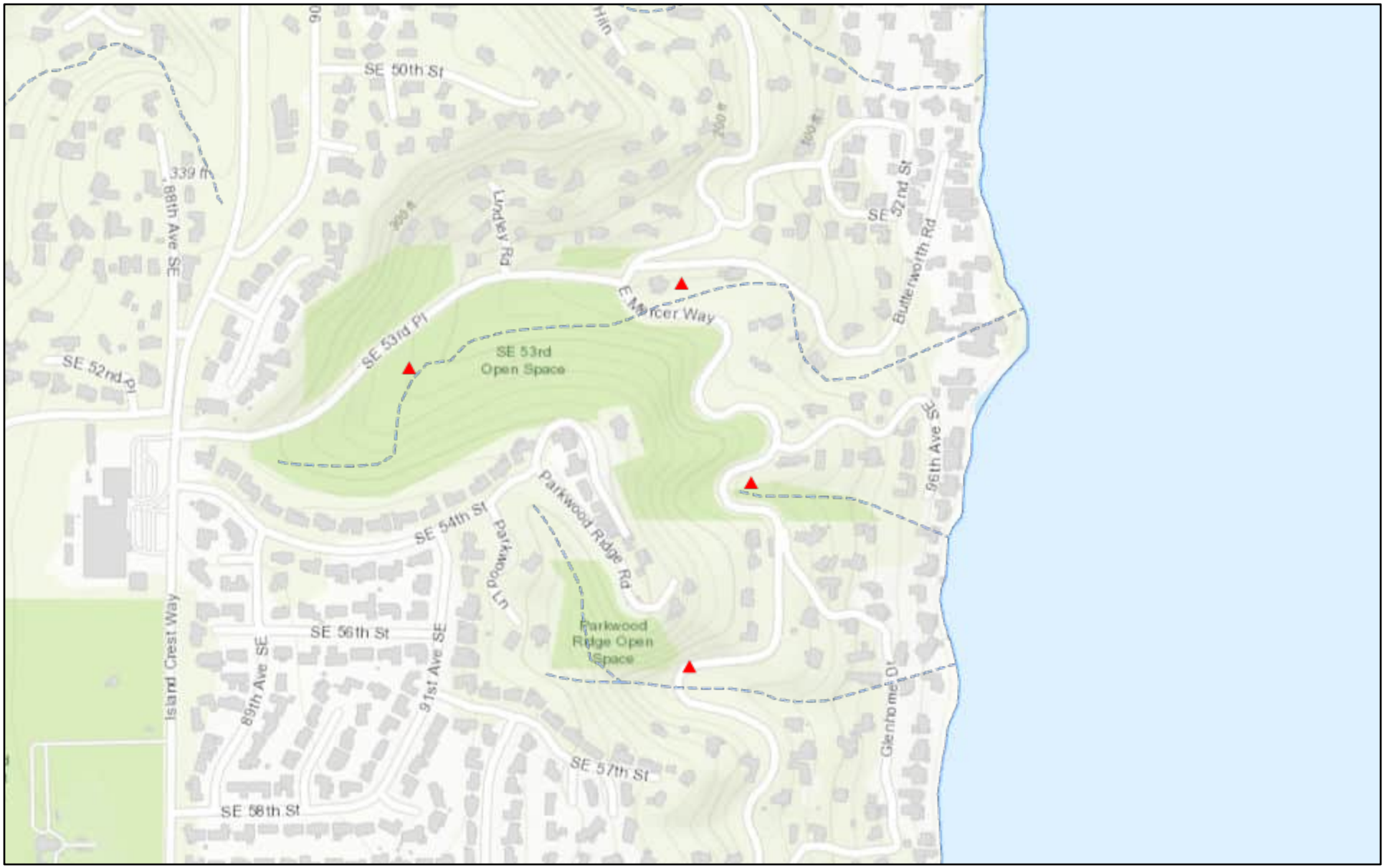
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Biodiversity Areas And Corridor	N/A	N/A	No

PHS Species/Habitats Details:

Biodiversity Areas And Corridor	
Priority Area	Terrestrial Habitat
Site Name	MERCER ISLAND OPEN SPACE AREAS.
Accuracy	1/4 mile (Quarter Section)
Notes	RELATIVELY DENSELY FORESTED TRACTS. SOME STEEP HILLSIDES.
Source Record	902041
Source Dataset	PHSREGION
Source Name	MULLER, TED
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00023
Geometry Type	Polygons

DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necesssary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.

Subbasin 46a.3



July 15, 2024

▲ Total Fish Passage Blockage

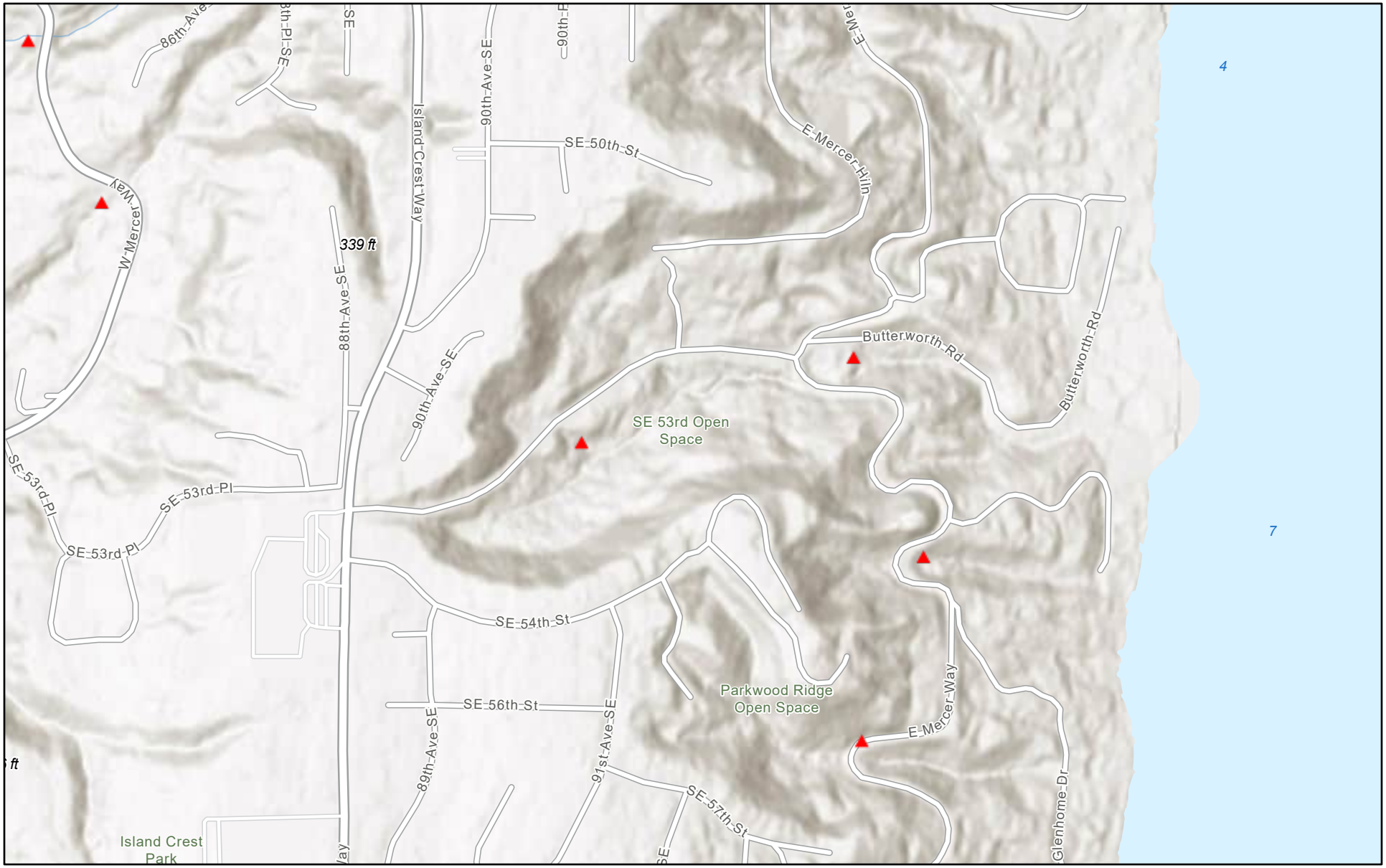
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0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Restoration Division of the DFW Habitat Program, City of Bellevue, WA, County of King, Bureau of Land Management, Esri Canada, Esri, HERE,

Washington State Fish Passage



9/15/2023, 2:52:32 PM

▲ Total Fish Passage Blockage

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Restoration Division of the DFW Habitat Program, Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, City of Bellevue, WA, King

WDFW

Washington Department of
Fish and Wildlife

Fish Passage & Diversion Screening Inventory Database
Report Cover Sheet

The following report is extracted from the Washington Department of Fish and Wildlife's (WDFW) Fish Passage and Diversion Screening Inventory Database (FPDSI). WDFW makes every attempt to keep these reports in sync with FPDSI; however, the dynamic nature of the data and workflows associated with maintaining the database may result in short-term differences.

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- EXIF data presented with Image Reports may be erroneous due to camera battery failures and resetting of camera clock functions.

Abbreviations:

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The FPDSI database often uses default values such as '**-99.99**' or '**-999**' to represent null values.

WDFW Fish Passage and Diversion Screening Inventory Database

Site Description Report

Site ID 920822 **Project** CITY ☐ **Mitigated**

Geographic Coordinates

Latitude (WGS 84):	47.556079
Longitude (WGS 84):	-122.214006
East (NAD 83 HARN):	1,217,192.4
North (NAD 83 HARN)	815,212.6

Waterbody

Stream:	unnamed
Tributary To:	Lake Washington
WRIA:	08
River Mile:	-999.99
Fish Use Potential:	Yes
FUP Criteria:	Physical

General Location

Road Name:	Mercer Way E
Mile Post:	-999.99
County:	King
WDFW Region:	4

Owner

Type:	City
Name:	City of Mercer Island

PI Species

☐ Sockeye	☐ Chinook	☑ Sea Run Cutthroat
☐ Pink	☐ Coho	☑ Resident Trout
☐ Chum	☑ Steelhead	☐ Bull Trout

Associated Features

☐ Culvert	☑ Dam	☐ Natural Barrier	☐ Diversion
☐ Non-Culvert Xing	☐ Other	☐ Fishway	

Location/Directions

The culvert is located under a sharp turn in Mercer Way E just south of the intersection with Butterworth Rd. The outlet is approx. 60 m east of the dam inlet parallel to Mercer Way E.

Site Comments

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database

Dam Assessment Report

Site ID:	**920822**				
Latitude:	**47.556079**	Stream:	**unnamed**	WRIA:	**08**
Longitude:	**-122.214006**	Trib To:	**Lake Washington**	Fish Use Potential:	**Yes**

Data Source

Organization:	Washington Department of Fish and Wildlife		
Field Crew:	Barrett;Metzger;Rains	Review Date:	3/25/2015

Description

Dam Name:		Type:	Other	Operated:	
Resevoir Name:		Span:	Full	Fishway Present:	No
Primary Purpose:	Flood Control	Outlet:	Culvert		

Assessment Parameters

Length (m):	1.2
Height (m):	1.95
Water Surface Difference (m):	1.95
Plunge Pool Depth (m):	-99.99



Results

Barrier:	Yes
Reason:	WS Drop
Passability (%):	0
Recheck:	

Description

Standpipe inlet with a collection pool u/s. Trash rack on the inlet. Culvert outlet (RND, CST, Span=0.42, Rise=0.56, Length=74.61, Slope=5.7, Outfall drop = 1.4 m, Roadfill depth = 7 m, Bankfull = 1.1 m)

Comments

Outlet culvert is dented. Outlets onto rip-rap so the hydraulic drop was taken to the first resting pool. Two stormwater run-off pipes on the LB at the outlet.

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WDFW Fish Passage and Diversion Screening Inventory Database

Dam Assessment Report

Site ID:	**920822**				
Latitude:	**47.556079**	Stream:	**unnamed**	WRIA:	**08**
Longitude:	**-122.214006**	Trib To:	**Lake Washington**	Fish Use Potential:	**Yes**

Potential Habitat Gain

Survey Type:		Rearing (sq m):		Length (m):	
Significant Reach:	Unknown	Spawning (sq m):		**PI Total:**	

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database

Image Report - Active

Site ID:	**920822**				
Latitude:	**47.556079**	Stream:	**unnamed**	WRIA:	**08**
Longitude:	**-122.214006**	Tributary To:	**Lake Washington**	Fish Use Potential:	**Yes**

Associated Features

☐ Culvert	☑ Dam	☐ Natural Barrier	☐ Diversion
☐ Non-Culvert Xing	☐ Other	☐ Fishway	





11/21/2021

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Washington Department of
Fish and Wildlife

Fish Passage & Diversion Screening Inventory Database
Report Cover Sheet

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Abbreviations:

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WDFW Fish Passage and Diversion Screening Inventory Database

Site Description Report

Site ID 920825 **Project** CITY ☐ **Mitigated**

Geographic Coordinates

Latitude (WGS 84):	47.555224
Longitude (WGS 84):	-122.218081
East (NAD 83 HARN):	1,216,179.6
North (NAD 83 HARN)	814,922.7

Waterbody

Stream:	unnamed
Tributary To:	Lake Washington
WRIA:	08
River Mile:	-999.99
Fish Use Potential:	Yes
FUP Criteria:	Physical

General Location

Road Name:	53rd Pl SE
Mile Post:	-999.99
County:	King
WDFW Region:	4

Owner

Type:	City
Name:	City of Mercer Island

PI Species

☐ Sockeye	☐ Chinook	☐ Sea Run Cutthroat
☐ Pink	☐ Coho	☑ Resident Trout
☐ Chum	☐ Steelhead	☐ Bull Trout

Associated Features

☐ Culvert	☑ Dam	☐ Natural Barrier	☐ Diversion
☐ Non-Culvert Xing	☐ Other	☐ Fishway	

Location/Directions

Site Comments

Only fish bearing approx. 30 m u/s. Greater than 12% gradient.

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database

Dam Assessment Report

Site ID:	**920825**				
Latitude:	**47.555224**	Stream:	**unnamed**	WRIA:	**08**
Longitude:	**-122.218081**	Trib To:	**Lake Washington**	Fish Use Potential:	**Yes**

Data Source

Organization:	Washington Department of Fish and Wildlife		
Field Crew:	Barrett;Metzger;Rains	Review Date:	3/26/2015

Description

Dam Name:		Type:	Concrete	Operated:	Year Round
Resevoir Name:		Span:	Full	Fishway Present:	No
Primary Purpose:	Flood Control	Outlet:	Culvert		

Assessment Parameters

Length (m):	1.6
Height (m):	-999.99
Water Surface Difference (m):	1.55
Plunge Pool Depth (m):	-99.99



Results

Barrier:	Yes
Reason:	WS Drop
Passability (%):	0
Recheck:	

Description

Inaccessible capped standpipe u/s. Outlets into RND CST culvert (Span - 0.65, Rise - 0.77, Water Depth in Culvert - 0.01, Outlet hydraulic drop - 0.55, Length - 32.56, Slope - 18%, BFW - 0.78).

Comments

Could not access the inside of the standpipe to collect height information.

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WDFW Fish Passage and Diversion Screening Inventory Database

Dam Assessment Report

Site ID:	**920825**				
Latitude:	**47.555224**	Stream:	**unnamed**	WRIA:	**08**
Longitude:	**-122.218081**	Trib To:	**Lake Washington**	Fish Use Potential:	**Yes**

Potential Habitat Gain

Survey Type:		Rearing (sq m):		Length (m):	
Significant Reach:	No	Spawning (sq m):		**PI Total:**	

11/21/2021

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WDFW Fish Passage and Diversion Screening Inventory Database

Image Report - Active

Site ID:	**920825**				
Latitude:	**47.555224**	Stream:	**unnamed**	WRIA:	**08**
Longitude:	**-122.218081**	Tributary To:	**Lake Washington**	Fish Use Potential:	**Yes**

Associated Features

☐ Culvert	☑ Dam	☐ Natural Barrier	☐ Diversion
☐ Non-Culvert Xing	☐ Other	☐ Fishway	





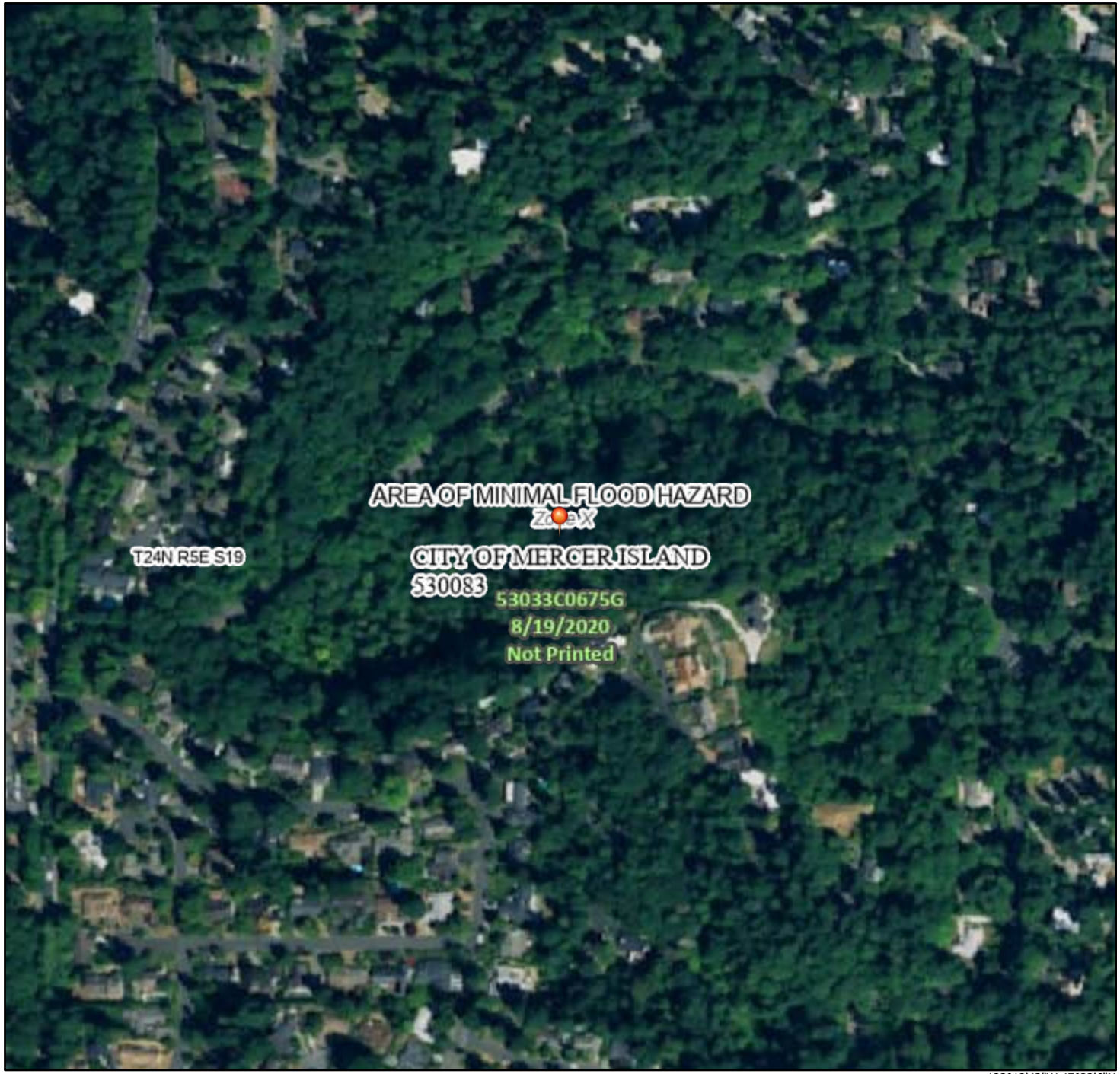
11/21/2021

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National Flood Hazard Layer FIRMette

FEMA

122°13'19"W 47°33'31"N



Feet
0 250 500 1,000 1,500 2,000

1:6,000

122°12'42"W 47°33'6"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/15/2024 at 4:16 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

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



February 23, 2024

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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AmB—Arents, Alderwood material, 0 to 6 percent slopes.....14
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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: 1:2,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

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 19, Aug 29, 2023

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	15.2	88.1%
AmB	Arents, Alderwood material, 0 to 6 percent slopes	2.1	11.9%
Totals for Area of Interest		**17.3**	**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: Moraines, eskers, kames
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

AmB—Arents, Alderwood material, 0 to 6 percent slopes

Map Unit Setting
National map unit symbol: 1hmsp
Elevation: 160 to 590 feet
Mean annual precipitation: 35 to 60 inches
Mean annual air temperature: 50 degrees F
Frost-free period: 150 to 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Arents, alderwood material, and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents, Alderwood Material

Setting

Landform: Till plains
Parent material: Basal till

Typical profile

H1 - 0 to 26 inches: gravelly sandy loam
H2 - 26 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: 20 to 40 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 16 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B/D
Hydric soil rating: No

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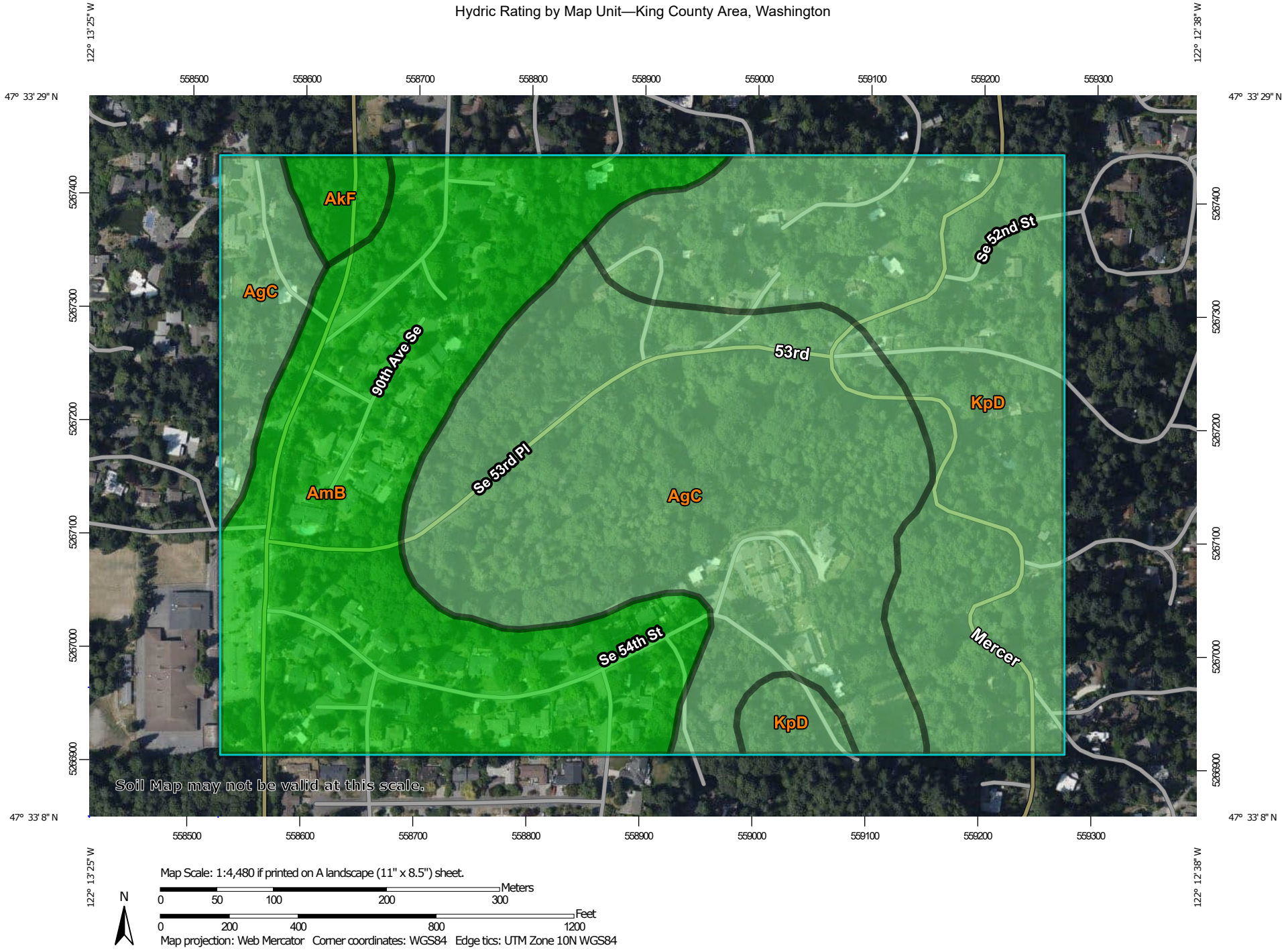
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Map Scale: 1:4,480 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

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 19, Aug 29, 2023

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	37.1	37.8%
AkF	Alderwood and Kitsap soils, very steep	0	1.6	1.7%
AmB	Arents, Alderwood material, 0 to 6 percent slopes	0	31.3	31.9%
KpD	Kitsap silt loam, 15 to 30 percent slopes	3	28.1	28.6%
Totals for Area of Interest			**98.1**	**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:

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

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Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix D

Site Photographs

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



View facing downstream at Station 10+00 along stream.



View of Seep 1 entering the Sub-Basin 46a.3 Stream.



View facing up Tributary 3.



View facing downstream at Station 9+00 along stream.



View facing up Seep 2 from the Sub-Basin 46a.3 Stream.



View facing downstream at Station 8+00 along stream.

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



View facing up Seep 3 from the Sub-Basin 46a.3 Stream.



View facing downstream at Station 7+00 along stream.



View facing downstream at Station 6+00 along stream.



View facing downstream at Station 5+00 along stream.



A view facing up Tributary 2 from the Sub-Basin 46a.3 Stream.



View facing downstream at Station 4+00 along stream.

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



Left: Tributary 1, downstream of the project reach, showing base flows and facing Watercourse 46a.3 in the background.



Right: Loose soil near Watercourse 46a.3 stream channel.



A general view of Wetland A (Cat. III).



Wetland B (Cat. III) from Watercourse 46a.3.



A view of the sediment pond at E Mercer Way, facing upstream.



Sandy soil in central 53rd Place Open Space area, north of Watercourse 46a.3, facing east.

Site Photographs — Sub-Basin 46a.3 Watercourse Stabilization Design — Mercer Island

Critical Areas Delineations and Geologic Hazard Site Visit— Photos taken February 9, 2024 and April 23-24, 2024



Left: Sandy silt soil exposed on scarp-like feature.



Right: Silty soil near Watercourse 46a.3 channel in hummocky ground.



Trees growing on scarp-like feature.



Stiff silty soil in Watercourse 46a.3 stream channel.



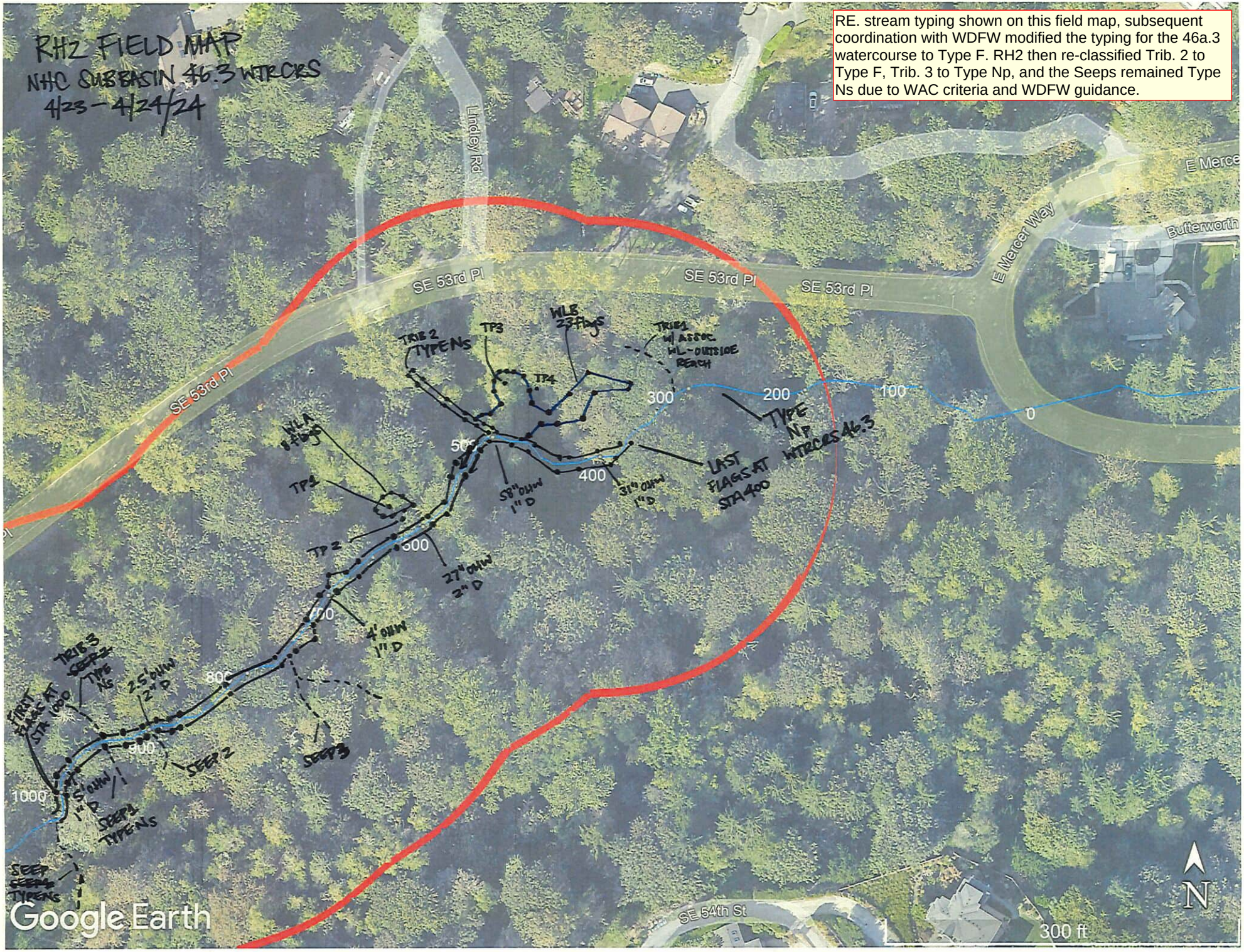
Vertical tree perched above scarp-like feature.



Vertical trees and dry soil in south central 53rd Place Open Space area.

Appendix E

Site Investigation Data and Maps


RH2 FIELD MAP
NHC SUBBASIN 46.3 WTRCRS
4/23 - 4/24/24
RE. stream typing shown on this field map, subsequent coordination with WDFW modified the typing for the 46a.3 watercourse to Type F. RH2 then re-classified Trib. 2 to Type F, Trib. 3 to Type Np, and the Seeps remained Type Ns due to WAC criteria and WDFW guidance.
Lindley Rd
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
E Mercer Way
Butterworth
E Merce
TRIB 2 TYPE Ns
TP3
WLB 23 flags
TRIB 1 W/ ASSOC WL-OUTSIDE REACH
TP4
300
200
100
0
TYPE Np WTRCRS 46.3
WLA 9 flags
TP1
500
58" DHW 1" D
400
31" DHW 1" D
LAST FLAGS AT STA 400
TP2
300
27" DHW 2" D
200
4' DHW 1" D
TRIB 3 SEEP 1 TYPE Ns
2.5' DHW 2" D
800
FIRST FLAGS AT STA 1000
900
SEEP 2
SEEP 3
1000
5' DHW 1" D
SEEP 1 TYPE Ns
SEEP
SEEP
TYPE Ns
SE 54th St
Google Earth
N
300 ft

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

Project/Site: Subbasin 46.3a Watercourse Stabilization City/County: City of Mercer Island Sampling Date: 4/23/2024
Applicant/Owner: City of Mercer Island State: WA Sampling Point: TP-1
Investigator(s): A. Pettibone, S. Netherland, N. Bloxton Section, Township, Range: 19, 24 North, 05 East
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 20
Subregion (LRR): LRR A - WMVC Lat: 47.5556446 Long: -122.2169474 Datum: WGS 84
Soil Map Unit Name: Alderwood gravelly sandy loam 8-15% slopes 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	40	Y	FAC
2.			
3.			
4.			
	40 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Ribes spectabilis	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Equisetum arvense	25	Y	FAC
2. Ranunculus repens	40	Y	FAC
3. Rubus ursinus	15	N	FACU
4. Cardamine pensylvanica	2	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	82 = Total Cover		

Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 18

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: "Abnormally dry" conditions documented per US Drought Monitor & APT confirmed conditions w/ "drier than normal" rating

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
0-3	10YR 4/2	100					SiCl Lo	
3-13	10YR 4/2	60	2.5Y 4/1	20	D	M	SaCl Lo	Coarse to very coarse
			10YR 5/6	20	C	M, PL		Fine to medium
13-16	10YR 4/2	75	7.5YR 4/4	5	C	M	SaCl Lo	Very coarse
			2.5Y 4/1	20	D	M		Coarse to very coarse
								Redox features were common, fine, and faint to distinct in appearance

[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): 0.5

Water Table Present? Yes ✓ No ___ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 12

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Surface water at site approximately ½" deep and ~ 8 ft from test pit.

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

Project/Site: Subbasin 46.3a Watercourse Stabilization City/County: City of Mercer Island Sampling Date: 4/23/2024
Applicant/Owner: City of Mercer Island State: WA Sampling Point: TP-2
Investigator(s): A. Pettibone, S. Netherland, N. Blanton Section, Township, Range: 19, 24 North, 05 East
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 30
Subregion (LRR): LRR A – WMVC Lat: 47.5556255 Long: -122.2169046 Datum: WGS 84
Soil Map Unit Name: Alderwood gravelly, sandy loam 8-15% slopes NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	15	Y	FAC
2.			
3.			
4.			
	15 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus spectabilis	10	Y	FAC
2. Thuja plicata	5	Y	FAC
3.			
4.			
5.			
	15 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Equisetum arvense	15	N	FAC
2. Ranunculus repens	20	Y	FAC
3. Circaea alpina	40	Y	FAC
4. Fragaria vesca	10	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		

Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 15

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:
"Abnormally dry" conditions documented per US Drought Monitor & APT confirmed conditions w/ "drier than normal" rating

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
0-4	10YR 3/2						loam	
4-14	10YR 4/3						Salo	
14-16	10YR 4/3	96	10YR 4/2	2	D	M	Cl Lo	Very coarse
			7.5YR 4/4	2	C	M		Coarse
								Redox features were
								few, fine, and faint to
								distinct in appearance

[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): 16"

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: Sub-basin 46.3a Watercourse Upb. City/County: M-I | King Sampling Date: 4/23/24
Applicant/Owner: City of Mercer Island State: WA Sampling Point: TP-3
Investigator(s): a. pettibone, n. bloxton, s. netherland, RH2 Section, Township, Range: 19, 24 North, 05 East
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): slope Slope (%): 15%
Subregion (LRR): LRR A – WMVC Lat: 47.559264 Long: -122.216904 Datum:
Soil Map Unit Name: Alderwood gravelly sandy loams 8-15% slopes NWI classification: NA
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	40%	Y	FAC
2. Acer circinatum	10%	Y	FAC
3.			
4.			
	50% = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus spectabilis	30%	Y	FACW
2. Picea sitchensis	5%	N	FAC
3. Thuja plicata	2%	N	FAC
4.			
5.			
	37% = Total Cover		
Herb Stratum (Plot size: 5')			
1. Athyrium felix-femina	5%	Y	FAC
2. Equisetum arvense	5%	Y	FAC
3. Urtica dioica	3%	N	FAC
4. Tolmiea menziesii	7%	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20% = Total Cover		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 80%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (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:
"Abnormally dry" conditions documented per US Drought Monitor
"Drier than Normal" conditions per APT

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)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16"	10YR 2/1	100%	—	—	—	—	silty muck	mostly muck, but a little gravels

[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): <1"

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

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 10"

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: Sub-basin 46.3a Watercourse Stabilization City/County: Mercer Island / King Sampling Date: 4/23/24

Applicant/Owner: State: WA Sampling Point: TP-4

Investigator(s): a. pethbone, n bloxton, s. netherland Section, Township, Range: 19, 24 North, 05 East

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 20%

Subregion (LRR): LRR A – WMVC Lat: 47.5559366 Long: -122.2164389 Datum:

Soil Map Unit Name: Alderwood gravelly sandy loam, 15 to 30 % slopes NWI classification: NA

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. Tsuga heterophylla	15%	Y	FACU
2. acer circinatum	5%	N	FAC
3. acer macrophyllum	30%	Y	FACU
4.			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. rubus spectabilis	40%	Y	FAC
2. acer circinatum	15%	Y	FAC
3.			
4.			
5.			
	55% = Total Cover		

Herb Stratum (Plot size: 5')			
1. urtica dioica	10%	Y	FAC
2. polystichum munitum	40%	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50% = Total Cover		

Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 50%

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (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:

"Abnormally dry" conditions per US Drought Monitor

"Drier than Normal" conditions per AFT

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)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	10YR 3/2	100%	—	—	—	—	loam	fine fibrous roots
8-10"	2.5Y 4/3	99%	10YR 3/6	1%	C	M	SiCL	fine, few, prominent redox
10-16"	10YR 4/3	100%	—	—	—	—	SaLo	cobbles
								redox features were
								few, fine and faint
								in appearance.

[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 name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Subbasin 46.32 Wtrcrs - Wetland A Date of site visit: 4/23/24

Rated by S. Netherland, J. Pettibone, N. Bloxton Trained by Ecology? ✓Yes ___No Date of training 4/19/24 & 3/2023

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 ESRI Maps

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	6	3	7	16

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	N/A

Wetland name or number A

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	1
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 A

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 A

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 A

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	1
Total for S 1 — Add the points in the boxes above	1

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)	0
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	3

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

Wetland name or number A

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	0

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	0
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	0

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 A

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

1

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**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

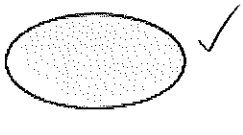
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

If you counted: > 19 species	points = 2
~~5 - 19 species~~ alder, piggyback, equisetum, fragaria, oxalis, lady fern	✓ points = 1
< 5 species	points = 0

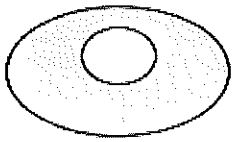
1

H 1.4. Interspersion of habitats

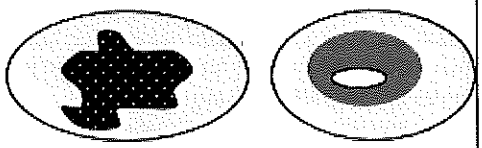
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always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



None = 0 points



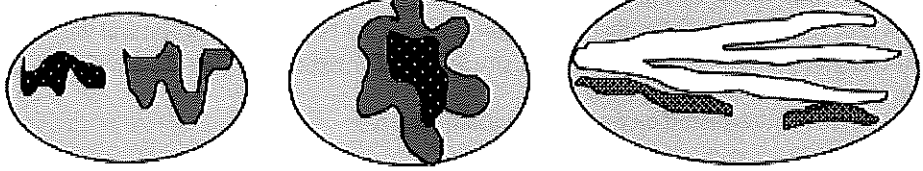
Low = 1 point



Moderate = 2 points

0

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



Wetland name or number A

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)	2
Total for H 1 — Add the points in the boxes above	5

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 5 + [(% moderate and low intensity land uses)/2] 45 = 50 % 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	3
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 5 + [(% moderate and low intensity land uses)/2] 45 = 50 % 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	5

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 A

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 A

— **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 A

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 A

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

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Subbasin 46.32 Wtrces - Wetland B Date of site visit: 4/23/24

Rated by S, Nether land, Spethbone, n.blaker Trained by Ecology? ✓ Yes ___ No Date of training 4/19/24 & 3/23

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 ESRI Maps

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			TOTAL
	Circle the appropriate ratings									
Site Potential	H	M	(L)	H	M	(L)	H	(M)	L	
Landscape Potential	H	(M)	L	H	(M)	L	(H)	M	L	
Value	(H)	M	L	H	M	(L)	(H)	M	L	
Score Based on Ratings	6			4			8			18

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
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	N/A

Wetland name or number B

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	1
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 B

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 B

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 B

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	2
Total for S 1 — Add the points in the boxes above	2

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)	0
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	3

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

Wetland name or number B

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 (circled)	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 (circled) 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 (circled)	0
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 (circled)	0
Total for S 6 — Add the points in the boxes above	0

Rating of Value If score is: __2-4 = H ___1 = M ✓0 = L *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number B

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

2

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
- ✓ Seasonally flooded or inundated
- ___ Occasionally flooded or inundated
- ✓ Saturated only
- ___ 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**

4 or more types present: points = 3
✓ 3 types present: (points = 2)
2 types present: points = 1
1 type present: points = 0

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft².

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

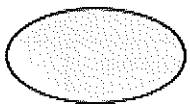
If you counted: > 19 species — points = 2
(5 - 19 species) — points = 1
< 5 species — points = 0

alder, skunk cabbage, salmonberry, vine maple, equisetum, piggyback plant

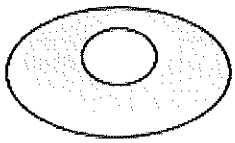
1

H 1.4. Interspersion of habitats

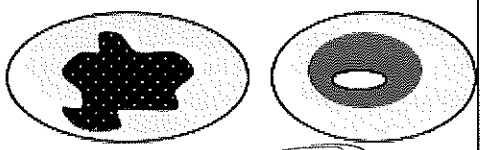
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always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



None = 0 points

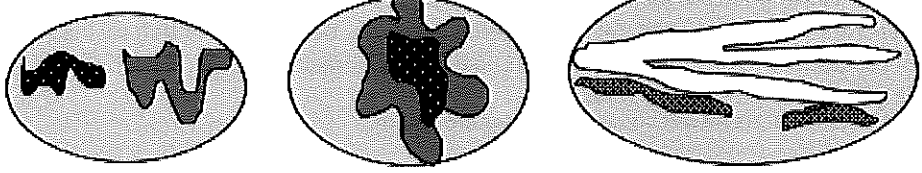


Low = 1 point



Moderate = 2 points

All three diagrams in this row are High = 3 points



2

Wetland name or number B

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	10

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___ + [(% moderate and low intensity land uses)/2]___ = _____% 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 Provided by WATOR	3
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat___ + [(% moderate and low intensity land uses)/2]___ = _____% 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 Provide by WATOR	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	5

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 B

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 B

— **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 B

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

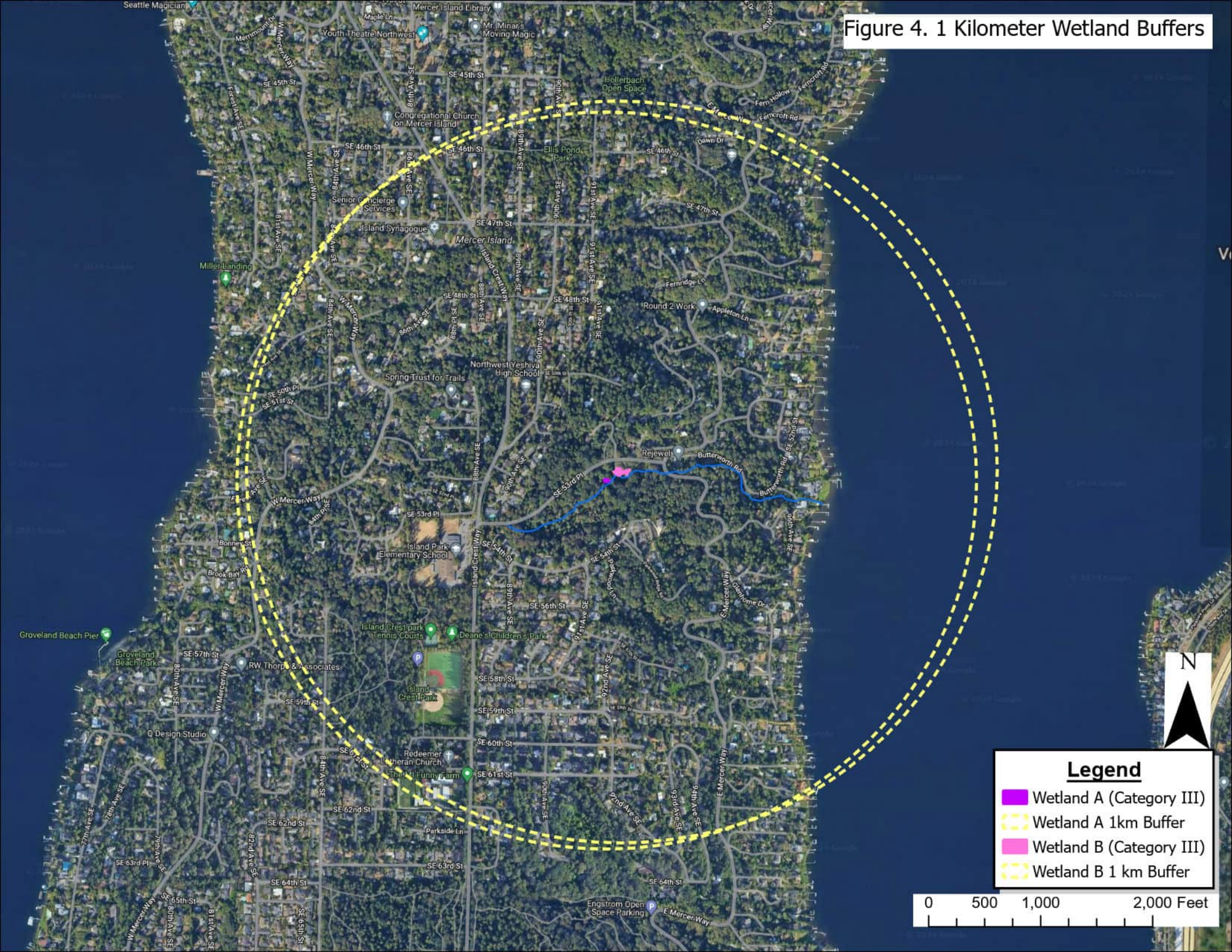
Wetland name or number B

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


Figure 1. Cowardin Classes and 150 ft Buffer
Lindley Rd
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
SE 53rd P
Tributary 2, Type F
Wetland B, Cat. III
Wetland A, Cat. III
Subbasin 46a.3 Stream, Type F
Tributary 3, Type Np
100
200
300
400
500
600
700
800
900
1000
N
Legend
RH2 Delineated Wetlands
Wetland Test Pits
150 ft Buffer
Seeps (Type Ns)
Subbasin 46a.3 stream
Mercer Stationing
Cowardin Classes
Emergent
Forested
Scrub-Shrub
0
37.5
75
150 Feet

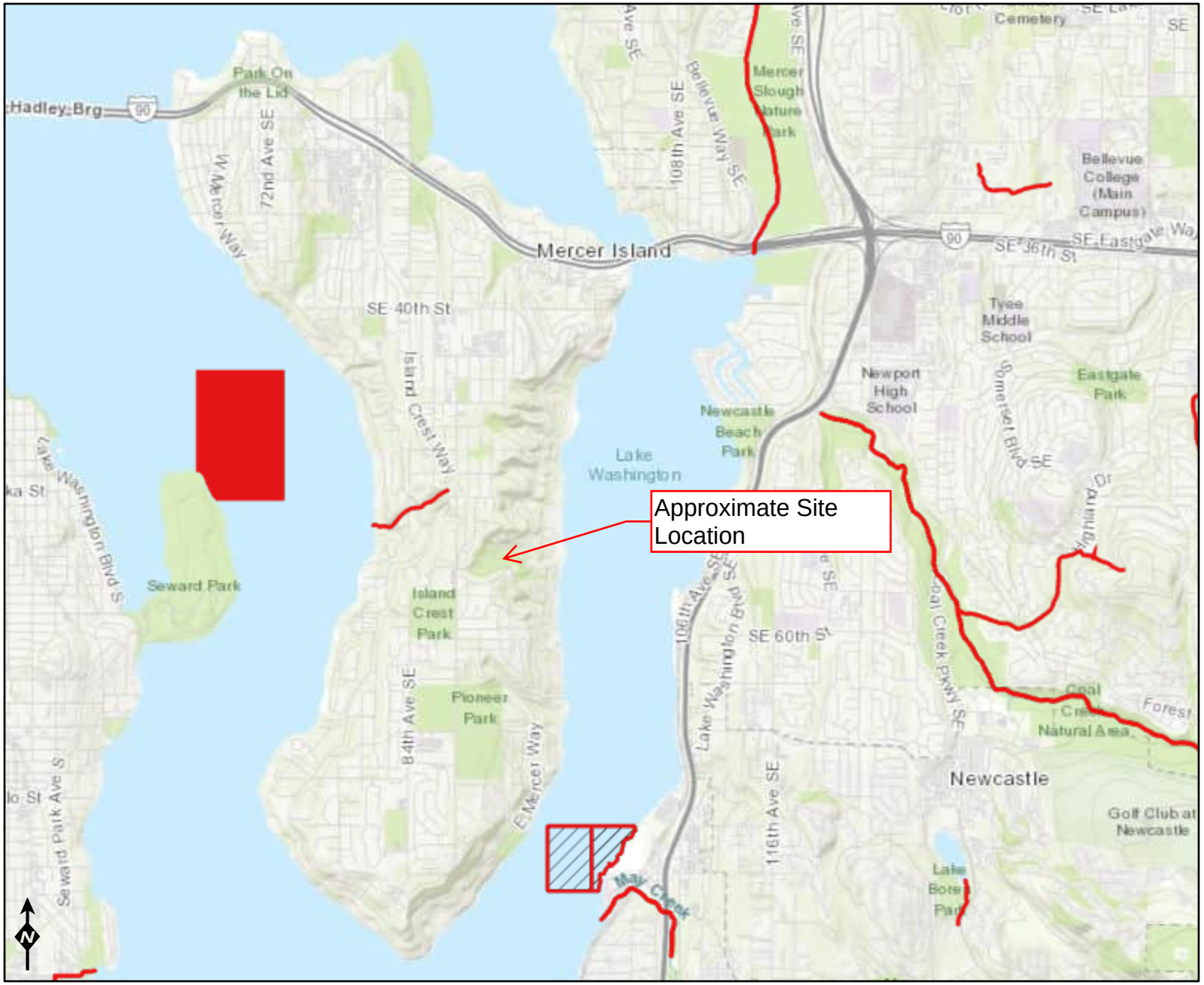

Figure 2. Wetland Hydroperiods
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
Lindley Rd
Tributary 2, Type F
Wetland B, Cat. III
Wetland A, Cat. III
300
400
500
600
700
800
Subbasin 46a.3 Stream, Type F
N
Legend
Seeps (Type Ns)
Subbasin 46a.3 stream
Mercer Stationing
Hydroperiods
Saturated Only
Seasonally Flooded
0
25
50
100 Feet


Figure 3. Plant Cover
Lindley Rd
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
SE 53rd Pl
Tributary 2, Type F
Wetland B, Cat. III
Wetland A, Cat. III
Subbasin 46a.3 Stream, Type F
300
400
500
600
700
800
N
Legend
Seeps (Type Ns)
Subbasin 46a.3 stream
Plant Cover
Dense herbaceous non-rigid
Dense woody
Sparse Herbaceous Cover
0
25
50
100 Feet


Figure 4. 1 Kilometer Wetland Buffers
Legend
Wetland A (Category III)
Wetland A 1km Buffer
Wetland B (Category III)
Wetland B 1 km Buffer
0
500
1,000
2,000 Feet
N
Mercer Island
Island Park Elementary School
Island Crest Park
Island Crest park Tennis Courts
Deane's Children's Park
Groveland Beach Park
Groveland Beach Pier
Mercer Island Library
Youth Theatre Northwest
Mr. Minar's Moving Magic
Congregational Church on Mercer Island
Hollerbach Open Space
Ellis Pond Park
Senior Concierge Services
Island Synagogue
Miller Landing
Northwest Yeshiva High School
Spring Trust for Trails
Round 2 Work
Rejewel
Redeemer Lutheran Church
Engstrom Open Space Parking
RW Thorpe & Associates
Q Design Studio
SE 45th St
SE 46th St
SE 47th St
SE 48th St
SE 50th Pl
SE 51st St
SE 53rd Pl
SE 54th St
SE 56th St
SE 57th St
SE 58th St
SE 59th St
SE 60th St
SE 61st St
SE 62nd St
SE 63rd Pl
SE 63rd St
SE 64th St
SE 65th St
W Mercer Way
E Mercer Way
86th Ave SE
88th Ave SE
89th Ave SE
90th Ave SE
91st Ave SE
84th Ave SE
80th Ave SE
81st Ave SE
Island Crest Way
Butterworth Rd
Fernhill Rd
Fernhill Rd
Fern Hollow
Dawn Dr
Fernridge Ln
Appleton Ln
Parkwood Ln
Glenhome Dr
Parkside Ln
Brook Bay Rd
Bonney St
Forest Ave SE
Merrimount Dr
Maple Ln
Seattle Magician

April 26, 2024

Figure 5 - 303(d) Waters



Assessed Water/Sediment

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

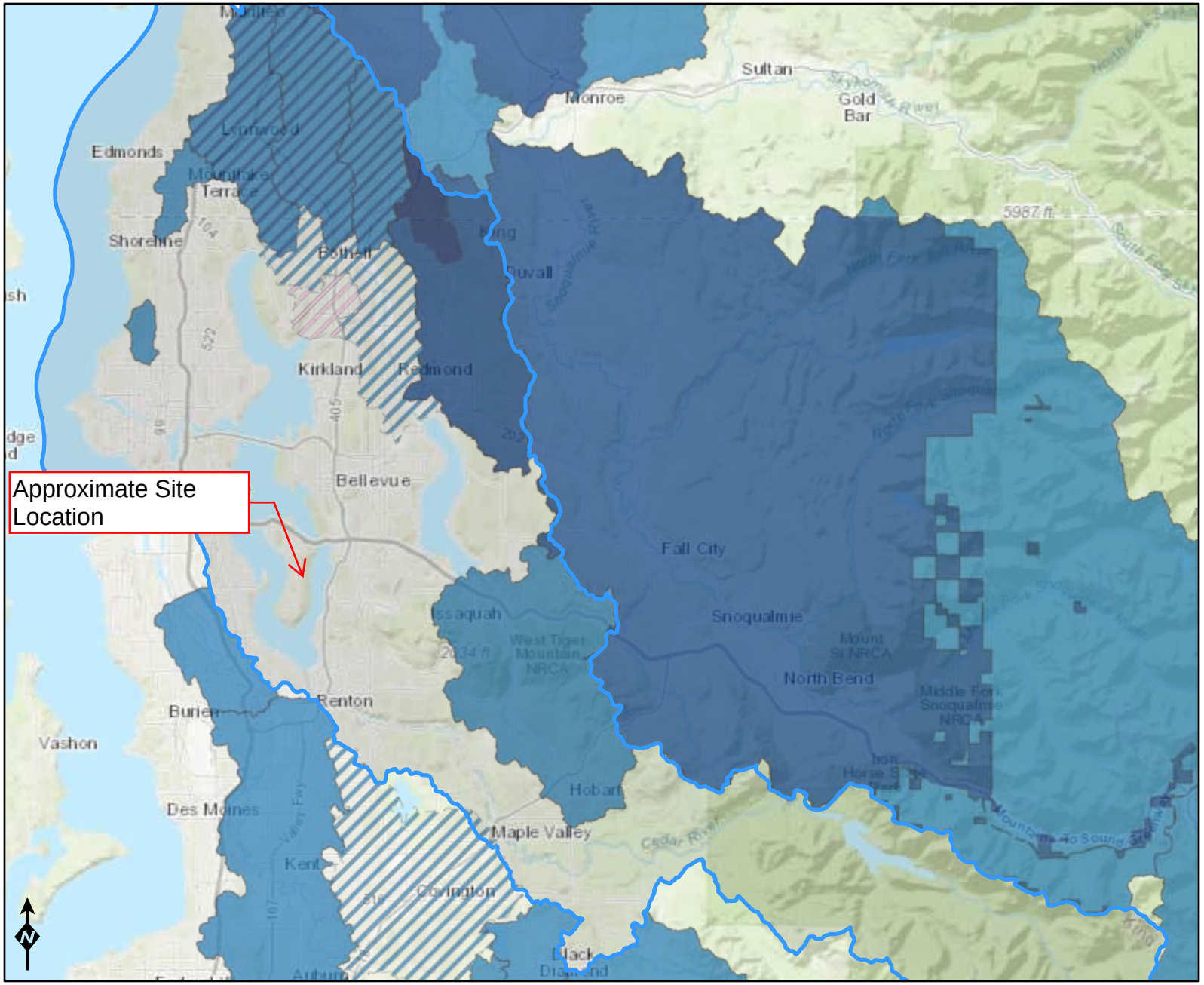
Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

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

April 26, 2024

Figure 6 - TMDL's for WRIA 8 Map



WQ Improvement Projects

- TMDL - Approved
- 4B - Approved
- STI - Approved
- ARP - Approved
- TMDL - In Development
- STI - In Development
- ARP - In Development

Miles
0 3.75 7.5 15

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and

Appendix F

Open Space Restoration Activities

Alicia Pettibone

From: Lizzy Stone <lizzy.stone@mercerisland.gov>
Sent: Thursday, September 4, 2025 5:44 PM
To: Alicia Pettibone
Cc: Dan Heckendorf; Clint Morris; Lauren Kumle
Subject: RE: Mercer Island Plan Review: Watercourse Restoration (2503-210)
Attachments: SE 53rd Open Space.pdf; Restoration Specifications 2025.docx

Follow Up Flag: Follow up
Flag Status: Completed

Hi Alicia,

I am happy to expand on previous work and plans for future work in that area. For our work planning and contracting, the park is divided up into separate restoration units, which are shown on the attached map. Units S50901, S51001a, and S51001b border the stream, so I will focus on those. Happy to expand on what work has happened in the other units as well if you're interested.

As a bit of context, we have a variety of restoration tasks that we contract out or do in-house if we have capacity. I am attaching the specifications that we use for contractors here. The initial steps to move a site towards a healthier state are to 1) remove ivy from on and around trees (ivy rings), 2) plant new trees to establish a next generation of canopy, 3) treat invasive trees that are dominating the understory. When new trees have been planted, we will do planting maintenance and watering on for 1-2 years afterwards. These plants will be revisited for maintenance every ~3-5 years afterwards, depending on conditions. Each time we revisit for planting maintenance, we remove surrounding weeds, add a ring of mulch, reflag the plants, and take a census of alive or dead plants.

Once these tasks have been done, if a site meets our prioritization criteria, we will undergo three years of Comprehensive Weed Removal, which involves removing all non-native plants from a site. Once these three consecutive years of removal are done, we will revisit those sites to do invasive removal maintenance every 4-5 years, depending on conditions. We will also infill plant shrubs and trees as needed through this process.

In SE 53rd Open Space, we have conducted 3 years of comprehensive removal and at least one year of maintenance on all of the restoration units bordering the stream (S50901, S51001a, S5001b). S50901 completed three years of removal in 2012, and has had maintenance (full weed removal) 4 times since, with the most recent maintenance in 2021. S51001a completed 3 years of comprehensive removal in 2017 and has gotten two rounds of maintenance, with the last one also in 2021. Both of these sites are due for maintenance in 2026. S51001b finished three years of comprehensive removal in 2019 and is receiving a round of maintenance this year.

Our site maintenance tasks are focused on weed removal and maintaining plantings. These tasks happen on an ongoing basis with different return intervals for each task and site (planting maintenance every 3-5 years, full weed removal maintenance every 4-5 years). Aside from the three years of comprehensive removal, we will rarely do work on a site for many years in a row.

I hope that answers your questions. Please let me know if I missed anything or if I can be of any more help!

Lizzy Stone (she/her)
office: 206.275.7882 | c: 206.507.3796

Notice: Emails and attachments may be subject to disclosure pursuant to the Public Records Act (chapter 42.56 RCW).

From: Alicia Pettibone <apettibone@rh2.com>
Sent: Thursday, September 4, 2025 4:53 PM
To: Lizzy Stone <lizzy.stone@mercerisland.gov>
Cc: Dan Heckendorf <dheckendorf@nhcwater.com>; Clint Morris <clint.morris@mercerisland.gov>; Lauren Kumle <lauren.kumle@mercerisland.gov>
Subject: RE: Mercer Island Plan Review: Watercourse Restoration (2503-210)

Hi Lizzy,
Checking back in with you after meeting with Clint and Lauren today. I mentioned previously that we received a comment from the Snoqualmie Tribe requesting development of a formal maintenance and monitoring plan (see attached for comment). We're wondering if you can expand on what sort of monitoring and maintenance is completed by the City in the open space area currently? I recall you mentioned the City does so, but is there a plan for that and/or documentation of approach? What's the frequency? Is it mainly focused on vegetation survival and invasives management? We're trying to determine whether what the City is currently doing could be used and/or modified to demonstrate the City is already completing this type of monitoring in this area. Let us know if a virtual meeting would be easier/helpful to discuss.

Sincerely,
Alicia Pettibone | RH2 Engineering, Inc.
O: 425.951.5436 | C: 425.466.6727 | www.rh2.com

From: Alicia Pettibone <apettibone@rh2.com>
Sent: Friday, August 22, 2025 10:32 AM
To: Lizzy Stone <lizzy.stone@mercerisland.gov>
Cc: Dan Heckendorf <dheckendorf@nhcwater.com>
Subject: RE: Mercer Island Plan Review: Watercourse Restoration (2503-210)

Hi Lizzy,
Apologies for the delayed reply; this week has been very busy.

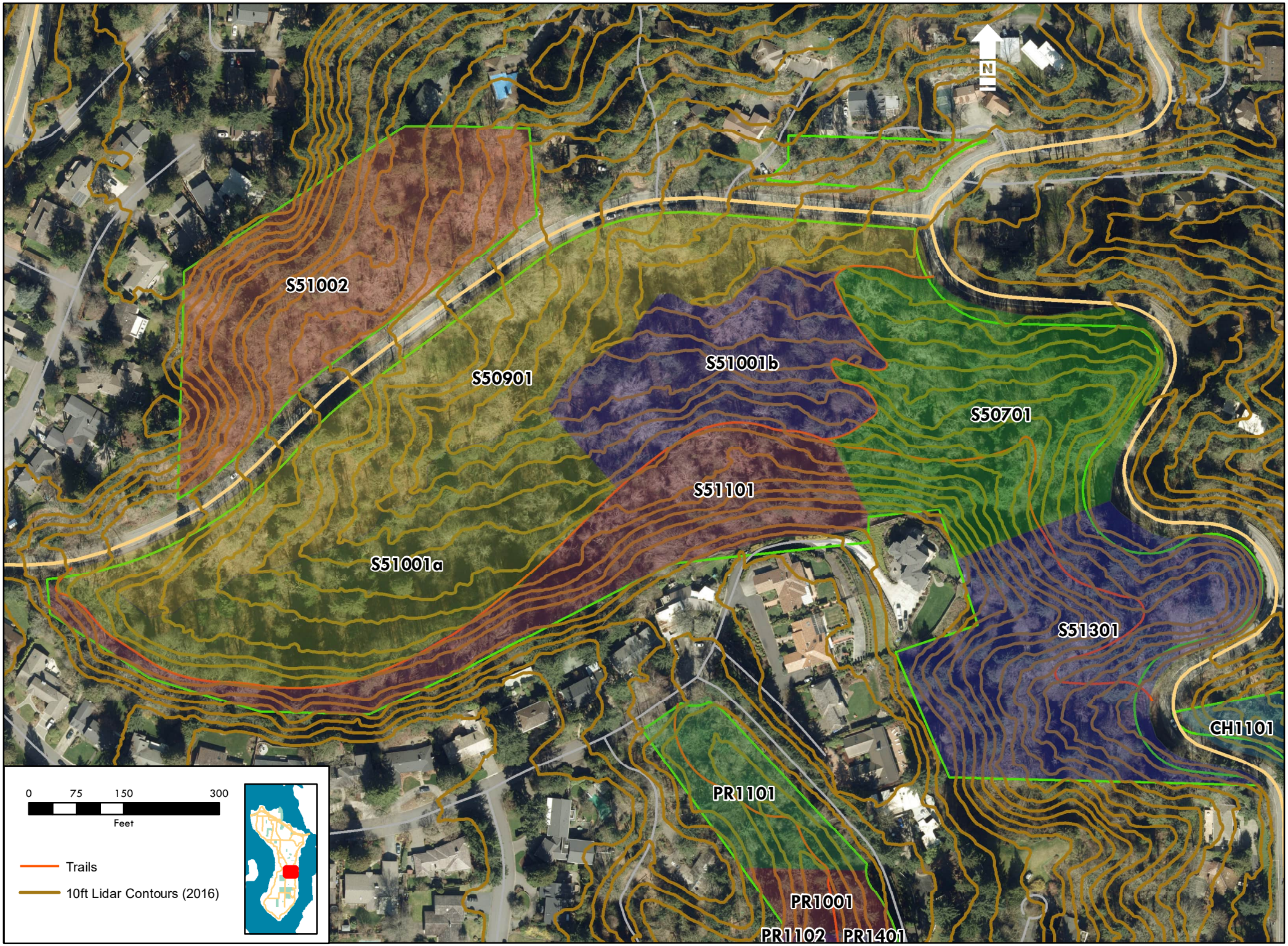
Thank you for the input. The confirmation of re-planting in the disturbed corridor is helpful and makes sense. Same with the confirmation that we want to be finalizing plant locations with City staff during construction. That will help me to respond on the SEPA comments back to the Planning Department.

Another question you might have input on: Are you aware of any monitoring or maintenance plans for these types of projects? We've had a request from the Snoqualmie Tribe to provide a formal maintenance and monitoring plan for the plantings and the LWD. Dan and I are familiar with this type of request for mitigation projects, but Elayne didn't mention if this was typical for City projects like this bank stabilization one. I sent the same request for clarification to Clint Morris (see attached. If you have any feedback though, that'd be helpful.

Thanks and have a great weekend,
Alicia Pettibone | RH2 Engineering, Inc.
O: 425.951.5436 | C: 425.466.6727 | www.rh2.com

From: Lizzy Stone <lizzy.stone@mercerisland.gov>
Sent: Tuesday, August 19, 2025 10:55 AM
To: Alicia Pettibone <apettibone@rh2.com>
Cc: Dan Heckendorf <dheckendorf@nhcwater.com>
Subject: RE: Mercer Island Plan Review: Watercourse Restoration (2503-210)

SE 53rd Open Space



SECTION 1. GUIDELINES FOR OPEN SPACE RESTORATION WORK

A. Work Conditions

Permitted work hours will be 7 am to 7 pm on weekdays, except as restricted by Right of Way Use permits. Work taking place on weekends must be approved at least two weeks in advance by the Natural Resource Project Manager. Use of power equipment within 200' of residential property is restricted to use between 8 am and 5 pm.

Work in the street Right-of-Way requires a street use permit and all required traffic controls, including certified flaggers. The contractor will be responsible for obtaining the Right-of-Way permit and the cost for the permit.

Work on or near any portion of the pedestrian paths in a park must be accompanied by traffic control. The contractor must temporarily close and reroute path traffic using barricades, flagging, and signs to insure the exclusion of park users from the work zone.

When working on City property, the Contractor's name and/or logo must be clearly displayed on company vehicles and personnel attire.

B. Access from private property

The Contractor will be solely responsible for execution of the work. If Contractor chooses to access the park through private property, they will make such arrangements with each property owner involved. The City of Mercer Island values good relationships with park neighbors and expects the Contractor to maintain a professional and courteous manner with every citizen it contacts**.**

C. Start of project

The Contractor will coordinate scheduling and performance of work with the Natural Resources staff. **A Natural Resources staff member will meet with the Contractor AND crew at the start time and day to confirm the scope of work and answer questions.**

D. Task completion

The Contractor will notify Natural Resources staff immediately by e-mail or phone after task completion. The Natural Resources staff will review the work completed and ensure that the work is satisfactory and then communicate with the Contractor about any remaining tasks.

E. Worker safety

a. The Contractor shall perform the work according to all applicable provisions of federal, state, and municipal safety and health laws and codes, including OSHA/WISHA requirements, Safety and Health Standards for Construction Work (Chapter 296-155 WAC), General Safety and Health Standards (Chapter 296-24 WAC) and General Occupational Health Standards (Chapter 296-62 WAC). The Contractor shall supply all required protective clothing and equipment needed for this work.

b. The Contractor shall follow all COVID-19 Safety Protocols in accordance with the most up-to-date guidance and orders from the Governor's office, WA State Department of Health, and Seattle-King County Public Health. The Contractor shall provide the City with a copy of their COVID-19 Safety Plan that demonstrates compliance with State COVID-19 safety protocols upon request.

F. Pesticide application requirements

The City's open space restoration program includes all potential pest suppression and control strategies with a focus on non-pesticide strategies whenever possible. Certain levels of weed populations are accepted within established thresholds and all reasonable non-pesticide weed control options are considered first before resorting to the use of pesticides.

a. Guidelines

- Herbicide applicators **must be certified as, or under the direct on-site supervision** of a currently licensed Commercial Operator and be properly trained to work with herbicides.
- Applicators must follow manufacturer's label instructions.
- Applicators must report any unsafe work practices to their supervisor.
- Operator must supply City with copies of pesticide application records for all herbicide applications on City property **at the end of each month**. In accordance with WA state law, records must be updated the same day that pesticide is applied and include: name and address of City liaison, location, time, full product name or package label and EPA registration number, weather conditions, total amount applied, rate, concentration, plants treated, applicator's name, and area treated.
- **Applicator must post signs to notify park users of herbicide application in accordance with state law.** Qualifying signs will be provided to Contractors by the City upon request.

b. Environmental Conditions

Environmental conditions (weather and site conditions) required for application of herbicides are dependent upon label and WSDA pesticide regulation requirements. Conditions are determined by visually observing the area and by collecting information on site. Minimum environmental requirements: **liquid herbicides will not be applied on a site experiencing winds of greater than 10 mph or forecasted to receive a storm event within 12 hours, or label restrictions, whichever is more restrictive.**

c. Pollution Prevention and Spill Control

- Application equipment must be closed and spill-proof.
- Mixing may only take place on paved surfaces.
- Irrigation canals, open trenches, surface waters, wetlands, designated 303(d) waterbodies, and groundwater sources should be noted, and application shall be made to prevent contamination of these areas.
- In the event that herbicides are inadvertently spilled, the following steps are to be taken:
  i. Control the flow of the material being spilled.
  ii. Prevent contamination of water sources by using control measures such as storm drain inlet protection, absorbent materials, sandbags, or trenching.
  iii. Isolate the area, keeping people at least 30 ft. away.
  iv. If the spill occurred on an impermeable surface, use absorbent materials to soak up spilled materials. Dispose of absorbent materials according to WA state regulations.
  v. If the spill occurred on soil, remove the top three inches of soil, and cover the area with at least 2 inches of lime. Cover the lime with a layer of uncontaminated topsoil. Dispose of the contaminated soil according to WA state regulations.
  vi. Report the spill to City staff (206.275.7882) and the Department of Ecology at 425.649.7000.
  vii. For large spills, contact the Washington Emergency Management Division at 800.258.5990.

d. Weed Hygiene

Contractors shall avoid moving weeds on tools, materials, boots, and clothing within a restoration site or from site to site. To reduce the potential for moving weeds, Contractors will employ precautions prior to entering the site by ensuring that equipment, vehicles, and clothing are free of seeds and soil, including:

i. Clean all soil from tools while still on site using a stiff brush.
ii. Remove and wash/brush boots that are potentially carrying soil and seeds.
iii. Wash clothing that is potentially carrying soil and seeds.
iv. Consider your parking location, trying not to park in areas that have soil or seed sources nearby. Keep vehicles clean from day to day and between work sites.
v. Limit access through known noxious weed infestations to prevent seed/ propagule spread. Flag or fence off infested areas.

G. Site and plant damage

The Contractor shall plan and execute work to minimize damage to the park property or adjacent properties and the improvements thereon. The Contractor shall be responsible for correcting any damage it causes to the site or its improvements.

a. Damage to planted trees and native vegetation must be scrupulously avoided, except as directed in this scope of work. Damage to existing vegetation/trees by the Contractor or its employees will be corrected by the Contractor at its sole cost and expense, subject to the City's review and cost assessment.

b. Contractors shall work to minimize soil disturbance such as compaction and erosion due to accessing work areas. Contractors shall establish a single access point located in areas that are less susceptible to erosion or compaction. Trips through the access routes shall be kept to a minimum by identifying the necessary work and equipment needed to complete the activities planned within the project area. Contractors shall limit access routes across steep slopes and only locate routes parallel to slope contours and perpendicular to water flows.

H. Performance time limits

Most of the work listed in the scope above has time limits assigned to the work. If the work is not completed by the specified time limit, the City, at its sole discretion, may hire another contractor to complete the work. The Contractor will only receive compensation equivalent to the percentage of the work completed within the time limit, as determined by City staff.

SECTION 2. TASK SPECIFICATIONS

Restoration Task	Specifications	Performance Objectives

1. Year 1 Comprehensive Invasive Removal
 	
--- 	
 	
2. Year 2 Comprehensive Invasive Removal
 	
--- 	
 	
3. Year 3 Comprehensive Invasive Removal
 	
--- 	
 	
4. Invasive removal maintenance
	- Ivy Rings (see Restoration Task 6 Specification)
	
	- Invasive Tree Removal and Treatment (see Restoration Task 7 Specification)
	
	- Ground Ivy and Herbaceous Weed Removal
	  o Selectively remove above and below ground parts of all non-native plants. Exceptions are: species marked with an asterisk in the invasive plant species list (Section 4), unless specifically noted. **Avoid damage to all native plants.**
	  o Cut-stem herbicide application (Specification 8) allowed only to treat blackberry that is growing up through native vegetation where roots cannot be removed manually without damage to native plants.
	  o Pile all removed plant material on cardboard sheets or downed logs out of soil contact to prevent re-sprouting. Turn any previously existing debris piles onto new cardboard sheets or debris rafts constructed out of downed wood. Piles are to be no bigger than 3'x3'x3' and shall be staged a minimum of 10' from any trail, road, watercourse, or drainage ditch.
	
	- **Install jute or coir erosion control fabric in areas greater than 50 sq ft in size with slope greater than 60%** (per field measurement) **that have less than 50% native vegetation cover.** After all invasive plant material is removed, fabric should be installed and secured with landscape staples placed no more than 18" apart. Multiple jute or coir pieces must overlap by at least 12".
	
	Note: Areas receiving Invasive Removal Maintenance have generally received at least 3 years of comprehensive invasive removal.
		Year 1 Comprehensive: All ivy rings and invasive tree treatment completed and a coarse sweep to removal all other invasive plant material throughout. "Coarse sweep" is measured as no more than 25 cubic ft. of live invasive plant material remaining per 100 sq. ft of the remainder of site.
		
		Year 2 Comprehensive: All ivy rings and invasive tree treatment completed and less than 10 cubic ft. of live invasive plant material remaining per 100 sq. ft of the remainder of the site.
		
		Year 3 Comprehensive/ Invasive Removal Maintenance: Less than 1 cubic ft. of live invasive plant material remaining per 100 sq. ft.
		
		All tasks: Slopes greater than 60% with less than 50% native vegetation cover to be covered with jute or coir erosion control fabric.

Restoration Task	Specifications	Performance Objectives
5. Planting maintenance	Within the defined area, remove all above- and below-ground vegetation within a 4' diameter circle around and 8' above native plantings, living or dead. Maintain all live native trees 10' and under. Take a census of live and dead plantings and report number to Natural Resources Staff, identify canopy trees versus shrubs. Apply new mulch of 3" depth native leaf litter or arborist chips to **entire** circle. When on-site leaf litter is insufficient, the City may provide arborist chips depending on site accessibility. Remove any flagging tape or twine from main stem. Reflag any plants without flagging with 6" length of 1" wide fluorescent flagging tape attached to a lateral branch.	Less than 8 cubic inches of living plant material within 4 ft. diameter circle. All plantings properly flagged and mulched. 95% of total installed plants properly maintained.
6. Ivy rings	Within the defined area, cut ivy vines growing on all trees, snags, stumps, and structures at chest height and remove all vines and leaves from that point downward. For every canopy tree (1 ½ inch caliper deciduous; 6 feet tall conifer): Grub out surface roots of all ivy within a 4' radius from the base of the tree in all directions, taking care not to damage tree roots. If ivy rings are being done in an area with invasive removal maintenance, ivy debris should be placed on cardboard or downed wood. Otherwise, ivy can be scattered without covering native vegetation.	Tree trunk is fully visible and undamaged. Less than 10 cubic inches of living invasive plant material within a 4' radius of the tree trunk.
7. Invasive tree removal and treatment	A. Hand pull all small sprouts when roots can be removed fully. B. For all invasive trees **less than** 1" diameter at 6" above ground: If trees cannot be effectively hand pulled, cut the tree to 6" high and apply **aquatic-approved glyphosate or aquatic-approved triclopyr** herbicide immediately (within 30 minutes) to the **freshly cut** stump at the recommended rate (please refer to product label). Cut any brush and woody debris to lengths of 18" or less and scatter.	Dieback of greater than 50% of each tree canopy evident within two months of treatment. Those not meeting this objective must be retreated.

Restoration Task	Specifications	Performance Objectives
	C. For all invasive trees **greater than** 1" diameter at 6" above ground: Remove all branches making ground contact. Re-rooted branches must be hand pulled or cut and treated. Inject stem with **imazapyr capsules** using an **EZ-Ject lance** (or comparable injection device approved by Mercer Island Natural Resources Staff) at the recommended rate. Cut any brush and woody debris to lengths of 18" or less and scatter. D. For all invasive trees 6" DBH or greater, consult with Natural Resources staff before treating. **Follow all requirements for pesticide application as specified in Section 3F.** Invasive tree species include: • English laurel (*Prunus laurocerasus*) • English holly (*Ilex aquifolium*) • European mountain ash (*Sorbus aucuparia*) • English hawthorn (*Crataegus monogyna*) • wild cherry (*Prunus avium*) • Portugal laurel (*Prunus lusitanica*) • black locust (*Robinia pseudoacacia)* • cherry plum (*Prunus cerasifera*) • Norway maple (*Acer platanoides*) • horsechesnut (*Aesculus hippocastanum*) • tree-of-heaven (*Ailanthus altissima*) **Note:** Any herbicide used in Pioneer Park or Engstrom Open Space must follow the 2022 update to the Pioneer Park Herbicide Use Protocol. Please refer to protocol before any herbicide is used on these properties and consult with the Natural Resources Project Manager with any questions in advance of treatment.	All small sprouts of invasive trees either hand-pulled, or freshly cut and treated.
8. Cut-stem herbicide application	Cut the stem of target species (e.g., invasive blackberry species) to 6" high and apply **aquatic-approved glyphosate or aquatic-approved triclopyr** herbicide immediately to the **freshly cut** stem at the recommended rate (please refer to product label). Cut any debris to lengths of 18"	All target plants cut to 6" and all material scattered on site or placed on debris pile.

Restoration Task	Specifications	Performance Objectives
	or less and scatter, unless in an invasive removal maintenance area where debris must be placed out of ground contact on cardboard or downed wood. Avoid damage to native vegetation. **Follow all requirements for pesticide application as specified in Section 3F.** **Note:** Any herbicide used in Pioneer Park or Engstrom Open Space must follow the 2022 update to the Pioneer Park Herbicide Use Protocol. Please refer to protocol before any herbicide is used on these properties and consult with the Natural Resources Project Manager with any questions in advance of treatment.	Every stem properly treated to prevent regrowth. No regrowth of 90% or greater in the treatment area evident within four weeks of treatment. Those not meeting this objective must be retreated.
9. Foliar spray herbicide application	Treat invasive shrubs and herbs with **aquatic-approved glyphosate** or **aquatic-approved triclopyr** herbicide at the recommended rate (please refer to product label). Apply herbicide to the live foliage of plants after the leaves are fully developed during the recommended application period (see below). Use best practices to avoid drift and damage to native vegetation. When invasive shrubs are inaccessible for foliar spray (e.g., Himalayan blackberry growing from within native plants), use the cut-stem application specification outlined in Task 8. Target species included but not limited to: • Invasive blackberry species (*Rubus armeniacus, R. laciniatus*) – Knockdown mature thickets and apply herbicide to regrowth when plants have reached 1½' to 2' tall. Before spraying, cut all blackberry flowers or fruit within a 10' buffer of treatment area. Note- herbicide should only be used on blackberry when sprayed on regrowth or applied using the cut-stem method described in Task 8. • Thistle species (*Cirsium arvense, C. vulgare*) - Apply from rosette to bud stage. • Bindweed species (*Convolvulus arvensis, C. sepium*) – Apply postemergence at bud stage or at summer fallow in mid-summer. • Bamboo species – Cut to six inches high and place debris on raft or cardboard. Apply aquatic formulation of herbicide to regrowth. **Follow all requirements for pesticide application as specified in Section 3F.** **Note:** Any herbicide used in Pioneer Park or Engstrom Open Space must follow the 2023 update to the Pioneer Park Herbicide Use Protocol. Please refer to protocol before any herbicide is	Dieback of 90% or greater in the treatment area evident within four weeks of treatment. Those not meeting this objective must be retreated.

Restoration Task	Specifications	Performance Objectives
	used on these properties and consult with the Natural Resources Project Manager with any questions in advance of treatment.	
10. Invasive knockdown	Within the defined area, cut all invasive blackberry and invasive herbs (alive or dead) to a height of 6" using brush cutters in areas with little or no native vegetation, and using loppers or machetes in areas of high native vegetation, **to avoid damage to native vegetation and plantings.** Cut debris into < 1' pieces and scatter to achieve ground contact and avoid smothering native vegetation. Remove, chop, and scatter all canes (alive or dead) hung up in taller vegetation. Exceptions are: • English ivy • Bamboo (any species) • Knotweed	Invasive plants to be cut down to 6" tall and native vegetation left undamaged. Entire area to be walkable. No canes to remain hanging in taller vegetation.
11. Mulching	Within the defined project site, cover cleared areas completely with minimum 6" arborist wood chip mulch. Edges of site must be neat and well-delineated. Maintain mulch free ring within 1" of each plant stem/trunk. Unless otherwise noted in the Scope of Work, the City will deliver all mulch to parking lot of each site or other nearby accessible area. City staff must receive request for delivery of mulch at least 2 weeks prior to activity start date.	Entire project area covered with mulch to at least 6" depth, with no mulch in direct contact with trees or shrubs.
12. Sheet mulching	Within the defined project site, cover cleared areas completely with 1/2" of burlap or cardboard. Burlap or cardboard pieces must overlap each other by at least 4"- 6". Edges of site must be neat and well-delineated. Cover burlap or cardboard with minimum 6" arborist wood chip mulch. Maintain burlap/cardboard and mulch free ring within 1" of each plant stem/trunk.	Entire project area covered with burlap or cardboard as specified; mulch applied to at least 6" depth, with no mulch or burlap/cardboard in direct contact with trees or shrubs.

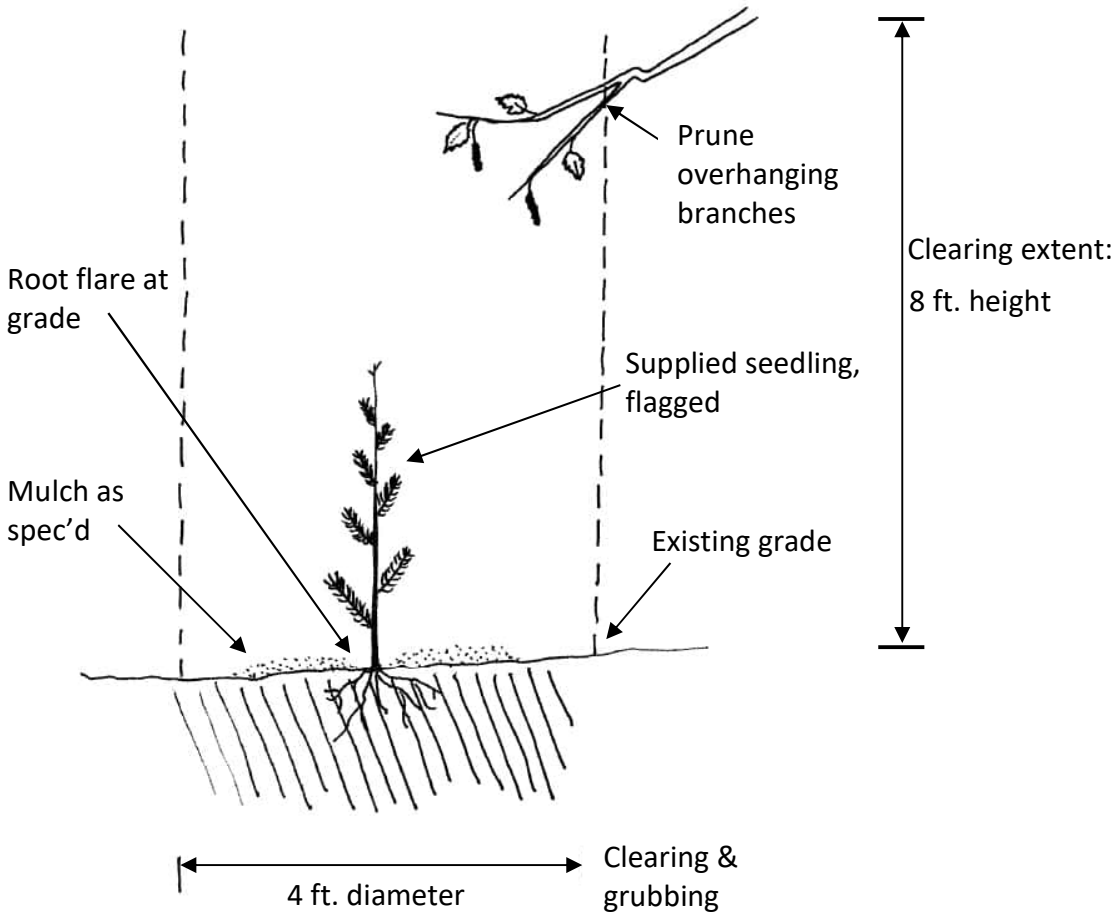
Restoration Task	Specifications	Performance Objectives
	In areas with slopes greater than 60%, burlap should be used for sheet mulching and wattles must be installed to prevent erosion. Wattles should be made of biodegradable materials (*i.e*. burlap filled with wood chips) and installed along the contour of the slope. Wattles should be placed every 6-8' and secured by 18-24" wooden stakes every placed 3-4'. **Burlap and cardboard will be provided by the Contractor.** Unless otherwise noted in the Scope of Work, the City will deliver all mulch to parking lot of each site or other nearby accessible area. City staff must receive request for delivery of mulch at least 2 weeks prior to activity start date.	
13. Planting	Within the defined area, grub 4' diameter planting circles free of above- and below- ground vegetation. Within said 4' circle, prune back any overhanging vegetation up to 8' above ground level to create a vegetation free "column." Refer to Section 3 for more detailed planting diagrams. Trees require a (minimum) 10' spacing from other trees (existing or planted) and from roads/trails. Shrubs require a (minimum) 4' spacing from trees and roads/trails. In some cases, native understory vegetation may need to be removed within the planting circle to achieve the spacing requirement. Apply 3" of available leaf litter or arborist chips to entire circle. Do not cut healthy native vegetation, large pieces of wood, or invasive plant material in place of leaf litter or arborist chips to mulch native plants. Flag the tree with 6" length of 1" wide flagging tape attached to a lateral branch. Do not tie flagging tape on the main stem. Flagging will be provided by the City. Remove any stabilizing stakes and ties. In areas with <60% slopes, apply at least 4 gallons of water to each newly installed plant on same day as planting. In areas with >60% slopes, apply at least 3 gallons of water to each newly installed plant, as described in Task 13.	Plant trees with root flares emerging just at soil level and according to detail (see Section 5 diagram). All native plants staged in sites that meet species-specific requirements (i.e., shade, sun, moist soil, etc.) Planting takes place between Nov 1 and Jan 15. Specific dates to be determined by City, in coordination with contractor.

Restoration Task	Specifications	Performance Objectives
14. Water plantings	Watering schedule begins three weeks after last significant rainfall event of the spring (>1”). Staff will alert contractor to this date, after which contractor will have 2 weeks to begin the first watering. Watering must be done 7 times during the growing season. **The exact schedule and allocation of watering may change with the weather.** The proposed schedule is as follows: • One watering in late May/ early June, depending on spring rain. • Beginning late June/ early July - Once per week for 4 weeks, for 4 consecutive waterings. • Two additional waterings once every four weeks, at the discretion of City staff. In areas with <30% slope, apply at least **4 gallons of water** to each tree or shrub planted in the previous year. On slopes (>30%), apply at least 3 gallons of water to each tree or shrub planted in the previous year. Water must be applied slowly enough to avoid surface runoff and ensure that water is infiltrating directly into root area. **Note: Contractor must contact City staff at the start of each watering. Watering tanks may be filled at the City Shop if appropriate attachments are used, and procedures are followed.**	Wetting of soil to at least 12” depth in rooting area.

SECTION 3. TREE PLANTING DETAIL

TREE PLANTING DETAIL – FLAT AREAS

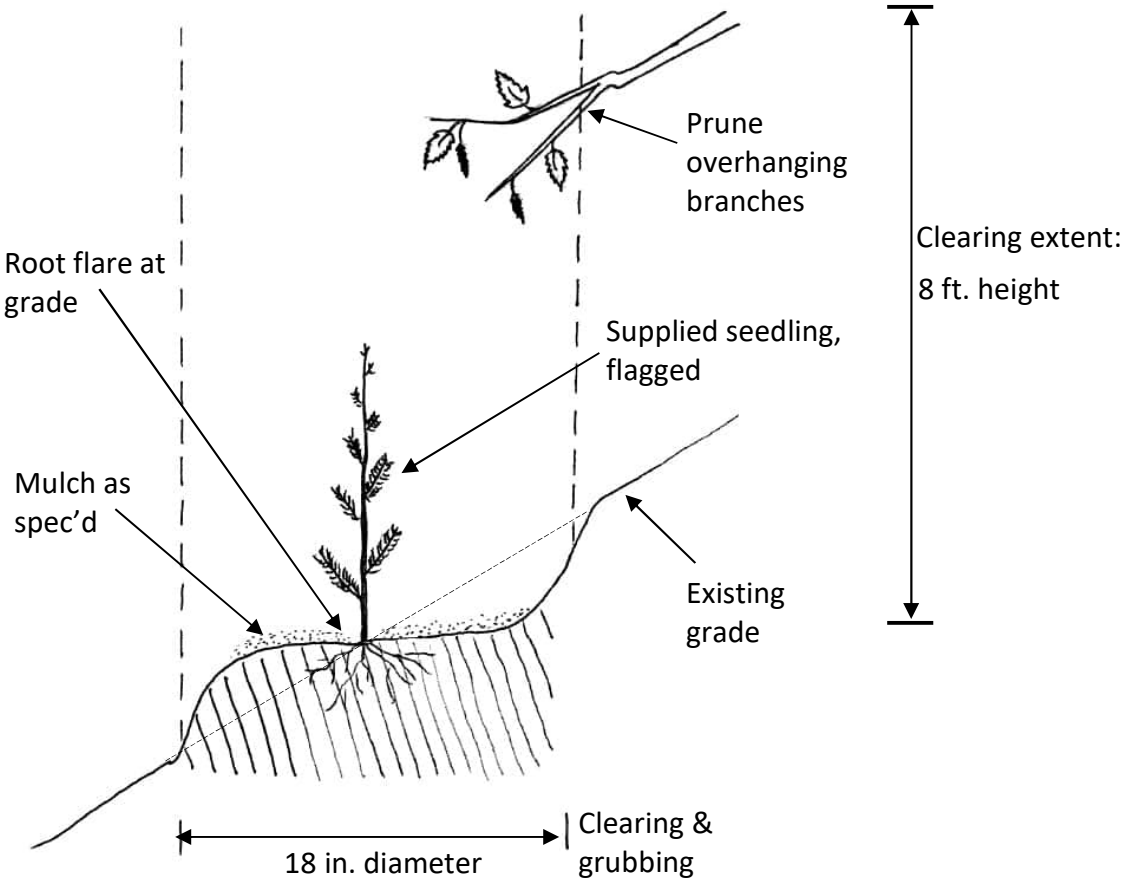
- Clearing and grubbing limits are minimum 4 ft. on slopes less than 30%. Soil to be grubbed free of competing vegetation and loosened throughout entire circle.
- Prune back *any* overhanging vegetation within 8' of ground level within said 4' circle to create a vegetation free "column". Follow generally accepted pruning practices.
- Form a mound of soil and spread roots in the planting hole radially and in a downward direction (it may be necessary to break up root mass and cut circling roots). No "J" roots or pancaked (flattened to a fan) roots.
- Root flare to be set at grade. Do not plant the tree any deeper!



- Backfill soil is native soil.
- Mulch is 3" depth arborist mulch or available leaf litter, as specified in project scope. Do not cover root flare. If leaf litter is scarce or unavailable, City staff may be able to deliver arborist chips to site, depending on availability.
- Flag the tree with 6" of 1" wide fluorescent flagging tape attached to a lateral branch. **Do not tie flagging tape on the main stem.** Flagging will be provided by the City.

TREE PLANTING DETAIL – SLOPE AREAS

- Clearing and grubbing limits are minimum 18" in diameter on slopes greater than 30%. Soil to be grubbed free of competing vegetation. Form a level shelf with available soil.
- Prune back *any* overhanging vegetation within 8' of ground level within said 18" circle to create a vegetation free "column". Follow generally accepted pruning practices.
- Form a mound of soil and spread roots in the planting hole radially and in a downward direction (it may be necessary to break up root mass and cut circling roots). No "J" roots or pancaked (flattened to a fan) roots.
- Root flare to be set at grade. Do not plant the tree any deeper!



- Backfill soil is native soil.
- Mulch is 3" depth arborist mulch or available leaf litter, as specified in project scope. Do not cover root flare. If leaf litter is scarce or unavailable, City staff may be able to deliver arborist chips to site, depending on availability.
- Flag the tree with 6" of 1" wide fluorescent flagging tape attached to a lateral branch. **Do not tie flagging tape on the main stem.** Flagging will be provided by the City.

SECTION 4. INVASIVE PLANT SPECIES

This chart lists invasive species that may be encountered in MI Open Space areas. Listed species should be recognizable to those performing invasive removal. However, additional invasive species may be present, and should also be removed**. If, in the course of work, the Contractor encounters an unknown species, he/she should contact Mercer Island Natural Resources staff and consult the Washington State and King County Noxious Weed Lists for identification and determination of invasive status.**

Species with * are not targeted for removal as part of Comprehensive, 2nd Year, 3rd Year Removals or Invasive Removal Maintenance tasks unless contract expressly includes their removal.

Latin name	Common name
Acer platanoides	Norway maple
Acroptilon repens	Russian knapweed
Aesculus hippocastanum	horse chestnut
Ailanthus altissima	tree of heaven
Alliaria petiolata	garlic mustard
**Arum italicum*	*Italian arum
Arundo donax	giant reed
Aucuba japonica	aucuba, golddust plant
Brachypodium sylvaticum	slender false brome
Bromus tectorum	cheatgrass
Buddleja davidii	butterfly bush
Cardaria draba	hoary cress
Cardaria pubescens	hairy whitetop
Carduus nutans, Carduus pycnocephalus	thistle
Centaurea stoebe, C. nigrescens, C. diffusa, C. virgata	knapweed
Centaurea melitensis, C. solstitialis	starthistle
Cirsium arvense	Canada thistle
Cirsium vulgare	bull thistle
Clematis vitalba	traveler's-joy old-man’s beard
Cortaderia jubata	jubata grass
Cotoneaster spp.	cotoneasters
Crataegus monogyna	English hawthorn
Cynoglossum officinale	houndstongue
Cytisus scoparius	Scotch broom
Daphne laureola	spurge laurel
Euphorbia esula	leafy spurge
Genista monspessulana	French broom
Geranium lucidum	shiny geranium, shining crane's-bill
Geranium robertianum	herb Robert; stinky Bob
Glecoma hederacea	ground ivy, creeping Charlie
Hedera helix	English ivy
Heracleum mantegazzianum	giant hogweed
Hieracium aurantiacum, H. caespitosum	hawkweed
Hypericum perforatum; H. androsaemum	St. John's wort
Ilex aquifolium	English holly
Impatiens capensis	orange jewelweed
Impatiens glandulifera	policeman's helmet

Continued…

Latin name	Common name
Iris pseudacorus	yellow flag iris
Isatis tinctoria	dyer's woad
Lamiastrum galeobdolon	yellow archangel
Lapsana communis	nipplewort
Lathyrus latifolius	sweet, perennial, or everlasting pea
Leucanthemum vulgare	oxeye daisy
Lepidium latifolium	perennial pepperweed
Ligustrum vulgare	common privet
Linaria dalmatica	dalmatian toadflax
Lotus corniculatus	birdsfoot trefoil
Lunaria annua	honesty; money plant
Lythrum salicaria	purple loosestrife
Mycelis muralis	wall lettuce
Onopordum acanthium	Scotch thistle
***Phalaris aquatica, P. arundinacea*	*Harding grass, reed canarygrass
***Poa bulbosa*	*bulbous bluegrass
***Polygonum cuspidatum, P. sachalinense, P. polystachyum, P. x bohemicum*	*knotweed
Potentilla recta	sulfur cinquefoil
Prunus laurocerasus	English laurel
Prunus lusitanica	Portugal laurel
Prunus avium	sweet cherry
Prunus cerasifera; P. domestica; P. spinosa	Thundercloud plum, domestic cherry
Pyracantha spp.	firethorn
***Ranunculus repens*	*creeping buttercup
Robinia pseudoacacia	black locust
Rubus armeniacus	Himalayan blackberry
Rubus laciniatus	cutleaf blackberry, evergreen blackberry
Solanum dulcamara	bittersweet nightshade
Sorbus aucuparia	European mountain-ash
Spartium junceum	Spanish broom
Tamarix ramosissima, T. parviflora	tamarisk
Taeniatherum caput-medusae	medusahead
Ulex europaeus	gorse
Vinca major; *V. minor*	Periwinkle, vinca