CRITICAL AREAS REPORT

Sunset Terrace Subdivision

Old Pacific Highway, Kalama, WA 98625
Tax Parcel No.: 411460100

Prepared by:

Jim Barnes, President
Cascadia Ecological Services, Inc.
14205 NW 56th Avenue
Vancouver, WA 98685
(360) 601-8631

Applicant:

Sunset Terrace LLC
P.O. Box 128
Kalama, WA 98625
(360) 883-2506

Project Engineer:

SGA Engineering
2005 Broadway Street
Vancouver, WA 98653
(360) 993-0911

Date: October 16, 2018

CASCADIA
ECOLOGICAL SERVICES, INC.

Executive Summary

The Sunset Terrace Subdivision project area is located to the east of pond known locally as Big Lake east of Interstate 5. Prior to the construction of the interstate in 1969, the area was an emergent wetland. Seasonal and perennial streams which flow into the wetlands have created a permanent pond due to the elevational grade and constricted culvert outlet at the interstatee to the west. Big Lake is a known stormwater facility for Interstate 5 by the Washington State Department of Transportation.

According to the USFWS National Wetland Inventory, the wetlands associated with Big Lake are 12.89 acres in area and contains components of freshwater emergent and forested wetlands, all of which are regulated by the U.S. Army Corps of Engineers (USACE), Washington State Department of Ecology (Ecology), and the City of Kalama. In general, the wetlands are palustrine emergent and forested Category 3 depressional wetlands. The wetlands provide moderate to high levels of hydrologic and water quality functions and moderate habitat functions. Vegetated buffers around the wetlands are wide, functional, and are dominated by upland mature forest.

Sunset Terrace, LLC proposes to develop the 19.49-acre project site east of the wetlands into 65 individual building lots for single-family residences. No impacts to critical areas or associated buffers are proposed by this project.

Table of Contents

Tables

Appendices

Acronyms and Abbreviations

CES	Cascadia Ecological Services, Inc.
CWA	Clean Water Act
DNR	Department of Natural Resources
Ecology	Washington State Department of Ecology
FPARS	Forest Practices Application Review System
HUC	Hydrologic Unit Code
KMC	Kalama Municipal Code
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PEM	palustrine emergent
PFO	palustrine forested
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington State Department of Fish and Wildlife
WRIA	Water Resource Inventory Area

The information and data in this critical areas report was compiled and prepared by the undersigned:

Jim Barnes
President,
Cascadia Ecological Services, Inc.

Chapter 1. Introduction

Sunset Terrace, LLC contracted with Cascadia Ecological Services, Inc. (CES) to complete a critical area report and mitigation plan for the Sunset Terrace Subdivision Project. The purpose of the report is to identify and describe wetlands and streams, and to identify possible sensitive plant, fish, and wildlife species within the confines of the project area.

This report facilitates the applicant's efforts to:

1. Avoid or minimize impacts to wetlands and streams during the design process.
2. Document wetland and stream boundary determinations for review by regulatory authorities.
3. Provide early indications to project engineers of sensitive species within the project area.
4. Provide a mitigation strategy for critical area impacts proposed by the project.

This report is anticipated to support permits locally through the City of Kalama (Chapter 15.02 Critical Areas Protection); at the state by the Ecology (CWA Section 401); and at the federal level by the USACE (CWA Section 404).

Chapter 2. Proposed Project

2.1 Location

Project Location: No situs address. Located to the west of Old Pacific Highway South within the city limits of Kalama, Washington. Interstate 5 is located to the west of the property (Figure 1)
County: Cowlitz
Local Jurisdiction: City of Kalama
HUC: 17080003 - Lower Columbia-Clatskanie
Section, Township and Range: S17, T6N, R1W of the Willamette Meridian
Latitude/Longitude: 45.9981, -122.8381

2.2 Purpose and Description

The applicant proposes to develop the 19.49 acre project site into 65 individual building lots for single-family residences. A site plan has been developed by the project engineer and is shown on Figure 5.

Chapter 3. Methods

This chapter summarizes the methods used to comply with federal, state, and local guidance. Wetlands and other natural habitats were assessed by traversing the property on foot. The wetland determinations were made using observable vegetation, hydrology, and soils in conjunction with data from the National Wetland Inventory maps of the U.S. Fish and Wildlife Service (USFWS), the Soil Survey for Clark County (McGee, 1972), and aerial photos. See Appendix B for maps showing soils, topography, and the wetland inventory. Wetlands were determined by using the methodology of the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE, 2010). The boundaries of jurisdictional wetlands occurring within the confines of the property are defined by steep topography which slopes from the east to the edge of Big Lake as delineated during a site visit on December 14, 2017. The location and features of the wetlands are described in Chapter 4 and shown on Figure 5. Wetlands were rated and functionally assessed by using the methodology of the Washington State Wetland Rating System for Western Washington: 2014 Update (Hruby, 2014).

The condition of wetland buffers within 150 feet of the wetlands was qualitatively assessed using the following criteria:

- Dominant land use (e.g., agriculture, residential, commercial, industrial).
- Dominant buffer vegetation type (tree, shrub, herb, vine, un-vegetated).
- Estimated percent cover of invasive plants by species.

Chapter 4. Existing Conditions

4.1 Landscape Setting

The 19.49-acre project area consists of a rocky hillslope leading west from Old Pacific Highway South to the edge of Big Lake. The hillslope is dominated by mature upland forest. Large-lot residential properties are located to the north and south of the project area. No developed structures exist on the property at this time. The Columbia River is approximately 1,100 feet west of the site.

4.2 Critical Areas

4.2.1 Wetlands

The project area borders Big Lake which is a stormwater pond that resulted from the construction of Interstate 5. The lake receives inputs from a perennial DNR Type F stream along its southeast side and a seasonal non-fish bearing stream that enters from the east across the project area from a culvert underneath Old Pacific High South. The wetland is classified by the USFWS National Wetland Inventory as freshwater emergent wetlands as follows and in Table 1:

1. PEM1A: Palustrine, Emergent, Persistent (1), Temporarily Flooded (A)
2. PEM1F: Palustrine, Emergent, Persistent (1), Semipermanently Flooded (F)
3. PEM1C: Palustrine, Emergent, Persistent (1), Seasonally Flooded (C)
4. PFOC: Palustrine, Forested, Seasonally Flooded (C)

The wetlands are defined as Category 3 depressional by the Washington State Wetland Rating System for Western Washington: 2014 Update. Reference Table 1 for details regarding the wetland classifications and areas. Locations of the wetlands are shown on Figure 5.

Depressional wetlands occur in topographic depressions. Dominant water sources are precipitation, ground water discharge, and both interflow and overland flow from adjacent uplands. The direction of flow is normally from the surrounding uplands toward the center of the depression. Elevation contours are closed, thus allowing the accumulation of surface water. Depressional wetlands may have any combination of inlets and outlets or lack them completely. Dominant hydrodynamics are vertical fluctuations, primarily seasonal. Depressional wetlands may lose water through intermittent or perennial drainage from an outlet, by evapotranspiration and, if they are not receiving ground water discharge, may slowly contribute to ground water (NRCS, 2008).

Wetland A (~12.89 acres off-site) consists of Big Lake. The wetlands receive hydrology inputs from a seasonally high groundwater table, precipitation, and surface water flows from two streams. Per the DNR, a mapped Type F stream flows into the south end of the lake. The drainage basin of this stream is approximately 1.48 square miles.

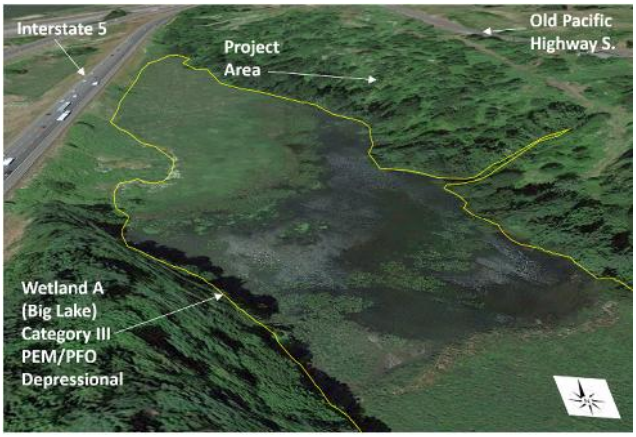
Table 1. Wetlands near the Project Area.

Wetland	Wetland Classification				Wetland Size Off-site (acre)	Buffer Width (feet)[D]
	Cowardin[A]	HGM	Ecology[B]	City of Kalama[C]		
A	PEM1A	Depressional	II	II	6.28	300
A	PEM1F	Depressional	II	II	4.07	300
A	PEM1C	Depressional	II	II	0.65	300
A	PFOC	Depressional	II	II	1.89	300
Total					12.89	

Notes:

A. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine emergent, PFO = Palustrine Forested.
B. Ecology rating according to Hruby (2014).
C. Wetlands rated according to City of Kalama Municipal Code, Chapter 15.02 Critical Areas Protection (City of Kalama, 2018).
D. Wetland buffer width according to City of Kalama Municipal Code, Chapter 15.02 Critical Areas Protection (City of Kalama, 2018).

Table 2. Wetland A Summary.

<table>
<tr><th colspan="3">WETLAND A – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2"></td></tr>
<tr><td colspan="2" rowspan="9"> 
</td><td>Local Jurisdiction</td><td>Kalama</td></tr>
<tr><td>WRIA</td><td>27 - Lewis</td></tr>
<tr><td>Ecology Rating (Hruby, 2004)</td><td>III</td></tr>
<tr><td>Local Jurisdiction Rating</td><td>III</td></tr>
<tr><td>Local Jurisdiction Buffer Width</td><td>150 feet</td></tr>
<tr><td>Wetland Size</td><td>12.89 acres</td></tr>
<tr><td>Cowardin Classification[A]</td><td>PEM & PFO</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td colspan="2">Flag color: Pink “Wetland Delineation”
WETLAND DELINEATION</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Phalaris arundinacea</td></tr>
<tr><td>Soils</td><td colspan="2">65 - Godfrey silt loam, 0 to 3 percent slopes</td></tr>
<tr><td>Hydrology</td><td colspan="2">Surface Water (A1), Saturation (A3)</td></tr>
<tr><th colspan="3">Wetland Rating Summary</th></tr>
<tr><td>Improving Water Quality</td><td colspan="2">Site Potential: M; Landscape Potential: M; Value: H; Total: 7 pts.</td></tr>
<tr><td>Hydrologic</td><td colspan="2">Site Potential: M; Landscape Potential: M; Value: H; Total: 7 pts.</td></tr>
<tr><td>Habitat</td><td colspan="2">Site Potential: L; Landscape Potential: M; Value: M; Total: 5 pts.</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">The buffer consists of mature upland forest along the east and south sides of the wetlands. Interstate 5 is adjacent to the west side of the wetlands. In this area, the buffer is dominated by a herbaceous plant community and blackberries.</td></tr>
</table>

Notes:

A. Cowardin et al. (1979) or National Wetland Inventory (NWI) Class based on vegetation: PEM = Palustrine emergent, PFO = Palustrine Forested.

Soils

The project area is mapped with the following soil series:

- 190 - Schneider-Rock outcrop complex, 15 to 65 percent slopes
- 123 - Mart silt loam, 0 to 8 percent slopes

The USDA (USDA, 2018) describes the Schneider-Rock outcrop complex series as comprised of mostly of Schneider soils and rock. The soil series is non-hydric and well drained.

The Mart series consists of very deep, well drained soils formed in material weathered from andesite or volcanic breccia on hillsides, ridgetops and mountain slopes, or deeply dissected plateaus. Slopes are 0 to 65 percent.

The Soil Survey Map is in Appendix B.

Vegetation

The project area consists of mature upland forest interspersed with open areas of blackberry thickets, shrubs, and weedy herbaceous vegetation. Due to the steep topography leading into the off-site wetlands from the project area, the wetland plant community is limited to a narrow fringe of reed canarygrass (*Phalaris arundinacea*) adjacent to open water. See Appendix B for a list of existing upland and wetland plant species observed on or near the project.

Hydrology

A query of the website Weather Underground on July 2, 2018 showed that the area had received 0.02 inches of precipitation during the week leading up to the site visit (Appendix A Table A-2). In general, the perimeter of the wetlands was saturated within twelve inches of the ground surface. Approximately 3.5 acres of the wetlands are permanently inundated. The wetlands receive hydrology inputs from a perennial stream which flows in from the south and a seasonal drainage that enters the site from a culvert to the southeast of proposed Lot 54.

4.2.2 Wetland Buffers

In general, the wetland buffers on-site consist of mature upland forest dominated by a Douglas fir (*Pseudotsuga menziesii*), big-leaf maple (*Acer macrophyllum*), Oregon white oak (*Quercus garryana*), and western red cedar (*Thuja plicata*) overstory. The shrub layer is dominated by vine maple (*Acer circinatum*), beaked hazelnut (*Corylus cornuta*), Scotch broom (*Cytisus scoparius*), and poison oak (*Toxicodendron diversilobum*). Large areas of the buffer contain thickets of Himalayan blackberries (*Rubus armeniacus*).

The City of Kalama requires wetland buffers of 150 feet for Category 3 wetlands per KMC Table 15.02.120-1 (City of Kalama, 2018). The project, as designed, does not encroach into the base wetland buffers on the site. Therefore, no wetland or buffer impacts are proposed.

4.2.3 Wetland Functions

Wetland functions were evaluated using the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby, 2014).

The delineated wetlands provide medium levels of water quality, hydrologic functions, and habitat functions (Table 5).

Table 5. Functions and Values of the Existing Wetlands.

Function/Value[a]	Wetland
	A
Water Quality Functions	
Sediment Removal	+
Nutrient and Toxicant Removal	+
Hydrologic Functions	
Flood Flow Alteration	+
Erosion Control & Shoreline Stabilization	-
Habitat Functions	
Production & Export of Organic Matter	+
General Habitat Suitability	+
Habitat for Aquatic Invertebrates	+
Habitat for Amphibians	+
Habitat for Wetland-Associated Mammals	+
Habitat for Wetland-Associated Birds	+
General Fish Habitat	+
Native Plant Richness	+
Special Characteristics	
Educational or Scientific Value	-
Uniqueness and Heritage	-

[a]: "-" means that the function is not present; "X" means that the function is present is of lower quality; and "+" means the function is present an is of higher quality.

4.3 Streams

Per the DNR FPARS website, a Type F stream is located approximately 600 feet southwest of the project area. The stream flows into the southwest end of the wetlands. Due to the distance of the stream from the project area, no buffers extend onto the site. A DNR Type Ns stream originates from the outflow of an off-site slope wetland located to the southeast of the project area. The outflow of the wetland begins as a ditch which flows through a scrub-shrub woody vegetated area south of Old Pacific Highway. The drainage passes through a culvert underneath a driveway which provides access to the property directly southeast of the project area before passing through a blackberry dominated swale. At this point the drainage enters the project area southeast of proposed Lot 52 and passes through a third culvert underneath an unimproved road in the north part of the site. The drainage flows out of the culvert into a forested draw which extends south to the edge of the open water of Big Lake.

4.4 WDFW PHS and Fish and Wildlife Habitat Conservation Areas (KMC Chapter 15.02.130)

CES queried the WDFW PHS on the Web website (Washington Department of Fish and Wildlife, 2018; Washington Department of Natural Resources, 2018) on July 2, 2018 to determine if there are any mapped PHS areas on the project site. This source lists freshwater emergent wetlands and oak woodlands as PHS types on or near the project area.

Numerous Oregon white oaks (*Quercus garryana*) were identified by CES on the project site mainly along the southwest property boundary. The oaks were flagged in the field and later surveyed by SGA Engineering. Their locations are shown on Figure 5 of 7. All oaks will be retained on the project area and will be protected from disturbance during contruction activities through the installation of orange construction fencing around the tree driplines.

4.5 Washington Wetlands of High Conservation Value

Per a query of the Washington DNR Washington Wetlands of High Conservation Value website on July 2, 2018 (Washington Department of Natural Resources, 2018), the project area does not contain any wetland and riparian plant communities, rare plants, or rare nonvascular species that would be considered wetlands of high conservation value.

Chapter 7. References

City of Kalama. (2018, July 2). *Title 15 - Environment*. Retrieved from Kalama, Washington Code of Ordinances: https://library.municode.com/wa/kalama/codes/code_of_ordinances

Hruby, T. (2014). *Washington State Wetland Rating System for Western Washington: 2014 Update.* Olympia, WA: Washington Department of Ecology.

McGee, D. (1972). *Soil Survey of Clark County, Washington.* Washington, DC: Soil Conservation Service.

NRCS. (2008). *Hydrogeomorphic Wetland Classification System: An Overview and Modification to Better Meet the Needs of the Natural Resources Conservation Service.* Washington, DC: United States Department of Agriculture Natural Resources Conservation Service.

Taylor, S. (2018, July 2). Vancouver: SGA Engineering.

USACE. (2010). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).* Vicksburg, MS: U.S. Army Corps of Engineers Engineer Research and Development Center.

USDA. (2018, July 2). *Web Soil Survey*. Retrieved from Web Soil Survey: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Washington Department of Fish and Wildlife. (2018, July 2). PHS on the Web. Olympia, WA. Retrieved from http://apps.wdfw.wa.gov/phsontheweb/

Washington Department of Natural Resources. (2018, July 2). *WA Wetlands of High Conservation Value*. Retrieved from WA Wetlands of High Conservation Value: http://wadnr.maps.arcgis.com/apps/webappviewer

Appendix A — Methods and Tools

Table A-1. Methods and tools used to prepare the report.

Parameter	Method or Tool	Website	Reference
Wetland Delineation	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)	http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp2.pdf	Website
	USFWS / Cowardin Classification System	https://www.fws.gov/wetlands/data/wetland-codes.html	Website
	National Wetlands Inventory – Wetlands Mapper V2	https://www.fws.gov/wetlands/data/mapper.HTML	Website
Wetland Classification	Washington State Wetland Rating System – 2014 Update	Western Washington: https://fortress.wa.gov/ecy/publications/documents/1406029.pdf	Hruby. 2014. Washington State wetland rating system for western Washington –Revised. Publication # 14-06-029.
	City of Kalama Critical Areas Ordinance	https://www.municode.com/library/wa/Kalama/codes/code_of_ordinances?nodeId=CO_TIT18DECO_CH18.280CRARPR	Chapter 15.02.120 – Wetlands
Wetland Rating and Stream Classifications	Department of Natural Resources (DNR) Water Typing System	Forest Practices Water Typing: http://www.dnr.wa.gov/forest-practices-water-typing WAC 222-16-030: http://apps.leg.wa.gov/WAC/default.aspx?cite=222-16-030 Water Type Mapping: http://www.dnr.wa.gov/programs-and-services/forest-practices/forest-practices-application-review-system-fpars	Washington Administrative Code (WAC) 222-16-030. DNR Water typing system.
	City of Kalama Critical Areas Ordinance	https://www.municode.com/library/wa/Kalama/codes/code_of_ordinances?nodeId=CO_TIT18DECO_CH18.280CRARPR_18.280.110FIWIHACOAR	Chapter 15.02.130 – Fish and wildlife habitat conservation areas.
Soils Data	Cowlitz County GIS	http://www.co.cowlitz.wa.us/index.aspx?NID=201	Website
Priority Habitats and Species	Washington Priority Habitats and Species	http://apps.wdfw.wa.gov/phsontheweb/	Website accessed on 7/2/18. There are mapped PHS features on or near the project. Washington Department of Fish and Wildlife (WDFW).
Threatened and Endangered Species	USFWS species lists by County	Western Washington: https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=53011	Website

Table A-2. Precipitation record for week prior to site visit.

Appendix B — Background Information

Appendix B4 Existing Plant Species

Table B-4.1 Dominant wetland plant species existing on the project site.

Scientific Name	Common Name	WIS*
Fraxinus latifolia	Oregon ash	FACW
Alnus rubra	Red alder	FAC
Populus balsamifera	Black cottonwood	FAC
Acer circinatum	Vine maple	FAC
Juncus effusus	Soft rush	FACW
Phalaris arundinacea	Reed canarygrass	FACW
Rubus armeniacus	Himalayan blackberry	FAC

Table B-4.2 Dominant upland plant species existing on the project site.

Scientific Name	Common Name	WIS*
Pseudotsuga menziesii	Douglas fir	FACU
Acer macrophyllum	Big-leaf maple	FACU
Quercus garryana	Oregon white oak	FACU
Prunus emarginata	Bitter cherry	FACU
Alnus rubra	Red alder	FAC
Acer circinatum	Vine maple	FAC
Oemleria cerasiformis	Indian plum	FACU
Polystichum munitum	Swordfern	FACU
Mahonia aquifolium	Oregon grape	FACU
Corylus cornuta	Beaked hazelnut	FACU
Rubus armeniacus	Himalayan blackberry	FAC
Rubus ursinus	Trailing blackberry	FACU
Symphoricarpos albus	Common snowberry	FACU

* Wetland Indicator Status (WIS):

OBL	=	occurs in wetlands > 99% of time
FACW	=	occurs in wetlands 67-99% of time
FAC	=	occurs in wetlands 34-65% of time
FACU	=	occurs in wetlands 1-33% of time
UPL	=	occurs in uplands > 99% of time
NI	=	indicator status not known in this region
~	=	unsure as to FAC or FACU

Appendix C — Figures

Figure 1 of 7 – Vicinity Map

Figure 2 of 7 – Site Topography

Figure 3 of 7 – Soil Survey Map

Figure 4 of 7 – National Wetland Inventory Mapped Wetlands

Figure 5 of 7 – Delineated Wetlands and Site Plan

Figures 6 to 7 – Site Photos

Account No. R041435 Toteff Property

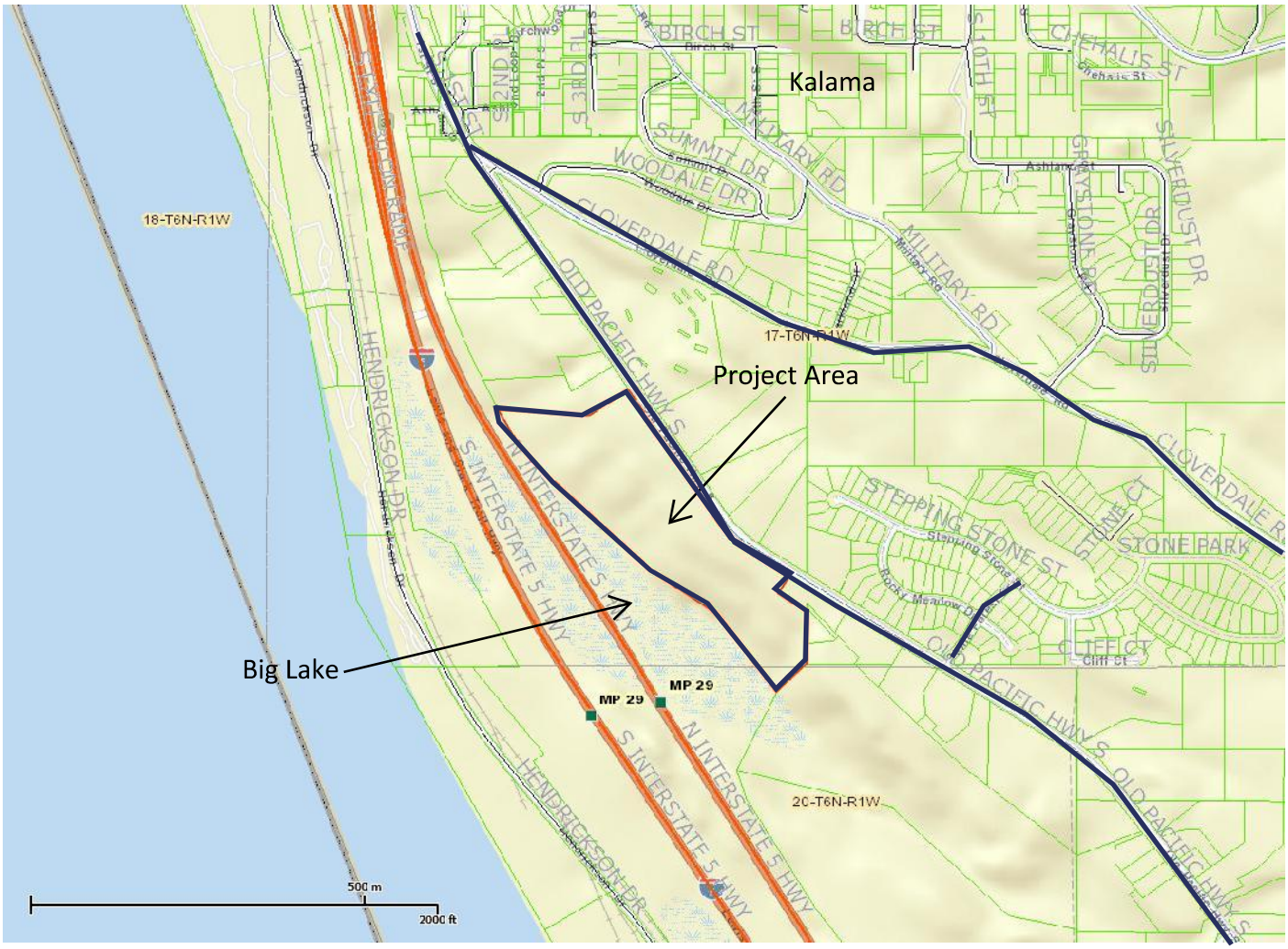


Figure 1 of 7. Vicinity Map

Critical Areas Report
Project: Sunset Terrace Subdivision
Date: 10/16/18

Location: Old Pacific Highway, Kalama, WA 98625

Property Owner: Sunset Terrace, LLC

Tax Parcel: 411460100

Latitude = 45.9988
Longitude = -122.8390

Legal: S17, T6N, R1W of the Willamette Meridian

County: Cowlitz

Applicant:
Sunset Terrace LLC
P.O. Box 128

CASCADIA
ECOLOGICAL SERVICES, INC.
14205 NW 56th Avenue
Vancouver, WA 98685
(360) 601-8631

Cowlitz County NetMaps
Printed: Friday, July 6, 2018 1:30:01 PM

Account No. R041435 Toteff Property

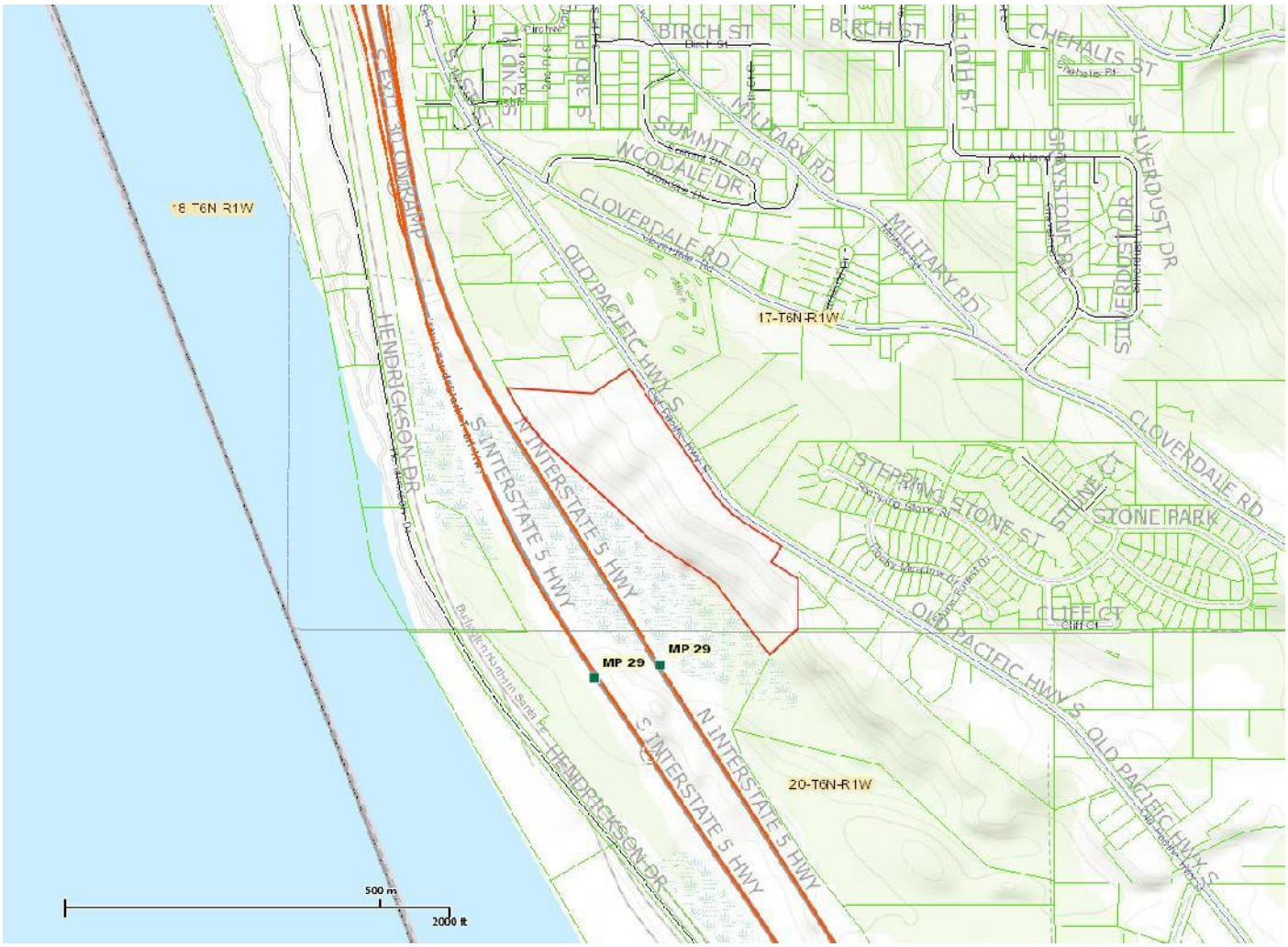


Figure 2 of 7. Site Topography

Critical Areas Report
Project: Sunset Terrace Subdivision
Date: 10/16/18

Location: Old Pacific Highway, Kalama, WA 98625

Tax Parcel: 411460100

Latitude = 45.9988
Longitude = -122.8390

Legal: S17, T6N, R1W of the Willamette Meridian

County: Cowlitz

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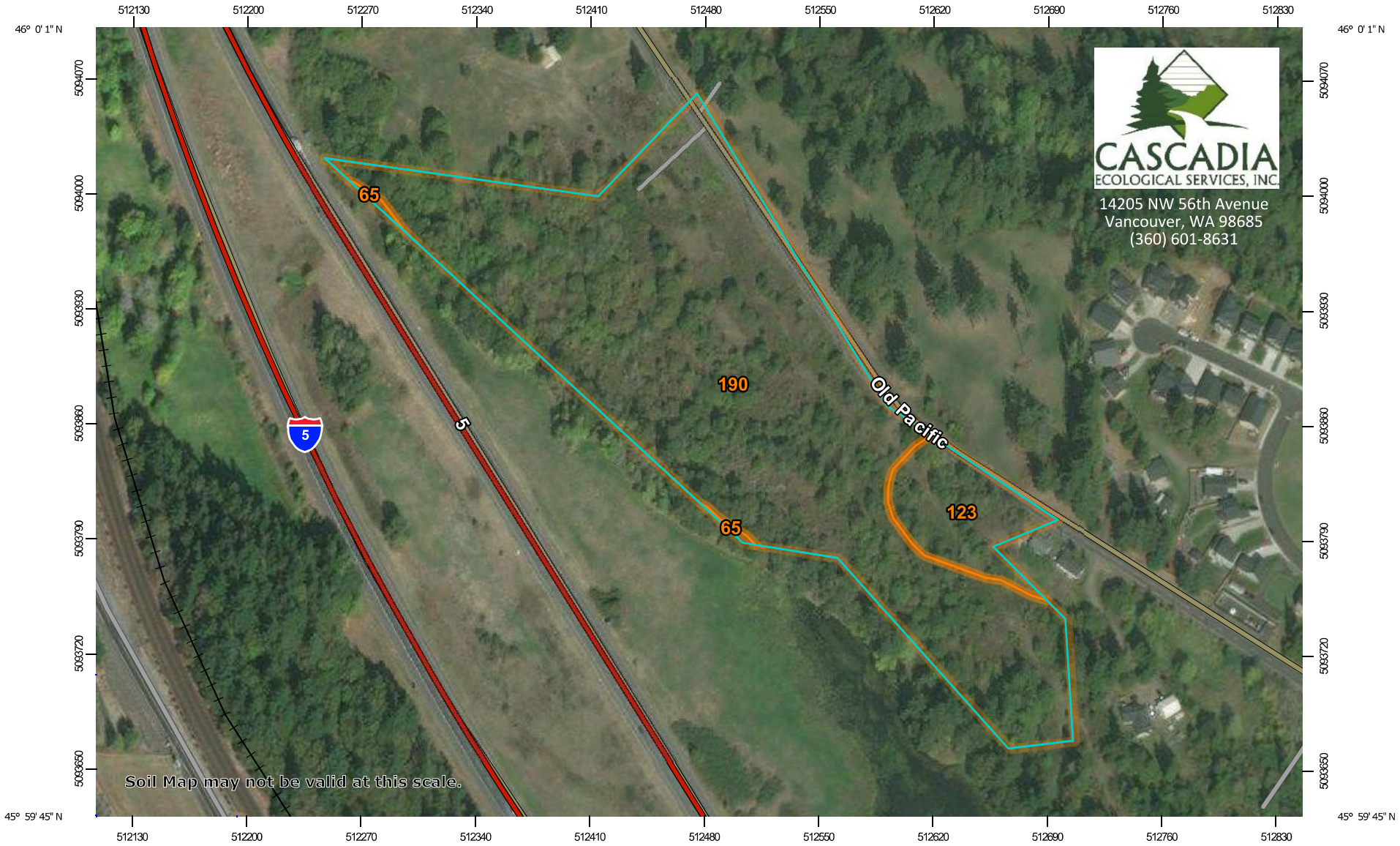
Figure 3 of 7. Soil Survey Map
Critical Areas Report
Project: Sunset Terrace Subdivision
Date: 10/16/18



Map Scale: 1:3,370 if printed on A landscape (11" x 8.5") sheet.

N

0 45 90 180 270 Meters

0 150 300 600 900 Feet

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

Mapped Soils On-Site:
65 - Godfrey silt loam, 0 to 3 percent slopes
123 - Mart silt loam, 0 to 8 percent slopes
190 - Schneider-Rock outcrop complex, 15 to 65 percent slopes

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

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: Cowlitz County, Washington
Survey Area Data: Version 18, Nov 9, 2017

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

Date(s) aerial images were photographed: Sep 29, 2015—Sep 13, 2016

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
65	Godfrey silt loam, 0 to 3 percent slopes	0.0	0.3%
123	Mart silt loam, 0 to 8 percent slopes	1.3	8.8%
190	Schneider-Rock outcrop complex, 15 to 65 percent slopes	13.1	90.9%
Totals for Area of Interest		**14.4**	**100.0%**

U.S. Fish and Wildlife Service
National Wetlands Inventory

Figure 4 of 7. National Wetland Inventory Mapped Wetlands
Critical Areas Report
Project: Sunset Terrace Subdivision
Date: 10/16/18

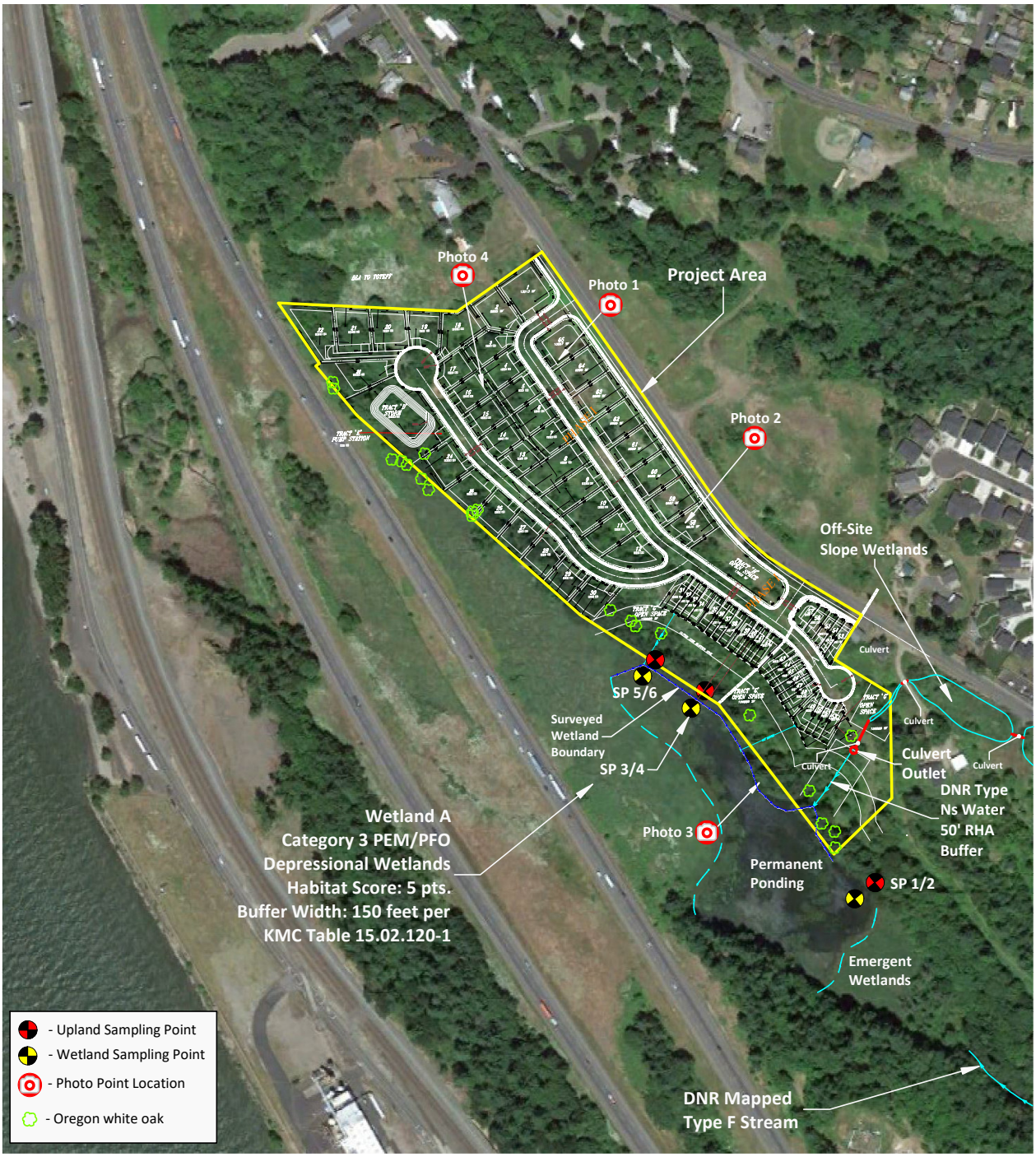
July 6, 2018

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.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper



Note: Critical areas shown on this graphic have been surveyed.
Base survey and site plan provided by SGA Engineering.

Drawn by: J. Barnes

CASCADIA
ECOLOGICAL SERVICES, INC.

Figure 5 of 7 - Delineated Wetlands and Proposed Site Plan
Critical Areas Report

Project: Sunset Terrace Subdivision
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
Legal: S17, T6N, R1W of the Willamette Meridian
45.9966 N. lat. /-122.8379 W long.
County: Cowlitz

Cascadia Ecological Services, Inc.
14205 NW 56th Avenue, Vancouver, WA 98685
(360) 601-8631
www.cascadia-inc.com

Date: 10/16/18

APPLICANT:
Sunset Terrace LLC
P.O. Box 128
Kalama, WA 98625
(360) 883-2506

Graphic Scale
0 100 200
Feet

Photo 1. Taken at the gravel entry road to the project area to the southwest of Old Pacific Highway facing northwest.

Photo 2. Taken at the gravel entry road to the project area to the southwest of Old Pacific Highway facing southeast.

CASCADIA ECOLOGICAL SERVICES, INC.

Figure 6 of 7 - Site Photos
Critical Areas Report

Project: Sunset Terrace Subdivision
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
Legal: S17, T6N, R1W of the Willamette Meridian
45.9966 N. lat. /-122.8379 W long.
County: Cowlitz

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(360) 601-8631
www.cascadia-inc.com

Date: 10/16/18

APPLICANT:
Sunset Terrace LLC
P.O. Box 128
Kalama, WA 98625
(360) 883-2506

Photo 3. Taken west of the project area at the edge of the wetlands associated with Big Lake.

Photo 4. Photo of upland slope vegetation in the north part of the project area.

CASCADIA ECOLOGICAL SERVICES, INC.

Figure 7 of 7 - Site Photos
Critical Areas Report
Project: Sunset Terrace Subdivision
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
Legal: S17, T6N, R1W of the Willamette Meridian
45.9966 N. lat. /-122.8379 W long.
County: Cowlitz

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www.cascadia-inc.com

Date: 10/16/18

APPLICANT:
Sunset Terrace LLC
P.O. Box 128
Kalama, WA 98625
(360) 883-2506

Appendix D — Wetland Determination Data Forms

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

Project/Site: Sunset Terrace Subdivision | City/County: Kalama/Cowlitz | Sampling Date: 14-Dec-17

Applicant/Owner: Sunset Terrace, LLC | State: WA | Sampling Point: 01

Investigator(s): Jim Barnes | Section, Township, Range: S 17 T 6N R 1W

Landform (hillslope, terrace, etc.): Toeslope | Local relief (concave, convex, none): concave | Slope: 5.0 % / 2.9 °

Subregion (LRR): LRR A | Lat.: 45.9966 | Long.: -122.8379 | Datum:

Soil Map Unit Name: 190 - Schneider-Rock outcrop complex, 15 to 65 percent 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:
Upland sampling point at base of hillslope along the SW edge of the project area.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
1. Pseudotsuga menziesii	90	☑ 90.0%	FACU
2. Quercus garryana	10	☐ 10.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	0	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus armeniacus	80	☐ 100.0%	FAC
2.	0	☐ 0.0%	
	80	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	50.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	180 (A)		640 (B)

Prevalence Index = B/A = 3.556

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrologic 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:
The sampling point is at the base of a steep hillslope at the edge of ponded water at Big Lake.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **01**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3	100					Gravelly silt loam	Rocky soil

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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)
- ☐ 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:

Soils contain considerable amounts of rock and cobble.

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 on 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 (minimum of two 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
Water Table Present?	Yes ○	No ◉	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	0

Wetland Hydrology Present? Yes ○ No ◉

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

In the week prior to the site visit, the area had received 0.02 inches of precipitation.

Remarks:

The sampling location is adjacent to Big Lake SW of the project area.

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

Project/Site: Sunset Terrace Subdivision | City/County: Kalama/Cowlitz | Sampling Date: 14-Dec-17

Applicant/Owner: Sunset Terrace, LLC | State: WA | Sampling Point: 02

Investigator(s): Jim Barnes | Section, Township, Range: S 17 T 6N R 1W

Landform (hillslope, terrace, etc.): Toeslope | Local relief (concave, convex, none): convex | Slope: 1.0 % / 0.6 °

Subregion (LRR): LRR A | Lat.: 45.9966 | Long.: -122.8379 | Datum:

Soil Map Unit Name: 65 - Godfrey silt loam, 0 to 8 percent 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:
Sampling point at base of hillslope along the SW edge of the project area adjacent to Big Lake.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	100	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus armeniacus	15	☐ 100.0%	FAC
2.	0	☐ 0.0%	
	15	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		245 (B)

Prevalence Index = B/A = 2.130

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrologic 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:
The sampling point is at the base of a steep hillslope at the edge of ponded water at Big Lake.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **02**

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 4/1	90	5YR 3/4	10	RM	M	Silt Loam	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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)
- ☐ 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:

Soils contained mottling and redox concentrations.

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 on 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 (minimum of two 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):	3
Water Table Present?	Yes ○	No ◉	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

In the week prior to the site visit, the area had received 0.02 inches of precipitation.

Remarks:

The sampling location is adjacent to Big Lake SW of the project area.

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

Project/Site: Sunset Terrace Subdivision | City/County: Kalama/Cowlitz | Sampling Date: 14-Dec-17

Applicant/Owner: Sunset Terrace, LLC | State: WA | Sampling Point: 03

Investigator(s): Jim Barnes | Section, Township, Range: S 17 T 6N R 1W

Landform (hillslope, terrace, etc.): Toeslope | Local relief (concave, convex, none): concave | Slope: 5.0 % / 2.9 °

Subregion (LRR): LRR A | Lat.: 45.9966 | Long.: -122.8379 | Datum:

Soil Map Unit Name: 190 - Schneider-Rock outcrop complex, 15 to 65 percent 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:
Upland sampling point at base of hillslope along the SW edge of the project area.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
1. Pseudotsuga menziesii	10	☐ 10.0%	FACU
2. Quercus garryana	90	☑ 90.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Corylus cornuta	80	☑ 80.0%	FACU
2. Acer circinatum	10	☐ 10.0%	FAC
3. Symphoricarpos albus	10	☐ 10.0%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	100	= Total Cover	
Herb Stratum (Plot size: 5')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	0	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus armeniacus	10	☐ 100.0%	FAC
2.	0	☐ 0.0%	
	10	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	190	x 4 =	760
UPL species	0	x 5 =	0
Column Totals:	210 (A)		820 (B)

Prevalence Index = B/A = 3.905

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrologic 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:
The sampling point is at the base of a steep hillslope at the edge of ponded water at Big Lake.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **03**

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 3/3	100					Gravelly silt loam	rocky soil

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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)
- ☐ 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:

Soils contain considerable amounts of rock and cobble.

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 on 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 (minimum of two 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
Water Table Present?	Yes ○	No ◉	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	0

Wetland Hydrology Present? Yes ○ No ◉

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

In the week prior to the site visit, the area had received 0.02 inches of precipitation.

Remarks:

The sampling location is adjacent to Big Lake SW of the project area.

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

Project/Site: Sunset Terrace Subdivision | City/County: Kalama/Cowlitz | Sampling Date: 14-Dec-17

Applicant/Owner: Sunset Terrace, LLC | State: WA | Sampling Point: 04

Investigator(s): Jim Barnes | Section, Township, Range: S 17 T 6N R 1W

Landform (hillslope, terrace, etc.): Toeslope | Local relief (concave, convex, none): convex | Slope: 1.0 % / 0.6 °

Subregion (LRR): LRR A | Lat.: 45.9966 | Long.: -122.8379 | Datum:

Soil Map Unit Name: 65 - Godfrey silt loam, 0 to 8 percent 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:
Sampling point at base of hillslope along the SW edge of the project area adjacent to Big Lake.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	100	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrologic 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:
The sampling point is at the base of a steep hillslope at the edge of ponded water at Big Lake.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **04**

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
0-17	10YR 4/1	80	5YR 3/6	20	RM	M	Silt Loam	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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)
- ☐ 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:

Soils contained mottling and redox concentrations.

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 on 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 (minimum of two 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
Water Table Present?	Yes ○	No ◉	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

In the week prior to the site visit, the area had received 0.02 inches of precipitation.

Remarks:

The sampling location is adjacent to Big Lake SW of the project area.

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

Project/Site: Sunset Terrace Subdivision | City/County: Kalama/Cowlitz | Sampling Date: 14-Dec-17

Applicant/Owner: Sunset Terrace, LLC | State: WA | Sampling Point: 05

Investigator(s): Jim Barnes | Section, Township, Range: S 17 T 6N R 1W

Landform (hillslope, terrace, etc.): Toeslope | Local relief (concave, convex, none): concave | Slope: 5.0 % / 2.9 °

Subregion (LRR): LRR A | Lat.: 45.9966 | Long.: -122.8379 | Datum:

Soil Map Unit Name: 190 - Schneider-Rock outcrop complex, 15 to 65 percent 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:
Upland sampling point at base of hillslope along the SW edge of the project area.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30')			
1. Pseudotsuga menziesii	100	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Corylus cornuta	80	☑ 80.0%	FACU
2. Symphoricarpos albus	20	☑ 20.0%	FACU
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	100	= Total Cover	
Herb Stratum (Plot size: 5')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	0	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Rubus armeniacus	15	☐ 100.0%	FAC
2.	0	☐ 0.0%	
	15	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	25.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	200	x 4 =	800
UPL species	0	x 5 =	0
Column Totals:	215 (A)		845 (B)

Prevalence Index = B/A = 3.930

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrologic 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:
The sampling point is at the base of a steep hillslope at the edge of ponded water at Big Lake.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **05**

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
0-17	10YR 3/3	100					Gravelly silt loam	rocky soil

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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)
- ☐ 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:

Soils contain considerable amounts of rock and cobble.

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 on 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 (minimum of two 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
Water Table Present?	Yes ○	No ◉	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):	0

Wetland Hydrology Present? Yes ○ No ◉

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

In the week prior to the site visit, the area had received 0.02 inches of precipitation.

Remarks:

The sampling location is adjacent to Big Lake SW of the project area.

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

Project/Site: Sunset Terrace Subdivision | City/County: Kalama/Cowlitz | Sampling Date: 14-Dec-17

Applicant/Owner: Sunset Terrace, LLC | State: WA | Sampling Point: 06

Investigator(s): Jim Barnes | Section, Township, Range: S 17 T 6N R 1W

Landform (hillslope, terrace, etc.): Toeslope | Local relief (concave, convex, none): convex | Slope: 1.0 % / 0.6 °

Subregion (LRR): LRR A | Lat.: 45.9966 | Long.: -122.8379 | Datum:

Soil Map Unit Name: 65 - Godfrey silt loam, 0 to 8 percent 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:
Sampling point at base of hillslope along the SW edge of the project area adjacent to Big Lake.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	100	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.000

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrologic 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:
The sampling point is at the base of a steep hillslope at the edge of ponded water at Big Lake.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: **06**

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
0-15	10YR 4/1	80	5YR 3/4	20	RM	M	Silt Loam	

[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 Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in 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)
- ☐ 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:

Soils contained mottling and redox concentrations.

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 on 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 (minimum of two 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
Water Table Present?	Yes ○	No ◉	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

In the week prior to the site visit, the area had received 0.02 inches of precipitation.

Remarks:

The sampling location is adjacent to Big Lake SW of the project area.

Appendix E — Rating Summary – W. Washington

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 1 Date of site visit: 12/14/17

Rated by Jim Barnes Trained by Ecology? X Yes ___No Date of training 11/12/13

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y X N

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

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions X or special characteristics___)

1. Category of wetland based on FUNCTIONS

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

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

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

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		Circle the appropriate ratings		
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	H (M) L	H (M) L	H (M) L	
Value	(H) M L	(H) M L	H (M) L	TOTAL
Score Based on Ratings	7	7	5	19

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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	WR1
Hydroperiods	D 1.4, H 1.2	WR1
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	WR1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	WR1
Map of the contributing basin	D 4.3, D 5.3	WR2
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	WR3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	WR4
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	WR5

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 undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	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 undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which 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	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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?
   X The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ___The water leaves the wetland **without being impounded**.

   NO – go to 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).

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.

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

DEPRESSIONAL AND FLATS WETLANDS

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

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	2
Total for D 1 Add the points in the boxes above	7

Rating of Site Potential If score is: ___ **12-16 = H** X **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

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

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

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	2
Total for D 3 Add the points in the boxes above	4

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

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

DEPRESSIONAL AND FLATS WETLANDS

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

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = (2)	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = (3)	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

The area of the basin is less than 10 times the area of the unit	points = (5)	5
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire wetland is in the Flats class	points = 5	

Total for D 4	Add the points in the boxes above	10

Rating of Site Potential If score is: ___ **12-16 = H** _X_ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges?	Yes = (1) No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = (1) No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = (0)	0
Total for D 5	Add the points in the boxes above	1

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

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):

• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = (2)	2
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the sub-basin.	points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* See note below	points = 0	
There are no problems with flooding downstream of the wetland.	points = 0	

D 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 — 2

Total for D 6	Add the points in the boxes above	4

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

Note: Wetland is in a topographic depression with no outlet

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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 or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

X Aquatic bed	4 structures or more: points = 4
X 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/ground-cover) that each cover 20% within the Forested polygon

0

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 or ¼ ac to count (*see text for descriptions of hydroperiods*).

X Permanently flooded or inundated	4 or more types present: points = 3
X Seasonally flooded or inundated	3 types present: points = (2)
____Occasionally flooded or inundated	2 types present: points = 1
X Saturated only	1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland	
____Seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

2

H 1.3. Richness of plant species

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

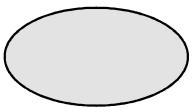
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

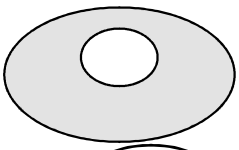
1

H 1.4. Interspersion of habitats

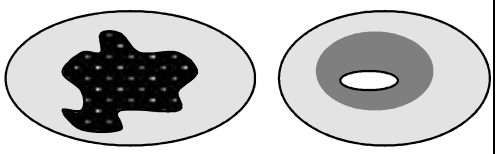
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



None = 0 points

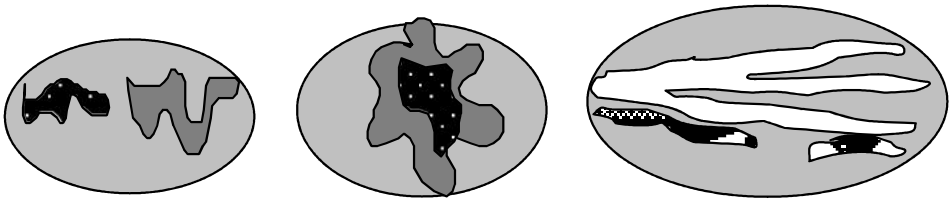


Low = (1 point)



Moderate = 2 points

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



1

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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 extends at least 3.3 ft (1 m) over 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)* __X__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 for list of strata*)	1
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** __X__**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 that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 10 + [(% moderate and low intensity land uses)/2] 0 = 10 % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = (0)	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 19 + [(% moderate and low intensity land uses)/2] 24 = 43 % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = (2) Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	2
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = (0)	0
Total for H 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is:___**4-6 = H** __X__**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 — 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	1

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

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

WDFW Priority Habitats

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

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

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

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

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

— **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) 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.

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

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

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **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.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

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

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

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

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 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.

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

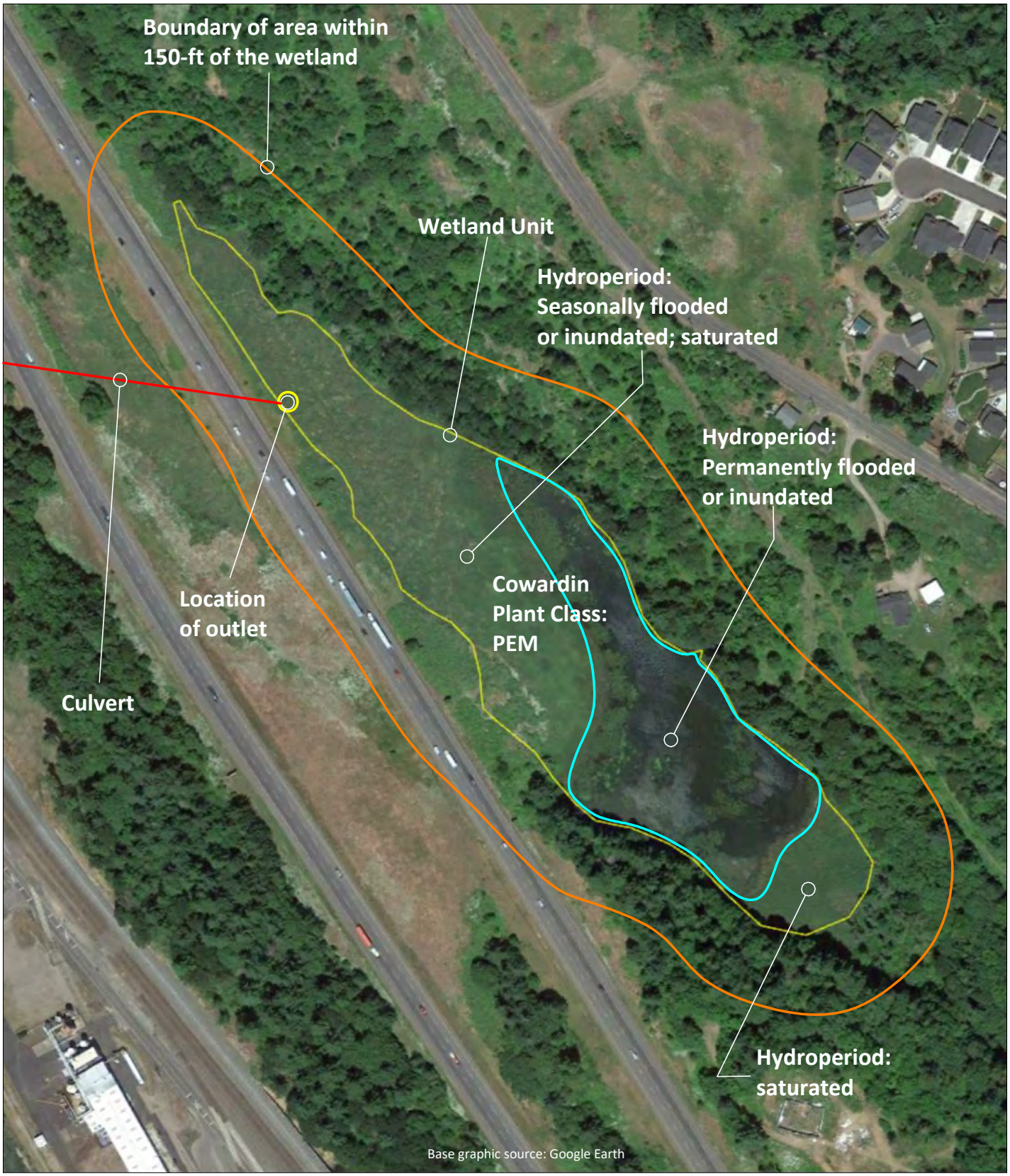
Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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 page 25) — 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. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **– Go to SC 2.2** No **– Go to SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** (No) **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? 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 = **Is 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 = **Is a 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 = **Is a Category I bog** (No) **= Is not a bog**	**Cat. I**

Wetland name or number 1 (Big Lake; adjacent to Tax Parcel Acct. No.: R041435 & I-5)

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)* 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 on p. 100). — 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 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



CASCADIA ECOLOGICAL SERVICES, INC.

Sheet WR-1: Cowardin plant classes, hydroperiods, location of outlet

Project: Sunset Terrace Townhomes
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
Legal: S17, T6N, R1W of the Willamette Meridian
45.9966 N. lat. /-122.8379 W long.
County: Cowlitz

Cascadia Ecological Services, Inc.
14205 NW 56th Avenue, Vancouver, WA 98685
(360) 601-8631
www.cascadia-inc.com

Date: 1/5/18

CLIENT:
Ron Veach
31226 NE Kelly Rd.
Yacolt, WA 98675

Graphic Scale
0 100 200
Feet

Sheet WR-2: Map of the contributing basin

Project: Sunset Terrace Townhomes
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
Legal: S17, T6N, R1W of the Willamette Meridian
45.9966 N. lat. /-122.8379 W long.
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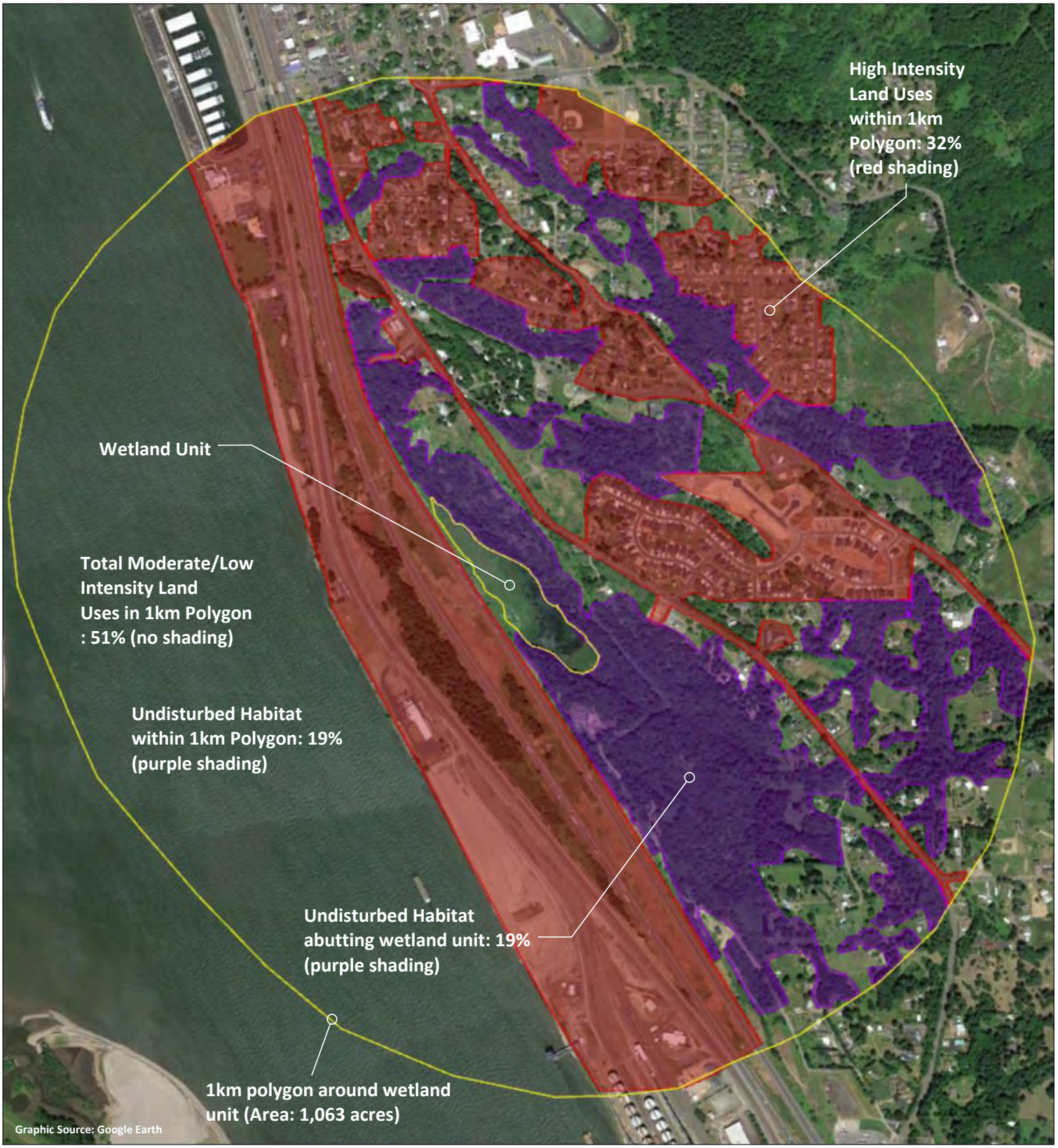
31226 NE Kelly Rd.
Yacolt, WA 98675

Graphic Scale
0 300 600
Feet



CASCADIA ECOLOGICAL SERVICES, INC.

Sheet WR-3: 1km Polygon: Area that extends 1km from the entire wetland edge

Project: Sunset Terrace Townhomes
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
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Date: 1/8/18

CLIENT:
Ron Veach
31226 NE Kelly Rd.
Yacolt, WA 98675

Graphic Scale
0 500 1000
Feet

Sheet WR-4: Screen capture of map of 303(d) listed waters in basin (from Ecology website)

Project: Sunset Terrace Townhomes
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
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45.9966 N. lat. /-122.8379 W long.
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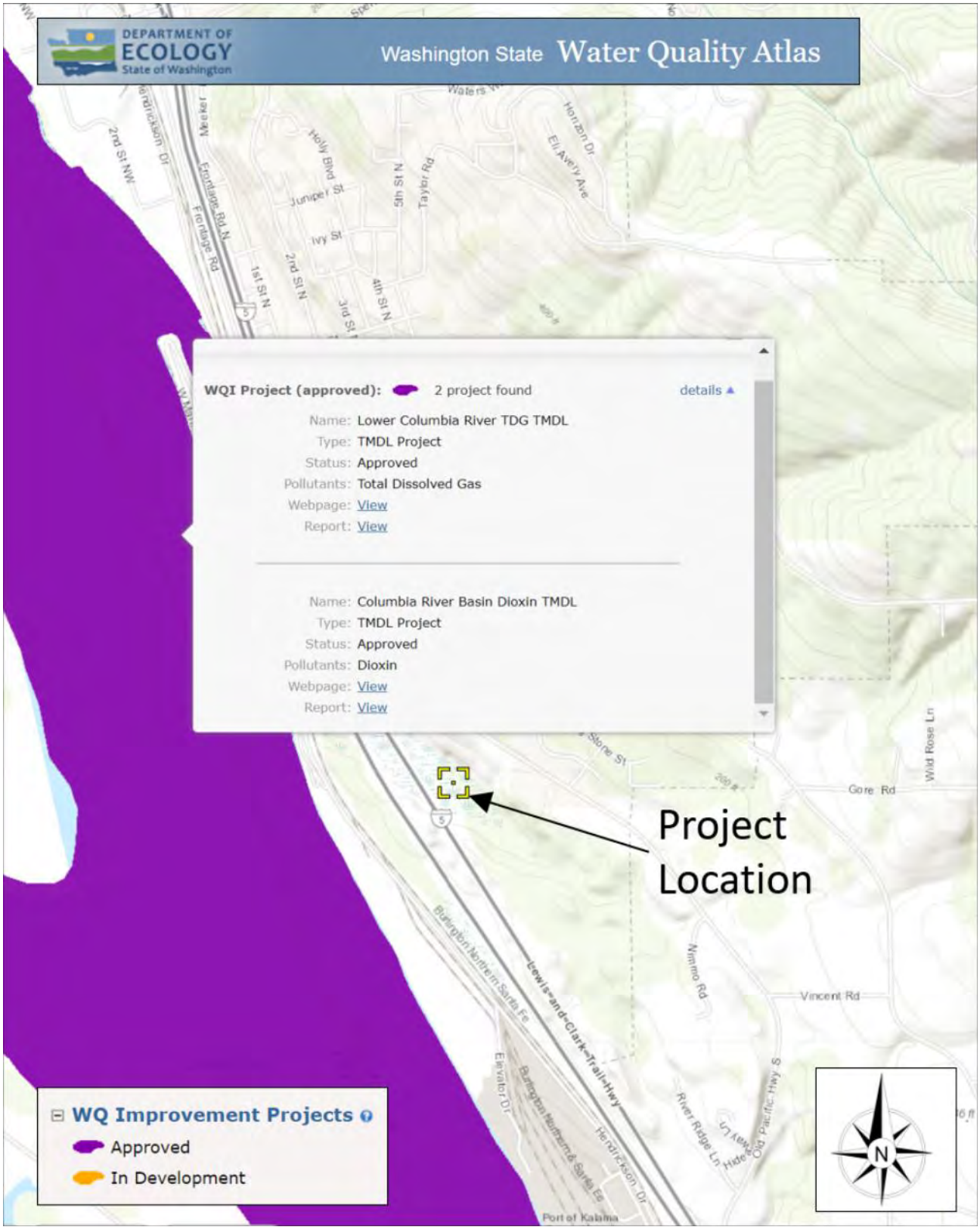
www.cascadia-inc.com

Date: 1/5/18

CLIENT:
Ron Veach
31226 NE Kelly Rd.
Yacolt, WA 98675



Sheet WR-5: Screen capture of list of TMDLs for WRIA in which unit is found (from web)

Project: Sunset Terrace Townhomes
Location: No situs address. West of Old Pacific Highway and east of Interstate 5, Kalama, WA 98625
Tax Parcels: 411460100
Legal: S17, T6N, R1W of the Willamette Meridian
45.9966 N. lat. /-122.8379 W long.
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