Exhibit 18
LI/BP21-01

Preliminary
Storm Drainage Report

PREPARED FOR:

Panattoni Development Company, Inc.
1821 Dock Street, Suite 100
Tacoma, WA 98402

PROJECT:

Camas Business Center
4723 NW Lake Road
Camas, WA 98607
2200867.10

PREPARED BY:

Matt Whittlesey, EIT
Project Engineer

REVIEWED BY:

Bart Brynestad, PE
Project Manager

J. Matthew Weber, PE
Principal

DATE:

October 2021

Preliminary Storm Drainage Report

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Project Manager

J. Matthew Weber, PE
Principal

DATE:

October 2021

10/19/2021

I hereby state that this Preliminary Storm Drainage Report for the Camas Business Center project has been prepared by me or under my supervision, and meets the standard of care and expertise that is usual and customary in this community for professional engineers. I understand that City of Camas does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me.

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Draft Geotechnical Report
Terra Associates, Inc.
July 12, 2021

Wetland and Fish and Wildlife Habitat Assessment Report
Soundview Consultants
October 2021

SECTION A — Project Overview

This Preliminary Storm Drainage Report accompanies the civil engineering plans submitted for the Site Plan Review process for the proposed Camas Business Center project.

The Camas Business Center project proposes to develop approximately 74.5 acres located in an LI/BP (Light Industrial/Business Park) zoning district with three warehouse/distribution facilities, totaling approximately 970,000 square feet. Site improvements include approximately 1,300 combined parking spaces for passenger vehicles and semi-trailers, maneuvering areas, concrete aprons, wet and dry utilities, stormwater facilities, and landscaping. Improvements also include the construction of a north-south public road and an east-west public road on the project site. The project is proposed to be completed in three phases. The first phase will consist of Building A, all onsite roads, and the site stormwater facilities. The second and third phases will consist of Building B and Building C, respectively.

This report demonstrates that the stormwater design for this project meets the requirements of the 2019 Department of Ecology (Ecology) *Stormwater Management Manual for Western Washington (SWMMWW),* as supplemented by the *Camas Stormwater Design Standards Manual* (*CSDSM)*.

Site Information

The site is located in a portion of the Southeast Quarter of Section 29, Township 02 North, Range 03 East, in the city of Camas, Clark County, Washington. The site consists of Parcel Nos. 176170000 and 176155000. The site is bounded by industrial development to the north, golf courses and industrial/commercial development to the east and west, and NW Lake Road to the south. The site is currently minimally developed, with a single-family residence and multiple barns and outbuildings on the southern portion of the site. Groundcover of the southern half of the site is predominately grass and the apparent use is livestock pasture. The northern half of the site contains scattered stands of fir, ash, and oak trees, as well as large thickets of blackberries. Four distinct wetland areas have been identified on the site. One is located on the east-central portion of the site and the remaining three are located in the northern portion of the site. Refer to Appendix C for the *Wetland and Fish and Wildlife Habitat Assessment Report* (Critical Areas Report) by Soundview Consultants dated October 2021. Topography slopes from east to west and south to north, with approximately 60 feet of relief across the site. Slopes are generally moderate in the southern and northern portions, with a steep south-north slope along the central portion of the site.

Proposed stormwater facilities include a closed conveyance system and a large combined wetpond/detention facility. Stormwater will be discharged at the site's natural outfall located in a wetland buffer in the northwest portion of the site.

SECTION B — Minimum Requirements

Determination of Applicable Minimum Requirements

Based on the information in the table below, the proposed project is subject to Minimum Requirements 1 through 9. Refer to Appendix A for the New Development Minimum Requirements Flow Chart.

Development Impact Areas (Preliminary)	
Existing Hard Surface Area	0.3 ac
New Hard Surface Area	48.0 ac

Development Impact Areas (Preliminary)	
Replaced Hard Surface Area	0.3 ac
Amount of Native Vegetation Converted to Lawn or Landscape	17.8 ac
Amount of Native Vegetation Converted to Pasture	0.00 ac
Total Amount of Land Disturbing Activity	66.4 ac

SECTION C — Soils Evaluation

The soils onsite are mapped by the Natural Resources Conservation Service (NRCS) as primarily Hesson clay loam (HcB & HcD), as well as Powell silt loam (PoB), with the wetland areas mapped as Cove silty clay loam (CwA). HcB and HcD soils are defined by NRCS as Hydrologic Soil Group C. CwA and PoB soils are defined by NRCS as Hydrologic Soil Group D. Refer to the NRCS Soils Map in Appendix A.

A field investigation performed by Terra Associates, Inc. revealed the site soils generally consist of 3 to 12 feet of medium stiff to very stiff silt, with varying amounts of sand and gravel. In some test pits in the north and north-central portions of the site, Columbia River Basalt (bedrock) was observed within the upper 3 to 9 feet. Groundwater was observed in 8 of 80 test pits between 2.5 and 12 feet below grade. Refer to Appendix C for the Draft Geotechnical Report.

For stormwater modeling, Clark County classifies soils into Soil Groups (SG) 1 through 5. Per the *CSDSM*, it is appropriate to use the Clark County Soil Group definitions within the Western Washington Hydrology Model (WWHM) for storm facility sizing. The onsite soils are defined by the *Clark County Stormwater Manua*l as SG3 and SG4. However, the project geotechnical report indicates that infiltration is not feasible in the onsite soils due to soil gradation, high groundwater concerns, and shallow depth to bedrock. Therefore, the onsite soils most closely match SG4, which is defined as “poorly drained soils (slowly infiltrating C soils, as well as D soils).” For stormwater facility sizing, the onsite soils have been modeled as SG4 in the WWHM program. This is consistent with the development of the project immediately to the west, Dwyer Creek Business Center, which contains similar soil conditions.

SECTION D — Source Control

The proposed project is required to provide source control of pollution. The following are proposed measures to be implemented as part of the civil plans.

- All pollutants, including waste materials and demolition debris created onsite during construction, shall be handled and disposed of in a manner that does not cause contamination of surface water.
- Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and non-inert wastes present on the site (see Chapter 173-304 WAC for the definition of inert waste).
- Maintenance and repair of heavy equipment and vehicles that may result in discharge or spillage of pollutants to the ground or into surface water runoff must be conducted using spill prevention measures such as drip pans.
- Concrete Handling (BMP C151) and Sawcutting and Surface Pollution Prevention (BMP C152) shall be used to prevent or treat contamination of surface water runoff by pH modifying sources.
- Landscaping and Lawn/Vegetation Management (BMP S411) shall be used to control fertilizer and pesticide applications, soil erosion, and site debris to prevent contamination of stormwater.

SECTION E — Onsite Stormwater Management BMPs

To satisfy this requirement, the project will implement List 2 Best Management Practices (BMPs) to the maximum extent feasible. Because of the nature of the site's soils and relatively high groundwater, infiltration is not feasible for the site. Refer to Appendix C for the Draft Geotechnical Report and additional information on site soils.

Lawn and Landscaped Areas

Post Construction Soil Quality and Depth will be implemented in accordance with BMP T5.13.

Roofs

Dispersion is not feasible because there is no vegetated flow path available for dispersion. Additionally, infiltration is not feasible due to the soils onsite. Lastly, perforated stub-out connections would likely conflict with the shallow groundwater. Roof runoff will be tight lined to the proposed detention system.

Other Hard Surfaces (Roads, Sidewalks, Driveways)

Runoff from all other hard surfaces such as driveways, sidewalks, roadways, and access aisles will be directed to the combination wetpond and detention pond.

Full dispersion is not feasible because there is not an adequate vegetated flow path available. Permeable pavement is not feasible because infiltration is not feasible on the site and because of high groundwater levels. Bioretention BMPs are not feasible because infiltration is not feasible on the site and because of high groundwater levels. Lastly, sheet flow dispersion is not feasible because there is not an adequate vegetated flow path available.

SECTION F — Runoff Treatment Analysis and Design

Because the project is located in the Lacamas watershed and above the dam at the south end of Round Lake, phosphorus treatment is required per the *CSDSM*. Basic and phosphorus treatment will be provided for all applicable surfaces by a combined wetpond/detention pond. The wetpond consists of dead storage located directly beneath the live storage portion of the pond. To comply with *SWMMWW* requirements for phosphorus treatment, the wetpond has been designed as a Large Wetpond. This necessitates increasing the calculated treatment volume by a factor of 1.5. The combined wetpond/detention pond has been preliminarily sized as part of this submittal. WWHM was used to determine the required treatment volume. Preliminary calculations are included in Appendix B.

It is anticipated that some areas of the project site will not be able to be conveyed to the main stormwater facility. Basic and phosphorus treatment for these surfaces will be provided by proprietary filter units that have Ecology General Use Level Designation (GULD) approval for basic and phosphorus treatment. Sizing calculations for these units will be included in the final engineering submittal.

SECTION G — Flow Control Analysis and Design

The proposed project is required to provide flow control for all applicable surfaces. Flow control will be provided by the combined wetpond/detention pond. The detention portion of the pond consists of the live storage volume, which is located on top of the dead storage, or treatment volume. The combined facility will discharge into the buffer of onsite Wetland B, which is the natural discharge location of the predeveloped site. The combined wetpond/detention pond has been preliminarily sized as part of this submittal. WWHM was used to determine the required detention volume. As discussed in Section C, onsite soils were modeled as Clark County SG4. To comply with wetlands protection requirements, a portion of the site consisting of the Building C roof will discharge to a flow splitter and then to Wetland A. The flow splitter will be designed to convey flows under 0.4 CFS to the wetland and flows over 0.4 CFS to the detention pond. Per the *SWMMWW*, areas requiring flow control can bypass the facility if the 100-year peak discharge from the bypass area is less than 0.4 CFS. The detention facility has been sized to accommodate the bypass area, which is modeled as discharging straight to the point of compliance and bypassing the detention facility. Preliminary calculations are included in Appendix B.

SECTION H — Wetlands Protection

Four wetlands are identified onsite. Wetland C will be filled and Wetlands A, B, and D will remain. Refer to Appendix C for the Critical Areas Report, which contains a detailed breakdown of the existing wetlands and relevant project conditions.

Per the Critical Areas Report, Wetlands A and D require compliance with *SWMMWW* Minimum Requirement 8 – Wetlands Protection. The project will comply with this requirement to the maximum extent feasible by attempting to maintain the existing hydroperiods of the wetlands. This project will use Method 2, which uses the WWHM model to compare predeveloped and developed discharges to the wetland for the following criteria:

Criteria 1. Mean Daily Total Discharge Volumes from the Site

Total volume of water into a wetland on daily basis should not be more than 20% higher or lower than the pre-project volumes.

- Calculate the average of the total discharge volumes from the site for each day over the period of precipitation record in the approved model for pre- and post-project scenarios. There will be 365 (366 for a leap year) average daily values for the pre-project scenario and 365 (366 for a leap year) for the post-project. No day can exceed 20% change in volume.

Criteria 2. Mean Monthly Total Discharge Volumes from the Site

Total volume of water into a wetland on a monthly basis should not be more than 15% higher or lower than the pre-project volumes.

- Calculate the average of the monthly total discharge volumes from the site for each calendar month over the period of precipitation record in the approved model for pre- and post-project scenarios. No month can exceed 15% change in volume.

The criteria will be met for Wetland D because its tributary basin consists only of its buffer area, which will remain undisturbed in the developed condition. The criteria will be met to the maximum extent feasible for Wetland A. The offsite portion of Wetland A's tributary basin will be conveyed to the wetland by a ditch or culvert in the developed condition. To match the existing hydroperiod as closely as possible, runoff from the Building C roof will be conveyed directly to the wetland. A flow splitter will send low flows to the wetland, while any flows exceeding the bypass allowance of the flow control facility will be conveyed to the detention pond. Preliminary wetland hydroperiod calculations are included in Appendix B.

SECTION I — Other Permits

- Department of Ecology National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit

SECTION J — Conveyance Analysis and Design

A full analysis of the conveyance capacity of the onsite stormwater pipe network will be provided with the final engineering submittal.

SECTION K — Offsite Analysis

The site has been evaluated for offsite runon from upland parcels, and the downstream flow path has been evaluated to ensure that the developed discharge location is consistent with the existing discharge location. A formal offsite analysis is not applicable for this project because it is not anticipated to have a significant adverse impact on the downstream or upstream drainage systems, per *CSDSM* Section 9.02. The combined wetpond/detention pond has been designed in accordance with *SWMMWW* requirements to maintain existing flow rates leaving the site and to remove phosphorus and other contaminants, as required. Additionally, the project has accommodated runon from upland parcels by conveying drainage either around the project site or into onsite wetlands, as appropriate.

SECTION L — Approval Conditions Summary

There are no conditions of approval related to stormwater in the provided City of Camas Pre-Application Meeting Notes dated December 3, 2020.

SECTION M — Special Reports and Studies

Included in the appendices are the following reports:

- Draft Geotechnical Report by Terra Associates, Inc., dated July 12, 2021
- Wetland and Fish and Wildlife Habitat Assessment Report by Soundview Consultants, dated October 2021

SECTION N — Maintenance and Operation Manual

The stormwater facilities will be privately owned and maintained. A Maintenance and Operation manual will be included with the final engineering submittal.

CONCLUSION

The proposed Camas Business Center project proposes to construct 970,000 square feet of single-story warehouse/distribution facilities on 74.5 acres. Site improvements include approximately 1,300 combined parking spaces for passenger vehicles and semi-trailers, maneuvering areas, concrete aprons, wet and dry utilities, stormwater facilities, landscaping, and construction of two public roads within the site. If constructed per plan, the stormwater system will manage anticipated runoff volumes based on the design criteria of the 2019 Ecology *Stormwater Management Manual for Western Washington (SWMMWW)*. This report and associated plans were prepared within the guidelines established by City of Camas.

This analysis is based on data and records either supplied to or obtained by AHBL. These documents are referenced within the text of the analysis. The analysis has been prepared using procedures and practices within the standard accepted practices of the industry.

AHBL, Inc.

Matt Whittlesey, EIT
Project Engineer

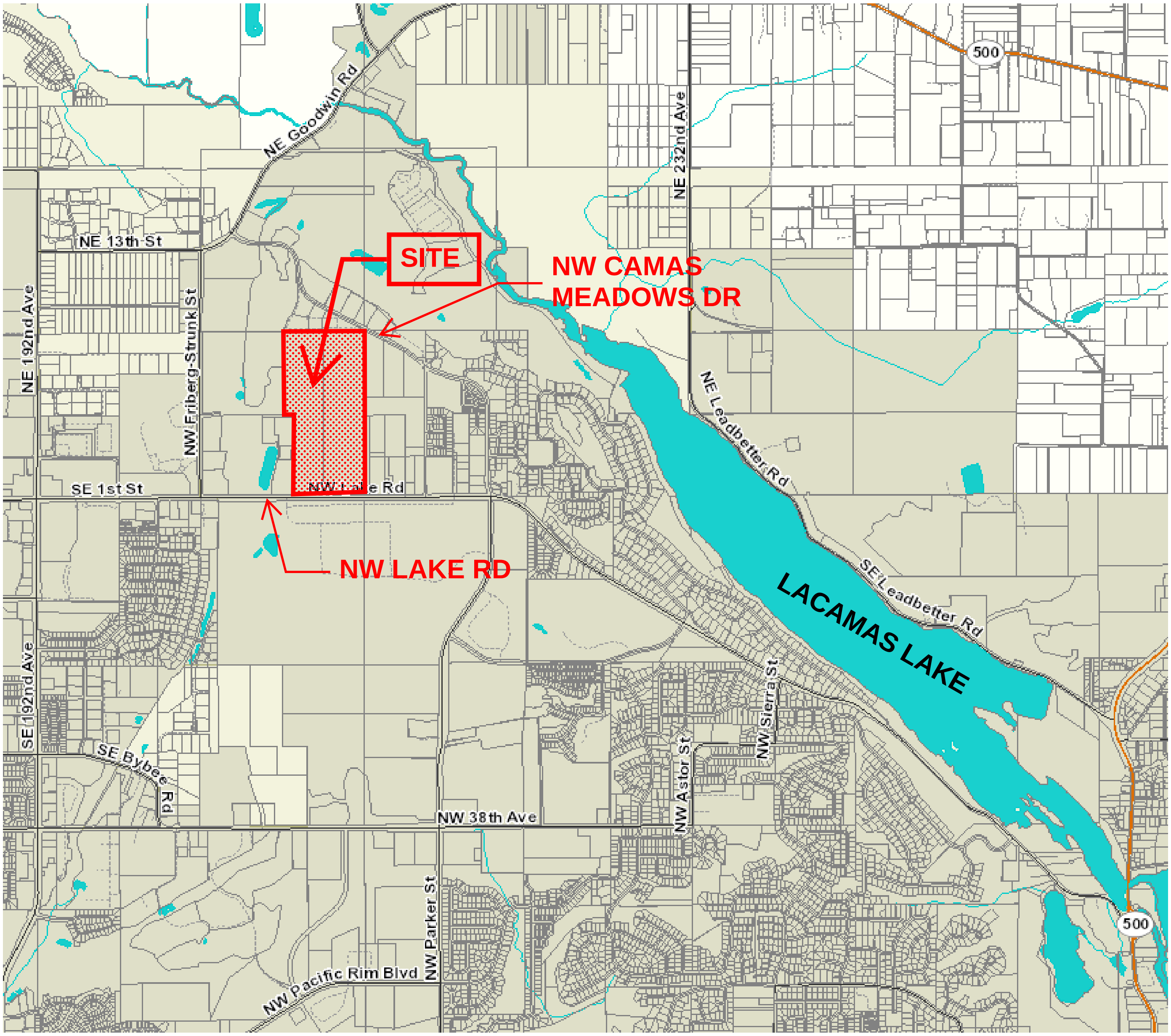
MKW/lsk

October 2021

Q:\2020\2200867\WORDPROC\Reports\20211019 Rpt (Prelim TIR) 2200867.10.docx

Appendix A

Exhibits



NOT TO SCALE

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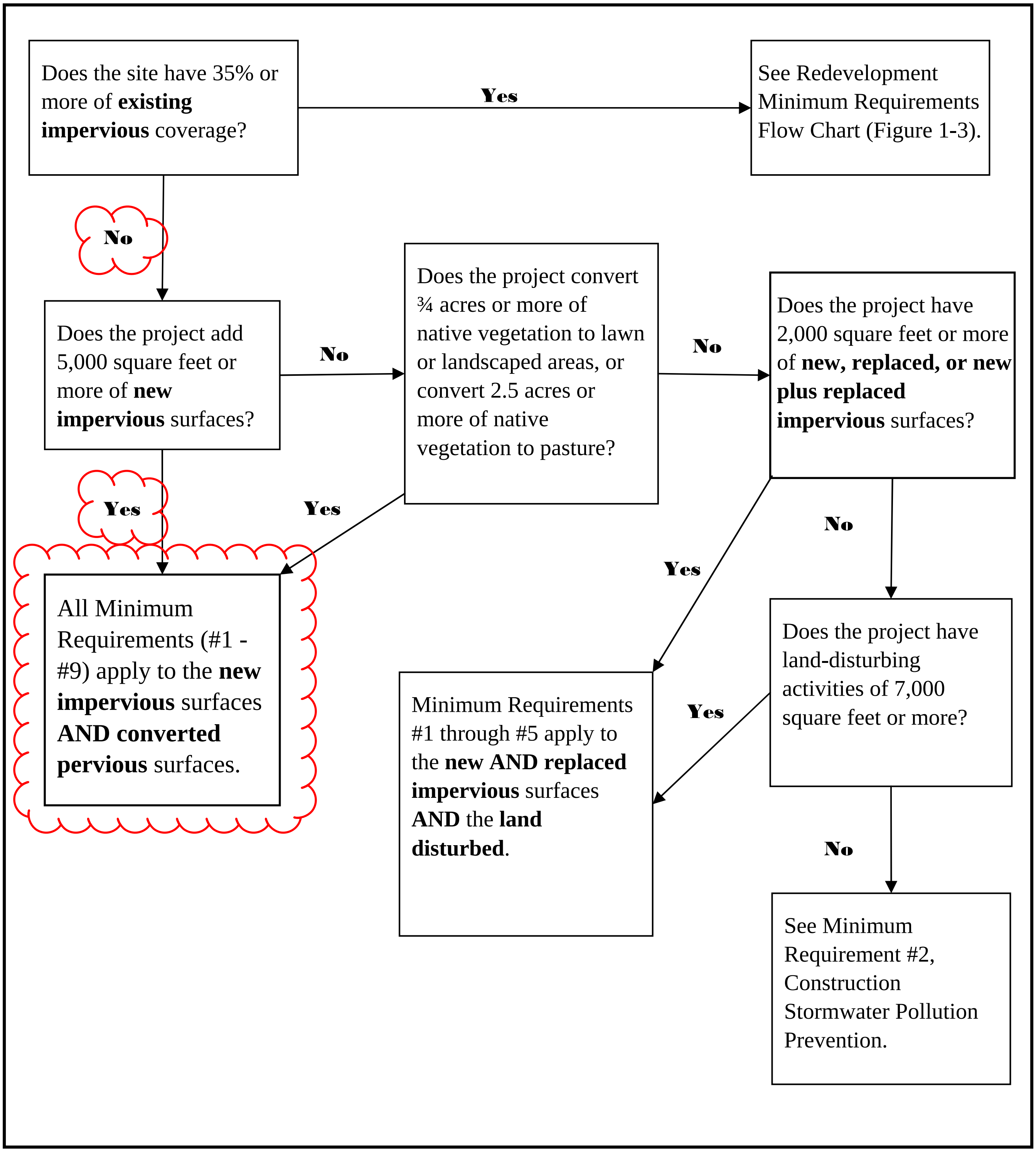
CAMAS BUSINESS CENTER
2200867.10

VICINITY MAP

EXHIBIT A-1

Figure 1.2: New Development Minimum Requirements Flow Chart



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CAMAS BUSINESS CENTER

EXISTING CONDITIONS MAP

JOB NO. 2200867.10

DATE: OCT 2021

A-3

CAMAS BUSINESS CENTER

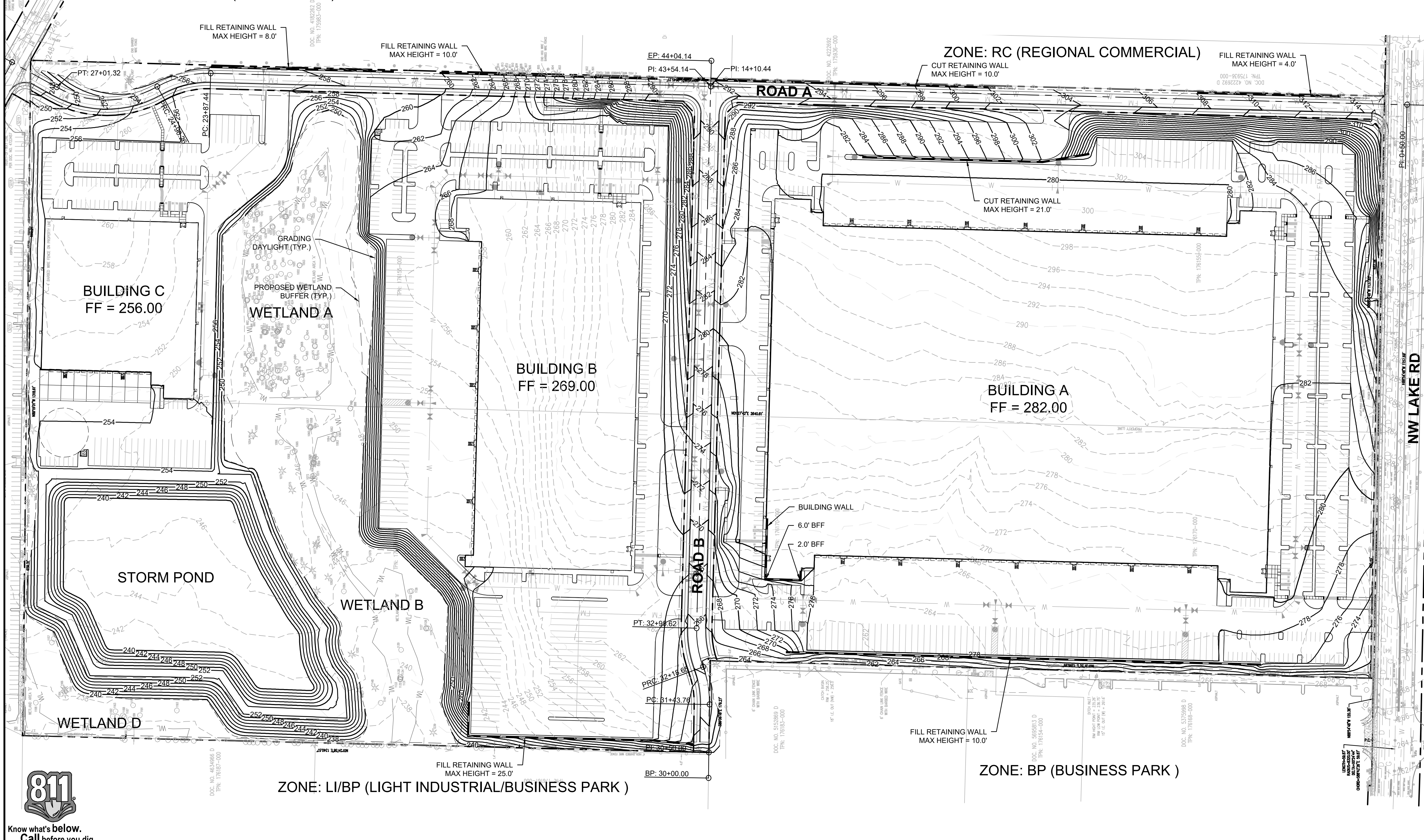
LOCATED IN THE SE 1/4 OF SECTION 29, TOWNSHIP 2 NORTH, RANGE 3 EAST, W.M., CITY OF CAMAS, CLARK COUNTY, WASHINGTON

EARTHWORK QUANTITIES

CUT: 425,500 CY (EXPORT)
FILL: 432,000 CY (IMPORT)
NET: 6,500 CY (IMPORT)

THE ABOVE QUANTITIES ARE ESTIMATES ONLY INTENDED FOR THE PERMITTING PROCESS. DO NOT USE FOR BID PURPOSES. THE QUANITIES DO NOT HAVE STRIPPING, COMPACTION, OR CUT OR FILL ADJUSTMENT FACTORS APPLIED TO THEM, NOR DO THEY ACCOUNT FOR PAVEMENT, SIDEWALK, OR BUILDING SECTIONS.

GRAPHIC SCALE
0 50 100 200
1" = 100 FEET



AHBL
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Project Title:
CAMAS BUSINESS CENTER

Client:
PANATTONI DEVELOPMENT COMPANY, LLC
1821 DOCK STREET, SUITE 100
TACOMA, WA 98402

Project No.
2200867.10

Issue Set & Date:
SEPA AND SITE PLAN REVIEW
10/07/2021

J. MATTHEW WEBER
STATE OF WASHINGTON
34858
REGISTERED PROFESSIONAL ENGINEER

NOTICE
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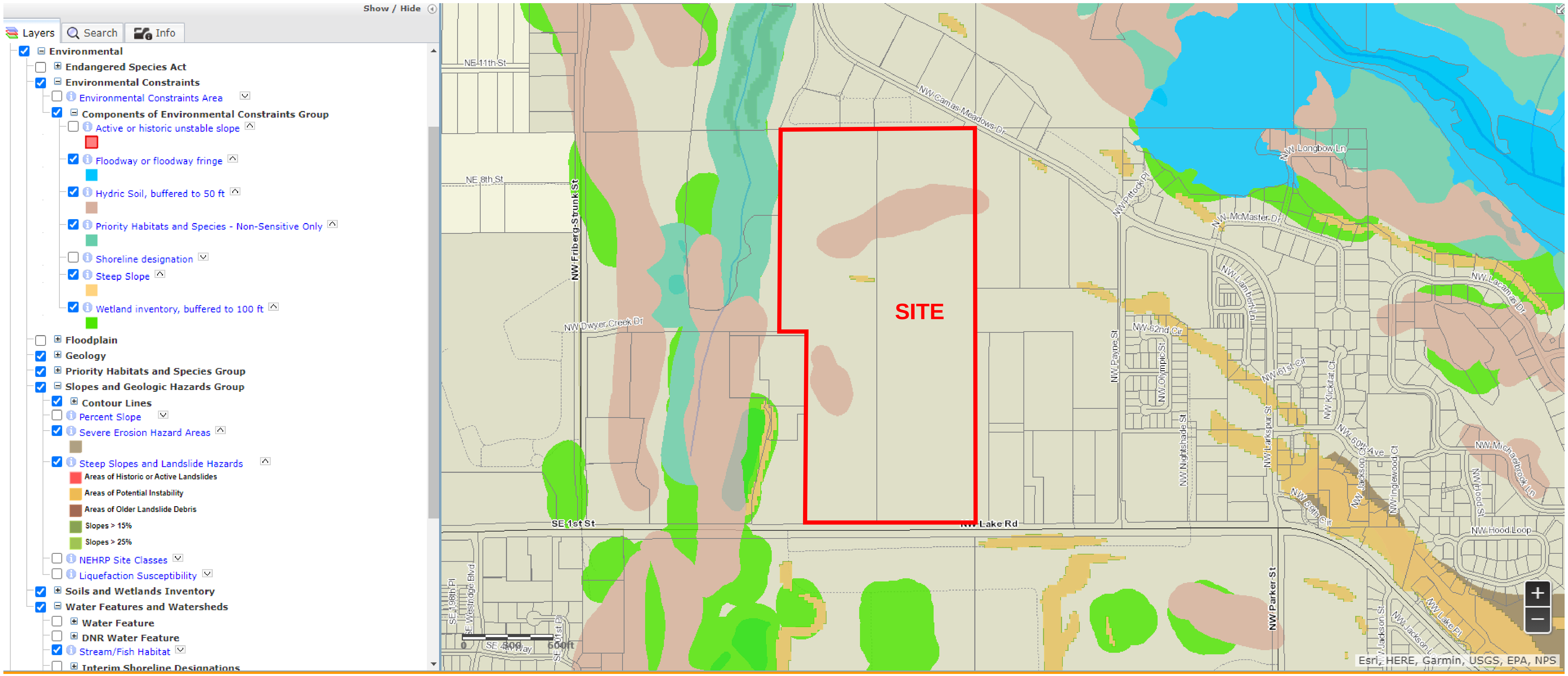
Revisions:

Sheet Title:
PRELIMINARY GRADING AND DRAINAGE PLAN

Designed by:	Drawn by:	Checked by:
TDW/MW/GG	TDS	BEB

Sheet No.
SPR2
2 of XX Sheets



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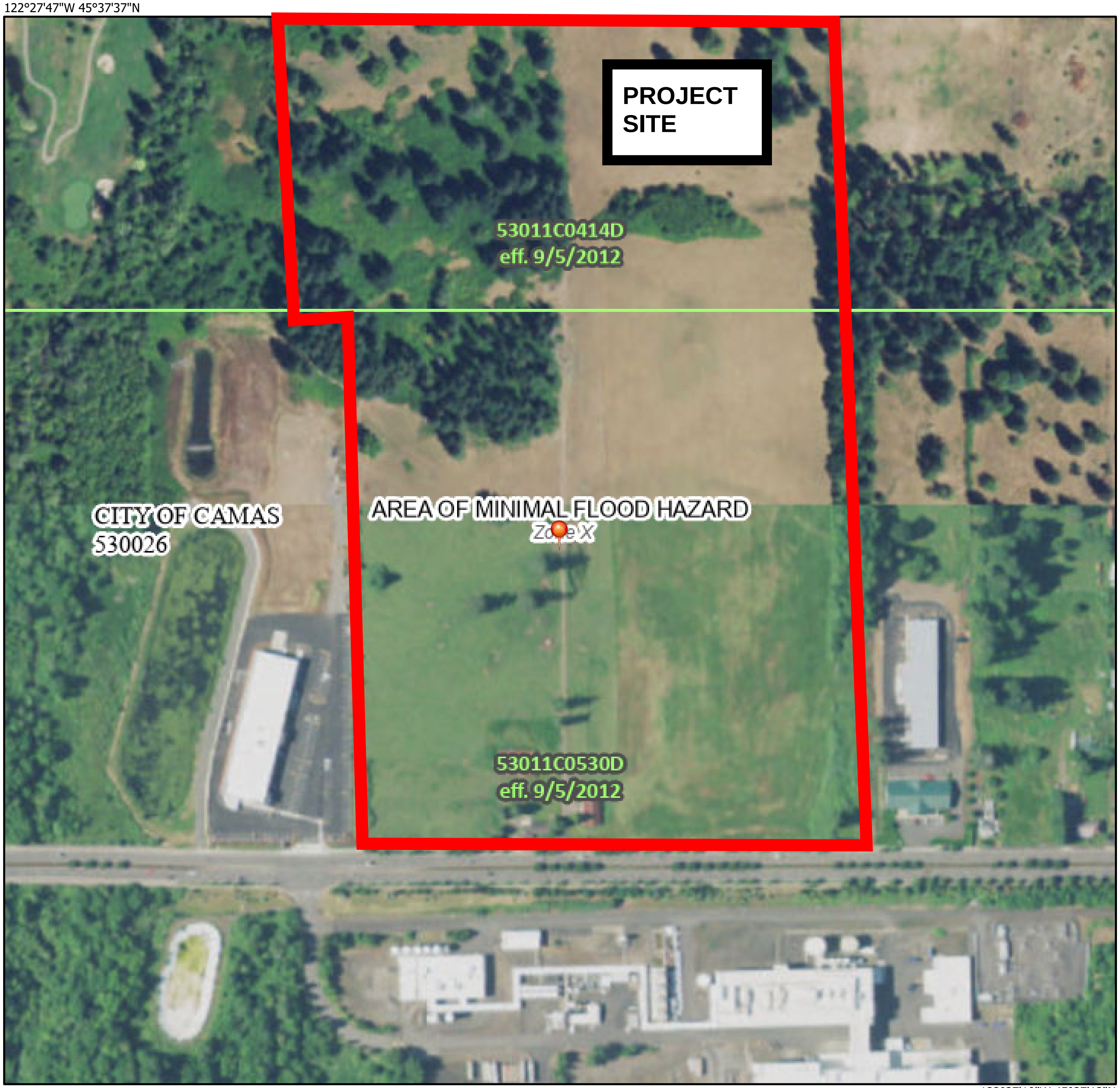
ENVIRONMENTAL CONSTRAINTS MAP

EXHIBIT A-5

National Flood Hazard Layer FIRMette

FEMA

122°27'47"W 45°37'37"N



122°27'10"W 45°37'12"N

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

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) *Zone A, V, A99*
		With BFE or Depth *Zone AE, AO, AH, VE, AR*
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
		Future Conditions 1% Annual Chance Flood Hazard *Zone X*
		Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
		Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
		Effective LOMRs
		Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES	B 20.2 / 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
	8	Coastal Transect
	513	Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/19/2021 at 4:00 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Map Scale: 1:8,130 if printed on B portrait (11" x 17") sheet.

Meters: 0, 100, 200, 400, 600

Feet: 0, 350, 700, 1400, 2100

N

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Clark County, Washington
Survey Area Data: Version 18, Jun 4, 2020

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

Date(s) aerial images were photographed: Oct 15, 2018—Oct 18, 2018

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
CvA	Cove silty clay loam, 0 to 3 percent slopes	109.8	14.8%
CwA Wetlands Soil Group: D	Cove silty clay loam, thin solum, 0 to 3 percent slopes	38.9	5.2%
DoB	Dollar loam, 0 to 5 percent slopes	75.5	10.2%
HcB NE+S Soil Group: C	Hesson clay loam, 0 to 8 percent slopes	303.5	40.8%
HcD Central+E Soil Group: C	Hesson clay loam, 8 to 20 percent slopes	57.8	7.8%
HcE	Hesson clay loam, 20 to 30 percent slopes	3.5	0.5%
HcF	Hesson clay loam, 30 to 55 percent slopes	0.0	0.0%
HgB	Hesson gravelly clay loam, 0 to 8 percent slopes	1.9	0.3%
LgB	Lauren gravelly loam, 0 to 8 percent slopes	34.3	4.6%
LgD	Lauren gravelly loam, 8 to 20 percent slopes	10.6	1.4%
OmE	Olympic stony clay loam, 3 to 30 percent slopes	0.4	0.1%
PoB N/NW Soil Group: D	Powell silt loam, 0 to 8 percent slopes	72.4	9.7%
PoD	Powell silt loam, 8 to 20 percent slopes	14.2	1.9%
W	Water	1.6	0.2%
WrB	Wind River gravelly loam, 0 to 8 percent slopes	19.3	2.6%
Totals for Area of Interest		**743.8**	**100.0%**

Appendix B

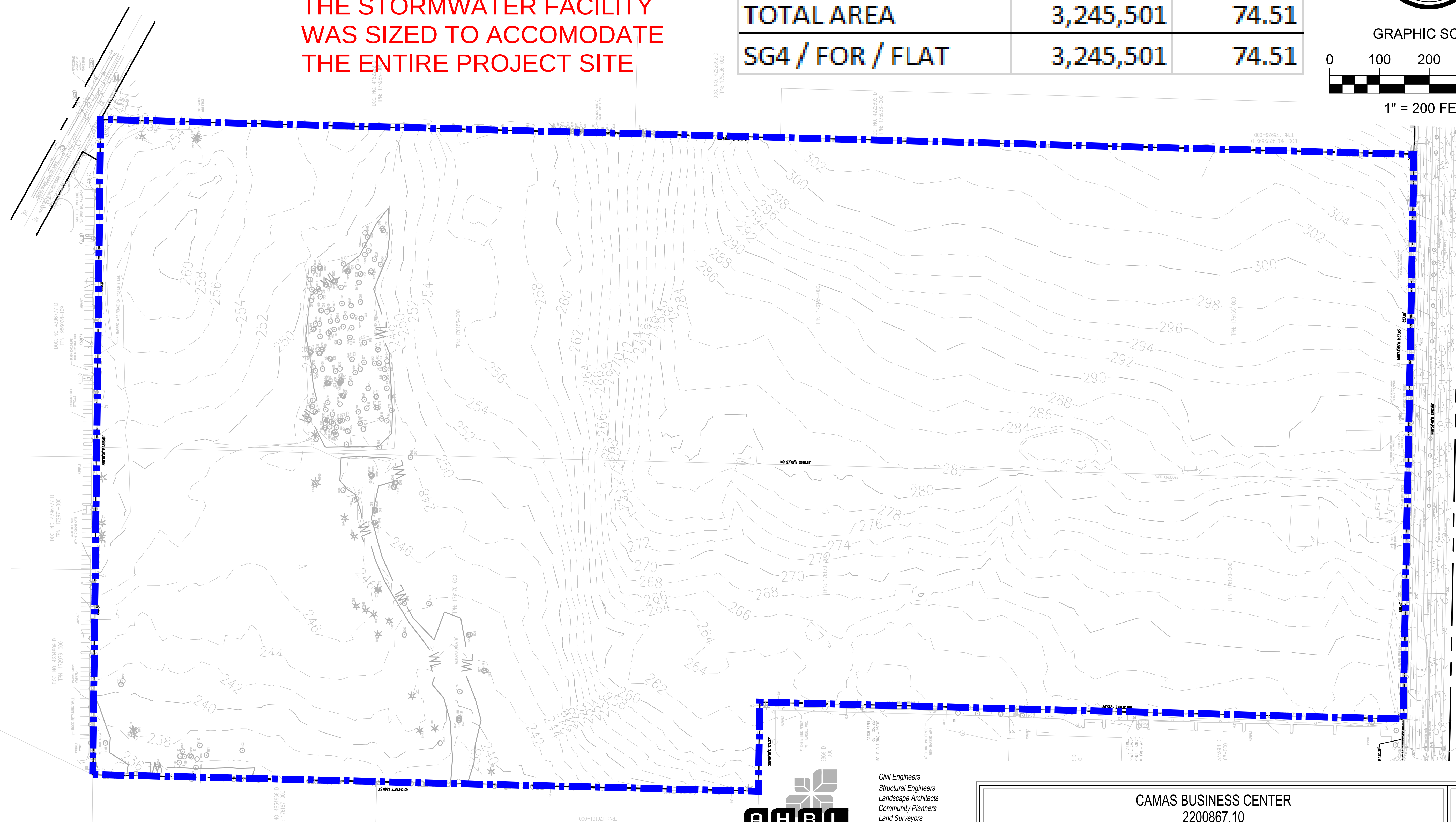
Calculations

NOTE:
FOR THE PRELIMINARY ENGINEERING SUBMITTAL, THE STORMWATER FACILITY WAS SIZED TO ACCOMODATE THE ENTIRE PROJECT SITE

PREDEVELOPED		
	SF	AC
TOTAL AREA	3,245,501	74.51
SG4 / FOR / FLAT	3,245,501	74.51

N

GRAPHIC SCALE
0 100 200 400
1" = 200 FEET



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Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighbors
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316 Occidental Avenue South, Suite 320, Seattle, WA 98104 206.267.2425 TEL

CAMAS BUSINESS CENTER
2200867.10
PREDEVELOPED BASIN MAP

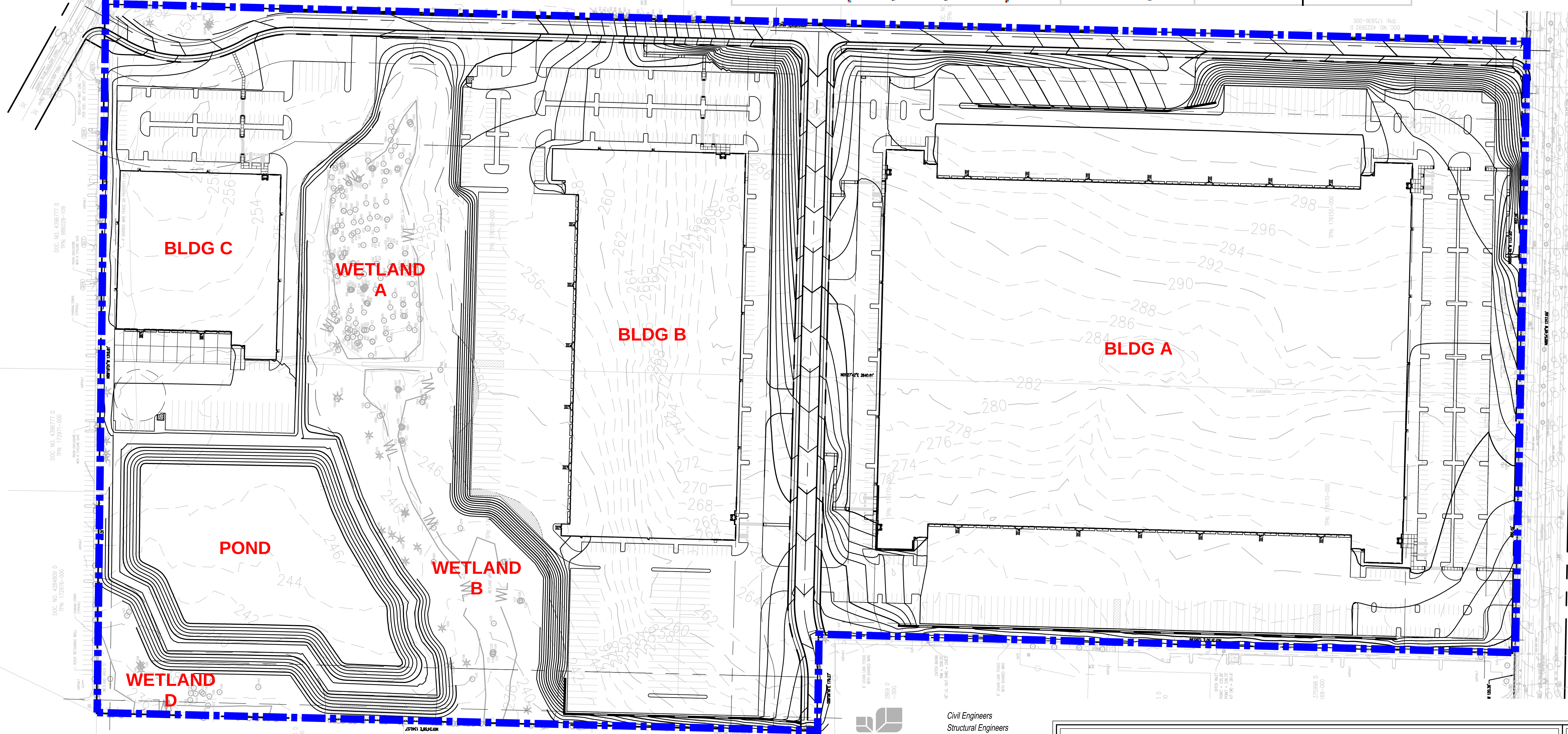
B-1

NOTE:
FOR THE PRELIMINARY ENGINEERING SUBMITTAL, THE STORMWATER FACILITY WAS SIZED TO ACCOMODATE THE ENTIRE PROJECT SITE

DEVELOPED	SF	AC	
TOTAL AREA	3,245,501	74.51	
BUILDING ROOFS	963,479	22.12	
ROAD/PAVEMENT	1,143,900	26.26	IMPERV:
POND	180,000	4.13	52.51
LANDSCAPE (SG4/LAWN/FLAT)	593,243	13.62	PERV:
WETLAND (SG4/FOR/FLAT)	364,879	8.38	22.00

N

GRAPHIC SCALE
0 100 200 400
1" = 200 FEET



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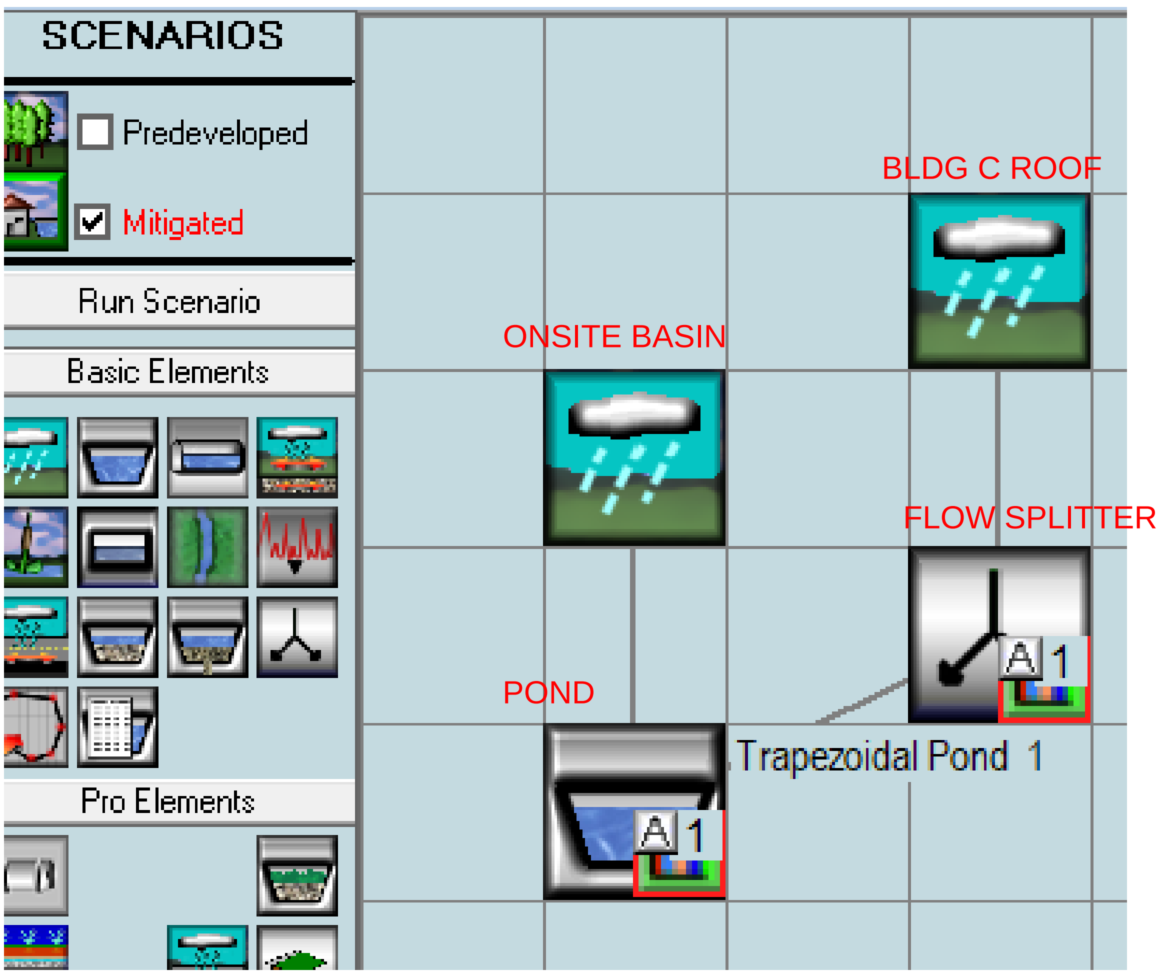
CAMAS BUSINESS CENTER
2200867.10
DEVELOPED BASIN MAP

B-2

NOTE:
FOR THE PRELIMINARY ENGINEERING SUBMITTAL, THE STORMWATER FACILITY WAS SIZED TO ACCOMODATE THE ENTIRE PROJECT SITE



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FLOW CONTROL CALCULATIONS

EXHIBIT B-3

PREDEVELOPED:

ONSITE BASIN

Available Pervious	Acres	Available Impervious	Acres
☑ SG4, Forest, Flat	74.46		

Pervious Total	74.46	Acres
Impervious Total	0	Acres
Basin Total	74.46	Acres

DEVELOPED:

ONSITE BASIN

Available Pervious	Acres	Available Impervious	Acres
☑ SG4, Forest, Flat	8.38	☑ ROADS/FLAT	26.3
☑ SG4, Lawn, Flat	13.6	☑ ROOF TOPS/FLAT	20
		☑ POND	4.13

Pervious Total	21.98	Acres
Impervious Total	50.43	Acres
Basin Total	72.41	Acres

BLDG C ROOF

Available Pervious	Acres	Available Impervious	Acres
		☑ ROOF TOPS/FLAT	2.1

Pervious Total	0	Acres
Impervious Total	2.1	Acres
Basin Total	2.1	Acres

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FLOW CONTROL CALCULATIONS

EXHIBIT B-3

DEVELOPED:

FLOW SPLITTER

Facility Name Flow Splitter 1

Downstream Connection

Both Exits

	Primary Exit(1)	Secondary Exit(2)
	0	Trapezoidal Pond 1

Upstream Storage Area Length (ft)	10
Maximum Depth of Ponding (ft)	10

Primary Exit(1) Structure **Secondary Exit(2) Structure**

Flow Threshold

Flow Threshold (cfs) 0.4

FLOWS UNDER 0.4 CFS GO DIRECTLY TO THE POINT OF COMPLIANCE. IN REALITY, THESE FLOWS ARE DIRECTED TO WETLAND A BUFFER. FLOWS ABOVE 0.4 CFS GO TO POND.

DETENTION POND

Facility Dimensions

Facility Bottom Elevation (ft)	0
Bottom Length (ft)	314.0134738
Bottom Width (ft)	104.6711579
Effective Depth (ft)	6
Left Side Slope (H/V)	3
Bottom Side Slope (H/V)	3
Right Side Slope (H/V)	3
Top Side Slope (H/V)	3
Infiltration	NO

Outlet Structure Data

Riser Height (ft)	5
Riser Diameter (in)	54
Riser Type	Notched
Notch Type	Rectangular
Notch Height (ft)	0.8597(
Notch Width (ft)	4.4752(

Orifice Number	Diameter (in)	Height (ft)
1	12.996	0
2	0	0
3	0	0

Pond Volume at Riser Head (ac-ft) 4.528

USE 5.0 AC-FT FOR PRELIMINARY

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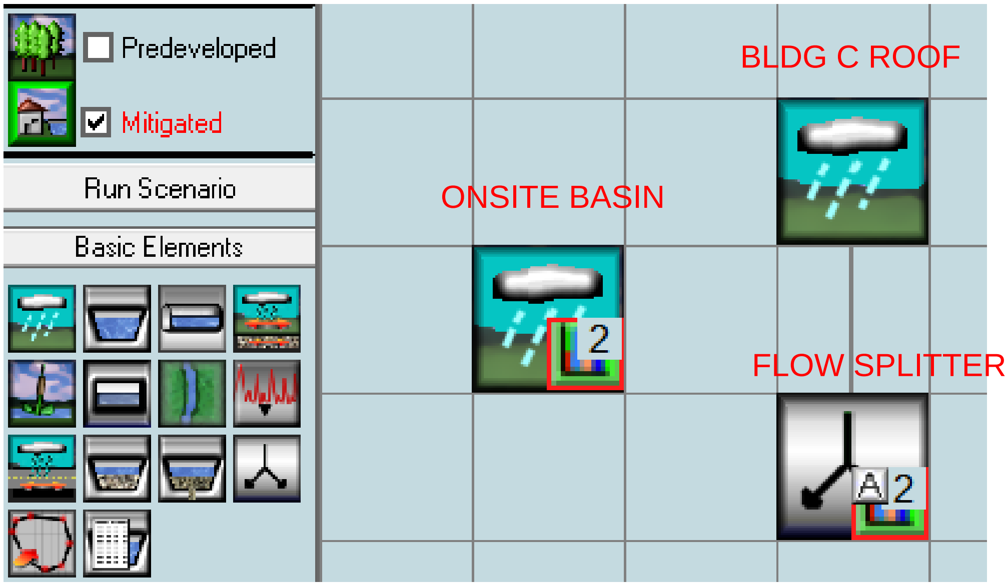
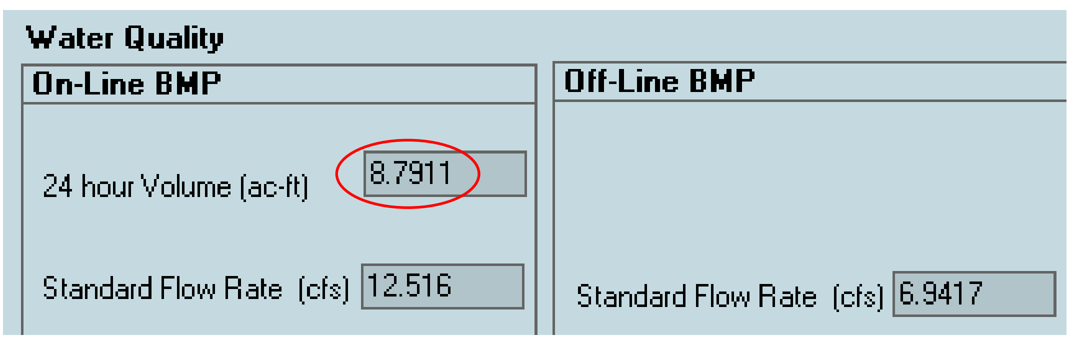
FLOW CONTROL CALCULATIONS

EXHIBIT B-3



THE FLOW SPLITTER SENDS FLOWS ABOVE 0.4 CFS FROM THE BUILDING C ROOF AREA TO THE POND (TREATMENT REQUIRED).



TO PROVIDE PHOSPHORUS TREATMENT, THE FACILITY IS SIZED AS A "LARGE WETPOND". A FACTOR OF 1.5 IS ADDED TO THE REQUIRED DEAD STORAGE VOLUME.

8.79 * 1.5 = 13.19 AC-FT

Per the Critical Areas Report by Soundview Consultants, Wetland Hydroperiod Protection is applicable to Wetland A and Wetland D on the project site. See the next page for the flowchart determination of wetland protection. The project will provide hydroperiod protection to the maximum extent feasible. Method 2 will be used to analyze wetland hydroperiod impacts. Criteria for Method 2 are listed below:

Method 2: Site Discharge Modeling

An alternative way to predict the risk to the wetland hydroperiod from stormwater discharges is to assess the changes in total volume of flows into a wetland that result from the development project. The size of the wetland and its capacity are not known or needed to utilize Method 2. The risk to wetland functions will be assumed to increase as the total discharge volumes from the site into the wetland diverge from the pre-project conditions. The risk will be decreased if the divergence is smaller.

As stormwater generated at the project site passes through the wetland buffer, total discharge volumes from the site to the wetland are to be calculated at the outflow of the wetland buffer. The existing or required length and area of wetland buffer per local and/or state regulations around the wetland should be included as an element in the model under both pre-project (existing) and post-project scenarios.

Criteria for Method 2

The project proponent must ensure they are meeting both of the following Method 2 criteria in order to comply with Wetland Hydroperiod Protection.

Criteria 1. Mean Daily Total Discharge Volumes from the Site

Total volume of water into a wetland on daily basis should not be more than 20% higher or lower than the pre-project volumes.

- Calculate the average of the total discharge volumes from the site for each day over the period of precipitation record in the approved model for pre- and post-project scenarios. There will be 365 (366 for a leap year) average daily values for the pre-project scenario and 365 (366 for a leap year) for the post-project. No day can exceed 20% change in volume.

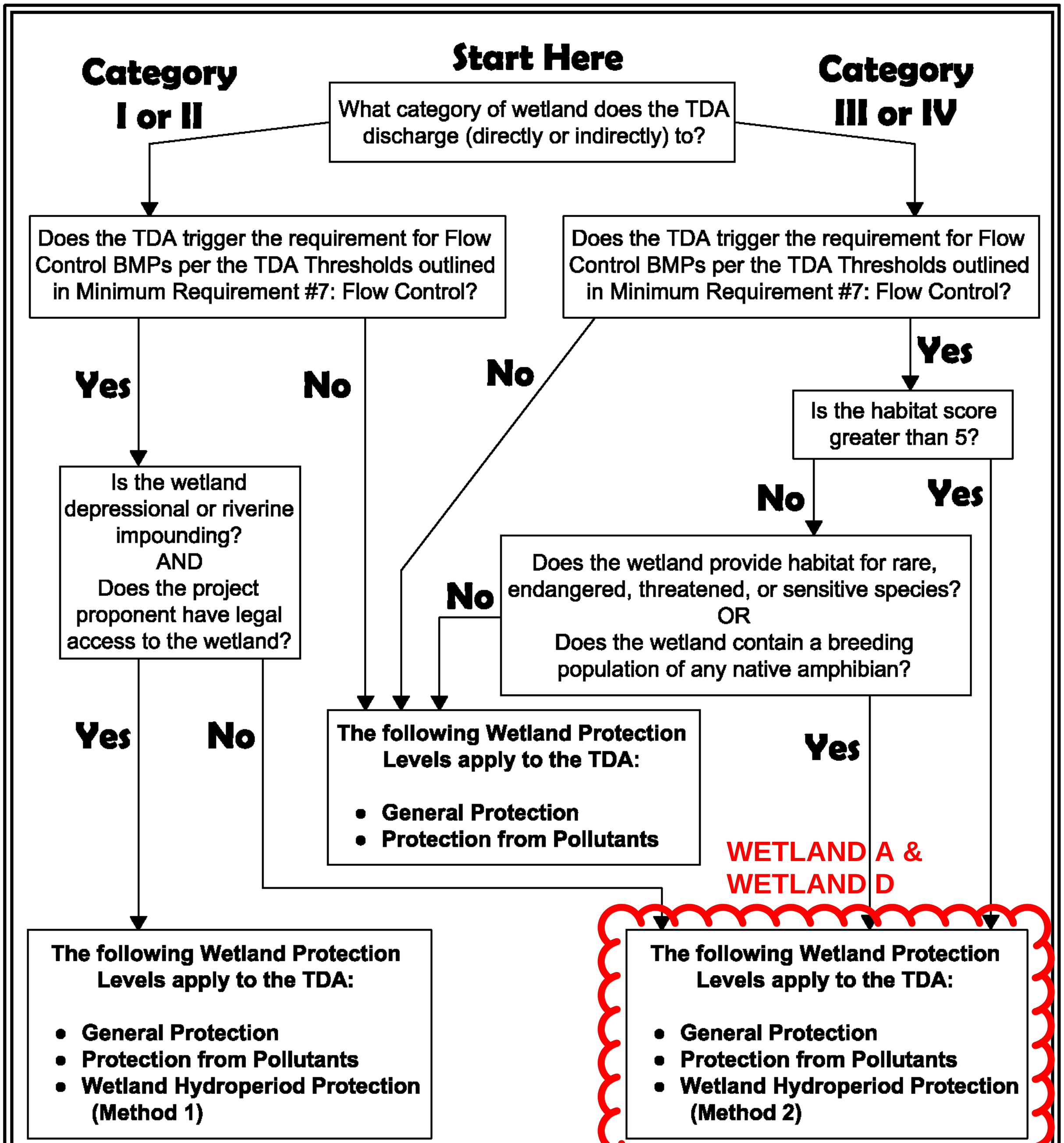
Criteria 2. Mean Monthly Total Discharge Volumes from the Site

Total volume of water into a wetland on a monthly basis should not be more than 15% higher or lower than the pre-project volumes.

- Calculate the average of the monthly total discharge volumes from the site for each calendar month over the period of precipitation record in the approved model for pre- and post-project scenarios. No month can exceed 15% change in volume.

The guidance for implementing Method 2 and assessing the criteria above in the respective model is provided in section I-C.5 Wetland Hydroperiod Data Collection and Evaluation Procedures.

Figure I-3.5: Flow Chart for Determining Wetland Protection Level Requirements



DEPARTMENT OF ECOLOGY
State of Washington

Flow Chart for Determining
the Wetland Protection Levels Required

Revised May 2019

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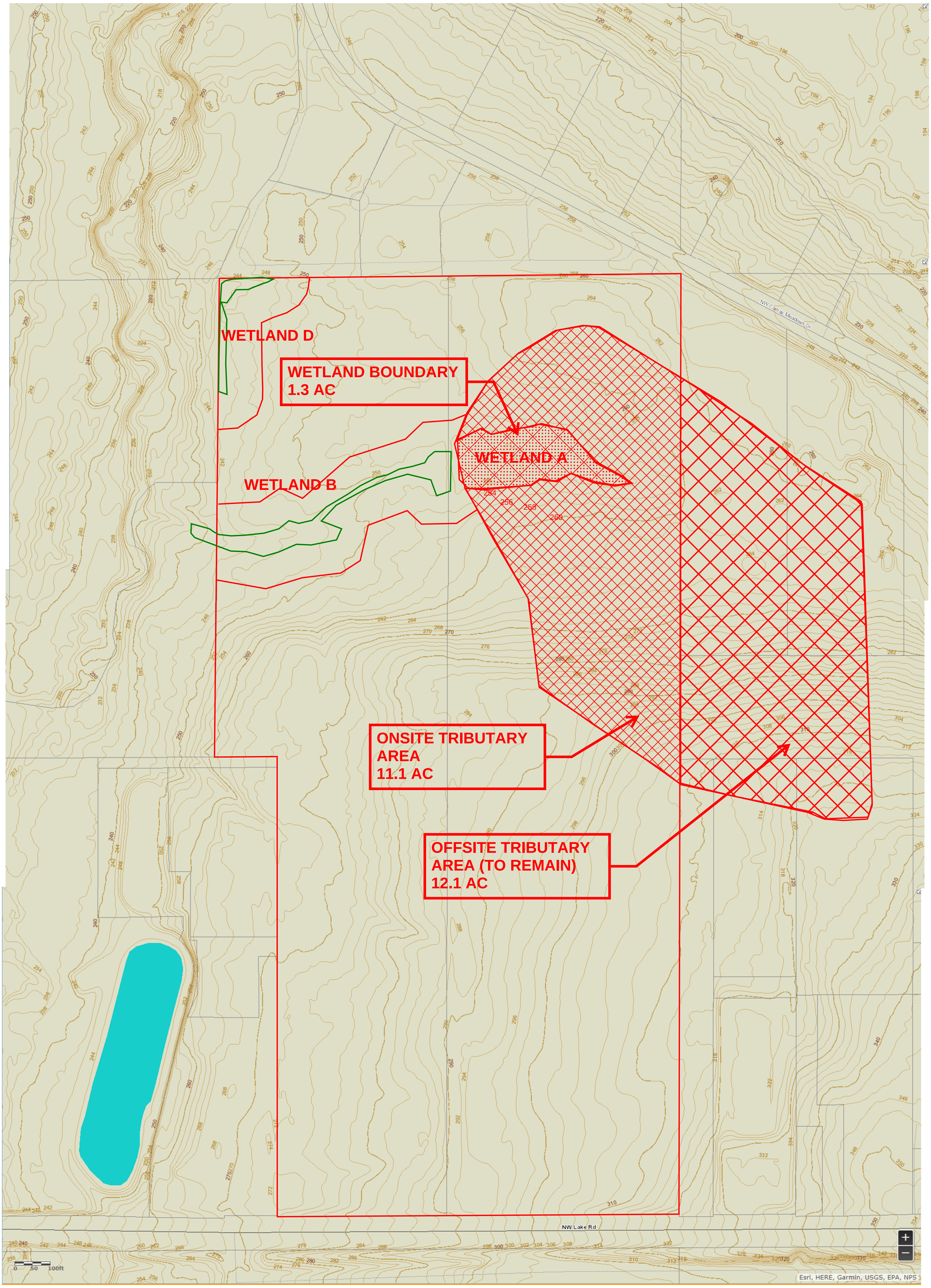
WETLAND PROTECTION CALCULATIONS

EXHIBIT B-5



WETLAND TRIBUTARY AREAS MAP

GRAPHIC SCALE

0 100 200 400

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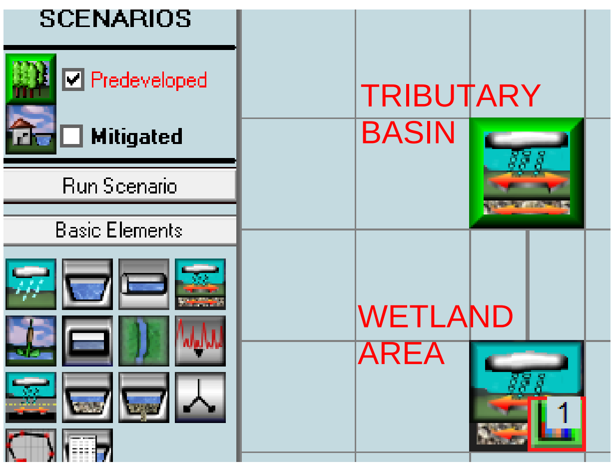
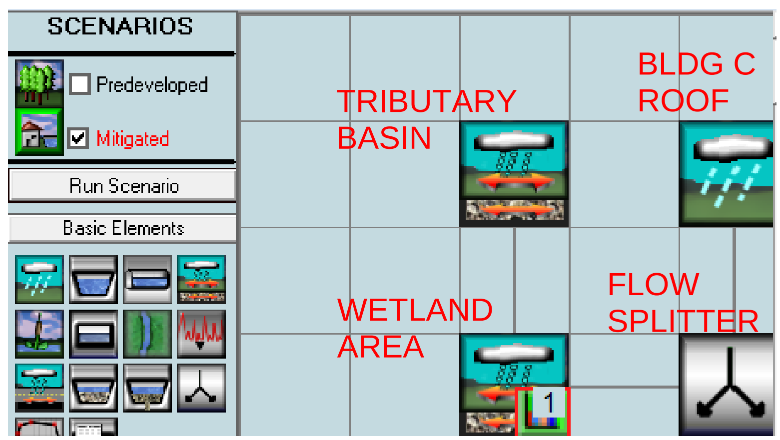
WETLAND PROTECTION CALCULATIONS

EXHIBIT B-5

It is assumed that the tributary area for Wetland D consists primarily of its wetland buffer as delineated by Soundview Consultants. Since the buffer will either be untouched or mitigated in the developed condition, it is assumed that there is no impact to the hydroperiod for this wetland.

WWHM was used to model the predeveloped and developed flows discharging to Wetland A, in accordance with the SWMMWW. The wetland has a large tributary area located outside the project boundary to the east. In the developed condition, this area will be connected to the Wetland A buffer with a ditch or culvert, so the flows will be maintained. The onsite portion of the wetland's tributary basin will be developed, and will not discharge to the wetland. In an attempt to match existing flows as much as possible, runoff from the 2.1-acre Building C roof will discharge directly to the Wetland A buffer. The maximum 100-year flow that is allowed to bypass the project flow control facility is 0.4 CFS. A flow splitter will direct flows less than 0.4 CFS to the wetland buffer. Flows greater than 0.4 CFS will be directed to the detention pond. Because of existing site conditions, it does not appear possible to meet all monthly and daily flow criteria for Method 2. The months of October and November usually receive too high of flows before other months reach the lower flow matching threshold. Sending clean roof runoff from Building C to the wetland after the flow splitter is intended as a maximum feasible effort to match the predeveloped wetland hydroperiod while also meeting flow control standards for the developed site. The WWHM calculations are summarized as follows:





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WETLAND PROTECTION CALCULATIONS

EXHIBIT B-5

PREDEVELOPED

Element Name	TRIBUTARY BASIN		
Runoff Type	Surface	Interflow	Groundwater
Downstream Connection	Lateral Basin 2	Lateral Basin 2	Lateral Basin 2
Element Type	Lateral Pervious Flow Basin		
Soil (PERLND) Type	SG4, Forest, Mod		Change
Lateral Area (ac)	23.2		

Element Name	WETLAND BOUNDARY		
Runoff Type	Surface	Interflow	Groundwater
Downstream Connection	0	0	0
Element Type	Lateral Pervious Flow Basin		
Soil (PERLND) Type	SG4, Forest, Flat		Chang
Lateral Area (ac)	1.3		

DEVELOPED

Element Name	TRIBUTARY BASIN		☐ Designate as B
Runoff Type	Surface	Interflow	Groundwater
Downstream Connection	Lateral Basin 2	Lateral Basin 2	Lateral Basin 2
Element Type	Lateral Pervious Flow Basin		
Soil (PERLND) Type	SG4, Forest, Mod		Change
Lateral Area (ac)	12.1		

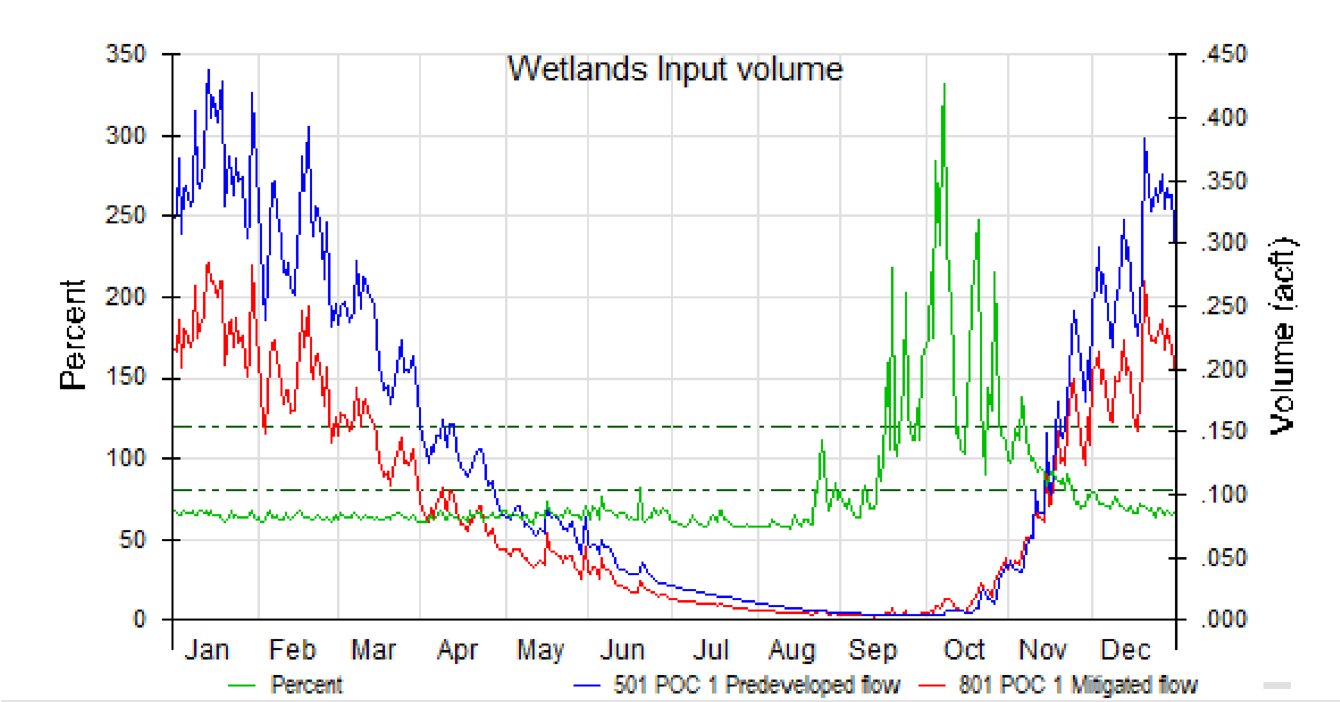
Element Name	WETLAND BOUNDARY		☐ Designate a
Runoff Type	Surface	Interflow	Groundwater
Downstream Connection	0	0	0
Element Type	Lateral Pervious Flow Basin		
Soil (PERLND) Type	SG4, Forest, Flat		Char
Lateral Area (ac)	1.3		

Subbasin Name: BLDG C ROOF ☐ Designate as Bypass for POC:

	Surface	Interflow	Groundwater
Flows To :	Flow Splitter 1	Flow Splitter 1	

Area in Basin ☑ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
		☑ ROADS/FLAT	2.1



Wetlands Input Volume
Average Annual Volume (acft)
Series 1: 501 POC 1 Predeveloped flow
Series 2: 801 POC 1 Mitigated flow

Month	Series 1	Series 2	Percent	Pass/Fail
Jan	11.1561	7.3026	65.5	Fail
Feb	8.7303	5.5606	63.7	Fail
Mar	6.9579	4.4421	63.8	Fail
Apr	3.8972	2.4826	63.7	Fail
May	2.3682	1.5538	65.6	Fail
Jun	1.3142	0.8758	66.6	Fail
Jul	0.6352	0.3857	60.7	Fail
Aug	0.2929	0.1880	64.2	Fail
Sep	0.1330	0.1303	97.9	Pass
Oct	0.3629	0.5376	148.2	Fail
Nov	3.6264	3.1054	85.6	Pass
Dec	8.9691	6.2563	69.8	Fail

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	20211013_CLARK SG_Detention w flow splitter
Site Name:	
Site Address:	
City:	
Report Date:	10/19/2021
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	0.000 (adjusted)
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Flat	74.46
Pervious Total	74.46
Impervious Land Use	acre
Impervious Total	0
Basin Total	74.46

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Flat	8.38
SG4, Lawn, Flat	13.6
Pervious Total	21.98
Impervious Land Use	acre
ROADS FLAT	26.3
ROOF TOPS FLAT	20
POND	4.13
Impervious Total	50.43
Basin Total	72.41

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Basin 2

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROOF TOPS FLAT	2.1
Impervious Total	2.1
Basin Total	2.1

Element Flows To:

Surface	Interflow	Groundwater
Flow Splitter 1	Flow Splitter 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	314.01 ft.
Bottom Width:	104.67 ft.
Depth:	6 ft.
Volume at riser head:	4.5281 acre-feet.
Side slope 1:	3 To 1
Side slope 2:	3 To 1
Side slope 3:	3 To 1
Side slope 4:	3 To 1
Discharge Structure	
Riser Height:	5 ft.
Riser Diameter:	54 in.
Notch Type:	Rectangular
Notch Width:	4.475 ft.
Notch Height:	0.860 ft.
Orifice 1 Diameter:	12.996 in.Elevation:0 ft.
Element Flows To:	
Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.754	0.000	0.000	0.000
0.0667	0.758	0.050	1.183	0.000
0.1333	0.762	0.101	1.673	0.000
0.2000	0.766	0.152	2.049	0.000
0.2667	0.770	0.203	2.366	0.000
0.3333	0.773	0.254	2.646	0.000
0.4000	0.777	0.306	2.898	0.000
0.4667	0.781	0.358	3.131	0.000
0.5333	0.785	0.410	3.347	0.000
0.6000	0.789	0.463	3.550	0.000
0.6667	0.793	0.515	3.742	0.000
0.7333	0.797	0.569	3.924	0.000
0.8000	0.801	0.622	4.099	0.000
0.8667	0.805	0.675	4.266	0.000
0.9333	0.809	0.729	4.427	0.000
1.0000	0.813	0.783	4.583	0.000
1.0667	0.817	0.838	4.733	0.000
1.1333	0.821	0.892	4.879	0.000
1.2000	0.824	0.947	5.020	0.000
1.2667	0.828	1.002	5.158	0.000
1.3333	0.832	1.058	5.292	0.000
1.4000	0.836	1.113	5.423	0.000
1.4667	0.840	1.169	5.550	0.000
1.5333	0.844	1.225	5.675	0.000
1.6000	0.848	1.282	5.797	0.000
1.6667	0.853	1.339	5.917	0.000
1.7333	0.857	1.396	6.034	0.000
1.8000	0.861	1.453	6.149	0.000
1.8667	0.865	1.510	6.262	0.000
1.9333	0.869	1.568	6.372	0.000
2.0000	0.873	1.626	6.481	0.000
2.0667	0.877	1.685	6.588	0.000

2.1333	0.881	1.743	6.694	0.000
2.2000	0.885	1.802	6.798	0.000
2.2667	0.889	1.861	6.900	0.000
2.3333	0.893	1.921	7.001	0.000
2.4000	0.897	1.980	7.100	0.000
2.4667	0.901	2.040	7.198	0.000
2.5333	0.906	2.101	7.295	0.000
2.6000	0.910	2.161	7.390	0.000
2.6667	0.914	2.222	7.484	0.000
2.7333	0.918	2.283	7.577	0.000
2.8000	0.922	2.344	7.669	0.000
2.8667	0.926	2.406	7.760	0.000
2.9333	0.930	2.468	7.849	0.000
3.0000	0.935	2.530	7.938	0.000
3.0667	0.939	2.593	8.026	0.000
3.1333	0.943	2.655	8.113	0.000
3.2000	0.947	2.718	8.198	0.000
3.2667	0.951	2.782	8.283	0.000
3.3333	0.956	2.845	8.367	0.000
3.4000	0.960	2.909	8.451	0.000
3.4667	0.964	2.973	8.533	0.000
3.5333	0.968	3.038	8.615	0.000
3.6000	0.972	3.102	8.696	0.000
3.6667	0.977	3.167	8.776	0.000
3.7333	0.981	3.233	8.855	0.000
3.8000	0.985	3.298	8.934	0.000
3.8667	0.989	3.364	9.012	0.000
3.9333	0.994	3.430	9.089	0.000
4.0000	0.998	3.497	9.166	0.000
4.0667	1.002	3.563	9.242	0.000
4.1333	1.007	3.630	9.318	0.000
4.2000	1.011	3.698	9.610	0.000
4.2667	1.015	3.765	10.13	0.000
4.3333	1.020	3.833	10.80	0.000
4.4000	1.024	3.901	11.58	0.000
4.4667	1.028	3.970	12.46	0.000
4.5333	1.033	4.038	13.43	0.000
4.6000	1.037	4.107	14.47	0.000
4.6667	1.041	4.177	15.59	0.000
4.7333	1.046	4.246	16.77	0.000
4.8000	1.050	4.316	18.02	0.000
4.8667	1.054	4.386	19.33	0.000
4.9333	1.059	4.457	20.70	0.000
5.0000	1.063	4.528	22.12	0.000
5.0667	1.068	4.599	23.01	0.000
5.1333	1.072	4.670	24.58	0.000
5.2000	1.076	4.742	26.59	0.000
5.2667	1.081	4.814	28.96	0.000
5.3333	1.085	4.886	31.62	0.000
5.4000	1.090	4.958	34.55	0.000
5.4667	1.094	5.031	37.71	0.000
5.5333	1.099	5.104	41.08	0.000
5.6000	1.103	5.178	44.62	0.000
5.6667	1.107	5.251	48.30	0.000
5.7333	1.112	5.325	52.11	0.000
5.8000	1.116	5.400	56.02	0.000
5.8667	1.121	5.474	60.00	0.000
5.9333	1.125	5.549	64.01	0.000

6.0000	1.130	5.624	68.04	0.000
6.0667	1.134	5.700	72.05	0.000

Flow Splitter 1

Bottom Length: 10.00 ft.
Bottom Length: 10.00 ft.
Depth: 10 ft.
Side slope 1: 0 To 1
Side slope 2: 0 To 1
Side slope 3: 0 To 1
Side slope 4: 0 To 1

Threshold Splitter Hydraulic Table

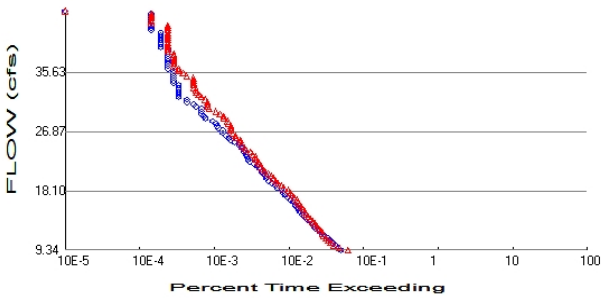
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Primary(cfs)	Secondary(cfs)
0.000	0.002	0.000	0.400	0.000
0.111	0.002	0.000	0.400	0.000
0.222	0.002	0.000	0.400	0.000
0.333	0.002	0.000	0.400	0.000
0.444	0.002	0.001	0.400	0.000
0.555	0.002	0.001	0.400	0.000
0.666	0.002	0.001	0.400	0.000
0.777	0.002	0.001	0.400	0.000
0.888	0.002	0.002	0.400	0.000
1.000	0.002	0.002	0.400	0.000
1.111	0.002	0.002	0.400	0.000
1.222	0.002	0.002	0.400	0.000
1.333	0.002	0.003	0.400	0.000
1.444	0.002	0.003	0.400	0.000
1.555	0.002	0.003	0.400	0.000
1.666	0.002	0.003	0.400	0.000
1.777	0.002	0.004	0.400	0.000
1.888	0.002	0.004	0.400	0.000
2.000	0.002	0.004	0.400	0.000
2.111	0.002	0.004	0.400	0.000
2.222	0.002	0.005	0.400	0.000
2.333	0.002	0.005	0.400	0.000
2.444	0.002	0.005	0.400	0.000
2.555	0.002	0.005	0.400	0.000
2.666	0.002	0.006	0.400	0.000
2.777	0.002	0.006	0.400	0.000
2.888	0.002	0.006	0.400	1000
3.000	0.002	0.006	0.400	1000
3.111	0.002	0.007	0.400	1000
3.222	0.002	0.007	0.400	1000
3.333	0.002	0.007	0.400	1000
3.444	0.002	0.007	0.400	1000
3.555	0.002	0.008	0.400	1000
3.666	0.002	0.008	0.400	1000
3.777	0.002	0.008	0.400	1000
3.888	0.002	0.008	0.400	1000
4.000	0.002	0.009	0.400	1000
4.111	0.002	0.009	0.400	1000
4.222	0.002	0.009	0.400	1000
4.333	0.002	0.009	0.400	1000
4.444	0.002	0.010	0.400	1000
4.555	0.002	0.010	0.400	1000
4.666	0.002	0.010	0.400	1000
4.777	0.002	0.011	0.400	1000
4.888	0.002	0.011	0.400	1000
5.000	0.002	0.011	0.400	1000
5.111	0.002	0.011	0.400	1000

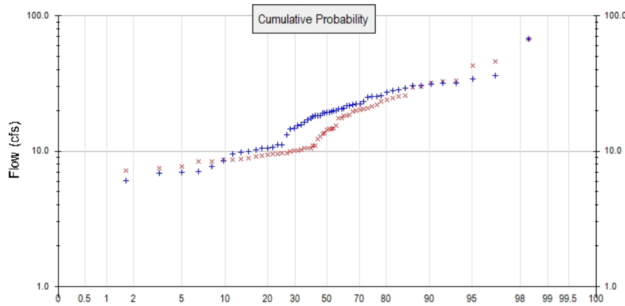
5.222	0.002	0.012	0.400	1000
5.333	0.002	0.012	0.400	1000
5.444	0.002	0.012	0.400	1000
5.555	0.002	0.012	0.400	1000
5.666	0.002	0.013	0.400	1000
5.777	0.002	0.013	0.400	1000
5.888	0.002	0.013	0.400	1000
6.000	0.002	0.013	0.400	1000
6.111	0.002	0.014	0.400	1000
6.222	0.002	0.014	0.400	1000
6.333	0.002	0.014	0.400	1000
6.444	0.002	0.014	0.400	1000
6.555	0.002	0.015	0.400	1000
6.666	0.002	0.015	0.400	1000
6.777	0.002	0.015	0.400	1000
6.888	0.002	0.015	0.400	1000
7.000	0.002	0.016	0.400	1000
7.111	0.002	0.016	0.400	1000
7.222	0.002	0.016	0.400	1000
7.333	0.002	0.016	0.400	1000
7.444	0.002	0.017	0.400	1000
7.555	0.002	0.017	0.400	1000
7.666	0.002	0.017	0.400	1000
7.777	0.002	0.017	0.400	1000
7.888	0.002	0.018	0.400	1000
8.000	0.002	0.018	0.400	1000
8.111	0.002	0.018	0.400	1000
8.222	0.002	0.018	0.400	1000
8.333	0.002	0.019	0.400	1000
8.444	0.002	0.019	0.400	1000
8.555	0.002	0.019	0.400	1000
8.666	0.002	0.019	0.400	1000
8.777	0.002	0.020	0.400	1000
8.888	0.002	0.020	0.400	1000
9.000	0.002	0.020	0.400	1000
9.111	0.002	0.020	0.400	1000
9.222	0.002	0.021	0.400	1000
9.333	0.002	0.021	0.400	1000
9.444	0.002	0.021	0.400	1000
9.555	0.002	0.021	0.400	1000
9.666	0.002	0.022	0.400	1000
9.777	0.002	0.022	0.400	1000
9.888	0.002	0.022	0.400	1000
10.00	0.002	0.023	0.400	1000
10.11	0.002	0.023	0.400	1000

Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:

Outlet 1	Outlet 2
	Trapezoidal Pond 1

Analysis Results
POC 1





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 74.46
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 21.98
Total Impervious Area: 52.53

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	18.681146
5 year	29.245431
10 year	35.00982
25 year	40.890677
50 year	44.391847
100 year	47.273752

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	14.261005
5 year	22.742621
10 year	29.778976
25 year	40.497423
50 year	49.949516
100 year	60.782942

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	14.587	14.398
1950	19.127	13.294
1951	25.266	10.530
1952	14.811	20.294
1953	19.981	9.566
1954	27.846	10.976
1955	15.503	9.116
1956	30.402	32.492
1957	23.122	14.867
1958	17.153	30.030

1959	9.971	7.692
1960	9.849	12.218
1961	27.379	18.311
1962	18.371	10.959
1963	20.414	10.220
1964	19.483	10.149
1965	17.467	18.536
1966	22.323	14.592
1967	19.451	10.088
1968	25.433	17.504
1969	20.723	42.731
1970	67.738	67.365
1971	10.713	8.350
1972	18.216	9.684
1973	18.142	19.588
1974	28.569	33.387
1975	15.568	9.500
1976	22.378	17.462
1977	0.609	7.503
1978	31.898	25.805
1979	21.590	23.156
1980	13.203	8.684
1981	30.324	24.051
1982	20.408	25.176
1983	33.951	21.279
1984	11.077	8.674
1985	8.538	13.624
1986	10.547	10.493
1987	18.406	15.342
1988	7.107	8.616
1989	7.722	9.314
1990	7.005	8.319
1991	19.868	9.652
1992	21.857	8.896
1993	25.691	29.572
1994	19.642	20.630
1995	16.298	24.733
1996	31.169	45.778
1997	36.096	31.706
1998	29.181	14.547
1999	21.808	19.897
2000	10.560	6.863
2001	6.086	7.190
2002	31.850	12.914
2003	25.039	20.677
2004	6.872	9.975
2005	10.272	9.421
2006	19.216	10.447
2007	9.513	22.046
2008	11.164	18.186

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	67.7383	67.3645
2	36.0959	45.7783
3	33.9509	42.7307
4	31.8977	33.3871

5	31.8498	32.4920
6	31.1687	31.7056
7	30.4023	30.0302
8	30.3236	29.5716
9	29.1813	25.8046
10	28.5688	25.1764
11	27.8457	24.7327
12	27.3787	24.0511
13	25.6912	23.1563
14	25.4326	22.0462
15	25.2658	21.2794
16	25.0390	20.6766
17	23.1223	20.6297
18	22.3775	20.2943
19	22.3230	19.8966
20	21.8566	19.5880
21	21.8081	18.5356
22	21.5896	18.3113
23	20.7233	18.1856
24	20.4139	17.5035
25	20.4083	17.4616
26	19.9811	15.3420
27	19.8677	14.8665
28	19.6419	14.5921
29	19.4826	14.5468
30	19.4513	14.3979
31	19.2158	13.6239
32	19.1265	13.2944
33	18.4055	12.9135
34	18.3714	12.2182
35	18.2164	10.9756
36	18.1421	10.9587
37	17.4672	10.5302
38	17.1525	10.4931
39	16.2977	10.4474
40	15.5683	10.2196
41	15.5034	10.1485
42	14.8106	10.0883
43	14.5874	9.9749
44	13.2028	9.6841
45	11.1635	9.6523
46	11.0769	9.5660
47	10.7132	9.5002
48	10.5601	9.4207
49	10.5471	9.3136
50	10.2721	9.1155
51	9.9713	8.8955
52	9.8491	8.6837
53	9.5129	8.6737
54	8.5385	8.6157
55	7.7218	8.3505
56	7.1068	8.3193
57	7.0050	7.6917
58	6.8720	7.5030
59	6.0857	7.1900
60	0.6093	6.8626

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
9.3406	1041	1298	124	Fail
9.6946	959	994	103	Fail
10.0487	894	852	95	Pass
10.4027	811	763	94	Pass
10.7568	746	711	95	Pass
11.1108	693	658	94	Pass
11.4649	632	621	98	Pass
11.8189	583	597	102	Fail
12.1730	536	561	104	Fail
12.5271	484	527	108	Fail
12.8811	456	498	109	Fail
13.2352	425	463	108	Fail
13.5892	403	438	108	Fail
13.9433	367	405	110	Fail
14.2973	336	379	112	Fail
14.6514	314	358	114	Fail
15.0054	298	343	115	Fail
15.3595	281	326	116	Fail
15.7135	265	309	116	Fail
16.0676	253	290	114	Fail
16.4216	238	278	116	Fail
16.7757	221	267	120	Fail
17.1297	201	246	122	Fail
17.4838	186	231	124	Fail
17.8379	175	219	125	Fail
18.1919	167	207	123	Fail
18.5460	145	180	124	Fail
18.9000	139	166	119	Fail
19.2541	126	149	118	Fail
19.6081	113	139	123	Fail
19.9622	104	131	125	Fail
20.3162	101	121	119	Fail
20.6703	95	110	115	Fail
21.0243	90	101	112	Fail
21.3784	85	94	110	Pass
21.7324	80	89	111	Fail
22.0865	71	83	116	Fail
22.4405	62	81	130	Fail
22.7946	59	75	127	Fail
23.1487	57	75	131	Fail
23.5027	56	69	123	Fail
23.8568	53	64	120	Fail
24.2108	52	56	107	Pass
24.5649	48	53	110	Pass
24.9189	45	49	108	Pass
25.2730	39	47	120	Fail
25.6270	35	47	134	Fail
25.9811	33	41	124	Fail
26.3351	30	40	133	Fail
26.6892	27	37	137	Fail
27.0432	27	35	129	Fail
27.3973	24	35	145	Fail
27.7513	23	35	152	Fail
28.1054	22	33	150	Fail

28.4594	20	32	160	Fail
28.8135	16	28	175	Fail
29.1676	15	28	186	Fail
29.5216	14	25	178	Fail
29.8757	14	22	157	Fail
30.2297	14	18	128	Fail
30.5838	12	17	141	Fail
30.9378	11	17	154	Fail
31.2919	9	17	188	Fail
31.6459	9	16	177	Fail
32.0000	7	14	200	Fail
32.3540	7	13	185	Fail
32.7081	7	12	171	Fail
33.0621	7	12	171	Fail
33.4162	7	11	157	Fail
33.7702	7	11	157	Fail
34.1243	6	11	183	Fail
34.4784	6	11	183	Fail
34.8324	6	11	183	Fail
35.1865	6	9	150	Fail
35.5405	6	8	133	Fail
35.8946	6	7	116	Fail
36.2486	5	7	140	Fail
36.6027	5	6	120	Fail
36.9567	5	6	120	Fail
37.3108	5	6	120	Fail
37.6648	5	6	120	Fail
38.0189	5	6	120	Fail
38.3729	5	6	120	Fail
38.7270	5	5	100	Pass
39.0810	5	5	100	Pass
39.4351	4	5	125	Fail
39.7892	4	5	125	Fail
40.1432	4	5	125	Fail
40.4973	4	5	125	Fail
40.8513	4	5	125	Fail
41.2054	4	5	125	Fail
41.5594	4	5	125	Fail
41.9135	3	5	166	Fail
42.2675	3	5	166	Fail
42.6216	3	5	166	Fail
42.9756	3	3	100	Pass
43.3297	3	3	100	Pass
43.6837	3	3	100	Pass
44.0378	3	3	100	Pass
44.3918	3	3	100	Pass

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Flow Splitter 1 POC	☐	377.97			☐	3.52			
Flow Splitter 1 POC	☐	377.97			☐	3.52			
Total Volume Infiltrated		755.93	0.00	0.00		3.52	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

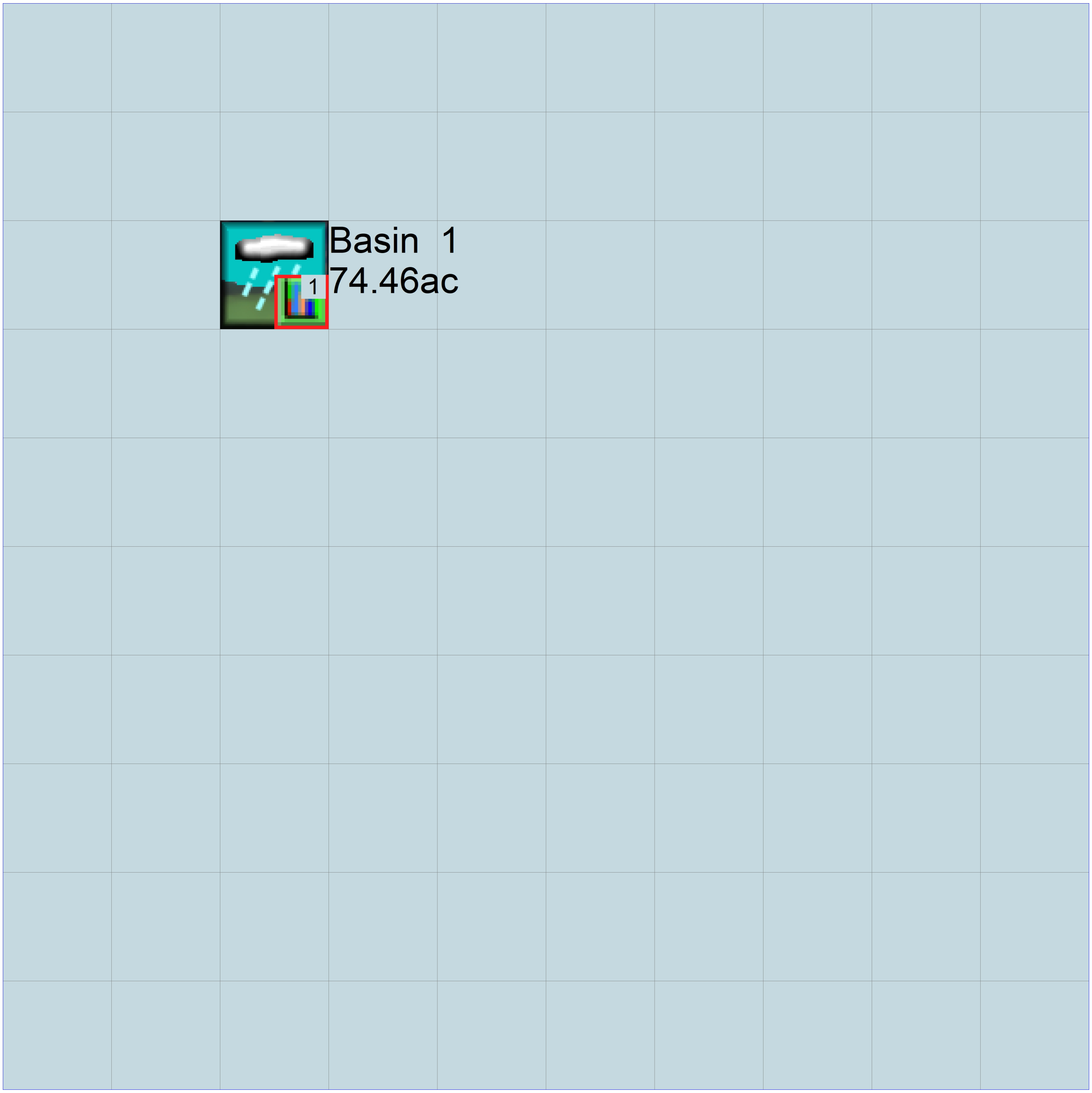
PERLND Changes

No PERLND changes have been made.

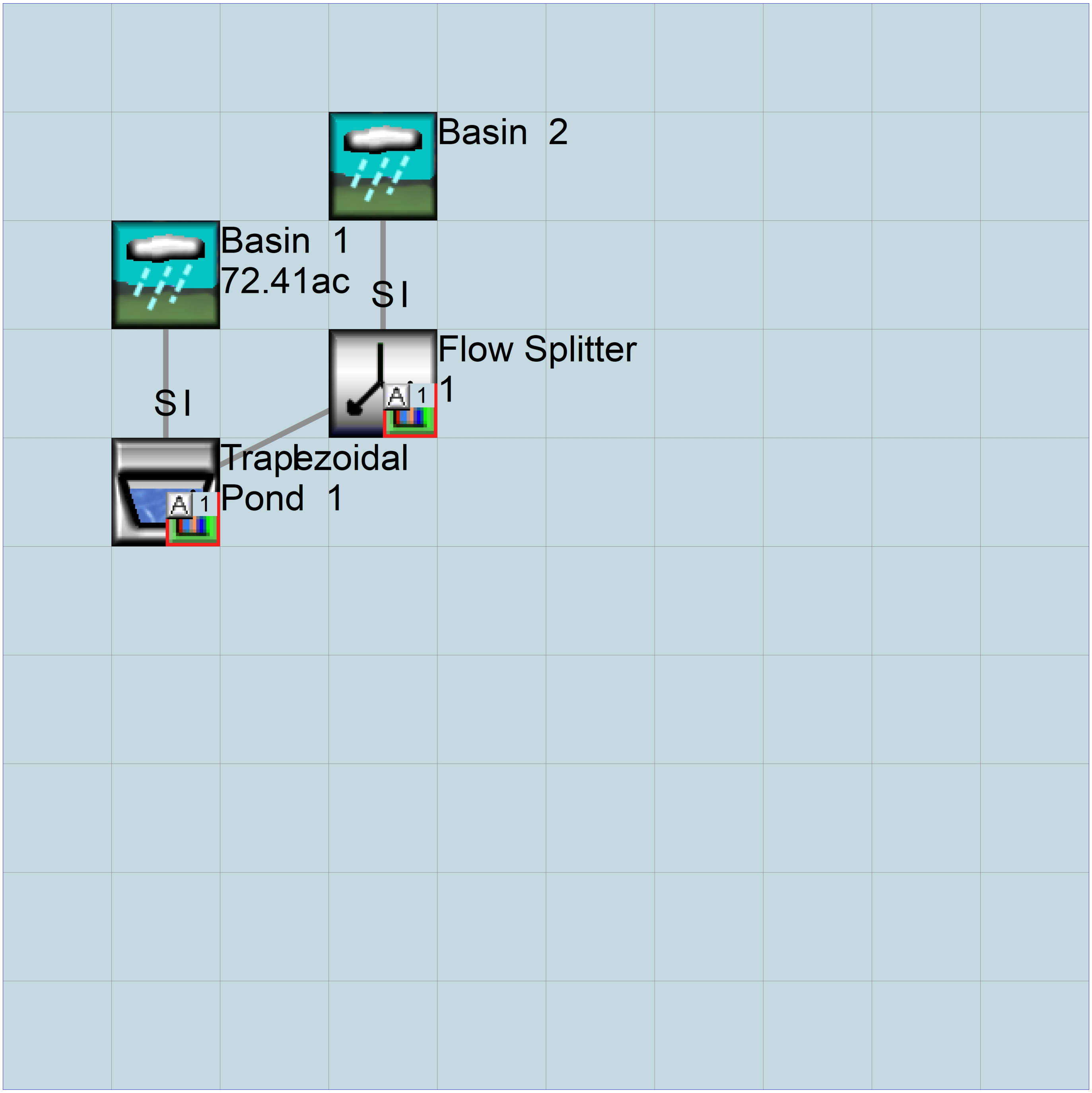
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   20211013_CLARK SG_Detention w flow splitter.wdm
MESSU      25   Pre20211013_CLARK SG_Detention w flow splitter.MES
           27   Pre20211013_CLARK SG_Detention w flow splitter.L61
           28   Pre20211013_CLARK SG_Detention w flow splitter.L62
           30   POC20211013_CLARK SG_Detention w flow splitter1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      28
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                      1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                            User  t-series Engl Metr ***
                                            in  out           ***
   28     SG4, Forest, Flat       1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   28         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   28         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   28         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   28             0         6      0.04       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   28             0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                   ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   28           0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   28             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out            ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  28                       74.46     COPY   501     12
PERLND  28                       74.46     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   20211013_CLARK SG_Detention w flow splitter.wdm
MESSU      25   Mit20211013_CLARK SG_Detention w flow splitter.MES
           27   Mit20211013_CLARK SG_Detention w flow splitter.L61
           28   Mit20211013_CLARK SG_Detention w flow splitter.L62
           31   POC20211013_CLARK SG_Detention w flow splitter2.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      34
      IMPLND       1
      IMPLND       4
      IMPLND      14
      RCHRES       1
      COPY         2
      COPY       502
      COPY       602
      DISPLY       2
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    2        Flow Splitter  1            MAX                    1    2   31    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
    2         1    1
  502         1    1
  602         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                           in  out           ***
   34      SG4, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   34         0    0    1    0    0    0    0    0    0    0    0    0
```

```
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   34         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   34         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   34              0         6      0.02       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   34              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   34            0.1       0.2      0.25         2       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   34              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                       in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
```

```
    1         0    0    0    0    0
    4         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  2***
IMPLND   4                        2.1     RCHRES   1      5
Basin  1***
PERLND  34                       13.6     COPY   502     12
PERLND  34                       13.6     COPY   602     12
PERLND  34                       13.6     COPY   502     13
PERLND  34                       13.6     COPY   602     13
IMPLND   1                       26.3     COPY   502     15
IMPLND   1                       26.3     COPY   602     15
IMPLND   4                         20     COPY   502     15
IMPLND   4                         20     COPY   602     15
IMPLND  14                       4.13     COPY   502     15
IMPLND  14                       4.13     COPY   602     15

******Routing******
IMPLND   4                        2.1     COPY   502     15
IMPLND   4                        2.1     COPY   602     15
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
    1     Flow Splitter  1-007    2    1    1    1   28    0    1
```

```
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *     *  *  *  *  *        *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   90    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.002296  0.000000  0.400000  0.000000
  0.111111  0.002296  0.000255  0.400000  0.000000
  0.222222  0.002296  0.000510  0.400000  0.000000
  0.333333  0.002296  0.000765  0.400000  0.000000
  0.444444  0.002296  0.001020  0.400000  0.000000
  0.555556  0.002296  0.001275  0.400000  0.000000
  0.666667  0.002296  0.001530  0.400000  11.00000
  0.777778  0.002296  0.001786  0.400000  21.00000
  0.888889  0.002296  0.002041  0.400000  31.00000
  1.000000  0.002296  0.002296  0.400000  41.00000
  1.111111  0.002296  0.002551  0.400000  51.00000
  1.222222  0.002296  0.002806  0.400000  61.00000
  1.333333  0.002296  0.003061  0.400000  71.00000
  1.444444  0.002296  0.003316  0.400000  81.00000
  1.555556  0.002296  0.003571  0.400000  91.00000
  1.666667  0.002296  0.003826  0.400000  101.0000
  1.777778  0.002296  0.004081  0.400000  111.0000
  1.888889  0.002296  0.004336  0.400000  121.0000
  2.000000  0.002296  0.004591  0.400000  131.0000
  2.111111  0.002296  0.004846  0.400000  141.0000
  2.222222  0.002296  0.005102  0.400000  151.0000
  2.333333  0.002296  0.005357  0.400000  161.0000
  2.444444  0.002296  0.005612  0.400000  171.0000
  2.555556  0.002296  0.005867  0.400000  181.0000
  2.666667  0.002296  0.006122  0.400000  191.0000
  2.777778  0.002296  0.006377  0.400000  201.0000
```

```
  2.888889  0.002296  0.006632  0.400000  211.0000
  3.000000  0.002296  0.006887  0.400000  221.0000
  3.111111  0.002296  0.007142  0.400000  231.0000
  3.222222  0.002296  0.007397  0.400000  241.0000
  3.333333  0.002296  0.007652  0.400000  251.0000
  3.444444  0.002296  0.007907  0.400000  261.0000
  3.555556  0.002296  0.008162  0.400000  271.0000
  3.666667  0.002296  0.008418  0.400000  281.0000
  3.777778  0.002296  0.008673  0.400000  291.0000
  3.888889  0.002296  0.008928  0.400000  301.0000
  4.000000  0.002296  0.009183  0.400000  311.0000
  4.111111  0.002296  0.009438  0.400000  321.0000
  4.222222  0.002296  0.009693  0.400000  331.0000
  4.333333  0.002296  0.009948  0.400000  341.0000
  4.444444  0.002296  0.010203  0.400000  351.0000
  4.555556  0.002296  0.010458  0.400000  361.0000
  4.666667  0.002296  0.010713  0.400000  371.0000
  4.777778  0.002296  0.010968  0.400000  381.0000
  4.888889  0.002296  0.011223  0.400000  391.0000
  5.000000  0.002296  0.011478  0.400000  401.0000
  5.111111  0.002296  0.011733  0.400000  411.0000
  5.222222  0.002296  0.011989  0.400000  421.0000
  5.333333  0.002296  0.012244  0.400000  431.0000
  5.444444  0.002296  0.012499  0.400000  441.0000
  5.555556  0.002296  0.012754  0.400000  451.0000
  5.666667  0.002296  0.013009  0.400000  461.0000
  5.777778  0.002296  0.013264  0.400000  471.0000
  5.888889  0.002296  0.013519  0.400000  481.0000
  6.000000  0.002296  0.013774  0.400000  491.0000
  6.111111  0.002296  0.014029  0.400000  501.0000
  6.222222  0.002296  0.014284  0.400000  511.0000
  6.333333  0.002296  0.014539  0.400000  521.0000
  6.444444  0.002296  0.014794  0.400000  531.0000
  6.555556  0.002296  0.015049  0.400000  541.0000
  6.666667  0.002296  0.015305  0.400000  551.0000
  6.777778  0.002296  0.015560  0.400000  561.0000
  6.888889  0.002296  0.015815  0.400000  571.0000
  7.000000  0.002296  0.016070  0.400000  581.0000
  7.111111  0.002296  0.016325  0.400000  591.0000
  7.222222  0.002296  0.016580  0.400000  601.0000
  7.333333  0.002296  0.016835  0.400000  611.0000
  7.444444  0.002296  0.017090  0.400000  621.0000
  7.555556  0.002296  0.017345  0.400000  631.0000
  7.666667  0.002296  0.017600  0.400000  641.0000
  7.777778  0.002296  0.017855  0.400000  651.0000
  7.888889  0.002296  0.018110  0.400000  661.0000
  8.000000  0.002296  0.018365  0.400000  671.0000
  8.111111  0.002296  0.018621  0.400000  681.0000
  8.222222  0.002296  0.018876  0.400000  691.0000
  8.333333  0.002296  0.019131  0.400000  701.0000
  8.444444  0.002296  0.019386  0.400000  711.0000
  8.555556  0.002296  0.019641  0.400000  721.0000
  8.666667  0.002296  0.019896  0.400000  731.0000
  8.777778  0.002296  0.020151  0.400000  741.0000
  8.888889  0.002296  0.020406  0.400000  751.0000
  9.000000  0.002296  0.020661  0.400000  761.0000
  9.111111  0.002296  0.020916  0.400000  771.0000
  9.222222  0.002296  0.021171  0.400000  781.0000
  9.333333  0.002296  0.021426  0.400000  791.0000
  9.444444  0.002296  0.021681  0.400000  801.0000
  9.555556  0.002296  0.021937  0.400000  811.0000
  9.666667  0.002296  0.022192  0.400000  821.0000
  9.777778  0.002296  0.022447  0.400000  831.0000
  9.888889  0.002296  0.022702  0.400000  841.0000
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
```

```
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
COPY   602 OUTPUT MEAN   1 1     48.4      WDM    902 FLOW     ENGL      REPL
RCHRES   1 HYDR   RO     1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1005 STAG     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Appendix C

Draft Geotechnical Report
Terra Associates, Inc.
July 12, 2021

Wetland and Fish and Wildlife Habitat Assessment Report
Soundview Consultants
October 2021

DRAFT

GEOTECHNICAL REPORT

Camas Business Center
4707 and 4723 – Northwest Lake Road
Camas, Washington

Project No. T-8553

Terra Associates, Inc.

Prepared for:

Panattoni Development Company
Tacoma, Washington

July 12, 2021

TERRA ASSOCIATES, Inc.
Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

July 12, 2021
Project No. T-8553

Mr. Bjorn Brynestad
Panattoni Development Company
1821 Dock Street, Suite 100
Tacoma, Washington 98402

DRAFT

Subject: Geotechnical Report
Camas Business Center
4707 and 4723 – Northwest Lake Road
Camas, Washington

Dear Mr. Brynestad:

As requested, we have conducted a geotechnical engineering study for the subject project. The attached report presents our findings and recommendations for the geotechnical aspects of project design and construction.

Our field exploration indicates the site is generally underlain by 1 to 11 inches of organic topsoil overlying medium stiff to very stiff silts with varying amounts of sand and gravel to the termination of the test pits. Test pits in the central and south-central portions of the site terminated in deposits of medium dense sands with varying silt and gravel contents. Additionally, Columbia River Basalt was encountered in the north and north-central portions of the site within the upper three to nine feet. Groundwater was observed in 28 of the 80 test pits at depths of 2.5 to 12 feet.

In our opinion, soil and groundwater conditions at the site will be suitable for support of the development as planned, provided recommendations contained herein are incorporated into project design and construction specifications.

We trust the information provided in the attached report is sufficient for your current needs. If you have any questions or need additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

Michael J. Xenos, E.I.T.
Staff Engineer

DRAFT

Carolyn S. Decker, P.E.
Project Engineer

TABLE OF CONTENTS

Geotechnical Report
Camas Business Center
4707 and 4723 – Northwest Lake Road
Camas, Washington

1.0 PROJECT DESCRIPTION

The project consists of developing the site with six industrial buildings with dock-high loading, along with a stormwater pond, associated access, parking, and utility improvements. Based on preliminary site plans prepared by Synthesis PLLC dated February 23, 2021, final floor areas are expected to range from approximately 35,775 square feet to 301,500 square feet. The preliminary site plans also show a stormwater pond in the northwestern portion of the site. Grading plans were not available at the time of this report. Based on the existing site topography we expect cuts and fills of up to approximately 10 feet will be required to achieve final pad elevations across the building area.

We anticipate the building will be constructed using precast reinforced concrete tilt-up perimeter wall panels with interior isolated columns supporting a steel or wood-truss roof system. We expect structural loads will be light, about 100 to 150 kips for isolated columns and 4 to 6 kips per foot for continuous perimeter bearing walls. Maximum product loading on the floors is not expected to exceed 350 pounds per square foot (psf).

The recommendations contained in the following sections of this report are based on the above design features. If actual features vary or changes are made, we should review them in order to modify our recommendations, as required. We should review the final design drawings and specifications to verify our recommendations have been properly interpreted and incorporated into project design and construction.

2.0 SCOPE OF WORK

Our work was completed in accordance with our authorized proposal dated January 21, 2021. Accordingly, on May 24, 2021, through May 26, 2021, we observed soil and groundwater conditions at 80 test pits excavated to maximum depths of 6 to 12 feet below current site grades. Using the information obtained from this subsurface exploration, we performed analyses to develop geotechnical recommendations for development at the site.

Specifically, this report addresses the following:

- Soil and groundwater conditions.
- Seismic design parameters per the current International Building Code (IBC).
- Geologic Hazards per the City of Camas Municipal Code.
- Site preparation and grading.
- Building preload/surcharge program.
- Excavations.

- Foundations including foundation alternatives.
- Slab-on-grade floors.
- Stormwater facilities.
- Infiltration feasibility.
- Drainage.
- Utilities.
- Pavements.

Recommendations outlined in this report regarding drainage are associated with soil strength, design earth pressures, erosion, and stability. Design and performance issues with respect to moisture as it relates to the structure environment are beyond Terra Associates, Inc.'s purview. A building envelope specialist or contractor should be consulted to address these issues, as needed.

3.0 SITE CONDITIONS

3.1 Surface

The site consists of 2 tax parcels totaling approximately 74 acres located at 4707 and 4723 NW Lake Road in Camas, Washington. The approximate site location is shown on Figure 1.

The site is currently occupied by 3 structures in the south-central portion of the site along with associated access and landscaping. The remainder of the site is vacant and predominately covered with brush and weeds, with the exception of the northwestern portion, which is covered with mature trees. Site topography in the southern portion of the site generally consists of a slope that descends from the east to the west with an overall relief of approximately 42 feet. At the approximate midpoint of the site from north to south, there is a moderate-to-steep slope that descends from the south to the north with an overall relief of approximately 48 feet. The grade then transitions to a slight slope, that continues to descend to the north with an overall relief of approximately 20 feet.

3.2 Soils

In general, the soil conditions at the site consist of approximately 1 to 11 inches of organic topsoil overlying 3 to 12 feet of medium stiff to very stiff silt with varying amounts of sand and gravel to the termination of the test pits. There were instances, most notably in the central and south-central portions of the site, where the test pits terminated in deposits of medium dense sand with silt and silty sand (with varying gravel contents), and similar deposits were occasionally exposed in the very north and southwest portions of the site. Additionally, Columbia River Basalt was encountered in the north and north-central portions of the site within the upper 3 to 9 feet. Test Pits TP-21 and TP-35, as well as several test pits located in the southwest of the site, also contained one to 6 feet of gravel with silt and sand to silty gravel with sand material underlying the upper silts. We observed, approximately 3 feet of fill material in Test Pit TP-78 with occasional organic and construction debris.

The *Geologic Map of the Camas Quadrangle, Clark County, Washington*, by R.C. Evarts and J.E. O'Connor (2008) maps the site as Quarternary-tertiary Sedimentary Conglomerate (Qt_c). This map unit is consistent with the underlying basalt bedrock observed in our field explorations. However, the upper silts, sands, and gravels observed in the test pits are more consistent with Sand and Silt Facies (Qf_s), and Gravel Facies (Qfg), which are mapped roughly 1,000 feet to the southwest and 2,000 feet to the northeast, respectively.

The preceding discussion is intended to be a brief review of the soil conditions observed at the site. More detailed descriptions are presented on the Test Pit Logs attached in Appendix A. The approximate location of the test pits is shown on attached Figure 2.

3.3 Groundwater

We observed minor to moderate groundwater seepage in 8 of the 80 test pits excavated. Groundwater was primarily observed in the test pits north of the wetland area, as well as in test pits located in the central, south-central, and southwest portions of the site at depths ranging from approximately 2.5 to 12 feet below existing grades. The observed seepage was typically observed within sandy or gravelly deposits, or perched within sandy seams or around pockets of gravel contained within the silt deposits.

Our observations in the test pits indicate observed groundwater levels correspond with the local groundwater table associated with Lacamas Creek located approximately 2,400 feet to the northeast. Groundwater seepage depth observations were made during the late spring, so groundwater is expected to be between seasonal high and seasonal low levels.

Mottled soils were observed throughout many of the test pits which indicated the presence of perched groundwater throughout much of the site. The occurrence of shallow perched groundwater is typical for sites underlain by fine-grained soils or relatively shallow bedrock. Fluctuations in the static groundwater level will occur seasonally. Typically, groundwater will reach maximum levels during the wet winter months. Based on our experience with groundwater conditions in the area, we would expect the seasonal high groundwater level to reach up to existing site grades.

3.4 Geologic Hazards

Chapter 16.59.010 of the City of Camas Municipal Code (CMC) defines geologic hazards as "…areas susceptible to erosion hazard, landslide hazard, seismic hazard, mine hazard, and other geologic events." We have evaluated the site for these hazards in the following sections below.

3.4.1 Erosion Hazard Areas

Chapter 16.59.020.A of the CMC defines erosion hazard areas as "…areas where there is not a mapped or designated landslide hazard, but where there are steep slopes equal to or greater than forty percent slope. Steep slopes which are less than ten feet in vertical height and not part of a larger steep slope system, and steep slopes created through previous legal grading activity are not regulated steep slope hazard areas."

The majority of the soils observed on the site are classified as Hesson clay loam, 0 to 8 percent slopes, in the south and northeast, and Powel silt loam, 0 to 8 percent slopes in the north by the United States Department of Agriculture Natural Resources Conservation Service (NRCS). Additionally, pockets of soils classified as Cove silty clay loam, thin solum, 0 to 3 percent slopes are located throughout the site. Over the site with existing slope gradients, these soils will have a slight to moderate potential for erosion when exposed.

The soils classified as Hesson clay loam, 8 to 20 percent slopes located at the approximate north-south midpoint along the moderate-to-steep slope will have a severe potential for erosion when exposed. Therefore, it is our opinion that an erosion hazard exists along the moderate-to-steep slope in the approximate center of the site.

Implementation of temporary and permanent Best Management Practices (BMPs) for preventing and controlling erosion will be required and will mitigate the erosion hazard. At a minimum, we recommend implementing the following erosion and sediment control BMPs prior to, during, and immediately following construction activities at the site.

Prevention

- Limit site clearing and grading activities to the relatively dry months (typically May through September).
- Limit disturbance to areas where construction is imminent.
- Locate temporary stockpiles of excavated soils no closer than ten feet from the crest of the slope.
- Provide temporary cover for cut slopes and soil stockpiles during periods of inactivity. Temporary cover may consist of durable plastic sheeting is securely anchored to the ground surface or straw mulch.
- Establish permanent cover by seeding, in conjunction with a mulch cover or appropriate hydroseeding, over exposed areas that will not be disturbed for a period of 30 days or more.

Containment

- Install a silt fence along site margins and downslope of areas that will be disturbed. The silt fence should be in place before clearing and grading is initiated.
- Intercept surface water flow and route the flow away from the slope to a stabilized discharge point. Surface water must not discharge at the top or onto the face of the steep slope.
- Provide onsite sediment retention for collected runoff.

The contractor should perform a daily review and maintenance of all erosion and sedimentation control measures at the site.

3.4.2 Landslide Hazard Areas

Chapter 16.59.020.B of the CMC defines landslide hazard areas as "…areas potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. They include areas susceptible because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors. Examples of these may include, but are not limited to the following:

1. Areas of pervious slope failures including areas of unstable old or recent landslides;
2. Areas with all three of the following characteristics:
    a. Slopes steeper than 15 percent,
    b. Hillsides intersecting geologic contacts with permeable sediments overlying a low permeability sediment or bedrock, and
    c. Any springs or ground water seepage;
3. Slopes that are parallel or sub-parallel to planes of weakness, such as bedding planes, joint systems and fault planes in subsurface materials;
4. Areas mapped by:
    a. Washington Department of Natural Resources Open File Report: Slope Stability of Clark County, 1975, as having potential instability, historical or active landslides, or as older landslide debris, and
    b. The Washington Department of Natural Resources Open File Report: Geologic Map of the Vancouver Quadrangle, Washington and Oregon, 1987, as landslides;
5. Slopes greater than eighty percent, subject to rock fall during earthquake shaking;
6. Areas potentially unstable as a result of rapid stream incision, stream bank erosion, and stream undercutting the toe of the slope;
7. Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris flows, debris torrents, or catastrophic flooding."

The onsite slopes do not match any of the above descriptions nor is the site located on the Washington Department of Natural Resources' Geologic Landslide Hazard Map. Therefore, in our opinion, the site does not present a landslide hazard as defined by the CMC in our opinion.

3.4.3 Seismic Hazard Areas

Chapter 16.59.020.C of the CMC defines seismic hazard areas as "… areas that are subject to severe risk of damage as a result of earthquake-induced soil liquefaction, ground shaking amplification, slope failure, settlement, or surface faulting. Relative seismic hazard is mapped on the NEHRP site class map of Clark County, published by the Washington Department of Natural Resources."

Liquefaction is a phenomenon where there is a reduction or complete loss of soil strength due to an increase in water pressure induced by vibrations. Liquefaction mainly affects geologically recent deposits of fine-grained sands underlying the groundwater table. Soils of this nature derive their strength from intergranular friction. The generated water pressure or pore pressure essentially separates the soil grains and eliminates this intergranular friction; thus, eliminating the soil's strength.

The NEHRP Site Class Map of Clark County, published by the Washington State DNR and dated September 2004, classifies the site as Seismic Site Class B to C, which typically present negligible risk for soil liquefaction. Additionally, based on the soil and groundwater conditions we observed, the risk for soil liquefaction occurring at the site is negligible due to the relative density of the soils and amount of cohesive material that would be sufficient to resist the cyclical loading of a seismic event. Columbia River Basalt likely underlies most of the site as evidenced by the north and north-central test pits. Therefore, in our opinion, the site would not be considered a seismic hazard area as defined by the CMC.

3.5 Seismic Site Class

Based on soil conditions observed in the test pits and our knowledge of the area geology, per Chapter 16 of the 2018 International Building Code (IBC), Site Class "C" should be used in structural design.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

Based on our study, development of the site as proposed is feasible from a geotechnical engineering standpoint. The primary geotechnical concern at the site is the presence of soil strata susceptible to consolidation under the planned building loads. The compressible soils consist of layers of medium stiff to very stiff silts that vary in thickness across the site. These soils are compressible and, if not mitigated, will likely experience unacceptable levels of differential settlement under proposed project loads.

Given the depth to the compressible silt layers, in our opinion, the potential post-construction building settlements can be mitigated by implementing a preload/surcharge program. This would entail raising site grades to finish floor elevation for a period of time to induce settlements prior to application of building loads. Building construction can begin after completion of the preload/surcharge program. The building can be supported on conventional spread footings bearing on the preload structural fill. Floor slabs can be similarly supported on the preload structural fill and pavements can be supported on structural fill or compacted native soils.

If building schedules do not allow for a surcharge program to take place, the building can be supported on ground improved by installing vibrated stone columns, which would preclude the need for a fill surcharge program.

The upper silt soils and lower silty sand to silty gravel soils observed at the site contain a significant amount of fines and will be difficult to compact as structural fill when too wet. The ability to use native soil soils from site excavations as structural fill will depend on its moisture content and the prevailing weather conditions at the time of construction. If grading activities will take place during winter, the owner should be prepared to import clean granular material for use as structural fill and backfill. Alternatively, stabilizing the moisture in the native and existing fill soils with cement or lime can be considered.

Detailed recommendations regarding these issues and other geotechnical design considerations are provided in the following sections. These recommendations should be incorporated into the final design drawings and construction specifications.

4.2 Site Preparation and Grading

To prepare the site for construction, all vegetation, organic surface soils, and other deleterious material should be stripped and removed from the site. Surface stripping depths of 1 to 11 inches should be expected to remove the organic surface soils and vegetation. In the developed portions of the site, demolition of existing structures should include removal of existing foundations and buried asphalt, and abandonment of underground septic systems and other buried utilities. Abandoned utility pipes that fall outside of new building areas can be left in place, provided they are sealed to prevent intrusion of groundwater seepage and soil. Organic topsoil will not be suitable for use as structural fill, but may be used for limited depths in nonstructural areas.

Once clearing and stripping operations are complete, cut and fill operations can be initiated to establish desired building grades. Prior to placing fill, all exposed bearing surfaces should be observed by a representative of Terra Associates, Inc. to verify soil conditions are as expected and suitable for support of new fill or building elements. Our representative may request a proofroll using heavy rubber-tired equipment to determine if any isolated soft and yielding areas are present. If excessively yielding areas are observed and they cannot be stabilized in place by compaction, the affected soils should be excavated and removed to firm bearing and grade restored with new structural fill. If the depth of excavation to remove unstable soils is excessive, the use of geotextile fabrics such as Mirafi 500X or an equivalent fabric can be used in conjunction with clean granular structural fill. Our experience has shown, in general, a minimum of 18 inches of a clean, granular structural fill place and compacted over the geotextile fabric should establish a stable bearing surface.

Our study indicates a majority of the native soils contain a sufficient percentage of fines (silt- and clay-sized particles) that will make them difficult to compact as structural fill if they are too wet or too dry. Accordingly, the ability to use these upper native soils from site excavations as structural fill will depend on their moisture content and the prevailing weather conditions when site grading activities take place. Soils that are too wet to properly compact could be dried by aeration during dry weather conditions or mixed with an additive such as cement or lime to stabilize the soil and facilitate compaction. If an additive is used, additional Best Management Practices (BMPs) for its use will need to be incorporated into the Temporary Erosion and Sedimentation Control plan (TESC) for the project.

Additionally, the bedrock soils will be difficult to reuse as structural fill. If bedrock is used, it will need to be crushed into pieces that are smaller than 6 inches in diameter and then compacted in 6 inch lifts.

If grading activities are planned during the wet winter months, or if they are initiated during the summer and extend into fall and winter, the contractor should be prepared to import wet-weather structural fill. For this purpose, we recommend importing a granular soil that meets the following grading requirements:

U.S. Sieve Size	Percent Passing
6 inches	100
No. 4	75 maximum
No. 200	5 maximum*

*Based on the 3/4-inch fraction.

Prior to use, Terra Associates, Inc. should examine and test all materials to be imported to the site for use as structural fill.

Structural fill should be placed in uniform loose layers not exceeding 6 or 12 inches and compacted to a minimum of 95 percent of the soil's maximum dry density, as determined by American Society for Testing and Materials (ASTM) Test Designation D-698 (Standard Proctor). The moisture content of the soil at the time of compaction should be within two percent of its optimum, as determined by this ASTM standard. In nonstructural areas, the degree of compaction can be reduced to 90 percent.

4.3 Preload/Surcharge

We recommend preloading the building area to limit building and floor slab settlements to tolerable levels. For this procedure, we recommend placing structural fill in the building areas to the design floor elevation, and delaying building construction until settlement under this fill load has occurred. The preload fill should extend a minimum of two feet beyond the building perimeter. A minimum fill depth of five feet is recommended.

Total settlement under the preload/surcharge fill is estimated in the range of 8 to 13 inches. These settlements are expected to occur in about 4 to 6 weeks following full application of the building fill.

To verify the amount of settlement and the time rate of movement, the preload program should be monitored by installing settlement markers. The settlement markers should be installed on the existing grade prior to placing any building or preload fills. Once installed, elevations of both the fill height and marker should be taken daily until the full height of the preload is in place. Once fully preloaded, readings should continue weekly until the anticipated settlements have occurred. A typical settlement marker detail is provided as Figure 3.

It is critical that the grading contractor recognize the importance of the settlement marker installations. All efforts must be made to protect the markers from damage during fill placement. It is difficult, if not impossible, to evaluate the progress of the preload program if the markers are damaged or destroyed by construction equipment. As a result, it may be necessary to install new markers and extend the surcharging time period in order to ensure that settlements have ceased and building construction can begin.

4.4 Excavations

All excavations at the site associated with confined spaces, such as those for utility construction, must be completed in accordance with local, state, or federal requirements. Based on current Washington Industrial Safety and Health Act (WISHA) regulations, the lower medium dense sands and medium dense to dense gravels found on the project site would be classified as Type C soils. The upper, medium stiff to very stiff silts would be classified as Type B soil.

Accordingly, temporary excavations in Type C soils should have their slopes laid back at an inclination of 1.5:1 (Horizontal:Vertical) or flatter, from the toe to the crest of the slope. Side slopes in Type B soils can be laid back at a slope inclination of 1:1 or flatter. If there is insufficient space to complete the excavations in this manner, or if excavations greater than 20 feet in depth are planned, temporary shoring to support the excavations may be required. Properly designed and installed shoring trench boxes can be used to support utility trench excavations where required.

Based on our study, groundwater should be anticipated within excavations extending below depths of about 7 to 12 feet below native surface grades. Excavations extending below this depth may encounter groundwater with volumes and flow rates sufficient to require some level of dewatering. Shallow excavations that do not extend more than two to three feet below the groundwater table can likely be dewatered by conventional sump-pumping procedures along with a system of collection trenches. Deeper excavations will require dewatering by well points or isolated deep-pump wells. The utility subcontractor should be prepared to implement excavation dewatering by well point or deep-pump wells, as needed. This will be an especially critical consideration for any deep excavations such for lift stations and sanitary sewer tie-ins.

This information is provided solely for the benefit of the owner and other design consultants and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

4.5 Foundations

Following the completion of the preload program. The building may be supported on conventional spread footing foundations bearing on subgrade prepared as recommended in Section 4.2 of this report. Perimeter foundations exposed to the weather should bear at a minimum depth of 1.5 feet below final exterior grades for frost protection. Interior foundations can be constructed at any convenient depth below the floor slab.

Building foundations should bear on a minimum of two feet of structural fill that replaces the native silt soils.

We recommend designing foundations bearing on two feet of structural fill for a net allowable bearing capacity of 2,500 psf. For short-term loads, such as wind and seismic, a one-third increase in this allowable capacity can be used. Following successful completion of the preload/surcharge program, with structural loading as anticipated and this bearing stress applied, estimated total foundation settlements of about one-inch and differential settlement of ½-inch should be expected.

For designing foundations to resist lateral loads, a base friction coefficient of 0.35 can be used. Passive earth pressures acting on the sides of the footings can also be considered. We recommend calculating this lateral resistance using an equivalent fluid weight of 300 pounds per cubic foot (pcf). We recommend not including the upper 12 inches of soil in this computation because it can be affected by weather or disturbed by future grading activity. This value assumes the foundations will be backfilled with structural fill as described in Section 4.2 of this report. The values recommended include a safety factor of 1.5.

Ground Improvement

As an alternative to the surcharging the building foundations, the buildings can be supported on improved ground using vibrated stone columns. This method creates highly densified columns of graded aggregate that would extend through the upper medium stiff soils into the underlying medium dense to dense sands and gravels. Due to the methods used to construct the columns, some improvement of the adjacent soils is also realized. Moreover, these methods can provide liquefaction mitigation by providing drainage paths and reduced pore pressures during ground shaking, and by constructing stiff, non-liquefiable inclusions in the soils. Once constructed, conventional spread footing foundations can be designed to bear immediately above the stone columns.

These ground improvement techniques are typically completed on a design/build approach with both design and construction completed by a specialty contractor. We can assist in contracting and selecting the specialty contractor, if desired.

4.6 Floor Slabs

Slab-on-grade floors may be supported on subgrade prepared as recommended in Section 4.2 of this report. Immediately below the floor slabs, we recommend placing a four-inch-thick capillary break layer of clean, free-draining, coarse sand or fine gravel that has less than five percent passing the No. 200 sieve. This material will reduce the potential for upward capillary movement of water through the underlying soil and subsequent wetting of the floor slabs.

The capillary break layer will not prevent moisture intrusion through the slab caused by water vapor transmission. Where moisture by vapor transmission is undesirable, such as covered floor areas, a common practice is to place a durable plastic membrane on the capillary break layer, then cover the membrane with a layer of clean sand or fine gravel to protect it from damage during construction and aid in uniform curing of the concrete slab. It should be noted, if the sand or gravel layer overlying the membrane is saturated prior to pouring the slab, it will be ineffective in assisting in uniform curing of the slab and can actually serve as a water supply for moisture transmission through the slab and affecting floor coverings. Therefore, in our opinion, covering the membrane with a layer of sand or gravel should be avoided if floor slab construction occurs during the wet winter months and the layer cannot be effectively drained. We recommend floor designers and contractors refer to the current American Concrete Institute (ACI) Manual of Concrete Practice for further information regarding vapor barrier installation below slab-on-grade floors.

With the subgrade prepared as recommended, design of the floor slab for storage rack loading and lift truck vehicle traffic, a subgrade modulus of 100 pounds per square inch per inch of deflection (pci) can be used.

4.7 Stormwater Facilities

No stormwater plans were available at the time of this report.

Detention Vault

If onsite detention will be provided by a buried vault, we expect that the bottom of the excavation would likely expose native, medium dense sands with silt, medium dense to dense silty gravels with sand, stiff to very stiff silts, and/or hard, moderately weathered Columbia River Basalt. Vault foundations supported by these native soils may be designed for an allowable bearing capacity of 4,000 psf provided that the foundation subgrade is at least 8 feet below current site grades. For short-term loads, such as seismic, a one-third increase in this allowable capacity can be used. Wet subgrade conditions that are easily disturbed by construction traffic will be exposed at the bottom of the vault excavation. To maintain a stable foundation subgrade, the native soils should be overexcavated a minimum depth of 12 inches below foundation grade and restored with clean 1 ¼-inch to 2-inch crushed rock.

Vault walls should be designed as below-grade retaining walls. The magnitude of earth pressure development on engineered retaining walls will partly depend on the quality of the wall backfill. We recommend placing and compacting wall backfill as structural fill as described in Section 4.2 of this report. To prevent overstressing the walls during backfilling, heavy construction machinery should not be operated within 5 feet of the wall. Wall backfill in this zone should be compacted with hand-operated equipment. To prevent hydrostatic pressure development, wall drainage must also be installed. A typical wall drainage detail is shown on Figure 4.

With the recommended wall backfill and drainage, we recommend designing the vault walls for an earth pressure imposed by an equivalent fluid weighing 50 pcf. Any portion of the wall for which drainage cannot be provided should be designed for an earth pressure equivalent to a fluid weighing 85 pcf. For evaluating walls under seismic loading, an additional uniform earth pressure equivalent to 8H psf, where H is the height of the below-grade wall in feet, can be used. These values assume a horizontal backfill condition. Where applicable, a uniform horizontal traffic value of 75 psf should be included in design of vault walls.

The detention vault will be subject to uplift pressures if drainage is not provided for the detention vault walls. For design, uplift forces should be based on a groundwater elevation equal to the current ground surface. The weight of the structure and the weight of the soil above its foundation will provide resistance to uplift. A soil unit weight of 120 pcf can be used in designing the structure to resist uplift forces.

Detention Pond

If fill berms will be constructed, the berm locations should be stripped of topsoil, duff, and soils containing organic material prior to the placement of fill. The fill berms should be constructed by placing structural fill in accordance with recommendations outlined in Section 4.2 of this report. Material used to construct pond berms should consist of predominately granular soils with a maximum size of 3 inches and a minimum of 20 percent fines.

Terra Associates, Inc. should examine and test all onsite or imported materials proposed for use as berm fill prior to their use.

It is possible that pockets of sandy or gravelly soils may be exposed within the pond area. Therefore, it may be necessary to line the dead storage portion of the pond for water quality purposes depending on the final grades and exposed soils.

Due to the exposure to fluctuating stored water levels and wave action, soils exposed on the interior side slopes of the ponds may be subject to some risk of periodic shallow instability or sloughing. Establishing interior slopes at a 3:1 gradient will significantly reduce or eliminate this potential. Exterior berm slopes and interior slopes above the maximum water surface should be graded to a finished inclination no steeper than 2:1. Finished slope faces should be thoroughly compacted and vegetated to guard against erosion.

We should review the stormwater plans when they are completed and revise our recommendations, if required.

4.8 Infiltration Feasibility

Based on our study, subsurface conditions are generally not favorable for infiltration of site stormwater. The surficial silt soils and relatively shallow silty sand soils observed at the site contain a high percentage of soil fines that would impede any downward migration of site stormwater. Additionally, the relatively shallow bedrock observed in the north and north-central portions of the site likely underlies the rest of the site and would not be a suitable receptor of site stormwater. Even low impact development (LID) techniques would likely fill up and overtop during rain events and cause minor local flooding. While zones of sands with silt and gravels were observed below the upper silts in the southwest and north portions of the site, there is an insufficient volume of material to support infiltration and many of these soils contained observable groundwater seepage which indicates site stormwater could not properly infiltrate into these deposits. Based on these soil conditions, infiltration at the site is not feasible and the stormwater should be managed using a conventional system.

4.9 Drainage

Surface

Final exterior grades should promote free and positive drainage away from the site at all times. Water must not be allowed to pond or collect adjacent to foundations or within the immediate building areas. We recommend providing a positive drainage gradient away from the building perimeters. If this gradient cannot be provided, surface water should be collected adjacent to the structures and directed to appropriate storm facilities.

Subsurface

In our opinion, with floor slabs at or elevated above the adjacent exterior grade, and positive drainage away from the structure maintained, installation of conventional perimeter foundation drains would not be necessary for the industrial grade building.

If positive drainage away from the building perimeters is not provided, or where landscaping is completed adjacent to the buildings, we recommend installing a continuous drain along the outside lower edge of the perimeter building foundations. The drains can be laid to grade at an invert elevation equivalent to the bottom of footing grade. The drains can consist of four-inch diameter perforated PVC pipe that is enveloped in washed half- to three-quarter-inch gravel-sized drainage aggregate. The aggregate should extend six inches above and to the sides of the pipe. The foundation drains and roof downspouts should be tightlined separately to an approved point of controlled discharge. All drains should be provided with cleanouts at easily accessible locations and should be serviced at least once each year.

4.10 Utilities

Utility pipes should be bedded and backfilled in accordance with American Public Works Association (APWA), or City of Camas specifications. As a minimum, trench backfill should be placed and compacted as structural fill, as described in Section 4.2 of this report. As noted, the native soils are moisture sensitive and close moisture control will be required to facilitate proper compaction. If utility construction takes place during the wet winter months, it will likely be necessary to import suitable wet weather fill for utility trench backfilling.

The utility contractor should also be prepared for encountering unstable soft alluvial soils below the pipe invert elevations. If not removed from below the pipe and replaced with crushed rock or additional bedding material, pipe deflections may occur as a result of the soil yielding and compressing in response to loading imposed during trench backfilling. The need to overexcavate and stabilize the pipe foundation before backfilling should be evaluated by observation and testing during construction. We recommend utilizing pipe connections that can accommodate the anticipated settlements discussed above.

4.11 Pavements

Pavement subgrades should be prepared as described in Section 4.2 of this report. Regardless of the degree of relative compaction achieved, the subgrade must be firm and relatively unyielding before paving. The subgrade should be proofrolled with heavy rubber-tired construction equipment such as a loaded 10-yard dump truck to verify this condition.

The pavement design section is dependent upon the supporting capability of the subgrade soils and the traffic conditions to which it will be subjected. We expect traffic at the facility will consist of cars and light trucks, along with heavy traffic in the form of tractor-trailer rigs. For design considerations, we have assumed traffic in parking and in car/light truck access pavement areas can be represented by an 18-kip Equivalent Single Axle Loading (ESAL) of 50,000 over a 20-year design life. For heavy traffic pavement areas, we have assumed an ESAL of 300,000 would be representative of the expected loading. These ESALs represent loading approximately equivalent to 3 and 18, loaded (80,000-pound GVW) RV rigs traversing the pavement daily in each area, respectively.

With a stable subgrade prepared as recommended, we recommend the following options for pavement sections:

Light Traffic and Parking:

- Two inches of hot mix asphalt (HMA) over six inches of crushed rock base (CRB)
- Full depth HMA – 4 inches

Heavy Traffic:

- Three inches of HMA over 8 inches of CRB
- Full depth HMA – 5.5 inches

For exterior Portland cement concrete (PCC) pavement, we recommend the following:

- 6 inches of PCC over two inches of CRB
    - 28-day compressive strength – 4,000 psi
    - Control joints spaced at a maximum of 15 feet.

Soil cement stabilization or constructing a soil cement base for support of the pavement section can also be considered as an alternative to the above conventional pavement sections. Assuming a properly constructed soil cement base having a minimum thickness of 12 inches and a minimum 7-day compressive strength of 100 pounds per square inch (psi), a minimum HMA pavement thickness of 3 inches would be required for the heavy traffic areas. The design of the soil cement base should be completed using samples of the subgrade exposed at the time of construction.

The paving materials used should conform to the Washington State Department of Transportation (WSDOT) specifications for half-inch class HMA, PCC, and CRB.

Long-term pavement performance will depend on surface drainage. A poorly drained pavement section will be subject to premature failure resulting from surface water infiltrating the subgrade soils and reducing their supporting capability. For optimum performance, we recommend surface drainage gradients of at least two percent. Some degree of longitudinal and transverse cracking of the pavement surface should be expected over time. Regular maintenance should be planned to seal cracks as they occur.

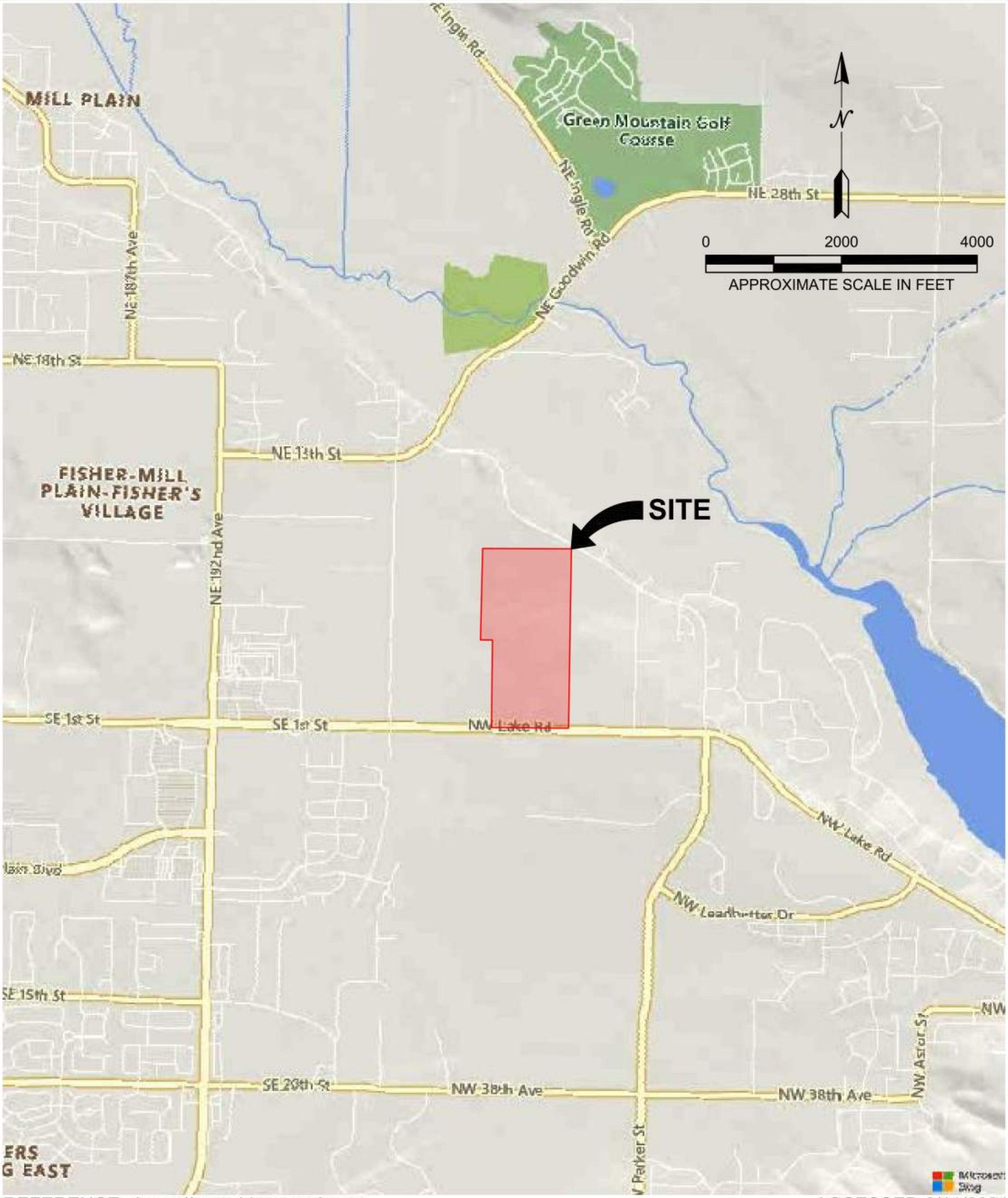
5.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review project designs and specifications to verify that earthwork and foundation recommendations have been properly interpreted and incorporated into project design. We should also provide geotechnical services during construction to observe compliance with our design concepts, specifications, and recommendations. This will allow for expedient design changes if subsurface conditions differ from those anticipated prior to the start of construction.

6.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. This report is the copyrighted property of Terra Associates, Inc. and is intended for specific application to the Camas Business Center in Camas, Washington. This report is for the exclusive use of Panattoni Development Company and their authorized representatives.

The analyses and recommendations presented in this report are based on data obtained from the subsurface explorations completed onsite. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to reevaluate the recommendations in this report prior to proceeding with construction.

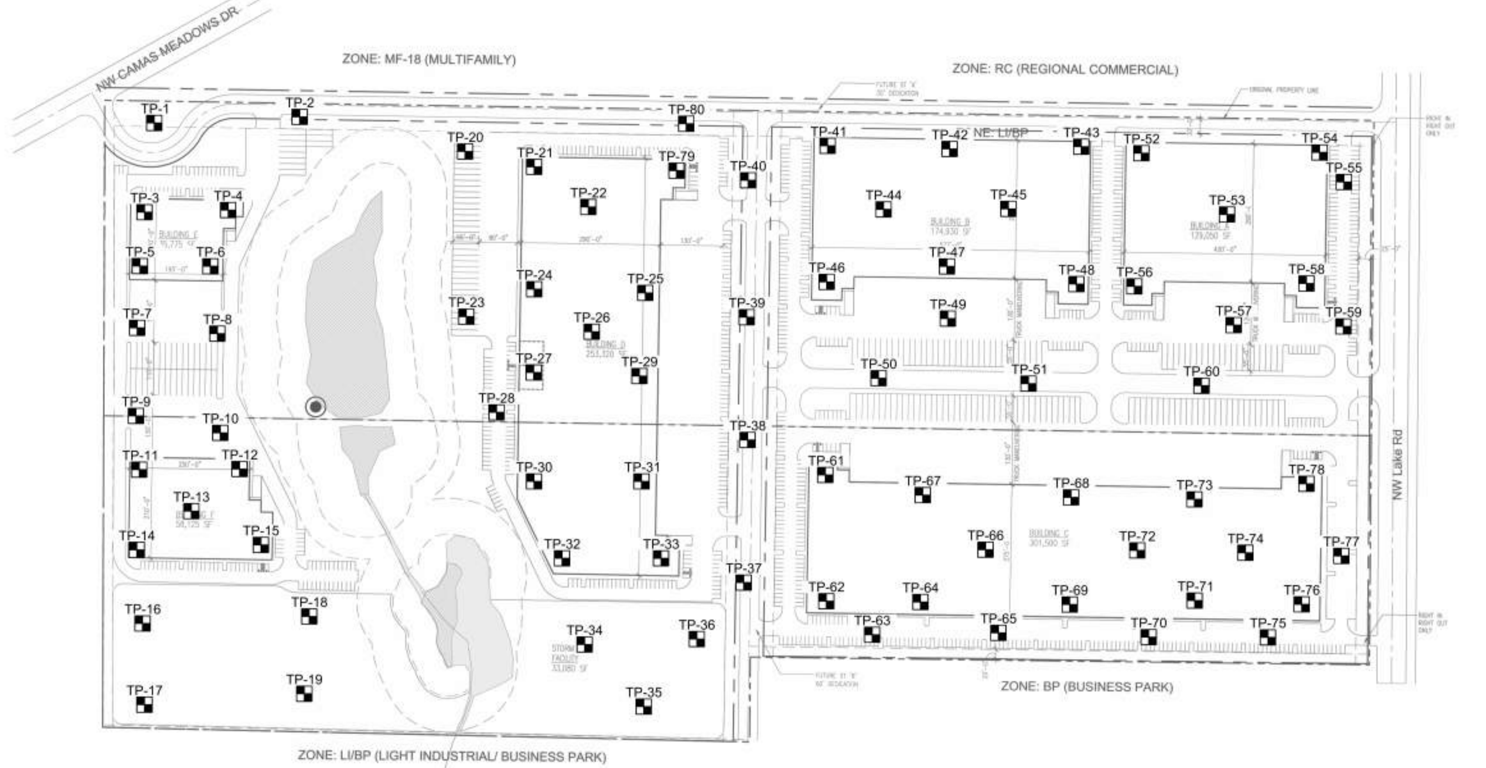


REFERENCE: https://www.bing.com/maps ACCESSED 6/11/2021

Terra Associates, Inc.
Consultants in Geotechnical Engineering
Geology and
Environmental Earth Sciences

VICINITY MAP
CAMAS BUSINESS CENTER
VANCOUVER, WASHINGTON

Proj.No. T-8553	Date:JUNE 2021	Figure 1



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: SITE PLAN PROVIDED BY PANATTONI.

LEGEND:

APPROXIMATE TEST PIT LOCATION

0 200 400

APPROXIMATE SCALE IN FEET

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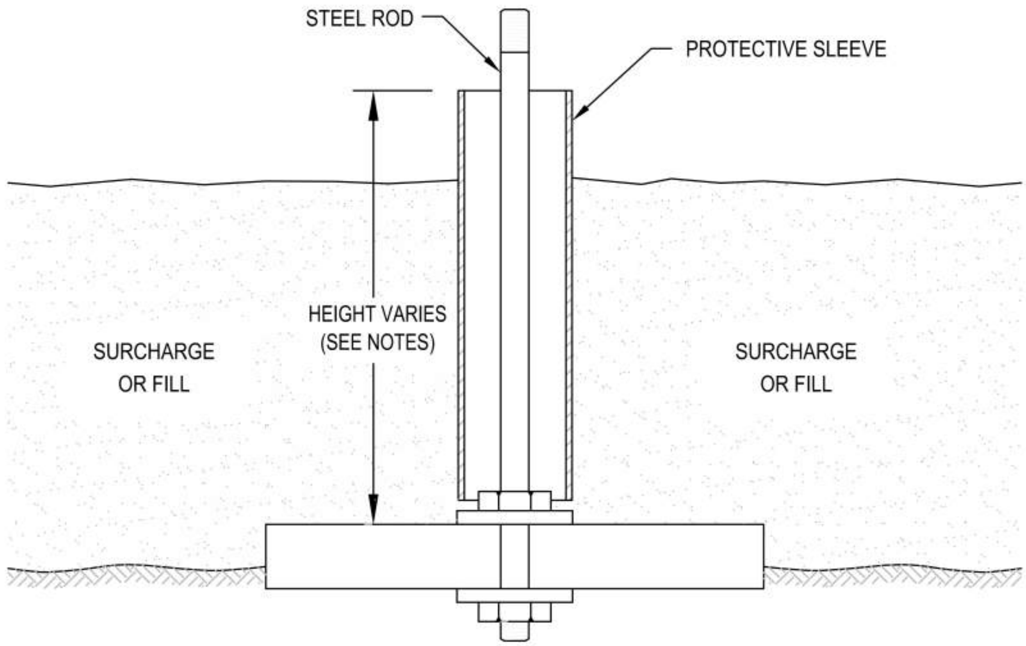
Geology and
Environmental Earth Sciences

EXPLORATION LOCATION PLAN
CAMAS BUSINESS CENTER
VANCOUVER, WASHINGTON

Proj.No. T-8553	Date:JUNE 2021	Figure 2



NOT TO SCALE

NOTES:

1. BASE CONSISTS OF 3/4" THICK, 2'x2' PLYWOOD WITH CENTER DRILLED 5/8" DIAMETER HOLE.
2. BEDDING MATERIAL, IF REQUIRED, SHOULD CONSIST OF CLEAN COARSE SAND.
3. MARKER ROD IS 1/2" DIAMETER STEEL ROD THREADED AT BOTH ENDS.
4. MARKER ROD IS ATTACHED TO BASE BY NUT AND WASHER ON EACH SIDE OF BASE.
5. PROTECTIVE SLEEVE SURROUNDING MARKER ROD SHOULD CONSIST OF 2" DIAMETER PLASTIC TUBING. SLEEVE IS NOT ATTACHED TO ROD OR BASE.
6. ADDITIONAL SECTIONS OF STEEL ROD CAN BE CONNECTED WITH THREADED COUPLINGS.
7. ADDITIONAL SECTIONS OF PLASTIC PROTECTIVE SLEEVE CAN BE CONNECTED WITH PRESS-FIT PLASTIC COUPLINGS.
8. STEEL MARKER ROD SHOULD EXTEND AT LEAST 6" ABOVE TOP OF PLASTIC PROTECTIVE SLEEVE.
9. PLASTIC PROTECTIVE SLEEVE SHOULD EXTEND AT LEAST 1" ABOVE TOP OF FILL SURFACE.

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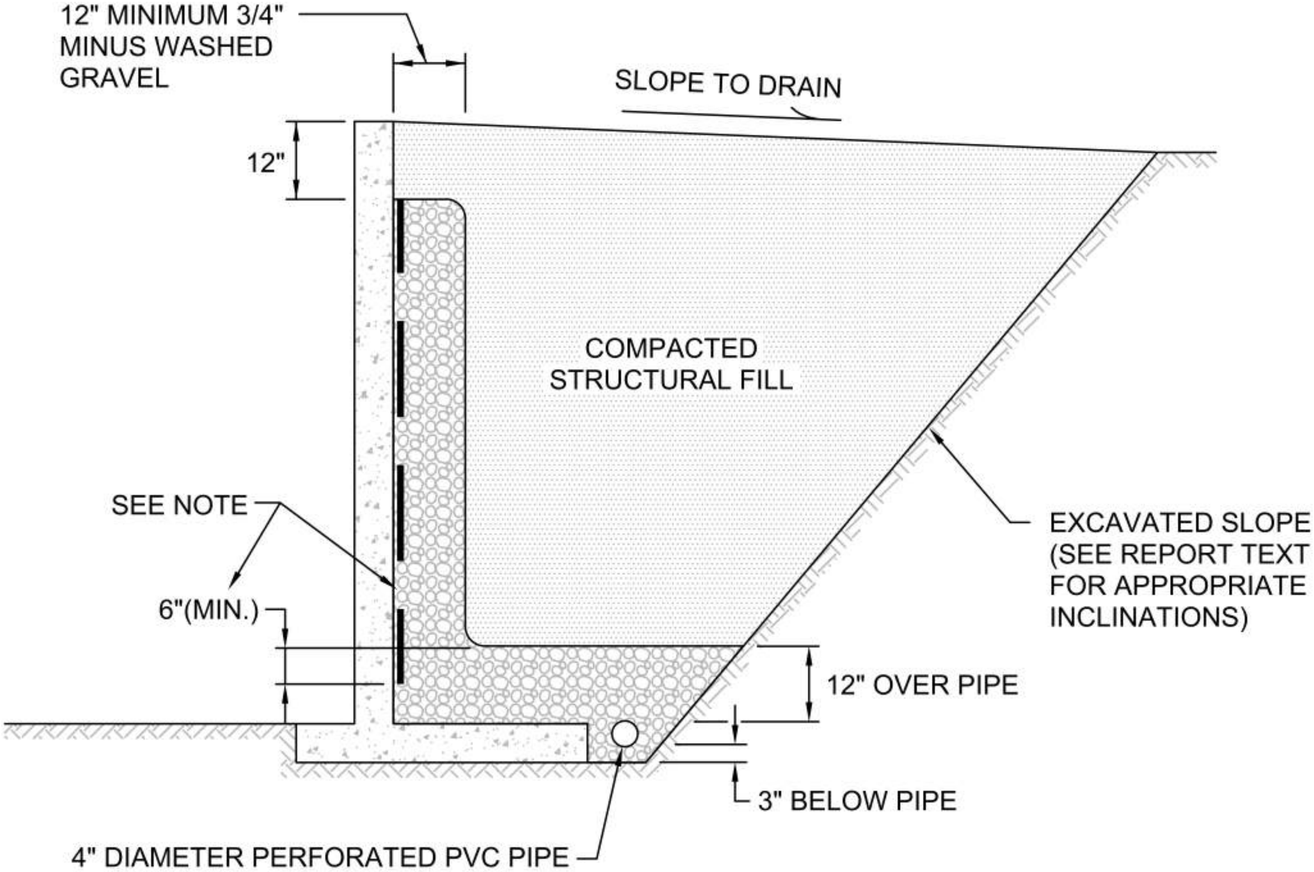
Environmental Earth Sciences

SETTLEMENT MARKER DETAIL
CAMAS BUSINESS CENTER
VANCOUVER, WASHINGTON

Proj.No. T-8553	Date:JUNE 2021	Figure 3



NOT TO SCALE

NOTE:

MIRADRAIN G100N PREFABRICATED DRAINAGE PANELS OR SIMILAR PRODUCT CAN BE SUBSTITUTED FOR THE 12-INCH WIDE GRAVEL DRAIN BEHIND WALL. DRAINAGE PANELS SHOULD EXTEND A MINIMUM OF SIX INCHES INTO 12-INCH THICK DRAINAGE GRAVEL LAYER OVER PERFORATED DRAIN PIPE.

Terra Associates, Inc. Consultants in Geotechnical Engineering Geology and Environmental Earth Sciences	TYPICAL WALL DRAINAGE DETAIL CAMAS BUSINESS CENTER VANCOUVER, WASHINGTON
	Proj.No. T-8553 | Date:JUNE 2021 | Figure 4

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

Camas Business Center
Camas, Washington

On May 24, 2021, through May 26, 2021, we completed our site exploration by observing soil conditions at 80 test pits. The test pits were excavated using a track-mounted excavator to maximum depths of approximately 6 to 12 feet below existing site grades. Test pit locations were determined in the field by measuring from existing site features. The approximate location of the test pits is shown on the attached Exploration Location Plan, Figure 2. Test Pit Logs are presented on Figures A-2 through A-81.

A geotechnical engineer from our office conducted the field exploration. Our representative classified the soil conditions encountered, maintained a log of each test pit, obtained representative soil samples, and recorded water levels observed during excavation. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described on Figure A-1.

Representative soil samples obtained from the test pits were placed in sealed plastic bags and taken to our laboratory for further examination and testing. The moisture content of selected samples was measured and is reported on the corresponding Test Pit Logs. Grain size analyses were also performed on select samples. The results are shown on Figures A-82 and A-83.

MAJOR DIVISIONS				LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS	More than 50% material larger than No. 200 sieve size	**GRAVELS** More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
			Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
				GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
		SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, sands with gravel, little or no fines.
				SP	Poorly-graded sands, sands with gravel, little or no fines.
			Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
				SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS	More than 50% material smaller than No. 200 sieve size	**SILTS AND CLAYS** Liquid Limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
				CL	Inorganic clays of low to medium plasticity. (Lean clay)
				OL	Organic silts and organic clays of low plasticity.
		SILTS AND CLAYS Liquid Limit is greater than 50%		MH	Inorganic silts, elastic.
				CH	Inorganic clays of high plasticity. (Fat clay)
				OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS				PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

COHESIONLESS

Density	Standard Penetration Resistance in Blows/Foot
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	>50

COHESIVE

Consistancy	Standard Penetration Resistance in Blows/Foot
Very Soft	0-2
Soft	2-4
Medium Stiff	4-8
Stiff	8-16
Very Stiff	16-32
Hard	>32

Symbol	Definition
	2" OUTSIDE DIAMETER SPILT SPOON SAMPLER
	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (Date)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot

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UNIFIED SOIL CLASSIFICATION SYSTEM
CAMAS BUSINESS CENTER
VANCOUVER, WASHINGTON

Proj.No. T-8553	Date:JUNE 2021	Figure A-1

LOG OF TEST PIT NO. TP-1

FIGURE A-2

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL) Brown SILT, moist, scattered rootlets, occasional cobble, weak cementation. (ML)		
1				24.6
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	34.1
7		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		60.0
9		Test Pit terminated at approximately 9 feet. No groundwater seepage observed. No caving observed.		61.2
11				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-2

FIGURE A-3

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL) Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				28.4
2				
3			medium stiff	51.5
		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		
4				
5				
6				58.2
		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
7				
8				52.5
		Test Pit terminated at approximately 8 feet. No groundwater seepage observed. No caving observed.		
9				
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-3

FIGURE A-4

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		29.0
2		Brown SILT with sand to sandy SILT, fine to coarse sand, moist, mottled below 8 feet, moderate cementation. (ML)		
3			medium stiff	35.0
4				
5				
6				35.8
7				
8			very stiff	
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		35.9
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-4

FIGURE A-5

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Brown SILT with sand, fine sand, moist, scattered rootlets, weak cementation. (ML)		
2				29.9
3			medium stiff	
4		Brown sandy SILT, fine to coarse sand, moist to wet, weak to moderate cementation. (ML)		
5				29.0
6				
7				
8			stiff	30.6
9				
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 9 feet. No caving observed.		41.1
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-5

FIGURE A-6

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				20.3
2				
3		Brown SILT with sand, fine to coarse sand, moist, moderate cementation. (ML)	medium stiff	
4				34.5
5				
6				
7				34.4
8			stiff	
9		Brownish-gray sandy SILT, fine to coarse sand, moist, weak cementation. (ML)		
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		26.3
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-6

FIGURE A-7

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		
				13.8
2				
3			medium stiff	
4		Brown sandy SILT, moist, fine to coarse sand, moist to wet, weak to moderate cementation. (ML)		24.9
5				
6				
7				
8				30.7
9			stiff	
10				35.1
11		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-7

FIGURE A-8

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
				13.8
2				
3		Brown SILT with sand, fine to coarse sand, moist. (ML)	medium stiff	
4				31.4
5		Brown sandy SILT, fine to coarse sand, moist, weak to moderate cementation. (ML)		
6				
7				27.2
8			stiff	
9				
10		Brownish-gray sandy SILT, fine to medium sand, moist to wet, weak cementation. (ML)		36.9
11		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-8

FIGURE A-9

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		13.8
2				
3		Brown SILT with sand, fine sand, moist, occasional rootlet. (ML)	medium stiff	23.1
4				
5		Brown sandy SILT, fine to coarse sand, moist, weak cementation. (ML)		26.7
6				
7			stiff	
8				
9		Brownish-gray silty SAND, fine to medium sand, wet. (SM)	medium dense	37.1
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 9 feet. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-9

FIGURE A-10

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	15.0
2				
3		Brown SILT with sand to sandy SILT, fine to coarse sand, moist to wet, weak cementation. (ML)		
4				31.1
5			stiff to very stiff	
6				
7		Brownish-gray sandy SILT, fine sand, moist to wet, weak cementation, interbedded silty SAND seams. (ML)		42.0
8				
9			stiff	34.7
10				
11		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		37.7
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-10

FIGURE A-11

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 7 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				19.7
2				
3		Brown to brownish-gray SILT with sand, fine to coarse sand, moist to wet, weak cementation. (ML)	medium stiff	
4				34.2
5				
6				
7			stiff	
8				35.6
9				
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 7 feet. No caving observed.		38.3
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-11

FIGURE A-12

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 11 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(11-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, occasional cobble, weak cementation. (ML)		14.4
2				
3		Brown SILT with sand, fine to medium sand, moist. (ML)	medium stiff	22.0
4				
5				
6		Gray sandy SILT, fine sand, moist to wet, mottled, alternating layers of brown silty SAND. (ML)		39.4
7				
8				33.4
9			stiff	
10				
11				
12		Test Pit terminated at approximately 12 feet. Moderate groundwater seepage observed at approximately 11 feet. No caving observed.		42.2
13				
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-12

FIGURE A-13

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL) Gray SILT with sand, fine sand, moist, mottled, occasional rootlet. (ML)		
1				
2			medium stiff	21.9
3				
4				
5		Brownish-gray sandy SILT, fine to coarse sand, moist to wet, mottled. (ML)		38.2
6				
7			stiff	
8				
9		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		58.2
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 9 feet. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-13

FIGURE A-14

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(11-inches organic TOPSOIL)		
1		Brownish-gray SILT with sand, fine sand, moist, mottled, occasional rootlet. (ML)		
2				19.6
3			medium stiff	
4				
5				36.6
6		Brownish-gray sandy SILT, fine to coarse sand, moist to wet, mottled, weak cementation. (ML)		
7				36.8
8			stiff	
9				
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		37.3
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-14

FIGURE A-15

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Gray SILT, moist, trace rootlets, occasional gravel, weak cementation. (ML)	medium stiff	22.2
3		Brownish-gray to gray SILT with sand, moist, mottled, occasional rootlet. (ML)	stiff	28.1
8		Brownish-gray SAND with silt, fine to coarse sand, moist to wet, interbededd mottled sandy SILT seams. (SP-SM)	medium dense	
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 9 feet. No caving observed.		41.4
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-15

FIGURE A-16

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
1		Gray SILT with sand, fine sand, moist, mottled. (ML)		
				26.3
2				
			medium stiff	
3				
4				
5				34.7
		Brownish-gray sandy SILT, fine to coarse sand, moist to wet, mottled, weak cementation. (ML)		
6				
7				
8			stiff	
9				
10				47.8
11				
		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-16

FIGURE A-17

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 7 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Gray SILT, dry to moist, trace rootlets, occasional gravel, weak cementation. (ML)	medium stiff	24.9
2				
3		Brownish-gray to gray SILT with sand, fine sand, moist, mottled. (ML)		25.2
4				
5		Brownish-gray to gray sandy SILT, fine to coarse sand, moist to wet, interbedded SAND with silt seams below 7 feet. (ML)		33.2
6				
7			stiff	38.5
8				
9				
10				
11				
12		Test Pit terminated at approximately 12 feet. Minor groundwater seepage observed at approximately 7 feet. No caving observed.		34.1
13				
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-17

FIGURE A-18

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 8 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Dark gray SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	21.4
2		Gray SILT with sand, fine sand, moist, mottled, occasional rootlet, occasional gravel. (ML)		28.9
3				
4				
5			stiff	37.3
6				
7				
8		Gray SAND with silt, fine to coarse sand, wet, interbedded SILT seams. (SP-SM)	medium dense	33.7
9		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 8 feet. No caving observed.		34.2
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-18

FIGURE A-19

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlet, weak cementation. (ML)		22.6
2				
3		Brownish-gray sandy SILT, fine to medium sand, moist, mottled, occasional gravel. (ML)	medium stiff	
4				28.9
5				
6		Brown to brownish-gray sandy SILT, fine to coarse sand, moist, weak cementation. (ML)		40.0
7				
8			stiff	
9		Brown SAND with silt, fine to coarse sand, wet, interbedded SILT seams. (SP-SM)		
10			medium dense	37.4
11		Test Pit terminated at approximately 11 feet. Minor seepage observed at approximately 9 feet. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-19

FIGURE A-20

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 26, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, occasional gravel, weak cementation. (ML)	medium stiff	21.8
2.5–3		Brown SILT with sand, fine sand, moist, occasional rootlet. (ML)		24.0
5		Brownish-gray sandy SILT, fine to coarse sand, moist, mottled. (ML)		40.1
7		Brownish-gray SILT with sand, fine sand, moist, mottled. (ML)	stiff	36.5
9		Brownish-gray sandy SILT, fine to coarse sand, moist, mottled. (ML)		44.5
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-20

FIGURE A-21

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4-inches organic TOPSOIL)		
		Brown SILT, dry, trace rootlets. (ML)		
1				
				14.4
2		Brown SILT with sand, fine to coarse sand, moist, trace gravel. (ML)		
3			medium stiff	37.5
4				
5				
6		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		53.2
7				
8				
9		Test Pit terminated at approximately 9 feet. No groundwater seepage observed. No caving observed.		54.7
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-21

FIGURE A-22

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL) Brown SILT, dry, occasional rootlet, weak cementation. (ML)		
1				22.7
			medium stiff	
2				
3		Reddish-brown SILT, moist, trace sand, occasional cobble, weak cementation. (ML)		23.7
4				
			stiff	
5				
6		Brown silty GRAVEL with sand, fine to coarse sand, fine to coarse gravel, moist, scattered cobbles. (GM)	dense	51.9
7		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
8		Test Pit terminated at approximately 8 feet. No groundwater seepage observed. No caving observed.		55.3
9				
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-22

FIGURE A-23

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 2.5 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL) Brown SILT, moist, occasional rootlet, weak cementation. (ML)		
1			medium stiff	33.2
2				
2.5		Light brown SILT with sand and gravel, fine to coarse sand, fine to coarse gravel, moist, weak cementation. (ML)		
3				65.8
4			stiff	
5		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
6		Test Pit terminated at approximately 6 feet. Minor groundwater seepage observed at approximately 2.5 feet. No caving observed.		56.6
7				
8				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-23

FIGURE A-24

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4-inches organic TOPSOIL) Brown SILT, dry, scattered rootlets, moderate cementation. (ML)		
1				14.8
2				
3		Brown SILT with sand, fine to coarse sand, moist. (ML)	medium stiff	41.4
4				
5				
6				
7		BbEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		51.6
8		Test Pit terminated at approximately 8 feet. No groundwater seepage observed. No caving observed.		
9				
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-24

FIGURE A-25

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
		Brown SILT with sand, fine to coarse sand, dry to moist, trace gravel. (ML)		
1				
				11.6
2				
3				53.5
			medium stiff	
4				
5				
6				57.0
7				59.9
		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
8				
9				54.9
		Test Pit terminated at approximately 9 feet. No groundwater seepage observed. No caving observed.		
10				
11				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-25

FIGURE A-26

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		19.7
2				
3		Brown SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)	medium stiff	
4				35.4
5				
6				
7				
8		Brownish-gray to gray sandy SILT, fine to medium sand, moist, mottled. (ML)	stiff	38.6
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		32.9
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-26

FIGURE A-27

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL) Brown SILT with sand, fine to coarse sand, moist, mottled, occasional gravel. (ML)	medium stiff	24.3
3		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		29.9
6		Test Pit terminated at approximately 6 feet. No groundwater seepage observed. No caving observed.		29.5
8				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-27

FIGURE A-28

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(11-inches organic TOPSOIL)		
		Brown SILT, dry, scattered rootlets, moderate cementation. (ML)		
1				
				18.4
2				
3				47.4
		Brown SILT with sand, fine to coarse sand, moist. (ML)	medium stiff	
4				
5				
6				
7		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
8				53.6
9		Test Pit terminated at approximately 9 feet. No groundwater seepage observed. No caving observed.		
10				
11				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-29

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL) Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		
1			medium stiff	16.7
2				
3		Brownish-gray sandy SILT, fine sand, moist, moderate cementation. (ML)		37.0
4			medium stiff to stiff	
5				
6		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		
7				54.0
8		Test Pit terminated at approximately 8 feet. No groundwater seepage observed. No caving observed.		
9				
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-29

FIGURE A-30

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4-inches organic TOPSOIL)		
1		Reddish-brown SILT, moist, trace rootlets. (ML)		26.9
2				
3		Brown SILT with sand, fine to coarse sand, moist, some mottling. (ML)		35.0
4				
5			medium stiff	
6				39.0
7				
8				
9		Dark gray silty SAND, fine to coarse sand, wet. (SM)		
10			medium dense	53.9
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-30

FIGURE A-31

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(11-inches organic TOPSOIL) Brown SILT, moist, trace rootlets. (ML)		
1				29.9
2				
3			medium stiff	
4		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		34.9
5				
6				
7		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		33.4
8				
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		56.2
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-31

FIGURE A-32

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 8 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets. (ML)		24.6
3		Brown SILT with sand, fine to coarse sand, moist. (ML)	medium stiff	32.5
6		Gray SILT with sand, fine to coarse sand, moist, mottled. (ML)	stiff	37.9
8		Dark gray silty SAND, fine to coarse sand, wet, occasional gravel, occasional SILT seam. (SM)	medium dense	58.7
12		Test Pit terminated at approximately 12 feet. Minor groundwater seepage observed at approximately 8 feet. No caving observed.		54.4
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-32

FIGURE A-33

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 3 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Dark brown SILT, moist, trace sand, trace rootlets. (ML)	medium stiff	27.0
2				
3		Reddish-brown SILT, moist. (ML)		33.7
4–5			stiff	
6				39.2
7			very stiff	
8		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		48.1
9				
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 3 feet. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-33

FIGURE A-34

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
		Reddish-brown SILT, moist, trace rootlets. (ML)		
1				
				21.7
2				
			medium stiff	
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		40.3
4				
5		BEDROCK: Moderate strength, brown to gray, fine to coarse, moderately weathered. (Columbia River Basalt)		24.6
6				
7				22.9
8		Test Pit terminated at approximately 8 feet. No groundwater seepage observed. No caving observed.		24.7
9				
10				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-34

FIGURE A-35

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, occasional organic. (ML)		
2			medium stiff	24.9
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		30.8
4				
5		Gray SILT, moist, mottled, interbedded SAND seams. (ML)		23.0
6				
7				
8			stiff	
9				
10				
11		Test PIt terminated at approximately 11 feet. No groundwater observed. No caving observed.		41.8
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-35

FIGURE A-36

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Blackberries **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
1		Dark brown to brown SILT, moist, trace rootlets. (ML)		
				34.0
2				
3			medium stiff	
4				36.4
		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		
5				
6				23.3
		Brown silty GRAVEL with sand, fine to coarse sand, fine to coarse gravel, moist, mottled, scattered cobbles. (GM)		
7			dense	
8				31.9
		Brown to gray SILT, moist, mottled, interbedded SAND with silt seams. (ML)		
9				
10			stiff	
11				31.4
		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-36

FIGURE A-37

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4-inches organic TOPSOIL)		
1		Brown SILT, dry, trace rootlets, occasional gravel, weak cementation. (ML)		14.8
3		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	36.4
7		Reddish-brown SILT, moist to wet, trace sand. (ML)	stiff	35.1
9		Gray clayey SILT, moist. (ML)	very stiff	32.9
11		Test Pit terminated at approximately 11 feet. Moderate groundwater seepage observed at approximately 9 feet. No caving observed.		
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-37

FIGURE A-38

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(2-inches organic TOPSOIL) Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				24.2
2				
3		Brown SILT with sand, fine to coarse sand, moist, mottled, occasional gravel. (ML)	medium stiff	
4				33.4
5				
6		Reddish-brown SILT, moist. (ML)		
7				30.2
8			stiff	
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		29.5
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-38

FIGURE A-39

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass/shrubs **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
				22.4
2				
3				
			medium stiff	
4		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)		32.8
5				
6				
7				36.0
8			stiff	
9				
10				33.3
11		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-39

FIGURE A-40

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	20.8
4		Brownish-gray to gray sandy SILT, fine to coarse sand, moist, mottled. (ML)	medium stiff	38.5
7			stiff	
10		Blueish-gray silty SAND with gravel, fine to coarse sand, fine to coarse gravel, wet. (SM)	medium dense	68.3
12		Test Pit terminated at approximately 12 feet. Moderate groundwater seepage observed at approximately 10 feet. No caving observed.		
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-40

FIGURE A-41

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		14.5
3.5		Brown SILT with sand to clayey SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)	medium stiff	35.2
7			stiff	
9		Brownish-gray to gray sandy SILT, fine to coarse sand, moist, mottled. (ML)		35.8
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-41

FIGURE A-42

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–3.5		(6-inches organic TOPSOIL) Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)	medium stiff	14.9
3.5–7		Brown SILT with sand to clayey SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)	medium stiff (to 6 ft); stiff (below 6 ft)	35.1
7–10		Brownish-gray to gray sandy SILT, fine to coarse sand, moist, mottled, occasional gravel. (ML)	stiff	33.3 35.1
10–12		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-42

FIGURE A-43

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, scattered rootlets, weak cementation. (ML)		
2				17.8
3			medium stiff	
4		Brown SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)		36.4
5				
6				
7		Gray sandy SILT, fine sand, moist, mottled. (ML)		36.8
8			stiff	
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		36.5
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-43

FIGURE A-44

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1.5				18.0
2				
3				
4			medium stiff	
5		Brown SILT with sand to clayey SILT with sand, fine to medium sand, moist, slightly mottled. (ML)		31.7
6				
7				
8			stiff	
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		38.4
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-44

FIGURE A-45

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0–4		(6-inches organic TOPSOIL) Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	27.3
4–7		Brown SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)		38.0
7–10		Brownish-gray to gray sandy SILT, fine sand, moist, mottled. (ML)	stiff	38.0
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		35.8

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-45

FIGURE A-46

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL) Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				20.8
2				
3			medium stiff	
4		Brown SILT with sand to clayey SILT with sand, fine to medium sand, moist, slightly mottled. (ML)		36.3
5				
6				
7				
8			stiff	
9		Gray silty SAND, fine to coarse sand, moist, mottled, occasional gravel. (SM)	medium dense	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		37.9
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-46

FIGURE A-47

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Red SILT, moist, scattered rootlets, weak cementation. (ML)		17.6
2			medium stiff	
3				
4		Gray clayey SILT, moist, mottled, trace sand. (ML)		34.0
5				
6				
7				
8			stiff	
9				
10		Blueish-gray clayey SILT, moist, mottled, trace sand. (ML)		
11				52.4
12		Test Pit terminated at approximately 12 feet. No groundwater seepage observed. No caving observed.		
13				
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-47

FIGURE A-48

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
0–4		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	19.4
4–5		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		29.3
5–8		Gray sandy SILT, fine sand, moist, mottled. (ML)	stiff	39.8
8–10		Blueish-gray silty SAND, fine to coarse sand, moist, trace organics, interbedded SILT seams. (SM)	medium dense	52.7
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-48

FIGURE A-49

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		
1				
				15.7
2				
3				
4			medium stiff	36.0
		Brown SKT with sand, fine to coarse sand, moist, mottled. (ML)		
5				
6				
7				
8				
		Blueish-gray silty SAND, fine to coarse sand, wet, interbedded SILT seams. (SM)		
9			medium dense	40.8
10				
		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-50

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
1		Brown SILT, moist, scattered rootlets, weak cementation. (ML)		18.6
3		Brown SILT with sand, fine to coarse sand, moist, mottled, occasional gravel. (ML)	medium stiff	31.5
6		Gray sandy SILT, fine sand, moist, mottled. (ML)	stiff	42.1
8		Blueish-gray silty SAND, fine to medium sand, moist, interbedded SILT seams. (SM)	medium dense	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		71.2
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-50

FIGURE A-51

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
		Red SILT, moist, scattered rootlets, weak cementation. (ML)		
1				
				18.6
2				
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	
4				40.8
5				
6		Gray sandy SILT, fine to meduim sand, moist, mottled. (ML)		37.7
7			stiff	
8		Blueish-gray silty SAND, fine to coarse sand, moist to wet, interbbed SILT layers. (SM)		
9			medium dense	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		60.4
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-52

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** 12 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(10-inches organic TOPSOIL)		
1		Brown SILT, moist, scattered rootlets, weak cementation. (ML)		
				21.3
2				
3			medium stiff	
4		Grayish-brown SILT with sand to sandy SILT, fine to medium sand, moist, mottled. (ML)		40.1
5				
6				
7		Blueish-gray silty SAND, fine to coarse sand, moist to wet, interbedded SILT layers. (SM)		
8				69.6
9			medium dense	
10				
11				
12		Test Pit terminated at approximately 12 feet. Minor groundwater seepage observed at approximately 12 feet. No caving observed.		31.9
13				
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-52

FIGURE A-53

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		
2				14.6
3				
4			medium stiff	
5		Brown SILT with sand to clayey SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)		34.6
6				
7				
8			stiff	
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		39.5
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-54

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL)		
1		Brown SILT, moist, scattered rootlets, weak cementation. (ML)		
				17.8
2				
3			medium stiff	
4				
5				
6				38.2
		Brown SILT with sand to clayey SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)		
7				
8			stiff	
9				
10				38.2
		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-54

FIGURE A-55

PROJECT NAME: Camas Buisness Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, scattered rootlets, weak cementation, occasional clayey SILT seam. (ML)	medium stiff	15.6
5				36.1
9		Brown SILT with sand, fine to coarse sand, moist, occasional gravel. (ML)	medium stiff to stiff	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		33.6
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-55

FIGURE A-56

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4-inches organic TOPSOIL)		
1		Brown SILT, moist, slightly mottled, trace rootlets, weak cementation. (ML)		16.9
2				
3				31.7
4			medium stiff	
5				
6				
7				
8		Brown silty SAND, fine to coarse sand, moist, trace gravel. (SM)		
9			medium dense	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		30.1
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-57

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
		Brown SILT, dry to moist, scattered rootlets, weak cementation. (ML)		
1				
				13.6
2			medium stiff	
3				
4				48.0
		Brownish-gray to gray SILT with sand, fine to medium sand, moist, mottled. (ML)		
5				
6				
7			stiff	47.8
		Blueish-gray sandy SILT, fine to coarse sand, moist to wet, trace organics. (ML)		
8				
9				55.4
10				
		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-57

FIGURE A-58

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
				17.5
2				
3				
			medium stiff	
4				
5		Brown to gray SILT with sand, fine to coarse sand, moist to wet, mottled. (ML)		34.7
6				
7				
8				35.1
			stiff	
9				
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		34.6
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-58

FIGURE A-59

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, scattered rootlets, weak cementation. (ML)		
				16.9
2			medium stiff	
3				
4				35.1
		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)		
5				
6				
7			stiff	35.8
8				
9				
10				34.9
		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-60

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	
1.5				25.8
4		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)		35.1
7			stiff	38.9
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		38.4
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-60

FIGURE A-61

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** 8 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
0–4		Red SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	22.5
4–8		Brownish-gray to gray clayey SILT with sand, fine to coarse sand, moist, mottled, trace gravel. (ML)	medium stiff (4–6 ft); stiff (6–8 ft)	37.0; 34.2
8–10		Blueish-gray silty SAND with gravel, fine to coarse sand, fine to coarse gravel, wet. (SM)	medium dense	30.1
10		Test Pit terminated at approximately 10 feet. Minor groundwater seepage observed at approximately 8 feet. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-62

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Duff/understory **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		19.6
2.5		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	36.2
6		Gray SILT with sand and gravel, fine to coarse sand, fine to coarse gravel, moist, mottled. (ML)	stiff	40.1
9		Blueish-gray to dark gray SILT to SILT with sand, fine to coarse sand, moist, trace gravel. (ML)	very stiff	49.1 41.7
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-63

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Duff/understory **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, moist, numerous roots, scattered rootlets. (ML)		
2				18.7
3		Brown SILT with sand, fine to coarse sand, moist, mottled, occasional organic. (ML)	medium stiff	30.4
4				
5				
6				
7		Brown to gray GRAVEL with silt and sand, fine to coarse sand, fine to coarse gravel, moist, mottled, trace cobbles. (GP-GM)	medium dense	41.4
8				
9				
10				
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		36.3
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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FIGURE A-64

LOG OF TEST PIT NO. TP-63

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 7 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
1		Dark brown SILT, moist, mottled, occasional rootlet. (ML)	medium stiff	18.0
2				
3		Gray SILT with sand, fine to coarse sand, moist, mottled. (ML)		35.0
4		Gray SILT, moist, mottled. (ML)	stiff	
5		Brown to gray GRAVEL with silt and sand, fine to coarse sand, fine to coarse gravel, moist to wet, mottled, scattered cobbles. (GP-GM)		38.9
6				
7				58.0
8			medium dense	
9				
10				
11		Test Pit terminated at approximately 11 feet. Moderate groundwater seepage observed at approximately 7 feet. No caving observed.		50.4
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-64

FIGURE A-65

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, moist, numerous rootlets, weak cementation. (ML)	medium stiff	19.7
2		Gray to dark gray SILT, moist, mottled, occasional rootlet. (ML)		22.1
3				
4				
5				37.4
6			stiff	
7				41.0
8				
9				
10				
11				54.0
12		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-65

FIGURE A-66

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(4-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	15.0
2		Gray to dark gray SILT, moist, mottled, occasional rootlet. (ML)	stiff	33.6
5		Brown to gray GRAVEL with silt and sand, fine to coarse sand, fine to coarse gravel, moist, mottled, scattered cobbles. (GP-GM)	medium dense	25.4
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		36.0
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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Environmental Earth Sciences

LOG OF TEST PIT NO. TP-66

FIGURE A-67

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
		Brown SILT, moist, trace rootlets, weak cementation. (ML)		16.6
3		Brown to gray SILT with sand, fine to medium sand, moist, mottled. (ML)	medium stiff	30.4
7		Brown to gray silty GRAVEL with sand, fine to coarse sand, fine to coarse gravel, moist, mottled. (GM)	medium dense	47.8
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		48.0

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-67

FIGURE A-68

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				21.1
2				
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	
4				33.5
5				
6		Gray SILT with sand, fine to medium sand, moist, mottled. (ML)		38.9
7				
			stiff	
8				
9		Brown to gray SILT, moist, mottled. (ML)	very stiff	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		31.5
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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Environmental Earth Sciences

LOG OF TEST PIT NO. TP-68

FIGURE A-69

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(5-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
				20.1
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	43.8
7		Gray SILT with sand to sandy SILT, fine sand, moist. (ML)		39.6
9		Blueish-gray SILT to SILT with sand, fine sand, moist. (ML)	stiff	44.6
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		32.3
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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Environmental Earth Sciences

LOG OF TEST PIT NO. TP-69

FIGURE A-70

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, occasional organic, weak cementation. (ML)		21.0
3		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	35.7
7		Brown to gray SILT with gravel, fine to coarse gravel, moist, mottled, scattered cobbles. (ML)		25.4
9		Brown to gray SILT with sand and gravel, fine to coarse sand, fine to coarse gravel, moist, mottled, trace cobbles. (ML)	stiff	56.3
11		Test Pit terminated at approximately 11 feet. No groundwater seepage observed. No caving observed.		57.2
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

Terra Associates, Inc.
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LOG OF TEST PIT NO. TP-70

FIGURE A-71

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		
				13.8
2				
3				
			medium stiff	
4				33.6
		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		
5				
6				
7				39.9
		Brown GRAVEL with silt and sand, fine to coarse sand, fine to coarse gravel, moist, mottled, trace cobbles. (GP-GM)		
8				
9			medium dense	
10				
11				26.3
		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 9 feet. No caving observed.		
12				
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

Terra Associates, Inc.
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Environmental Earth Sciences

LOG OF TEST PIT NO. TP-71

FIGURE A-72

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 9 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	17.2
4		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		37.7
7		Brown GRAVEL with silt and sand, fine to coarse sand, fine to coarse gravel, moist to wet, mottled, trace cobbles, occasional boulder. (GP-GM)	medium dense	17.8
12		Test Pit terminated at approximately 12 feet. Moderate groundwater seepage observed at approximately 9 feet. No caving observed.		39.8

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-72

FIGURE A-73

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 25, 2021 **DEPTH TO GROUNDWATER:** 10 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(7-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)	medium stiff	20.5
4		Brown SILT with sand, fine to coarse sand, moist, mottled. (ML)		35.3
7		Gray sandy SILT, fine sand, moist, slighlty mottled. (ML)	stiff	36.0
10		Brown to gray GRAVEL with silt and sand, fine to coarse sand, fine to coarse gravel, moist to wet, mottled. (GP-GM)	medium dense	40.1
11		Test Pit terminated at approximately 11 feet. Minor groundwater seepage observed at approximately 10 feet. No caving observed.		
13				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-73

FIGURE A-74

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, occasional cobble, occasional organic, weak cementation. (ML)		
				20.8
2				
3			medium stiff	
4		Brown to gray SILT with sand, fine to medium sand, moist, mottled. (ML)		34.5
5				
6				35.1
7				
8		Blueish-gray SILT with sand to sandy SILT, fine to medium sand, moist. (ML)	stiff	
9				31.7
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-74

FIGURE A-75

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, trace rootlets, weak cementation. (ML)		
				16.6
2				
3				
4			medium stiff	42.6
		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)		
5				
6				
7				
8				30.2
		Brown silty GRAVEL with sand, fine to coarse sand, fine to coarse gravel, moist, scattered cobbles. (GM)		
9			medium dense	
10				
		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-75

FIGURE A-76

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(8-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		19.5
2				
3				
4			medium stiff	
5		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)		40.9
6				
7				35.3
8			stiff	
9				
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		39.1
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

Terra Associates, Inc.
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Geology and
Environmental Earth Sciences

LOG OF TEST PIT NO. TP-76

FIGURE A-77

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** 7 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(9-inches organic TOPSOIL)		
1		Brown SILT with gravel, dry to moist, fine to coarse gravel, trace rootlets, weak cementation. (ML)	medium stiff	17.3
5		Brown to gray SILT with sand, fine to coarse sand, moist, mottled, occasional gravel. (ML)		36.9
7		Brown SAND with silt, fine to medium sand, moist to wet, interbedded silt seams. (SP-SM)	medium dense	37.7
9		Gray SILT, moist. (ML)	stiff	49.6
10		Test Pit terminated at approximatley 10 feet. Moderate groundwater seepage observed at approximately 7 feet. No caving observed.		
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

Terra Associates, Inc.
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LOG OF TEST PIT NO. TP-77

FIGURE A-78

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** 11 ft **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(11-inches organic TOPSOIL)		
1		Brown SILT, moist, trace rootlets, weak cementation. (ML)		19.2
2				
3				
4		Brown SILT with sand, fine to coarse sand, moist, mottled, occasional gravel. (ML)	medium stiff	41.5
5				
6				
7				
8				
9				
10				
11		Brown silty SAND with gravel, fine to coarse sand, fine to coarse gravel, wet, occasional cobble. (SM)	medium dense	48.8
12		Test Pit terminated at approximately 12 feet. Minor groundwater seepage observed at approximately 11 feet. No caving observed.		
13				
14				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-78

FIGURE A-79

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(11-inches organic TOPSOIL)		
1		FILL: Brown SILT, moist, trace rootlets, occasional organic, occasional metal debris, occasional plastic debris. (ML)		22.9
2				
3		Brown to gray SILT with sand, fine to coarse sand, moist, mottled. (ML)	medium stiff	33.7
4				
5				
6				39.5
7			stiff	
8		Gray SILT, moist, mottled. (ML)		
9			very stiff	
10		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		27.5
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-79

FIGURE A-80

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
1		Brown SILT, dry to moist, scattered rootlets, weak cementation. (ML)		18.0
3		Brown SILT with sand to clayey SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)	medium stiff	34.4
8		Brownish-gray sandy SILT, fine to coarse sand, moist, mottled. (ML)	stiff	46.0
10		Gray SILT with sand, fine to coarse sand, moist to wet, mottled, alternating layers of blueish-gray SILT with sand. (ML)	medium stiff to stiff	50.6
12		Test Pit terminated at approximately 12 feet. No groundwater seepage observed. No caving observed.		

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. TP-80

FIGURE A-81

PROJECT NAME: Camas Business Center **PROJ. NO:** T-8553 **LOGGED BY:** MJX

LOCATION: Camas, Washington **SURFACE CONDITIONS:** Tall Grass **APPROX. ELEV:** NA

DATE LOGGED: May 24, 2021 **DEPTH TO GROUNDWATER:** NA **DEPTH TO CAVING:** NA

Depth (ft)	Sample No.	Description	Consistency/ Relative Density	W (%)
0		(6-inches organic TOPSOIL)		
		Brown SILT, moist, trace rootlets, weak cementation. (ML)		
1				
				25.2
2				
3		Brown SILT with sand to clayey SILT with sand, fine to coarse sand, moist, slightly mottled. (ML)	medium stiff	
4				33.7
5				
6				
7				
8			stiff	
9		Brownish-gray sandy SILT, fine to coarse sand, moist, mottled. (ML)		
10				35.7
		Test Pit terminated at approximately 10 feet. No groundwater seepage observed. No caving observed.		
11				
12				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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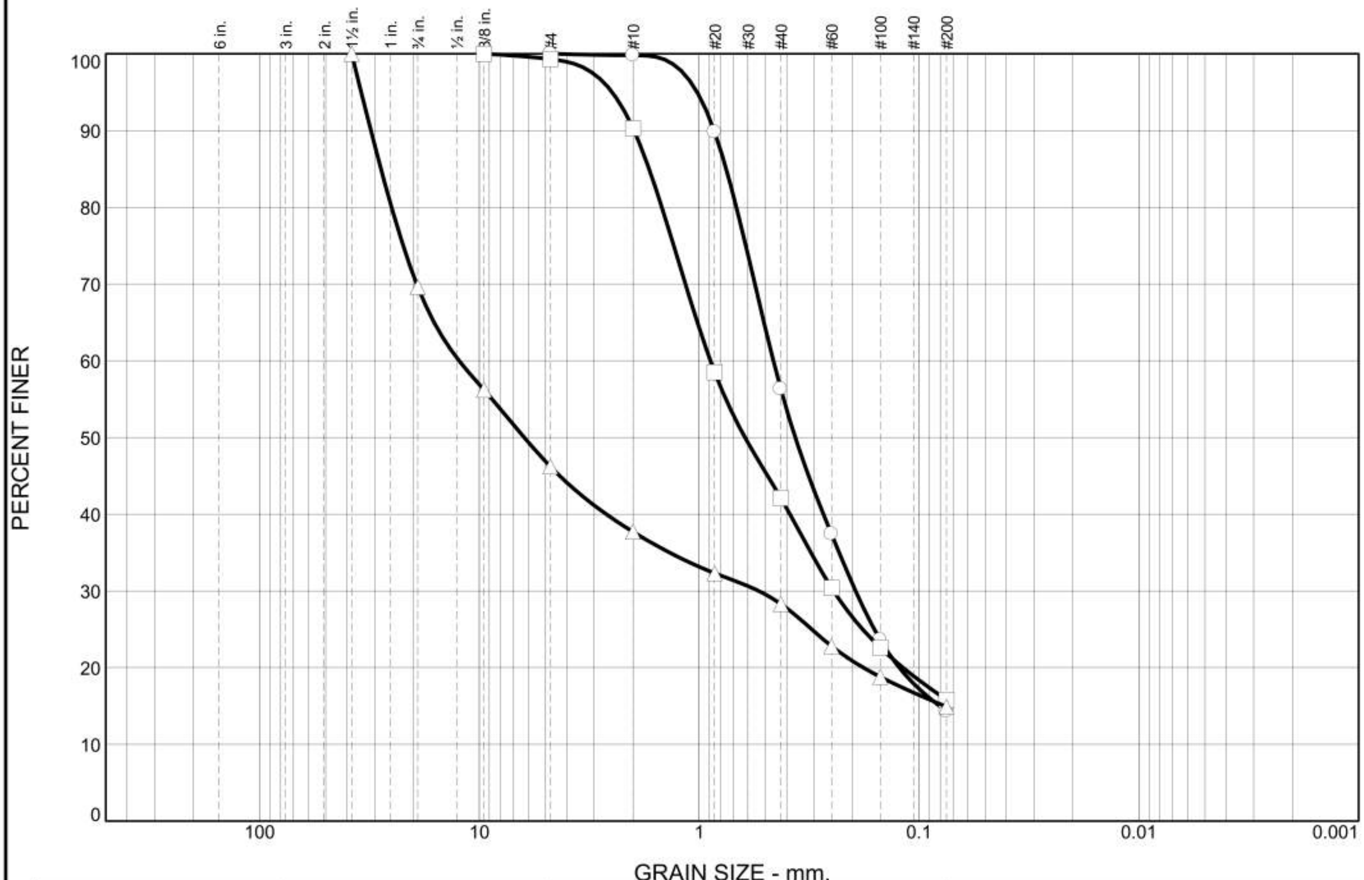
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	43.5	42.0	14.3	
□	0.0	0.0	0.7	9.0	48.2	26.3	15.8	
△	0.0	30.4	23.4	8.5	9.4	13.4	14.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.7536	0.4595	0.3654	0.1943	0.0807			
□			1.6902	0.8889	0.6189	0.2449				
△			28.0367	12.3693	6.2492	0.5373	0.0764			

	Material Description	USCS	AASHTO
○	silty SAND	SM	
□	silty SAND	SM	
△	silty GRAVEL with sand	GM	

Project No. T-8553 **Client:** Panattoni Development Company

Project: East Vancouver E-Commerce Center

○ **Location:** Test Pit TP-11 **Depth:** 8 ft **Sample Number:** 4

□ **Location:** Test Pit TP-31 **Depth:** 8 ft **Sample Number:** 4

△ **Location:** Test Pit TP-35 **Depth:** 6 ft **Sample Number:** 3

Remarks:

○Tested on June 8, 2021

□Tested on June 8, 2021

△Tested on June 8, 2021

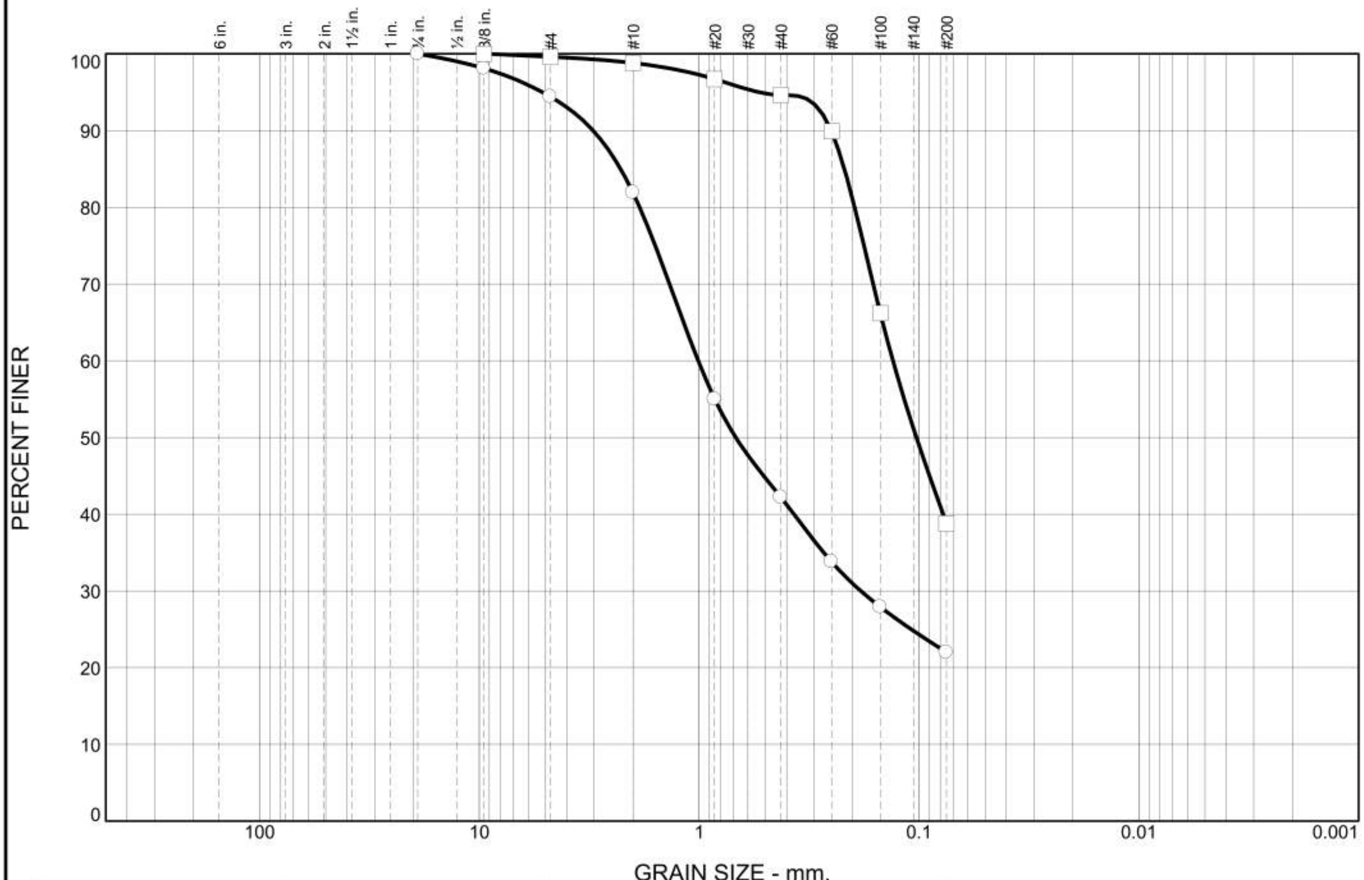
Terra Associates, Inc.

Kirkland, WA

Figure A-82

Tested By: FQ

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	5.6	12.5	39.7	20.2	22.0	
□	0.0	0.0	0.4	0.8	4.2	55.8	38.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			2.2786	1.0101	0.6816	0.1842				
□			0.2186	0.1314	0.1027					

Material Description	USCS	AASHTO
○ silty SAND with gravel	SM	
□ silty SAND	SM	

Project No. T-8553 **Client:** Panattoni Development Company

Project: East Vancouver E-Commerce Center

○ **Location:** Test Pit TP-39 **Depth:** 10 ft **Sample Number:** 3

□ **Location:** Test Pit TP-45 **Depth:** 10 ft **Sample Number:** 3

Terra Associates, Inc.

Kirkland, WA

Remarks:

○Tested on June 8, 2021

□Tested on June 8, 2021

Figure A-83

Tested By: FQ

Wetland and Fish and Wildlife Habitat Assessment Report

Camas Business Center

October 2021

Soundview Consultants
Environmental Assessment
Planning + Land Use Solutions

WETLAND AND FISH AND WILDLIFE HABITAT ASSESSMENT REPORT

CAMAS BUSINESS CENTER

OCTOBER 8, 2021

PROJECT LOCATION

4707 & 4723 NORTHWEST LAKE ROAD
CAMAS, WASHINGTON 98607

PREPARED FOR

PANATTONI DEVELOPMENT COMPANY, INC.
1821 DOCK STREET, SUITE 100
TACOMA, WASHINGTON 98402

PREPARED BY

SOUNDVIEW CONSULTANTS LLC
2907 HARBORVIEW DRIVE
GIG HARBOR, WASHINGTON 98335
(253) 514-8952

Soundview Consultants
Environmental Assessment
Planning + Land Use Solutions

Executive Summary

Soundview Consultants LLC (SVC) has been assisting Panattoni Development Company Inc. (Applicant) with a wetland and fish and wildlife habitat assessment and environmental planning to support the proposed Camas Business Center industrial development on a 74.06-acre site located at 4707 & 4723 Northwest Lake Road in the City of Camas, Washington. The subject property consists of two tax parcels situated in the Southeast ¼ of Section 29, Township 02 North, Range 03 East, W.M (Clark County Tax Parcel Numbers 176155000, and 176170000).

SVC performed an investigation and assessment of potentially regulated wetlands, streams, and other fish and wildlife habitat conservation areas on the subject property and publicly accessible areas within 300 feet of the site in December 2020, with follow-up investigations in April 2021. Using current methodology, SVC identified four potentially regulated wetlands (Wetlands A - D) on the subject property, and one potentially regulated stream (Offsite Stream Z) offsite to the west of the subject property. Wetland A is classified as Category III wetland with 4 total habitat points, and subject to a standard 80-foot buffer based on proposed high intensity land use per Camas Municipal Code (CMC) 16.53.040.B.2 Table 16.53.040-1. Wetland B is classified as a Category III wetland with 5 total habitat points and subject to a standard 120-foot buffer per CMC 16.53.040.B.2 Table 16.53.040-3. Wetland C is classified as a Category IV wetland and is likely exempt from buffer regulations per Camas Municipal Code (CMC) 16.53.010.C.2.a due to its isolated location in the landscape and small size (less than 4,350 square feet). Wetland D is classified as a Category III wetland with 6 total habitat points and subject to a standard 135-foot buffer per CMC 16.53.040.B.2 Table 16.53.040-3. Offsite Stream Z is likely a Type F stream with no known salmonid presence in accordance with Washington Department of Fish and Wildlife (WDFW) SalmonScape data and subject to a standard 75-foot buffer per CMC 16.61.040.D. The stream buffer is not anticiapted to project onto the subject property. No other potentially regulated wetlands or fish and wildlife habitat conservation areas were identified within 300 feet of the subject property.

The Applicant proposes industrial development of the subject property to create a business center that includes three buildings, internal access roads, parking and loading areas, utilities, and stormwater facilities. Necessary critical area impacts and mitigation requirements are outlined in a wetland mitigation plan prepared under separate cover. The table below summarizes the identified wetlands and streams and summarizes the potential regulatory status by local, state, and federal agencies.

Feature Name	Size/Length Onsite	Category/ Type[1]	Regulated Under CMC 16.53 & 16.61	Regulated Under RCW 90.48	Regulated Under Clean Water Act
Wetland A	56,558 sf	III	Yes	Yes	Likely
Wetland B	32,343 sf	III	Yes	Yes	Likely
Wetland C	3,167 sf	IV	No - Exempt	Yes	Not Likely
Wetland D	9,074 sf	III	Yes	Yes	Assumed
Offsite Stream Z	N/A (Offsite)	F	Yes	Yes	Likely

1. Wetlands classified according to Washington State Department of Ecology (WSDOE) wetland rating system for western Washington (Hruby, 2014); streams classified according Washington Department of Natural Resources (DNR) Water Typing System and CMC 16.61.040.

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Chapter 1. Introduction

Soundview Consultants LLC (SVC) has been assisting Panattoni Development Company Inc. (Applicant) with a wetland and fish and wildlife habitat assessment and environmental planning to support the proposed Camas Business Center industrial development on a 74.06-acre site located at 4707 & 4723 Northwest Lake Road in the City of Camas, Washington. The subject property consists of two tax parcels situated in the Southeast ¼ of Section 29, Township 02 North, Range 03 East, W.M (Clark County Tax Parcel Numbers 176155000, and 176170000).

The purpose of the wetland and fish and wildlife habitat assessment report is to identify the presence of potentially regulated wetlands and fish and wildlife habitat conservation areas that may be found on or near the subject property.

This report provides conclusions and recommendations regarding:

- Site description and area of assessment;
- Background research and identification of potential critical areas within the vicinity of the site;
- Identification and assessment of potentially regulated wetlands and streams;
- Existing site map detailing identified wetlands and offsite stream; and
- Supplemental information necessary for local, state, and federal regulatory review.

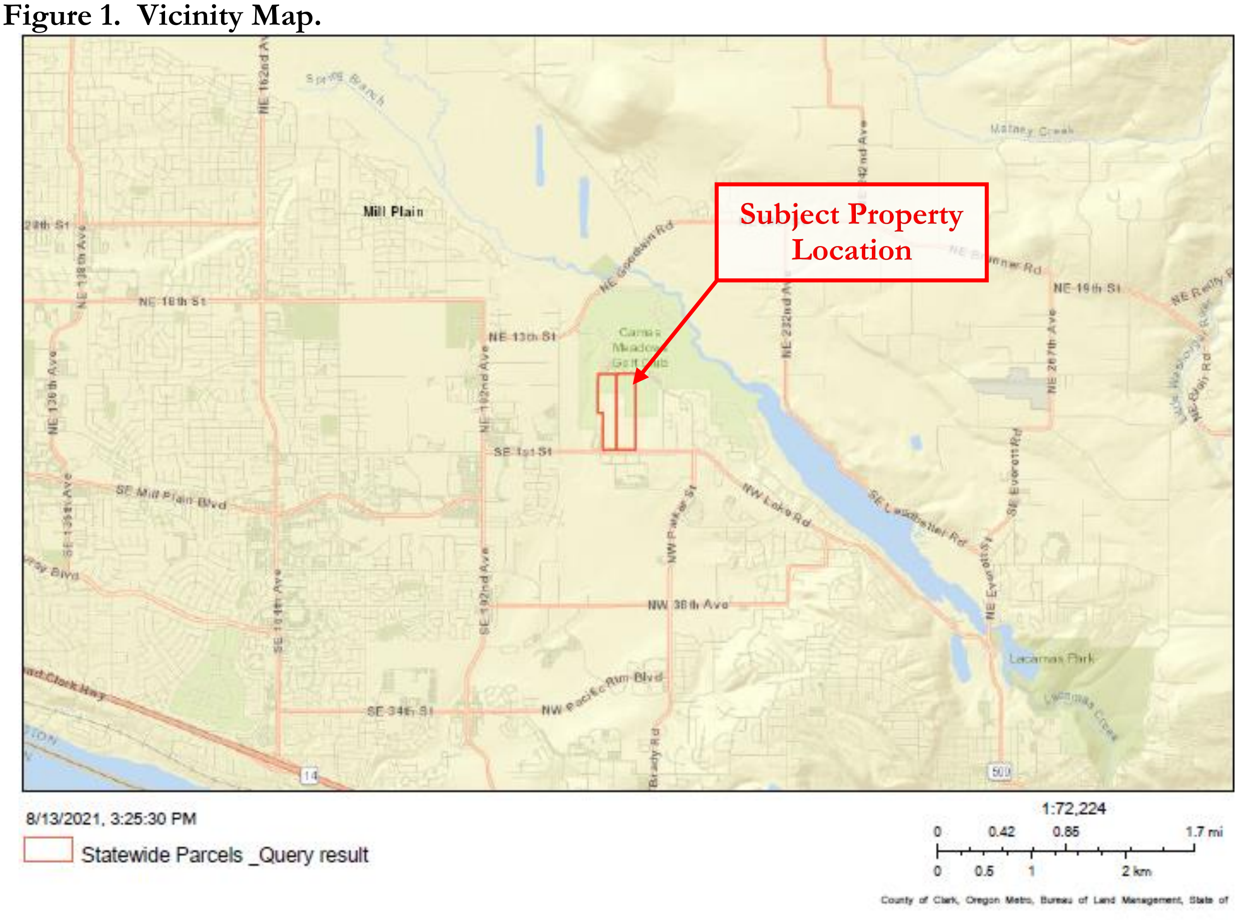
Chapter 2. Property Location

2.1 Proposed Location

The subject property is located at located at 4707 & 4723 Northwest Lake Road in the City of Camas, Washington. The subject property consists of two tax parcels situated in the Southeast ¼ of Section 29, Township 02 North, Range 03 East, W.M (Clark County Tax Parcel Numbers 176155000, and 176170000).

To access the subject property, heading southbound on Interstate-5 from the Ridgefield area, keep right at the fork to take the exit for Interstate 205 S toward Salem. After 10.1 miles, use the right two lanes to take exit 27 for Washington-14 East towards Camas. Continue for 4.3 miles, then take exit 10 for Southeast 192nd Avenue. Turn left on Southeast 192nd Avenue then right on Southeast Brady Road. At the traffic circle in 0.1 mile, take the first exit and stay on Southeast Brady Road. Follow Southeast Brady Road for 1.6 miles where it becomes Northwest Parker Street. Continue for 1.6 miles, and then turn left on Northwest Lake Road, where the property will be located on the right-hand side after 0.5 miles.

Figure 1. Vicinity Map.



2.2 Proposed Project

The Applicant proposes industrial development of the subject property to create a business center that includes three buildings, internal access roads, parking and loading areas, utilities, and stormwater facilities. Necessary critical area impacts and mitigation requirements are outlined in a wetland mitigation plan prepared under separate cover.

Chapter 3. Methods

SVC investigated, assessed, and/or delineated potentially regulated wetlands, streams and other fish and wildlife habitat on the subject property in December 2020 and April 2021. All determinations were made using observable vegetation, hydrology, and soils in conjunction with data from the U.S. Geological Survey (USGS) topographic maps, National Resource Conservation Service (NRCS) soil survey, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), Washington State Department of Natural Resources (DNR) water typing system, Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) and SalmonScape mapping tools, Clark County GIS, and various orthophotographic resources. Appendix A contains further details for the methods and tools used to prepare this report.

Wetland boundaries were determined using the routine approach described in the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and modified according to the guidelines established in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE, 2010) and *Field Indicators of Hydric Soils in the United States* (NRCS, 2018). Qualified wetland scientists marked boundaries of wetlands with orange surveyor's flagging labeled alpha-numerically and tied to 3-foot lath or vegetation along the wetland boundary. Pink surveyor's flagging was labeled alpha-numerically and tied to 3-foot lath or vegetation at formal sampling locations (DP-1 through DP-21) to mark the points where detailed data was collected. Additional tests pits were excavated at regular intervals inside and outside of the wetland boundaries to further confirm the delineation.

SVC classified all wetlands using both the hydrogeomorphic (Brinson, 1993) and Cowardin (Cowardin, 1979) classification systems. Following classification and assessment, WSDOE-trained scientists rated and categorized all wetlands using the *Washington State Wetlands Rating System for Western Washington* (Hruby, 2014) and the definitions established in Camas Municipal Code (CMC) 16.53.020.

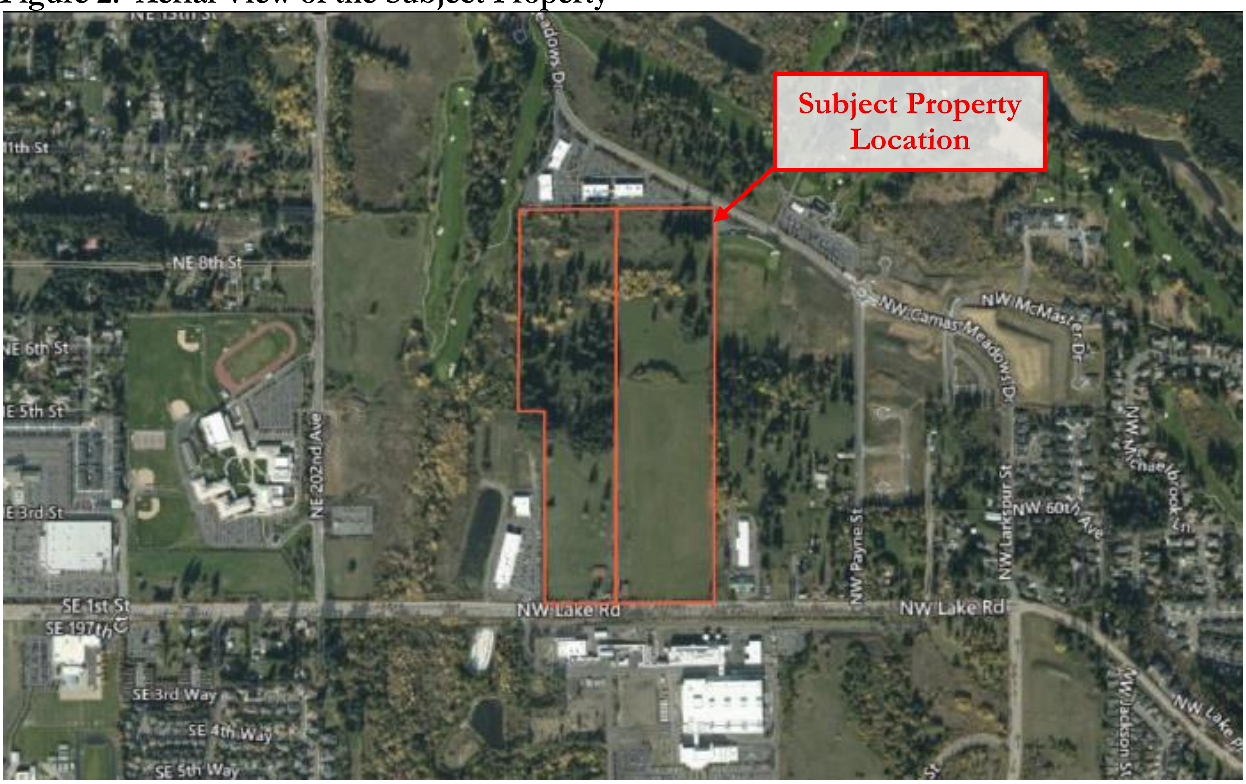
The fish and wildlife habitat assessment was conducted during the same site visit by qualified fish and wildlife biologists. The experienced biologists made visual observations using stationary and walking survey methods for both aquatic and upland habitats noting any special habitat features or signs of fish and wildlife activity.

Chapter 4. Existing Conditions

4.1 Landscape Setting

The subject property is located in a mixed light-commercial and industrial setting in the City of Camas. The parcels are undeveloped and sparsely forested, and currently used as grazing land for cattle (Figure 2). A single-family residence and associated infrastructure including a driveway, detached garage, and equipment storage shed/barn is located on the southern portion of the subject property. The site is bounded by commercial buildings to the north, undeveloped land and commercial buildings to the east, Northwest Lake Road to the south, and a golf course and commercial properties to the west. Topography onsite is generally flat with a slight downwards slope from to south to north. Elevation ranges from approximately 295 feet above mean sea level (amsl) on the southern portion of the site to approximately 244 feet amsl on the northern portion of the site. A topographic map is provided in Appendix B1. The subject property is located within Water Resource Inventory Area (WRIA) 28 – Salmon-Washougal.

Figure 2. Aerial View of the Subject Property



4.2 Soils

The NRCS Soil Survey of Clark County, Washington identifies four soil series on the subject property: Cove silty clay loam, thin solum, 0 to 3 percent (CwA), Hesson clay loam, 0 to 8 percent slopes (HcB), Hesson clay loam, 8 to 20 percent slopes (HcD), and Powell silt loam, 0 to 8 percent slopes (PoB). A soil map is provided in Appendix B2. Below is a detailed description of each soil series.

Cove silty clay loam, thin solum, 0 to 3 percent (CwA)
According to the survey, Cove silty clay loam, thin solum, 0 to 3 percent (CwA) is part of the Cove series of soils mapped by the NRCS in Clark County. The Cove series consists of deep, very poorly drained soils that were formed in water-laid deposits in old lakes and ponds. The CwA soils occur in low, wet basins and depressions on terraces in the central part of the county. A typical soil profile is a silty clay loam for the first 10 inches of depth and is a very dark grayish brown. From 10 to 14 inches, the soil is a dark-gray silty loam. Immediately below, is an extremely firm, black clay layer about 7 inches thick. The underlying material to a depth of about 60 inches is and olive-colored silt laom. Cove silty clay loam, thin solum, 0 to 3 percent slopes, is listed as hydric on the Clark County Hydric Soils List (NRCS, N.d.).

Hesson clay loam, 0 to 8 percent slopes (HcB)
According to the survey, Hesson clay loam, 0 to 8 percent slopes (HcB) is part of the Hesson series of soils mapped by the NRCS in Clark County. The Hesson series consists well-drained soils in mostly level to gently rolling terrain. Parent material is deeply weathered, old alluvium that consists of varying amounts of gravel. Annual precipitation typically varies between 50 and 60 inches. In a typical profile, the surface layer is a dark reddish-brown clay loam about 4 inches thick. Below this layer is a friable, dark reddish-brown clay loam about 10 inches thick. A reddish-brown clay to a depth of about 91 inches. The Hesson clay loam, 0 to 8 percent slopes (HcB) is listed as non-hydric on the Clark County Hydric Soils List (NRCS, N.d.).

Hesson clay loam, 8 to 20 percent slopes (HcD)
According to the survey, this soil is similar to the Hesson clay loam 0 to 8 percent except the surface layer is generally, 1 to 2 inches thinner, and up to 4 inches thinner where erosion has been active. The Hesson clay loam, 8 to 20 percent slopes (HcD) is listed as non-hydric on the Clark County Hydric Soils List (NRCS, N.d.).

Powell silt loam, 0 to 8 percent slopes (PoB)
According to the survey, the Powell series is a moderately, well-drained, medium textured soil found in rolling terrains. The annual precipitation is typically around 50 inches. Powell soils are used for row crops, hay production, pasture and timber. The Powell silt loam, 0 to 8 percent slopes (PoB) surface layer is dark brown silt loam to a depth of about 17 inches. Below the surface layer is a friable, mottled, grayish-brown silt loam about 6 inches thick. The following layer, to a depth of approximately 22 inches is a dark yellowish-brown silt loam that is firm, and mottled brown heavy silt loam in the lower part. Below this layer to a depth of approximately 63 inches is a firm, mottled, dark-brown heavy silt loam. The Powell silt loam, 0 to 8 percent slopes (PoW) is listed as non-hydric on the Clark County Hydric Soils List (NRCS, N.d.)

4.3 Vegetation

Vegetation on the subject property consists of an actively grazed pasture with partially forested areas on the west and northern portions of the property. The grazed areas on the property exhibited evidence of disturbance and heavily compacted soils from cattle activity. Vegetation in these areas consisted of common pasture grasses including tall fescue (*Schedonorus arundinaceus*), common velvetgrass (*Holcus lanatus*), orchard grass (*Dactylis glomerata*), Kentucky bluegrass (*Poa pratensis*), and soft rush (*Juncus effusus*). The forested portion of the site is generally dominated by a canopy of Oregon ash (*Fraxinus latifolia*), with smaller amounts of Douglas fir (*Psuedotsuga menziesii*), oneseed hawthorn (*Crataegus monogyna*), and hardhack (*Spiraea douglasii*). Non-native, invasive species were prevalent throughout the site, including Himalayan blackberry (*Rubus armeniacus*) (particularly in the north and northwest portions of the property), reed canarygrass (*Phalaris arundinacea*), and bird's-foot trefoil (*Lotus corniculatus*).

4.4 Wetland and Stream Inventories and Priority Habitats and Species

The USFWS NWI map (Appendix B3), WDFW PHS Map (Appendix B4), and Clark County Stream and Wetland Inventory (Appendix B5) do not identify any potentially regulated wetlands, streams, or priority habitats or species on the subject property. The Clark County Stream and Wetland Inventory map and the USFWS NWI map identify potential wetlands offsite within 300 feet to the west of the subject property, associated with a potential offsite stream identified by Clark County and DNR (Appendix B6). DNR classifies the offsite stream as a Type F (fish-bearing) stream. The WDFW SalmonScape map (Appendix B7) does not identify potential salmonid presence within the offsite stream, or within 300 feet of the site. The WDFW PHS map identifies potential caves or cave-rich areas within the township, but not necessarily on the subject property. No other potential wetlands, streams, or other priority habitats or species are documented on or within 300 feet of the subject property.

4.6 Precipitation

Precipitation data was obtained from the National Oceanic and Atmospheric Administration (NOAA) weather station at Portland International Airport in order to obtain percent of normal precipitation during and preceding the investigation. A summary of data collected is provided in Table 1.

Table 1. Precipitation Summary[1].

Date	Day of	Day Before	1 Week Prior	2 Weeks Prior	30 Days Prior (Observed/Normal)	Year to Date (Observed/Normal)[2]	Percent of Normal (Year to Date[2])
12/21/2020	0.33	1.43	2.80	3.96	4.99/5.98	10.80/12.89	84
04/06/2021	0.00	0.00	0.00	0.33	1.37/3.82	24.19/27.99	86
04/07/2021	0.00	0.00	0.00	0.33	1.12/3.79	24.19/28.09	86

1. Precipitation levels provided in inches. Data obtained from NOAA (http://w2.weather.gov/climate/xmacis.php?wfo=pqr) for Sea-Tac airport.
2. Year-to-Date precipitation is for the water year from the preceding October 1st to the onsite date.

Precipitation data during the December 21, 2020 site investigation were within the statistical normal range for the prior 30 days and for the year-to-date (approximately 84 percent of normal). This investigation followed a heavy storm event where 1.43 inches of precipitation accumulation was reported the previous day, and 1.76 inches reported in the prior 24-48 hours. Precipitation data for the April 6 and 7, 2021 site visits were drier than normal for the prior 30 days though within the statistical normal range for the year-to-date (approximately 86 percent of normal). Precipitation data suggests that conditions were at the lower end of the normal range during the April 2021 delineation work, which was completed during the early growing season. Such conditions were considered in making professional wetland boundary determinations.

Chapter 5. Results

The site investigations on December 21, 2020, and April 6 and 7, 2021 identified and delineated four wetlands (Wetlands A - D) on the subject property and identified one stream (Offsite Stream Z) offsite to the west of the subject property. No other wetlands, streams, or other fish and wildlife habitat conservation areas were identified within 300 feet of the subject property during the site investigations.

5.1 Wetlands

SVC identified and delineated four wetlands (Wetlands A - D) on the subject property. The identified wetlands contained indicators of wetland hydrology, hydric soils, and a predominance of hydrophytic vegetation according to current wetland delineation methodology. The data forms (DP-1 through DP-21), wetland rating forms, and wetland rating maps are provided in Appendices D, E, and F, respectively. Table 2 summarizes the wetlands identified during the site investigations.

Table 2. Wetland Summary

Wetland	Predominant Wetland Classification / Rating				Wetland Size Onsite (sq ft)	Standard Buffer Width (feet)
	Cowardin[1]	HGM[2]	WSDOE[3]	City of Camas[4]		
A	PFOC	Depressional	III	III	56,558	80
B	PFO/EMBC	Slope	III	III	32,343	120
C	PEMB	Slope	IV	IV	3,167	N/A[5]
D	PFO/SS/EMBC	Depressional	III	III	9,074	135

Notes:
1. Cowardin et al. (1979); Federal Geographic Data Committee (2013); class based on vegetation: PFO = Palustrine Forested, PSS = Scrub-Shrub, PEM = Palustrine Emergent. Modifiers for Water Regime: B = Seasonally Saturated, C = Seasonally Flooded.
2. Brinson, M. M. (1993).
3. Current WSDOE rating (Hruby, 2014).
4. Current WSDOE rating system (Hruby, 2014) per CMC 16.53.020.B.
5. Exempt per CMC 16.53.010.C.2.a

5.1.1 Wetland A

Wetland A is 56,558 square feet (1.30 acres) in size and is located on the northern portion of the subject property. Hydrology for Wetland A is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent uplands. A culvert is located on the west end of the wetland and reduces the storage capacity of the wetland. Wetland vegetation is dominated by an overstory of Oregon ash, with an understory of oneseed hawthorn, hardhack, and shortawn foxtail (*Alopecurus aequalis*). Non-native, invasive species observed in Wetland A include Himalayan blackberry, reed canarygrass, meadow foxtail, and bird's-foot trefoil. Wetland A is a Palustrine Forested, Seasonally Flooded (PFOC) wetland. Wetland A is a Category III depressional wetland with a habitat score of 4 points under current WSDOE wetland rating methodology (Hruby, 2014). Table 3 provides a detailed summary of Wetland A.

5.1.2 Wetland B

Wetland B is 32,343 square feet (0.74 acre) in size and is located on the western portion of the subject property, extending offsite to the west. Hydrology for Wetland B is provided by direct precipitation, a seasonally high-water table, and surface runoff from adjacent uplands. A culvert provides hydraulic connectivity between Wetland A and Wetland B. Wetland vegetation is dominated by an overstory of Oregon ash, with an understory dominated by tall fescue and Kentucky bluegrass, and non-native, invasives Himalayan blackberry, reed canarygrass, and bird's-foot trefoil. Wetland B is a Palustrine Forested/Emergent, Seasonally Flooded/Seasonally Saturated (PFO/EMBC) wetland. Wetland B is a Category III slope wetland with a habitat score of 5 points under current WSDOE wetland rating methodology (Hruby, 2014). Table 4 provides a detailed summary of Wetland B.

5.1.2 Wetland C

Wetland C is 3,167 square feet (0.07 acre) in size and located on the eastern portion of the subject property. Hydrology for Wetland C is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent uplands. Wetland vegetation is dominated by soft rush, with smaller amounts of common velvetgrass, Kentucky bluegrass, and tall fescue. Wetland C is a Palustrine, Emergent, Seasonally Saturated (PEMB) wetland. Wetland C is a Category IV slope wetland under current WSDOE wetland rating methodology (Hruby, 2014). Table 4 provides a detailed summary of Wetland C.

5.1.2 Wetland D

Wetland D is 9,074 square feet (0.21 acre) in size and located in the northwestern corner of the subject property. Hydrology for Wetland B is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent uplands. Wetland vegetation is dominated by an overstory of Oregon ash with an understory consisting of hardhack, oneseed hawthorn, soft rush, and fringed willow herb (*Epilobium ciliatum*), as well non-native invasive species including Himalayan blackberry, rambler rose (*Rosa multiflora*), bull thistle (*Cirsium vulgare*), reed canarygrass, tall fescue, and bird's foot trefoil. Wetland D is a Palustrine Forested/Scrub-shrub/Emergent, Seasonally Flooded/Seasonally Saturated (PFO/SS/EMBC) wetland. Wetland D is a Category III depressional wetland with a habitat score of 6 points under current WSDOE wetland rating methodology (Hruby, 2014). Table 4 provides a detailed summary of Wetland D.

Table 3. Wetland A Summary

<table>
<tr><th colspan="3">WETLAND A – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2">Located on the northern portion of the subject property, centrally located.</td></tr>
<tr><td colspan="2" rowspan="11"></td><td>Local Jurisdiction</td><td>City of Camas</td></tr>
<tr><td>WRIA</td><td>28 – Salmon-Washougal</td></tr>
<tr><td>WSDOE Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>City of Camas Rating</td><td>III</td></tr>
<tr><td>City of Camas Buffer Width</td><td>80</td></tr>
<tr><td>Wetland Size</td><td>56,558 SF</td></tr>
<tr><td>Cowardin Classification</td><td>PFOC</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Wetland Data Sheet(s)</td><td>DP-3W</td></tr>
<tr><td>Upland Data Sheet(s)</td><td>DP-4U</td></tr>
<tr><td>Boundary Flag color</td><td>Orange</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Wetland vegetation is dominated by an overstory of Oregon ash., with an understory comprised of native and non-native shrubs and herbaceous plants including reed canary grass, Himalayan blackberry, shortawn foxtail, hardhack and tall fescue.</td></tr>
<tr><td>Soils</td><td colspan="3">Hydric soil indicator F3 (Depleted Matrix) was observed.</td></tr>
<tr><td>Hydrology</td><td colspan="3">Hydrology for Wetland A is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent wetlands.</td></tr>
<tr><td>Rationale for Delineation</td><td colspan="3">Wetland boundaries were determined by topographic drop and a transition to a hydrophytic plant community.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="3">Wetland rating based on the current WSDOE wetland rating system for Western Washington (Hruby, 2014) per CMC 16.53.020.B.</td></tr>
<tr><th colspan="4">Wetland Functions Summary</th></tr>
<tr><td>Water Quality</td><td colspan="3">Wetland A has moderate potential to improve water quality due to the presence of an outlet, seasonal ponding in more than half the wetland unit, and being located in an area of land use that generates pollutants. However, these functions are limited by the small amount of persistent, ungrazed plants throughout the wetland unit and lack of stormwater entering the wetland. The value of any water quality improvement functions within the wetland is increased as the wetland is located in a sub-basin with 303(d) listed waters and an area identified as important for maintaining water quality. This wetland scores 7 out of 9 points for water quality functions.</td></tr>
<tr><td>Hydrologic</td><td colspan="3">This wetland has moderate potential to reduce flooding and erosion due to moderate storage potential during wet periods, the moderate contribution of storage within the watershed, and the presence of a constricted outlet (culvert) leading to a downgradient wetland. These functions are limited by less the 25% of the contributing basin being covered in intensive human land uses. This wetland scores 6 out of 9 points for hydrologic functions.</td></tr>
<tr><td>Habitat</td><td colspan="3">Wildlife habitat functions provided by the wetland are considered low and may include small mammal and bird forage and cover. Wetland A has only one Cowardin class and hydroperiod, and is relatively low in species diversity. However, Wetland A contains limited priority and special habitat features (snags and logs). The surrounding landscape has a limited potential to support habitat connectivity between the wetland and other potential habitat due to existing habitat fragmentation and surrounding land uses. Wetland A scores 4 out of 9 points for habitat function.</td></tr>
<tr><td>Buffer Condition</td><td colspan="3">The buffer for Wetland A is considered degraded as it contains extensive amounts of non-native invasive, Himalayan blackberry.</td></tr>
</table>

Table 4. Wetland B Summary

<table>
<tr><th colspan="3">WETLAND B – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2">Located on the western portion of the subject property, extending offsite to the west.</td></tr>
<tr><td rowspan="11" colspan="1"></td><td>Local Jurisdiction</td><td>City of Camas</td></tr>
<tr><td>WRIA</td><td>28 – Salmon-Washougal</td></tr>
<tr><td>WSDOE Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>City of Camas Rating</td><td>III</td></tr>
<tr><td>City of Camas Buffer Width</td><td>120</td></tr>
<tr><td>Wetland Size</td><td>32,343 SF</td></tr>
<tr><td>Cowardin Classification</td><td>PFO/EMBC</td></tr>
<tr><td>HGM Classification</td><td>Slope</td></tr>
<tr><td>Wetland Data Sheet(s)</td><td>DP-5W</td></tr>
<tr><td>Upland Data Sheet(s)</td><td>DP-4U and DP-15U</td></tr>
<tr><td>Boundary Flag color</td><td>Orange</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Wetland vegetation is dominated by an overstory of Oregon ash, with an understory dominated by tall fescue and Kentucky bluegrass, and non-native, invasives Himalayan blackberry, reed canarygrass, and bird's-foot trefoil.</td></tr>
<tr><td>Soils</td><td colspan="2">Hydric soil indicator F3 (Depleted Matrix) was observed.</td></tr>
<tr><td>Hydrology</td><td colspan="2">Hydrology for Wetland B is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent wetlands.</td></tr>
<tr><td>Rationale for Delineation</td><td colspan="2">Wetland boundaries were determined by a transition to a hydrophytic plant community and hydric soils.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="2">Wetland rating based on the current WSDOE wetland rating system for Western Washington (Hruby, 2014) per CMC 16.53.020.B.</td></tr>
<tr><th colspan="3">Wetland Functions Summary</th></tr>
<tr><td>Water Quality</td><td colspan="2">Wetland B has some potential to improve water quality due to relatively low slope grade of the wetland unit, surrounding land uses that generate pollutants and being located in a sub-basin with 303(d) listed waters and an area identified as important for maintaining water quality. However, the wetland lacks the appropriate types and coverage of plants needed to trap sediments and pollutants. This wetland scores 6 out of 9 points for water quality function.</td></tr>
<tr><td>Hydrologic</td><td colspan="2">This wetland has some potential to reduce flooding and erosion due to being located in an area that generates excess surface runoff and surface flooding problems down-gradient. However, these functions are limited by the lack of dense, uncut, rigid plants in the wetland unit required to reduce surface water velocities. This wetland scores 5 out of 9 points for hydrologic function.</td></tr>
<tr><td>Habitat</td><td colspan="2">Wildlife habitat functions provided by the wetland are considered low and may include small mammal and bird forage and cover. Wetland B contains some plant diversity with two Cowardin classes, two hydroperiods, and low interspersion of habitat. The surrounding landscape has a low potential to support habitat connectivity between the wetland and other potential habitat due to existing habitat fragmentation and surrounding high intensity land uses. Wetland B scores 5 out of 9 points for habitat function.</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">The offsite buffer for Wetland A is considered degraded as it contains extensive amounts of non-native invasive, Himalayan blackberry.</td></tr>
</table>

Table 5. Wetland C Summary

<table>
<tr><th colspan="3">WETLAND C – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="2">Located on the eastern boundary of the subject property.</td></tr>
<tr><td rowspan="11"></td><td>Local Jurisdiction</td><td>City of Camas</td></tr>
<tr><td>WRIA</td><td>28 – Salmon-Washougal</td></tr>
<tr><td>WSDOE Rating (Hruby, 2014)</td><td>IV</td></tr>
<tr><td>Clark County Rating</td><td>IV</td></tr>
<tr><td>Clark County Buffer Width</td><td>N/A</td></tr>
<tr><td>Wetland Size</td><td>3,167 SF</td></tr>
<tr><td>Cowardin Classification</td><td>PEMB</td></tr>
<tr><td>HGM Classification</td><td>Slope</td></tr>
<tr><td>Wetland Data Sheet(s)</td><td>DP-10W</td></tr>
<tr><td>Upland Data Sheet(s)</td><td>DP-11U</td></tr>
<tr><td>Boundary Flag color</td><td>Orange</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="2">Wetland vegetation is dominated by soft rush, with smaller amounts of common velvetgrass, Kentucky bluegrass, and tall fescue.</td></tr>
<tr><td>Soils</td><td colspan="2">Hydric soil indicator F6 (Redox Dark Surface) was observed.</td></tr>
<tr><td>Hydrology</td><td colspan="2">Hydrology for Wetland C is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent wetlands.</td></tr>
<tr><td>Rationale for Delineation</td><td colspan="2">Wetland boundaries were determined by a transition to hydric soils and a hydrophytic plant community.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="2">Wetland rating based on the current WSDOE wetland rating system for Western Washington (Hruby, 2014) per CMC 16.53.020.B.</td></tr>
<tr><th colspan="3">Wetland Functions Summary</th></tr>
<tr><td>Water Quality</td><td colspan="2">Wetland C has some potential to improve water quality due to the relatively low slope grade of the wetland and being located in an area with surrounding land uses that generate pollutants. However, the wetland lacks the appropriate types and coverage of plants needed to trap sediments and pollutants. The value of any water quality improvement functions within the wetland is increased as the wetland is located in a sub-basin with 303(d) listed waters and in area identified as important for maintaining water quality. This wetland scores 6 out of 9 points for water quality functions.</td></tr>
<tr><td>Hydrologic</td><td colspan="2">This wetland has some potential to reduce flooding and erosion due to potential excess surface runoff entering the wetland, however, these functions are limited due to the lack of dense, uncut, rigid vegetation required to reduce surface water velocities. This wetland scores 5 out of 9 points for hydrologic functions</td></tr>
<tr><td>Habitat</td><td colspan="2">Wildlife habitat functions provided by the wetland are low and may include small mammal and bird forage and cover. Wetland C contains very little plant diversity with one Cowardin class, one hydroperiod, and no interspersion of habitat. The surrounding landscape has a low potential to support habitat connectivity between the wetland and other potential habitat due to existing habitat fragmentation and surrounding high intensity land uses. Wetland C scores 4 out of 9 points for habitat function</td></tr>
<tr><td>Buffer Condition</td><td colspan="2">The area surrounding Wetland C is considered degraded due to being an actively grazed cattle pasture. Wetland C buffer is likely waived from buffer requirements per CMC 16.53.010.C.2.a.</td></tr>
</table>

Table 5. Wetland D Summary

<table>
<tr><th colspan="4">WETLAND D – INFORMATION SUMMARY</th></tr>
<tr><td>Location:</td><td colspan="3">Located on the northwest corner of the subject property.</td></tr>
<tr><td colspan="2" rowspan="11"></td><td>Local Jurisdiction</td><td>City of Camas</td></tr>
<tr><td>WRIA</td><td>28 – Salmon-Washougal</td></tr>
<tr><td>WSDOE Rating (Hruby, 2014)</td><td>III</td></tr>
<tr><td>City of Camas Rating</td><td>III</td></tr>
<tr><td>City of Camas Buffer Width</td><td>135</td></tr>
<tr><td>Wetland Size</td><td>9,074 SF</td></tr>
<tr><td>Cowardin Classification</td><td>PFO/SS/EMBC</td></tr>
<tr><td>HGM Classification</td><td>Depressional</td></tr>
<tr><td>Wetland Data Sheet(s)</td><td>DP-12W</td></tr>
<tr><td>Upland Data Sheet(s)</td><td>DP-13U</td></tr>
<tr><td>Boundary Flag color</td><td>Orange</td></tr>
<tr><td>Dominant Vegetation</td><td colspan="3">Wetland vegetation is dominated by a canopy of Oregon ash with an understory consisting of hardhack, oneseed hawthorn, soft rush, and fringed willow herb, and non-native invasive species including Himalayan blackberry, rambler rose, bull thistle, reed canarygrass, tall fescue, and bird's foot trefoil.</td></tr>
<tr><td>Soils</td><td colspan="3">Hydric soil indicators A11 (Depleted Below Dark Surface) and F3 (Depleted Matrix) were observed.</td></tr>
<tr><td>Hydrology</td><td colspan="3">Hydrology for Wetland D is provided by direct precipitation, a seasonally high water table, and surface runoff from adjacent wetlands.</td></tr>
<tr><td>Rationale for Delineation</td><td colspan="3">Wetland boundaries were determined by topographic drop and a transition to a hydrophytic plant community.</td></tr>
<tr><td>Rationale for Local Rating</td><td colspan="3">Wetland rating based on the current WSDOE wetland rating system for Western Washington (Hruby, 2014) per CMC 16.53.020.B.</td></tr>
<tr><th colspan="4">Wetland Functions Summary</th></tr>
<tr><td>Water Quality</td><td colspan="3">Wetland D has moderate potential to improve water quality due to the lack of an outlet, persistent, ungrazed vegetation of more than 50 percent of the areas, and seasonal ponding in greater than half the unit. However, the land use in the area immediately surrounding the wetland does not generate pollutants and stormwater discharge, limiting potential for water quality improvement. The value of any water quality improvement functions within the wetland is increased as the wetland is located in a sub-basin with 303(d) listed waters and an area identified as important for maintain water quality. This wetland scores 7 out of 9 points for water quality functions.</td></tr>
<tr><td>Hydrologic</td><td colspan="3">This wetland has some potential to reduce flooding and erosion due to the lack of an outlet and moderate storage potential during wet periods. The small size of the wetland relative to the size of the watershed results in lower hydrologic benefit to the surrounding area. The immediate surrounding area generates excessive runoff, stormwater discharge, and intensive human land uses. The hydrologic functions provided onsite are valuable to society. This wetland scores 6 out of 9 points for hydrologic function</td></tr>
<tr><td>Habitat</td><td colspan="3">Wildlife habitat functions provided by the wetland is moderate and may include small mammal and bird forage and cover. Wetland D contains moderate diversity with three Cowardin classes, two hydroperiods, moderate interspersion of habitat and multiple priority and habitat features. The surrounding landscape has a low potential to support habitat connectivity between the wetland and other potential habitat due to existing habitat fragmentation and surrounding high intensity land uses. Wetland D scores 6 out of 9 points for habitat function.</td></tr>
<tr><td>Buffer Condition</td><td colspan="3">Wetland D buffer is in fair condition with dominant vegetation including Oregon ash, quaking aspen (Populus tremuloides), and Himalayan blackberry.</td></tr>
</table>

5.2 Offsite Stream Z

One stream (Offsite Stream Z) was identified offsite to the west of the subject property. Offsite Stream Z is identified by the DNR water typing map as a Type F (fish habitat) stream. The WDFW SalmonScape inventory does not identify any potential salmonid presence within Offsite Stream Z. SVC was unable to access the offsite stream; however high-resolution LiDAR imagery, topographic maps, and aerial imagery suggest that Offsite Stream Z may be a tributary to Lacamas Creek. Based on the WDFW SalmonScape Inventory and DNR water typing map, Offsite Stream Z is a Type F stream that lacks documented or potential salmonid presence. As such, Offsite Stream Z is classified as a Type F stream (without anadromous salmonids).

5.3 Non-Regulated Farm Pond

An excavated farm pond was identified on the south-central portion of the subject property during the site investigations. The farm pond was located in the middle of an actively grazed cattle pasture and utilized by livestock. The farm pond exhibited sharp edges typical of artificially excavated features rather than natural wetland conditions. The farm pond is slightly elevated relative to the surrounding land suggesting the banks are occasionally built up and reinforced. Topography in this area of the site slopes downgradient from east to west. An elevated dirt road/trail bisects the property in a north south direction and acts as an impoundment of overland storm flows, creating surface water in the farm pond during the rainy season. Therefore, the farm pond was determined to be an artificially and intentionally created feature for use by cattle based on land use, the presence of a road, and geomorphic positioning. Per CMC 16.53.010.C.2.b, *wetlands created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, stormwater facilities, farm ponds, and landscape amenities,* shall be exempt from wetland regulations. As such, the farm pond is likely considered a non-regulated feature by the City of Camas.

Chapter 6. Regulatory Considerations

The site investigations in December of 2020 and April of 2021 identified and delineated four wetlands (Wetlands A - D) on the subject property and one stream (Offsite Stream Z) offsite to the west of the subject property. No other wetlands, streams, or other fish and wildlife habitat conservation areas were identified within 300 feet of the subject property during the site investigations.

6.1 Local Critical Areas Buffer Requirements

CMC 16.53.020.B describes wetland categorizations with reference to the *Washington State Wetlands Rating System for Western Washington-Revised – Washington State Department of Ecology Publication No. 04-06-029, published August 2014* (Hruby, 2014). Category IV wetlands are typically more disturbed, smaller, and/or more isolated in the landscape than Category I, II, or III wetlands. Category IV wetlands provide low levels of functions and score less than 16 out of 27 points on the *Revised Washington State Wetland Rating System for Western Washington* (Hruby, 2014). Category III wetlands have generally been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands. Category III provide moderate levels of functions and score between 16 to 19 points on the *Revised Washington State Wetland Rating System for Western Washington* (Hruby, 2014).

Wetland A is classified as Category III wetland with 4 total habitat points, and subject to a standard 80-foot buffer based on proposed high intensity land use per CMC 16.53.040 Table-3. Wetland B is classified as a Category III wetland with 5 total habitat points and subject to a standard 120-foot buffer based on the proposed high intensity land use. Wetland C is classified as a Category IV wetland and is likely exempt from buffer regulations per CMC 16.53.010.C.2.a. Wetland D is classified as a Category III wetland with 6 total habitat points and subject to a standard 135-foot buffer.

Offsite Stream Z is likely a Type F stream with no known salmonid presence in accordance with Washington Department of Fish and Wildlife (WDFW) SalmonScape data and subject to a standard 75-foot buffer per CMC 16.61.040.D. The stream buffer is not anticipated to project onto the subject property.

6.2 State and Federal Considerations

In a December 2, 2008 memorandum from the Environmental Protection Agency (EPA) and USACE, joint guidance is provided that describes waters that are to be regulated under section 404 of the CWA (USACE, 2008). This memorandum was amended on February 2, 2012 where the EPA and USACE issued a final guidance letter on waters protected by the CWA.

The 2012 guidance describes the following waters where jurisdiction would be asserted: 1) traditional navigable waters, 2) interstate waters, 3) wetlands adjacent to traditional navigable waters, 4) non-navigable tributaries of traditional navigable waters that are relatively permanent meaning they contain water at least seasonally (e.g. typically three months and does not include ephemeral waters), and 5) wetlands that directly abut permanent waters. The regulated waters are those associated with naturally occurring waters and water courses and not artificial waters (i.e. stormwater pond outfalls).

The 2012 memorandum further goes on to describe waters where jurisdiction would likely require further analysis: 1) Tributaries to traditional navigable waters or interstate waters, 2) Wetlands adjacent to jurisdictional tributaries to traditional navigable waters or interstate waters, and 3) Waters that fall under the "other waters" category of the regulations.

In addition, the 2012 guidance identifies thirteen waters or areas where jurisdiction will not be asserted: 1) Wet areas that are not tributaries or open waters and do not meet the agencies regulatory definition of "wetlands", 2) Waters excluded from coverage under the CWA by existing regulations, 3) Waters that lack a "significant nexus: where one is required for a water to be jurisdictional, 4) Artificially irrigated areas that would revert to upland if the irrigation ceased, 5) Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing, 6) Artificial reflecting pools or swimming pools excavated in uplands, 7) Small ornamental waters created by excavating and/or diking dry land to retain water for primarily aesthetic reasons, and puddles, 8) Water-filled depressions created incidental to construction activity, 9) Groundwater, including groundwater drained through subsurface drainage systems, 10) Erosional features (gullies and rills), 11) Non-wetland swales, 12) Ditches that are excavated wholly in uplands, drain only uplands or non-jurisdictional waters, and have no more than ephemeral flow, and 13) Ditches that do not contribute flow, either directly or through other waterbodies, to a traditional navigable water, interstate water, or territorial sea.

As a tributary to a traditionally navigable water, Offsite Stream Z Creek is likely regulated by USACE as WOTUS. Wetlands A and B likely contribute surface waters to Offsite Stream Z and are likely regulated as an adjacent wetlands. Wetlands C and D are likely non-jurisdictional waters as they do not have surface water connections to Offsite Stream Z, they do not contain direct surface water connection to any traditional navigable water or a tributary to a traditional navigable water, and are also not considered "adjacent" wetlands. However, the project will assume jurisdiction of Wetland D to expedite the review process.

Future industrial development is anticipated to require complete fill of Wetland C. Once an approved jurisdictional determination is obtained from the USACE confirming the non-jurisdictional status of the identified wetland, an Administrative Order will be sought from WSDOE for the required wetland fill.

All identified wetlands (Wetlands A-D) and stream (Offsite Stream Z) are likely to be regulated as waters of the state by WSDOE under RCW 90.48.

Chapter 7. Closure

The findings and conclusions documented in this report have been prepared for specific application to this project. They have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. Our work was also performed in accordance with the terms and conditions set forth in our proposal. The conclusions and recommendations presented in this report are professional opinions based on an interpretation of information currently available to us and are made within the operation scope, budget, and schedule of this project. No warranty, expressed or implied, is made. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, our observations and conclusions applicable to this project may need to be revised wholly or in part.

All wetland boundaries delineated by SVC are based on conditions present at the time of the site inspection and considered preliminary until the flagged wetland boundaries are validated by the jurisdictional agencies. Validation of the wetland boundaries by the regulating agency provides a certification, usually written, that the wetland boundaries verified are the boundaries that will be regulated by the agencies until a specific date or until the regulations are modified. Only the regulating agencies can provide this certification.

As wetlands are dynamic communities affected by both natural and human activities, changes in wetland and waterbody boundaries may be expected; therefore, wetland delineations cannot remain valid for an indefinite period of time. Local agencies typically recognize the validity of wetland delineations for a period of five years after completion of a wetland delineation report. Development activities on a site five years after the completion of this wetland delineation report may require revision of the wetland delineation. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, our observations and conclusions applicable to this site may need to be revised wholly or in part.

Chapter 8. References

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TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center. Vicksburg, Mississippi.

USACE. 2018. *National Wetland Plant List, version 3.4*. http://wetland-plants.usace.army.mil/.

Appendix A — Methods and Tools

Table A1. Methods and tools used to prepare the report.

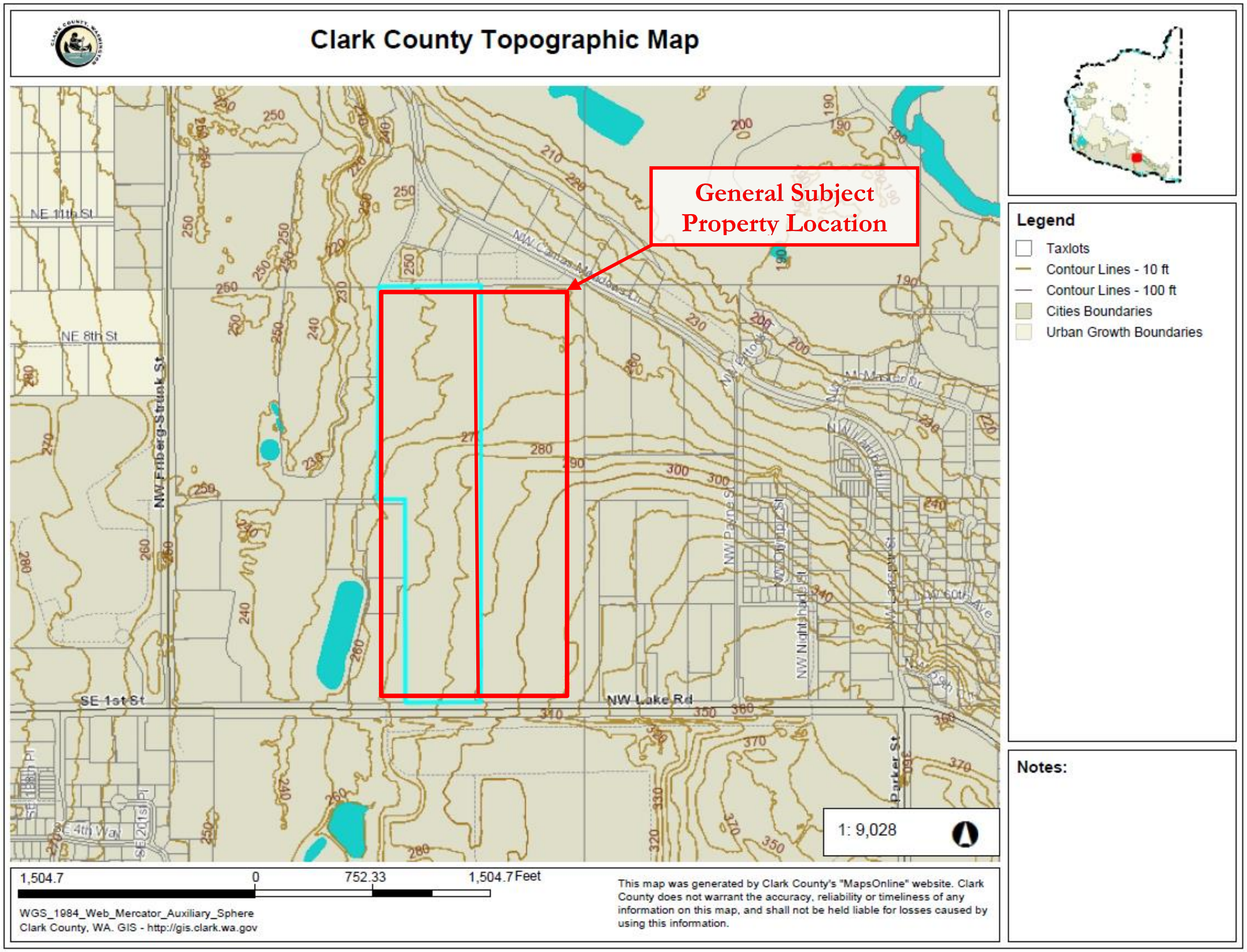
Parameter	Method or Tool	Website	Reference
Wetland Delineation	USACE 1987 Wetland Delineation Manual	http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf	**Environmental Laboratory.** 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
	Western Mountains, Valleys, and Coast Region Regional Supplement	http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp.pdf	**U.S. Army Corps of Engineers.** 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
Wetland Classification	USFWS / Cowardin Classification System	http://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States.pdf https://www.fgdc.gov/standards/projects/wetlands/nvcs-2013	**Cowardin**, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. Government Printing Office, Washington, D.C. **Federal Geographic Data Committee.** 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.
	Hydrogeomorphic Classification (HGM) System	http://el.erdc.usace.army.mil/wetlands/pdfs/wrpde4.pdf	**Brinson**, M. M. (1993). "A hydrogeomorphic classification for wetlands," Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
Wetland Rating	2014 Washington State Wetland Rating System	http://www.ecy.wa.gov/biblio/0406025.html	**Hruby, T**. 2014. Washington State wetland rating system for western Washington –Revised. Publication # 04-06-025.
Wetland Indicator Status	2018 National Wetland Plant List	http://wetland-plants.usace.army.mil/	**U.S. Army Corps of Engineers.** 2018. National Wetland Plant List, version 3.4**.**
Plant Names	USDA Plant Database	http://plants.usda.gov/	Website.
Soils Data	NRCS Soil Survey	http://websoilsurvey.nrcs.usda.gov/app/	Website GIS data based upon: **McGee, Dale A.** 1972. Soil Survey of Clark County Area, Washington. Soil Conservation Service United States Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station. Natural Resource Conservation Service.
	Clark County Hydric Soils List	http://www.wa.nrcs.usda.gov/technical/soils/hydric_lists/hydsoil-wa-653.pdf	**Natural Resources Conservation Service.** 2001. *Hydric Soils List: Clark County Area, Washington.* U.S. Department of Agriculture. Washington D.C.

Parameter	Method or Tool	Website	Reference
Threatened and Endangered Species	Washington Natural Heritage Program	http://data-wadnr.opendata.arcgis.com/datasets/wnhp-current-element-occurrences	**Washington Natural Heritage Program** (Data published 07/19/17). Endangered, threatened, and sensitive plants of Washington. Washington State Department of Natural Resources, Washington Natural Heritage Program, Olympia, WA
	Washington Priority Habitats and Species	http://wdfw.wa.gov/hab/phspage.htm	**Priority Habitats and Species (PHS) Program** Map of priority habitats and species in project vicinity. Washington Department of Fish and Wildlife.
Species of Local Importance	WDFW GIS Data	http://wdfw.wa.gov/mapping/salmonscape/	Website
Report Preparation	Camas Municipal Code (CMC)	https://library.municode.com/wa/camas/codes/code_of_ordinances?nodeId=TIT16EN_CRAR	CMC Title 16 – Environment – Critical Areas

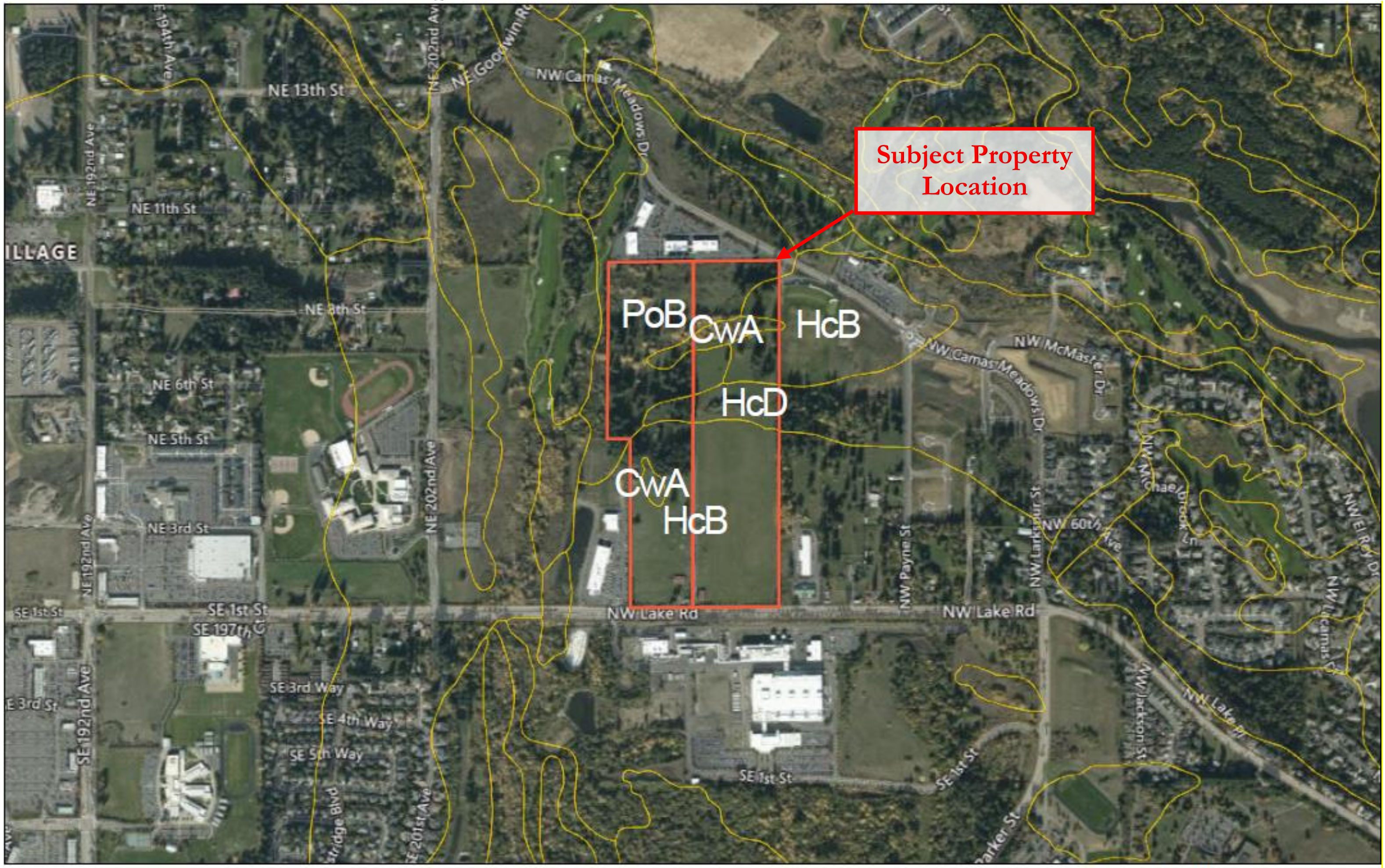
Appendix B — Background Information

This appendix includes a Clark County Topographic map (B1); NRCS Soil Survey map (B2); USFWS NWI map (B3); WDFW PHS map (B4); Clark County Stream and Wetland Inventory map (B5); DNR Stream Typing map (B6); and WDFW SalmonScape map (B7).

Appendix B1. Clark County Topographic Map



Appendix B2. NRCS Soil Survey Map



12/4/2020, 2:52:12 PM

Statewide Parcels _Query result

USA Soils Map Units

CwA: Cove silty clay loam, thin solum, 0 to 3 percent slopes
HcB: Hesson clay loam, 0 to 8 percent slopes
HcD: Hesson clay loam, 8 to 20 percent slopes
PoB: Powell silt loam, 0 to 8 percent slopes

1:18,056

0 0.1 0.2 0.4 mi

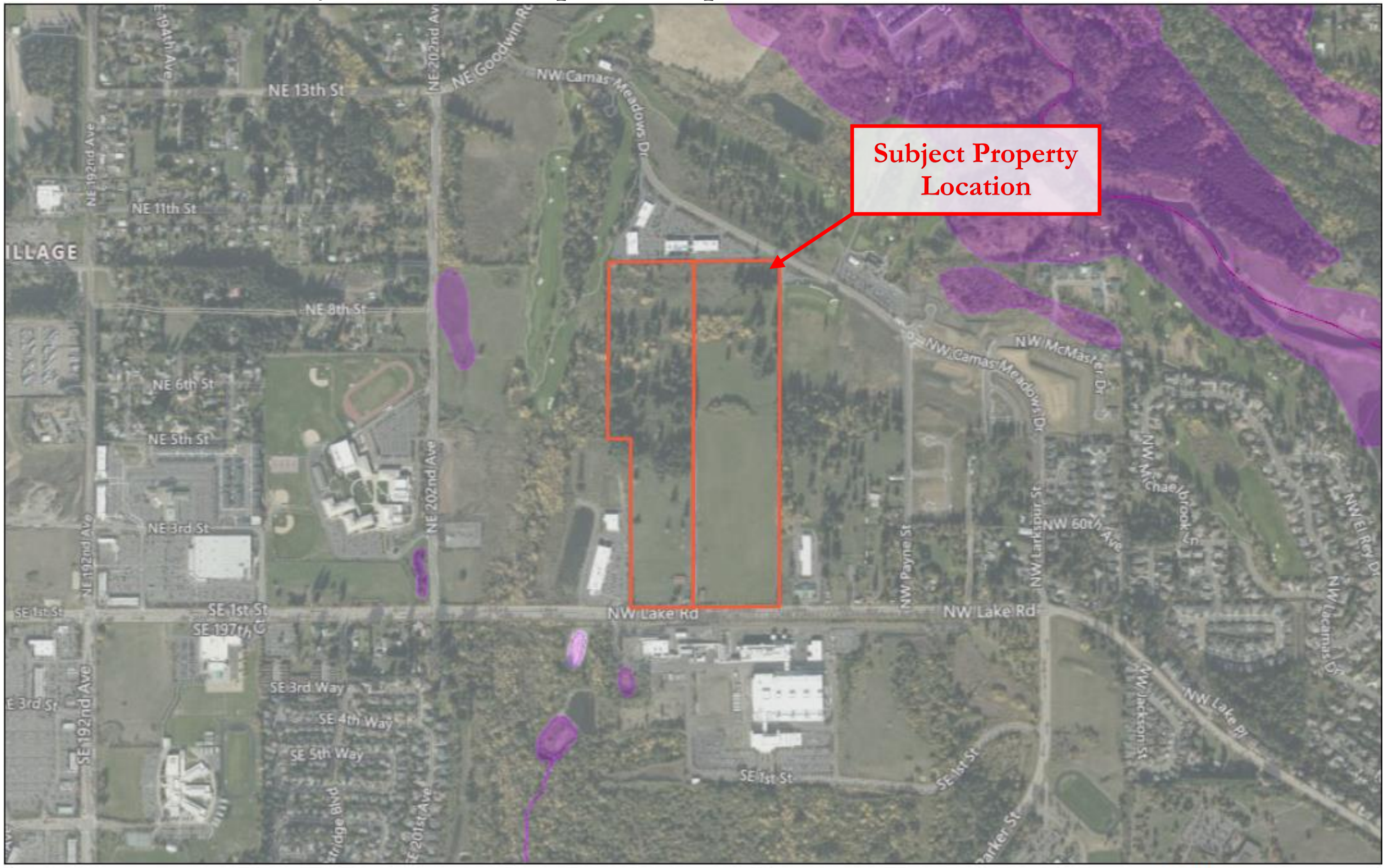
0 0.15 0.3 0.6 km

Source: USDA NRCS, Esri, © 2020 Microsoft Corporation © 2020 Maxar

Soundview Consultants

Appendix B3. USFWS National Wetland Inventory Map

Appendix B4. WDFW Priority Habitats and Species Map



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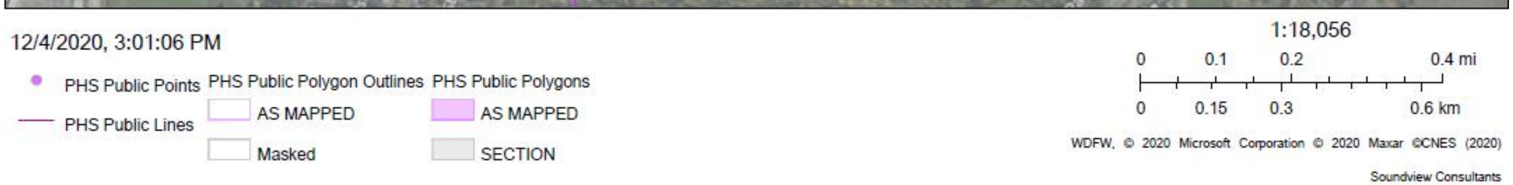


PHS Species/Habitats Overview:

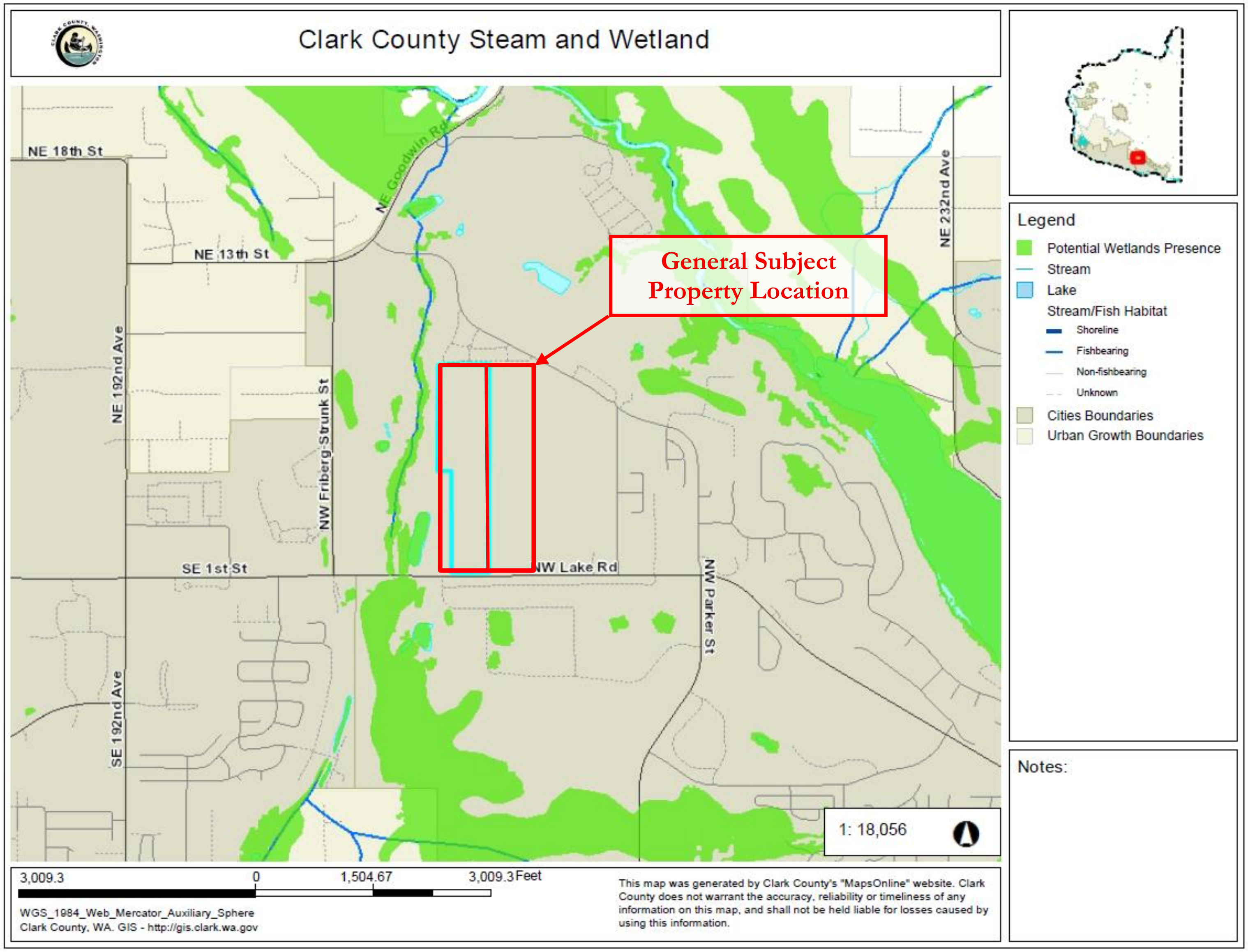
Occurence Name	Federal Status	State Status	Generalized Location
Freshwater Forested/Shrub Wetland	N/A	N/A	No
Caves Or Cave-rich Areas	N/A	N/A	Yes

PHS Species/Habitats Details:

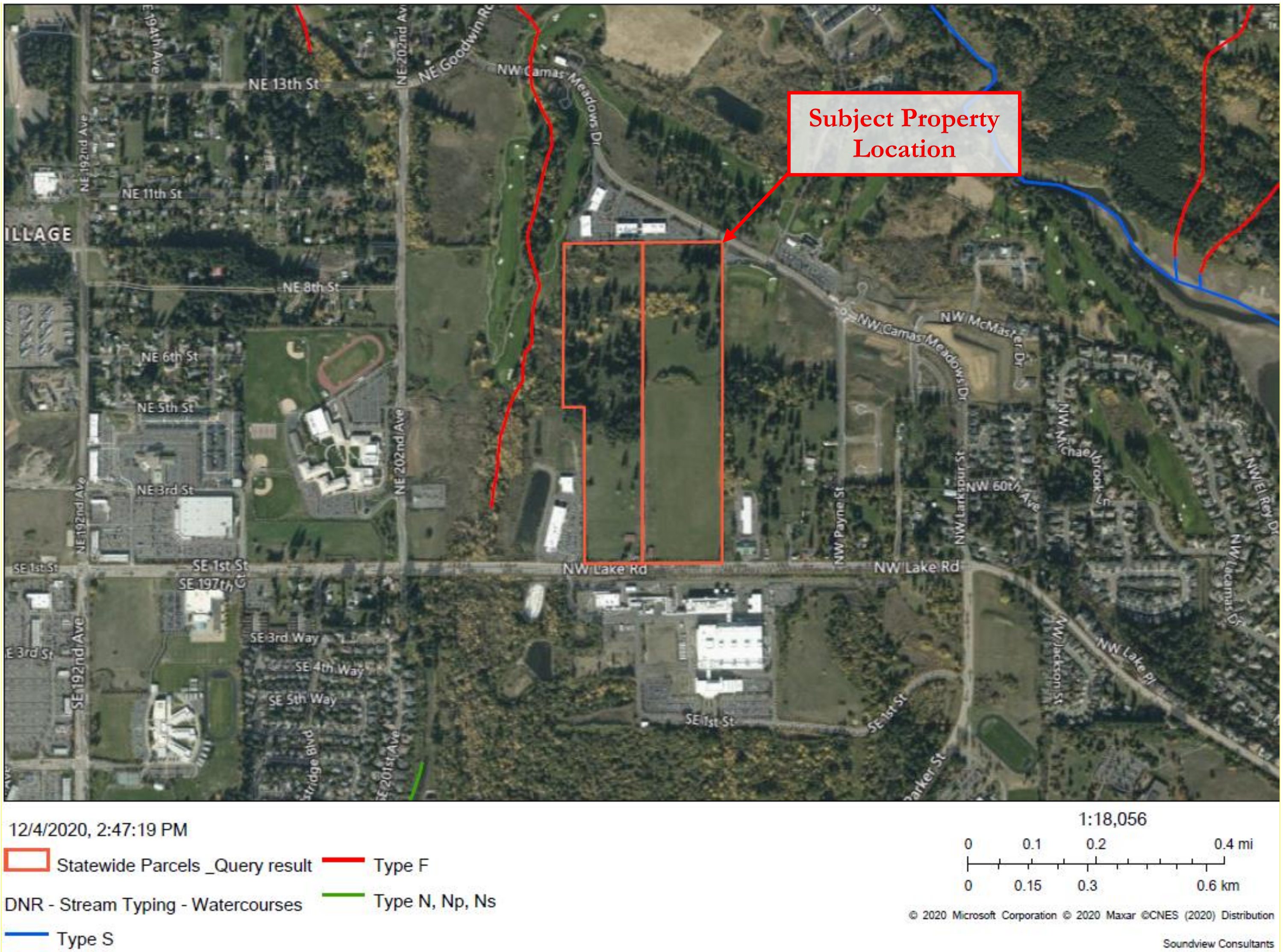
Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOA
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Caves Or Cave-rich Areas	
Notes	This polygon mask represents one or more records of the above species or habitat occurrence. Contact PHS Data Release (360-902-2543) for obtaining information about masked sensitive species and habitats.
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	Y
SGCN	N
Display Resolution	TOWNSHIP

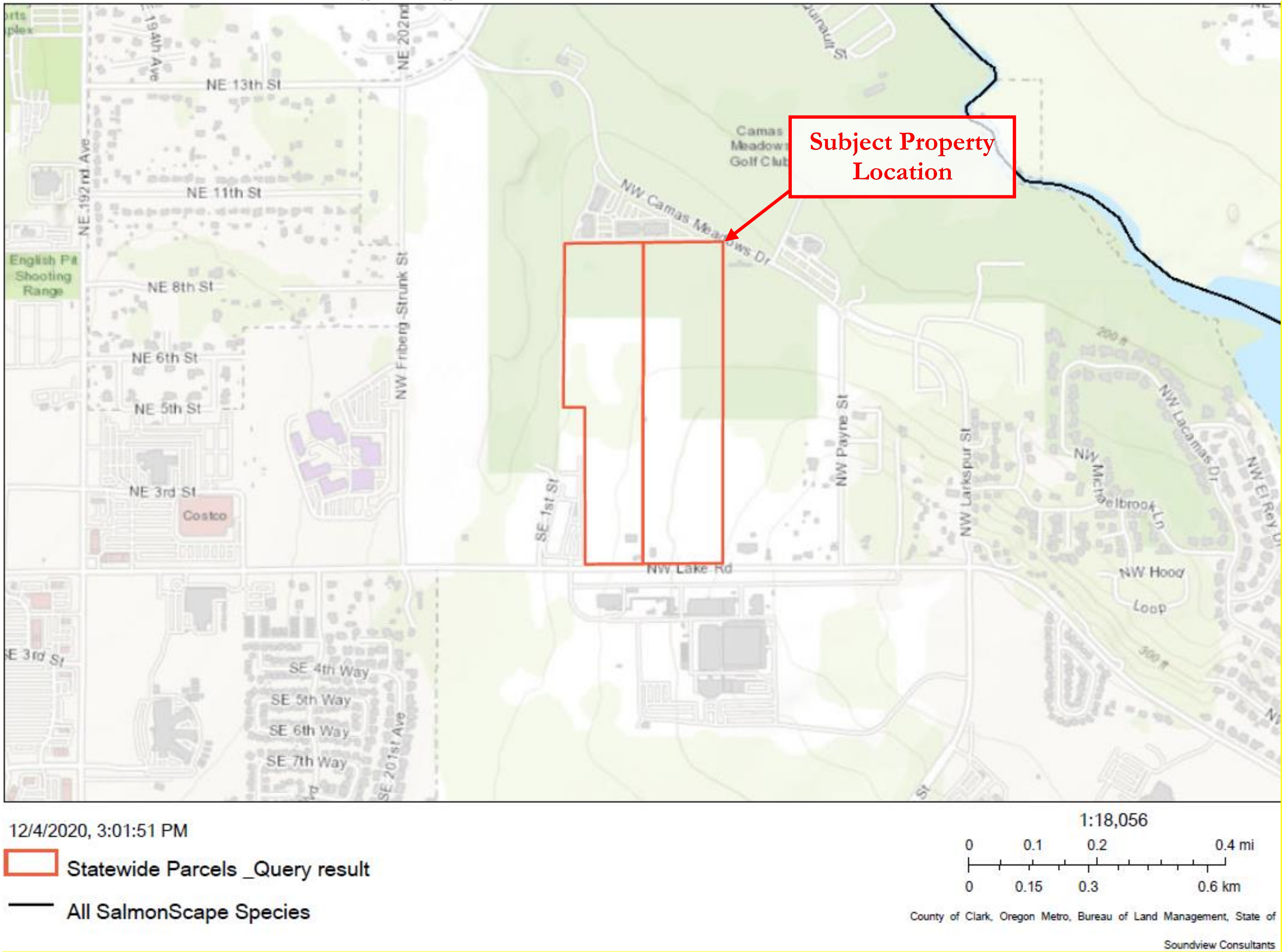
Appendix B5. Clark County Stream and Wetland Inventory Map



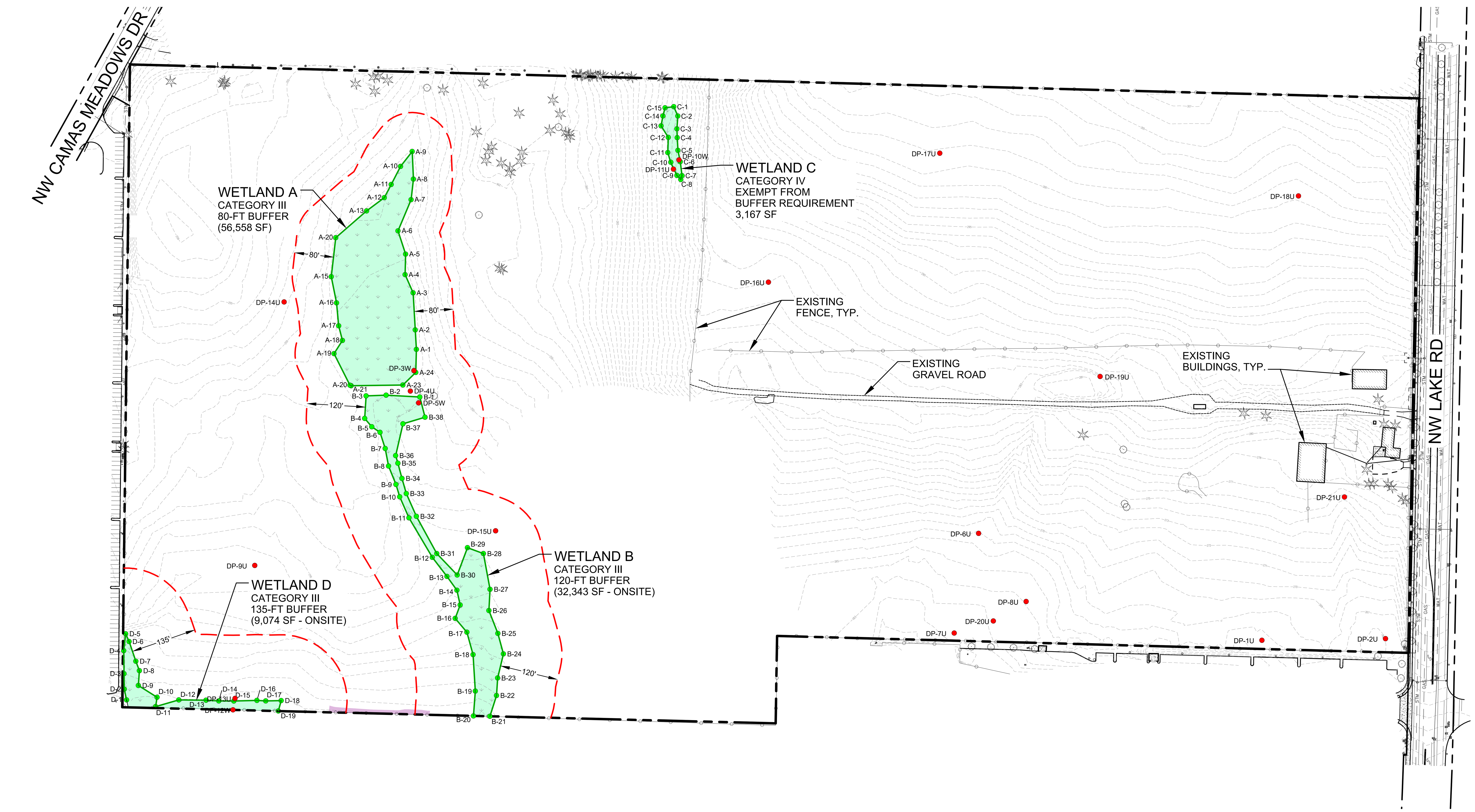
Appendix B6. DNR Stream Typing Map



Appendix B7. WDFW SalmonScape Map



Appendix C — Existing Conditions Map



VICINITY MAP

SOURCE: CLARK COUNTY GIS
(ACCESSED 8/17/2021)

LOCATION

THE SE ¼ OF SECTION 29,

TOWNSHIP 02N, RANGE 03E, WM

APPLICANT/OWNER

PANATTONI DEVELOPMENT COMPANY, INC
1821 DOCK STREET, SUITE 100
TACOMA, WASHINGTON 98402
CONTACT: BJORN BRYNESTAD, DEVELOPMENT MGR.
PHONE: (206) 838-1730
PHONE: BJORN@PANATTONI.COM

ENVIRONMENTAL CONSULTANT

SOUNDVIEW CONSULTANTS LLC
2907 HARBORVIEW DRIVE, SUITE D
GIG HARBOR, WA 98355
(253) 514-8952

0 125 250 500

GRAPHIC SCALE
1"= 125'

PLAN LEGEND

PROPERTY LINE
EXISTING WETLAND BOUNDARY
APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
WETLAND BUFFER
W-# WETLAND FLAG LOCATION
DP-# DATA PLOT LOCATION
EXISTING 1-FT CONTOURS

SHEET INDEX

SHEET NUMBER	SHEET TITLE
1	EXISTING CONDITIONS

SOURCES:

SYNTHESIS PLLC
THE FUSION OF ARCHITECTURE, DESIGN TECHNOLOGY & PEOPLE

Soundview Consultants LLC
Environmental Assessment • Planning • Land Use Solutions
2907 HARBORVIEW DRIVE, SUITE D
GIG HARBOR, WASHINGTON 98335
P. 253.514.8952
F. 253.514.8954
WWW.SOUNDVIEWCONSULTANTS.COM

CAMAS BUSINESS CENTER
4707 & 4723 NW LAKE ROAD
CAMAS, WASHINGTON 98607

CLARK COUNTY
PARCEL NUMBER(S):
176155000 & 176170000

DATE: 10/6/2021
JOB: 1144.0027
BY: MW
SCALE: AS SHOWN
SHEET: 1

Appendix D — Data Forms

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-1u

Investigator(s): Rachael Hyland Section, Township, Range: 29, 02N, 03E, SE

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

Subregion (LRR): A2 Lat: 45.622295 Long: -122.45968640 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: **Not all three wetland criteria met; only hydrophytic vegetation and hydric soils present. Data collected on the southwest corner of the property near the property line, approximately 300 feet north of NW Lake Road.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus spectabilis	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Schedonorus arundinaceus	50	Yes	FAC
2. Poa pratensis	50	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum 0			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-1u

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 %	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 2/2	95	5 YR 3/4	5	C	M	SiLo	Silt Loam
9-16	10 YR 4/3	83	7.5 YR 4/4	C	7	M	SiClLo	Silty Clay Loam
9-16	10YR 3/1	10	-	-	-	-	SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-2u

Investigator(s): Rachael Hyland Section, Township, Range: 29, 02N, 03E, SE

Landform (hillslope, terrace, etc.): Terrace; swale Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR): A2 Lat: 45.621607 Long: -122.45965103 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: **Not all three wetland criteria met; only hydric soils present. Data collected on the southwest portion of the property near the property line, approximately 70 feet north of NW Lake Road.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus spectabilis	20	Yes	FAC
2. Symphoricarpos albus	5	Yes	FACU
3.			
4.			
5.			
	25	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	70	Yes	FAC
2. Dactylis glomerata	20	Yes	FACU
3. Schedonorus arundinaceus	5	No	FAC
4. Jacobaea vulgaris	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= 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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: No hydrophytic vegetation criteria met.
Prevalence Index not warranted due to combined back of hydric soils and wetland hydrology.

SOIL

Sampling Point: DP-2u

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
0-12	10YR 2/2	95	10YR 3/2	10	C	M	SiClLo	Silt Clay Loam
0-12	-	-	7.5 YR 3/4	10	C	M	SiClLo	Silty Clay Loam
12-16	10YR 3/1	60	7.5 YR 3/4	10	C	M	SiClLo	Mixed Matrix, Silty Clay Loam
12-16	10 YR 3/2	30	-	-	-	-	-	Mixed Matrix, Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-3w

Investigator(s): Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

Landform (hillslope, terrace, etc.): Valley bottom on terrace Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR): A2 Lat: 45.627118 Long: -122.45771061 Datum: WGS 84

Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 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:
All three wetland criteria met. Data collected on the north-central portion of the property in Wetland A.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus latifolia	15	Yes	FACW
2.			
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus spectabilis	10	Yes	FAC
2. Symphoricarpos albus	5	Yes	FACU
3. Fraxinus latifolia	5	Yes	FACW
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Alopecurus aequalis	25	Yes	OBL
2. Schedonorus arundinaceus	25	Yes	FAC
3. Juncus effusus	25	Yes	FACW
4. Poa pratensis	10	No	FAC
5. Ranunculus repens	5	No	FAC
6. Geum macrophyllum	1	No	FAC
7.			
8.			
9.			
10.			
11.			
	91	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 9

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-3w

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
0-6	7.5 YR 4/1	95	5YR 3/4	5	C	M, PL	SiClLo	Silt Clay Loam
6-16	10 YR 4/1	93	7.5 YR 4/6	7	C	M	SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria met through indicator F3.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☒ No ☐ Depth (inches): 10"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 7"

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

Hydrologic criteria met through primary indicators A2 & A3.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-4U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

Landform (hillslope, terrace, etc.): Berm Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): A2 Lat: 45.627137 Long: -122.45787799 Datum: WGS 84

Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 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: **No wetland criteria met. Data collected on the north-central portion of the property in an upland area between Wetlands A and B.**

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus aremniacus	60	Yes	FAC
2.			
3.			
4.			
5.			
	60	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	30	Yes	FAC
2. Foeniculum vulgare	30	Yes	UPL
3. Carex hoodii	20	Yes	FACU
4. Leucanthemum vulgare	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	82	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum 18			

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: No hydrophytic vegetation criteria met.

SOIL

Sampling Point: DP-4U

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 %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 2.5/2	100	-	-	-	-	SiLo	Silty Loam
12-16	7.5YR 2.5/2	98	7.5YR 3/3	2	C	M	SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

No hydric soil indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-5w

Investigator(s): Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

Landform (hillslope, terrace, etc.): Terrace; swale Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR): A2 Lat: 45.627088 Long: -122.45797095 Datum: WGS 84

Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 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:
All three wetland criteria met. Data collected on the north-central portion of the property, inside Wetland B.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus spectabilis	30	Yes	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	50	Yes	FAC
2. Alopecurus pratensis	35	Yes	FAC
3. Holcus lanatus	10	No	FAC
4. Taraxacum officinale	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	97	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 3

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-5w

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
0-6	10YR 4/1	95	2.5 YR 3/6	5	C	M, PL	SiClLo	Silt Clay Loam
6-16	7.5 YR 4/1	90	7.5 YR 4/6	10	C	M	SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria met through indicator F3.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☒ No ☐ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 9"

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

Hydrologic criteria met through primary indicator A3.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-6U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): A2 Lat: 45.623905 Long: -122.45889649 Datum: WGS 84

Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent 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: **Not all three wetland criteria met; only hydrophytic vegetation and hydric soils present. Data collected in an upland area on the western portion of the property.**

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	50	Yes	FAC
2. Schedonorus arundinaceus	20	Yes	FAC
3. Dactylis glomerata	20	Yes	FACU
4. Alopecurus pratensis	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-6U

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	82	7.5YR 2.5/2	10	C	M	SiLo	Silt Loam
0-4	-	-	5YR 3/4	8	C	M	SiLo	Silt loam
4-16	10YR 2/2	84	5YR 3/4	8	CM		SiLo	Silt Loam; 8% charcoal found in matrix

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ **No** ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year. Additionally, no hydrology indicators were observed in the December 2020 reconnaissance investigation, immediately following a heavy rain event.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-7u

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.624025 Long: -122.45970392 Datum: WGS 84

Soil Map Unit Name: Hesson clay loam, 8 to 20 percent 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: Not all three wetland criteria met; only hydrophytic vegetation and hydric soil present. Data collected in an upland area approximately 20 feet from the western property boundary.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	40	Yes	FAC
2. Alopecurus pratensis	30	Yes	FAC
3. Dactylis glomerata	20	Yes	FACU
4. Schedonorus arundinaceus	5	No	FAC
5. Juncus effusus	5	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Hydrophytic vegetation met through dominance test

SOIL

Sampling Point: DP-7u

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 %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/1	90	7.5YR 2.5/3	10	C	M	SiLo	Silty Loam w/ manure
6-12	2.5Y 3/1	80	5YR 3/4	20	C	M	SiLo	Silty Loam
12-16	2.5Y 3/1	90	10YR 4/4	10	C	M	Cl	Clay

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soils met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-8u

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.623624 Long: -122.45943141 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: **Not all three wetland criteria met; only hydrophytic vegetation and hydric soils present. Data collected in an upland area approximately 80 feet east of the western property boundary.**

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: 5 ft)			
1. Schedonorus arundinaceus	50	Yes	FAC
2. Poa pratensis	40	Yes	FAC
3. Alopecurus pratensis	10	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
= Total Cover	0		
% 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% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Hydrophytic vegetation met through dominance test.

SOIL

Sampling Point: DP-8u

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 %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	90	5YR 3/4	10	C	M	SiLo	Silty Loam
10-16	10YR 4/2	90	7.5YR 4/4	10	C	M	SiLo	Silty 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): None
Water Table Present?	Yes ☐	No ☒	Depth (inches): None
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-9u

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.627994 Long: -122.45925618 Datum: WGS 84

Soil Map Unit Name: Powell 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: **Not all three wetland criteria met; only hydrophytic vegetation and hydric soils present. Data collected in an upland area on the northwest portion of the property.**

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1. Fraxinus latifolia	35	Yes	FACW
2.			
3.			
4.			
	35	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus aremiacus	70	Yes	FAC
2. Lonicera involucrata	5	No	FAC
3. Symphoricarpos albus	5	No	FAC
4.			
5.			
	80	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Geum macrophyllum	40	Yes	FAC
2. Carex hoodii	5	No	FACU
3. Epilobium cilliatum	1	No	FACW
4. Urtica dioica	1	No	FAC
5. Lotus corniculatus	1	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	48	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum 2			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation met through dominance test. Approximately 50% moss was observed in the herbaceous stratum.

SOIL

Sampling Point: DP-9u

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
0-12	10YR 3/2	100	-	-	-	-	SiLo	Silty Loam with roots
12-16	10YR 4/1	30	-	-	-	-	SiLo	Silty Loam
12-16	10YR 4/2	65	10YR 3/4	5	C	M	SiLo	Silty 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator A11.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year. Additionally, no hydrology indicators were observed in the December 2020 reconnaissance investigation, immediately following a heavy rain event.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-10w

Investigator(s): Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

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

Subregion (LRR): A2 Lat: 45.625686 Long: -122.45595449 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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:
All three wetland criteria met. Data collected on the eastern portion of the property, inside Wetland C.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Holcus lanatus	35	Yes	FAC
2. Juncus effusus	25	Yes	FACW
3. Poa pratensis	15	No	FAC
4. Alopecurus aequalis	10	No	OBL
5. Schedonorus arundinaceus	10	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	95	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum 5			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-10w

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100	-	-	-	-	-	Silt Clay Loam
4-11	7.5 YR 3/2	93	2.5 YR 3/4	7	C	M	SiClLo	Clay Loam
11-16	7.5 YR 3/3	98	5 YR 4/4	2	C	C	GrSaClLo	Gravelly, Sandy, Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): None
Water Table Present?	Yes ☒	No ☐	Depth (inches): 5"
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): 2"

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

Hydrologic criteria observed through primary indicators A2 and A3.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-11u

Investigator(s): Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

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

Subregion (LRR): A2 Lat: 45.625705 Long: -122.45602020 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: **Not all three wetland criteria not met; only hydrophytic vegetation present. Data collected on the eastern portion of the property outside Wetland C.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Holcus lanatus	40	Yes	FAC
2. Poa pratensis	30	Yes	FAC
3. Alopecurus pratensis	10	No	FAC
4. Juncus effusus	5	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = Total Cover		
% Bare Ground in Herb Stratum 15			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-11u

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	7.5 YR 3/2	100	-	-	-	-	-	Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

No hydric soil indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 16"

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

No hydrologic criteria met.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/06/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-12w

Investigator(s): Rachel Hyland, Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

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

Subregion (LRR): A2 Lat: 45.628098 Long: -122.46040961 Datum: WGS 84

Soil Map Unit Name: Powell 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: **All three wetland criteria not met. Data collected on the northwest portion of the property, near the western property boundary, inside Wetland D.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus latifolia	30	Yes	FACW
2. Crataegus monogyna	10	Yes	FAC
3. Salix sp.*	10	Yes	FACW
4.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Fraxinus latifolia	20	Yes	FACW
2. Rubus armeniacus	15	Yes	FAC
3. Crataegus monogyna	2	No	FAC
4. Symphiocarpus alba	1	No	FACU
5.			
	38	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	1	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	1	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum 99			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.
*Salix species considered FACW for scoring purposes.

SOIL

Sampling Point: DP-12w

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 %	Type[1]	Loc[2]	Texture	Remarks
0-11	10 YR 3/2	90	2.5 YR 3/6	10	C	M	SaClLo	Sandy Clay Loam
11-16	10 YR 4/2	94	7.5 YR 4/1	5	D	M	SaClLo	Sandy Clay Loam
11-16	-	-	2.5 YR 3/6	1	C	M	SaClLO	Sandy Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria through indicators F6 and A11.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☒ No ☐ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 9"

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

Hydrologic criteria observed through primary indicators A2 and A3.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-13U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.628087 Long: -122.46031821 Datum: WGS 84

Soil Map Unit Name: Powell silt loam, 0 to 8 percent 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: **Not all three wetland criteria met, only hydrophytic vegetation present. Data collected on the northwest portion of the subject property, near the western property boundary, outside Wetland D.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus latifolia	20	Yes	FACW
2. Crataegus monogyna	15	Yes	FAC
3.			
4.			
	35	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus armeniacus	30	Yes	FAC
2. Rubus laciniatus	10	Yes	FACU
3. Symphoricarpos albus	10	Yes	FACU
4.			
5.			
	50	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Geum macrophyllum	50	Yes	FAC
2. Geranium molle	3	No	UPL
3. Epilobium ciliatum	2	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	55	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 45

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ________

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test. Approximately 20% moss was observed in the herbaceous stratum.

SOIL

Sampling Point: DP-13U

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
0-12	10YR 3/2	100	-	-	-	-	SiLo	Silt Loam
12-14	10YR 3/2	78	10YR 4/2	20	D	M	SiLo	Silt Loam
12-14	10YR 3/4	2	-	-	C	M	SiLo	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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

No hydric soil indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

No wetland hydrology criteria met.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-14U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): A2 Lat: 45.627869 Long: -122.45716955 Datum: WGS 84

Soil Map Unit Name: Powell silt loam, 0 to 8 percent 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:
Not all three wetland criteria met; only hydrophytic vegetation present. Data collected in an upland area on the northeast portion of the property.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	35	Yes	FAC
2. Schedonorus arundinaceus	20	Yes	FAC
3. Leucantheum vulgare	20	Yes	FACU
4. Lupinus sp.	15	No	FAC
5. Hypochaeris radicata	5	No	FACU
6. Trifolium repens	5	No	FAC
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ________

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:
Hydrophytic vegetation criteria met through dominance test.
Lupinus species considered facultative for scoring purposes.

SOIL

Sampling Point: DP-14U

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 %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100	-	-	-	-	Lo	Loam
4-8	10YR 3/2	98	2.5YR 5/8	2	C	M	Lo	Loam
8-16	7.5YR 3/3	98	5YR 4/6	2	C	M	SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☐ No ☒

Remarks:

No hydric soil indicators met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): None
Water Table Present?	Yes ☐	No ☒	Depth (inches): None
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-15U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.626657 Long: -122.45893760 Datum: WGS 84

Soil Map Unit Name: Cove silty clay loam, thin solum, 0 to 3 percent 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: **Not all three wetland criteria met; only hydrophytic vegetation and hydric soils present. Data collected on the west-central portion of the property, outside Wetland B.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus armeniacus	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Agrostis capillaris	40	Yes	FAC
2. Hypochaeris radicata	20	Yes	FACU
3. Schedonorus arundinaceus	10	No	FAC
4. Trifolium repens	10	No	FAC
5. Leucanthemum vulgare	5	No	FACU
6. Holcus lanatus	5	No	FAC
7. Taraxacum officinale	3	No	FACU
8. Ranunculus repens	2	No	FAC
9.			
10.			
11.			
	95	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	
% Bare Ground in Herb Stratum 5			

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-15U

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 %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/1	98	5YR 3/4	2	C	PL	SiClLo	Silty Clay Loam
6-11	5YR 4/1	2	-	-	-	-	SiClLo	Silty Clay Loam; Mixed Matrix
6-11	10YR 5/2	35	7.5YR 4/6	5	C	M/PL	SiClLo	Silty Clay Loam; Mixed Matrix
11-13	10YR 5/2	90	7.5YR 5/8	10	C	M	SiClLo	Silty Clay Loam
13-16	10YR 4/1	98	5YR 4/6	2	C	PL	SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria met through indicator F3.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year. Additionally, no hydrology indicators were observed in the December 2020 reconnaissance investigation, immediately following a heavy rain event.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-16U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.625117 Long: -122.45694596 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: Not all three wetland criteria met; only hydrophytic vegetation present. Data collected on the east-central portion of the property.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Trifolium repens	30	Yes	FAC
2. Poa pratensis	25	Yes	FAC
3. Alopecurus pratensis	20	Yes	FAC
4. Anthoxanthum odoratum	10	No	FACU
5. Schedonorus arundinaceus	10	No	FAC
6. Taraxacum officinale	5	No	FACU
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-16U

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
0-4	7.5YR 2.5/3	100	-	-	-	-	Lo	Loam
4-8	7.5YR 2.5/3	60	-	-	-	-	Lo	Loam; mixed matrix
4-8	7.5YR 2.5/1	40					SiClLo	Silty Clay Loam; mixed matrix
8-10	7.5YR 2.5/1	100					SiClLo	Silty Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

No hydric soil criteria met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-17u

Investigator(s): Rachel Hyland, Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

Landform (hillslope, terrace, etc.): Terrace; Swale Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR): A2 Lat: 45.624178 Long: -122.45586859 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: Not all three wetland criteria met; only hydrophytic vegetation present. Data collected on the eastern portion of the subject property.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	40	Yes	FAC
2. Trifolium repens	30	Yes	FAC
3. Hypochaeris radicata	20	Yes	FACU
4. Agrostis capillaris	10	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-17u

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 %	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5 YR 3/2	100	-	-	-	-	MeLo	Medium Loam
9-15	7.5 YR 3/2	98	7.5 YR 3/4	2	C	M	MeLo	Medium 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☐ No ☒

Remarks:

No hydric soil criteria met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-18u

Investigator(s): Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

Landform (hillslope, terrace, etc.): Terrace; Swale Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR): A2 Lat: 45.622168 Long: -122.45612559 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: Not all three wetland criteria not met; only hydrophytic vegetation present. Data collected in an upland area on the southeast portion of the property.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: 5 ft)			
1. Poa pratensis	40	Yes	FAC
2. Trifolium repens	35	Yes	FAC
3. Agrostis capillaris	20	Yes	FAC
4. Hypochaeris radicata	2	No	FACU
5. Taraxacum officinale	2	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	99		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
= Total Cover	0		
% Bare Ground in Herb Stratum 1			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-18u

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 %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5 YR 3/2	100	-	-	-	-	MeLo	Medium Loam
10-15	7.5 YR 3/2	99	7.5 YR 3/4	1	C	M	MeLo	Medium 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☐ No ☒

Remarks:

No hydric soil criteria met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-19u

Investigator(s): Jacob Layman Section, Township, Range: 29, 02N, 03E, SE

Landform (hillslope, terrace, etc.): Terrace; Swale Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR): A2 Lat: 45.623253 Long: -122.45761989 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: **Not all three wetland criteria not met; only hydric soils and hydrophytic vegetation present. Data collected in an upland area on the south-central portion of the site.**

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Agrostis capillaris	60	Yes	FAC
2. Poa pratensis	40	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= 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% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ________

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-19u

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
0-4	7.5 YR 3/2	60	2.5 YR 3/6	7	C	M, PL	MeLo	Medium Loam; Mixed matrix
0-4	5Y 3/1	33	-	-	-	-	MeLo	Medium Loam; Mixed matrix
4-12	7.5 YR 3/2	100	-	-	-	-	ClLo	Clay Loam
12-18	7.5 YR 3/2	98	7.5 YR 3/4	2	C	M	ClLO	Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year. Additionally, no hydrology indicators were observed in the December 2020 reconnaissance investigation, immediately following a heavy rain event.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-20U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

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

Subregion (LRR): A2 Lat: 45.623806 Long: -122.45958918 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: **Not all wetland criteria met; only hydrophytic vegetation and hydric soils present. Data collected in an upland area near the western property boundary approximately 845 feet north of NW Lake Road.**

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Agrostis capillaris	40	Yes	FAC
2. Poa pratensis	30	Yes	FAC
3. Alopercurus pratensis	20	Yes	FAC
4. Alopecurus aequalis	5	No	OBL
5. Anthoxanthum odoratum	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0 = Total Cover		
% Bare Ground in Herb Stratum 0			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-20U

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 %	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5YR 3/1	75	5YR 3/4	25	C	M/PL	SiClLo	Silty Clay Loam
9-16	7.5YR 3/1	70	7.5YR 3/4	30	C	M	ClLo	Clay 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

Hydric soil criteria met through indicator F6.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year.

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

Project/Site: 1144.0027 E Vancouver E-Commerce Center City/County: Camas, Clark Sampling Date: 04/07/2021

Applicant/Owner: Panattoni Development Company, Inc. State: WA Sampling Point: DP-21U

Investigator(s): Rachael Hyland, Jacob Layman Section, Township, Range: 29,02N,03E,SE

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): A2 Lat: 45.621863 Long: -122.45851848 Datum: WGS 84

Soil Map Unit Name: Hesson clay 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: Not all three wetland criteria met; only hydrophytic vegetation and hydric soil present. Data collected in southern portion of property approximately 150 feet northwest of the existing residence driveway.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. Agrostis capillaris	70	Yes	FAC
2. Poa pratensis	20	Yes	FAC
3. Schedonorus arundinaceus	10	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
	0	= 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% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ________

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Hydrophytic vegetation criteria met through dominance test.

SOIL

Sampling Point: DP-21U

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 %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 3/1	85	7.5YR 3/3	15	C	M/PL	SiLo	Silty Loam
6-16	7.5YR 3/2	92	7.5YR 3/3	8	C	M	SiLo	Silty 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 Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: None

Depth (inches): ---

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator F6. Soil was highly compacted.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): None

Water Table Present? Yes ☐ No ☒ Depth (inches): None

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): None

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrologic indicators observed. Soil pit was excavated to a depth of 16 inches. Data was collected early in the growing season when precipitation was within the normal range for the water year and the calendar year. Additionally, no hydrology indicators were observed in the December 2020 reconnaissance investigation, immediately following a heavy rain event.

Appendix E — Wetland Rating Forms

RATING SUMMARY – Western Washington

Name of wetland (or ID #): A Date of site visit: 04/07/21

Rated by Jake Layman Trained by Ecology? ✔ Yes ___No Date of training______

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

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

Source of base aerial photo/map ESRI ArcGIS

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

1. Category of wetland based on FUNCTIONS

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

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

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	M	M	L	
Landscape Potential	M	M	L	
Value	H	M	M	**TOTAL**
Score Based on Ratings	7	6	4	17

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

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and 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	

HGM Classification of Wetlands in Western Washington

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

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

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

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

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

☐**NO – Saltwater Tidal Fringe (Estuarine)** ☐**YES – Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

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

☒NO – go to 3 ☐**YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
   - ☐The wetland is on a slope (*slope can be very gradual*),
   - ☐The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as 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.

☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☒ **YES** – The wetland class is **Depressional**

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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

Wetland name or number A

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	1
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	4
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	0
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 Golf course Yes = 1 No = 0	1
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*

NOTES and FIELD OBSERVATIONS:

Wetland name or number A

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 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	2
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 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	3
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 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	3
Total for D 4 Add the points in the boxes above	8

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	0
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 • 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* ___________ points = 0 There are no problems with flooding downstream of the wetland. points = 0	1
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	0
Total for D 6 Add the points in the boxes above	1

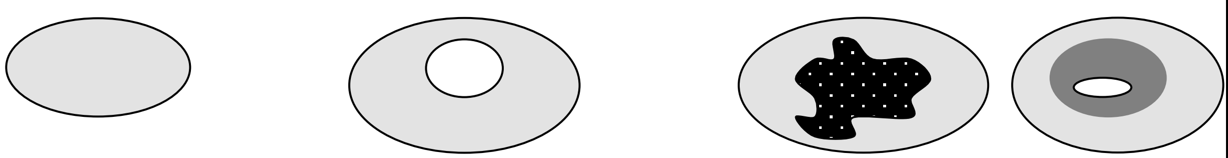
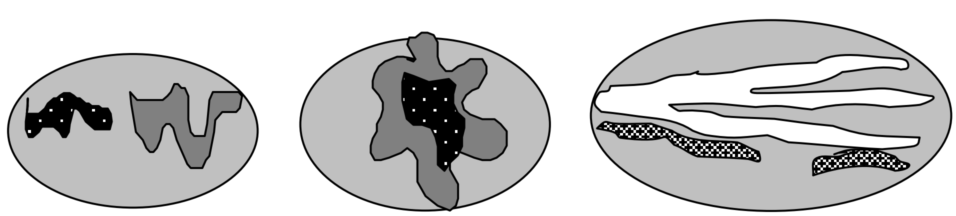
Rating of Value If score is:___**2-4 = H** _X_**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

These questions apply to wetlands of all HGM classes.

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.* ____Aquatic bed — 4 structures or more: points = 4 ____Emergent — 3 structures: points = 2 ____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 _X_Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* _X_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	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____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 ____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**	0
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 	0

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)* ____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*)	3
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:* 0.00 % undisturbed habitat **+** [(% moderate and low intensity land uses) 12.35 /2] = 6.175 % 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:* 9.1 % undisturbed habitat **+** [(% moderate and low intensity land uses) 33.73 /2] = 25.964999999999 % 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	1
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	-2
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** _X_**< 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 A

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.

— **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*).

— **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.

X **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 A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes –Go to **SC 1.1** ☒No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐Yes = **Category I** ☐No - Go to **SC 1.2**	
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**	
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**	
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**	

SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> 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**	
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**	
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**	
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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RATING SUMMARY – Western Washington

Name of wetland (or ID #): B Date of site visit: 04/07/21

Rated by Jake Layman Trained by Ecology? ✔ Yes ___No Date of training______

HGM Class used for rating Slope Wetland has multiple HGM classes?___Y ✔ N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map ESRI ArcGIS

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

1. Category of wetland based on FUNCTIONS

_______**Category I** – Total score = 23 - 27
_______**Category II** – Total score = 20 - 22
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	L	L	L	
Landscape Potential	M	M	L	
Value	H	M	H	**TOTAL**
Score Based on Ratings	6	5	5	16

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and 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 B

HGM Classification of Wetlands in Western Washington

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

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

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

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

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

☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐ **YES – Freshwater Tidal Fringe**

If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is an* ***Estuarine*** *wetland and is not scored. This method* ***cannot*** *be used to score functions for estuarine wetlands.*

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

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a Flats wetland, use the form for ***Depressional*** *wetlands.*

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
   - ☒ The wetland is on a slope (*slope can be very gradual*),
   - ☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as 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 B

☐ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☐ **YES** – The wetland class is **Depressional**

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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

Wetland name or number B

SLOPE WETLANDS

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

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

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

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

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

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

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

Wetland name or number B

SLOPE WETLANDS

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

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	0

Rating of Site Potential If score is: ___1 = M X 0 = L *Record the rating on the first page*

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

Rating of Landscape Potential If score is: X 1 = M ___0 = L *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	1

Rating of Value If score is: ___2-4 = H X 1 = M ___0 = L *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number B

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

____Aquatic bed	4 structures or more: points = 4	
_×_Emergent	3 structures: points = 2	
____Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1	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

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*).

____Permanently flooded or inundated	4 or more types present: points = 3	
_×_Seasonally flooded or inundated	3 types present: points = 2	
____Occasionally flooded or inundated	2 types present: points = 1	1
_×_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**	

H 1.3. Richness of plant species

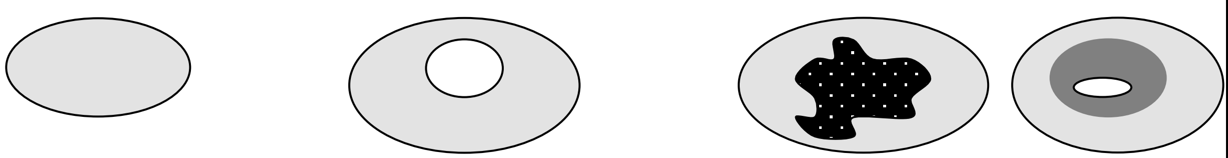
Count the number of plant species in the wetland that cover at least 10 ft^2.

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	1
< 5 species	points = 0	

H 1.4. Interspersion of habitats

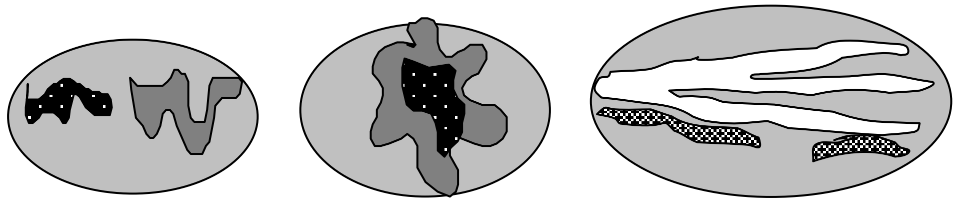
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



None = 0 points **Low** = 1 point **Moderate** = 2 points

1

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



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)* ____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:* 0.00 % undisturbed habitat **+** [(% moderate and low intensity land uses) 12.35 /2] = 6.175 % 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:* 9.17 % undisturbed habitat **+** [(% moderate and low intensity land uses) 33.73 /2] = 26.034999999999 % 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	1
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	-2
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** _X_**< 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	2

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

Wetland name or number B

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.

— **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*).

X **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.

X **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 B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes –Go to **SC 1.1** ☒No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐Yes = **Category I** ☐No - Go to **SC 1.2**	
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**	
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**	
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**	

Wetland name or number B

SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> 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**	
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**	
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**	
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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RATING SUMMARY – Western Washington

Name of wetland (or ID #): C Date of site visit: 04/07/21

Rated by Jake Layman Trained by Ecology? ✔ Yes ___No Date of training______

HGM Class used for rating Slope Wetland has multiple HGM classes?___Y ✔ N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map ESRI ArcGIS

OVERALL WETLAND CATEGORY IV (based on functions ✔ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_______**Category I** – Total score = 23 - 27
_______**Category II** – Total score = 20 - 22
_______**Category III** – Total score = 16 - 19
X **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			Circle the appropriate ratings	
Site Potential	L	L	L	
Landscape Potential	M	M	L	
Value	H	M	M	**TOTAL**
Score Based on Ratings	6	5	4	15

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

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and 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	

HGM Classification of Wetlands in Western Washington

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

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

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

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

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

☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐ **YES – Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

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

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
   - ☒ The wetland is on a slope (*slope can be very gradual*),
   - ☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as 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 C

☐ 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 C

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

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

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

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

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

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

Wetland name or number C

SLOPE WETLANDS

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

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	0

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

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

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

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	1

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number C

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.*

____Aquatic bed	4 structures or more: points = 4	0
_×_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

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*).

____Permanently flooded or inundated	4 or more types present: points = 3	0
____Seasonally flooded or inundated	3 types present: points = 2	
____Occasionally flooded or inundated	2 types present: points = 1	
_×_Saturated only	1 type present: points = 0	
____Permanently flowing stream or river in, or adjacent to, the wetland		
____Seasonally flowing stream in, or adjacent to, the wetland		
____**Lake Fringe wetland**	**2 points**	
____**Freshwater tidal wetland**	**2 points**	

H 1.3. Richness of plant species

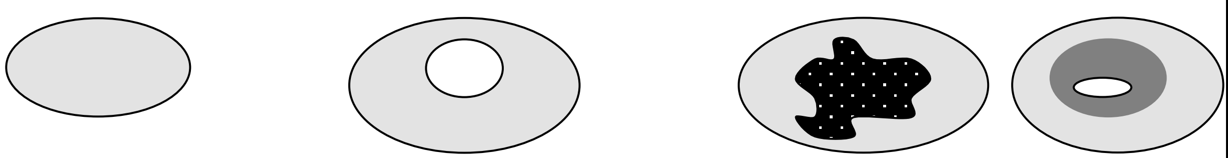
Count the number of plant species in the wetland that cover at least 10 ft^2.

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	1
5 - 19 species	points = 1	
< 5 species	points = 0	

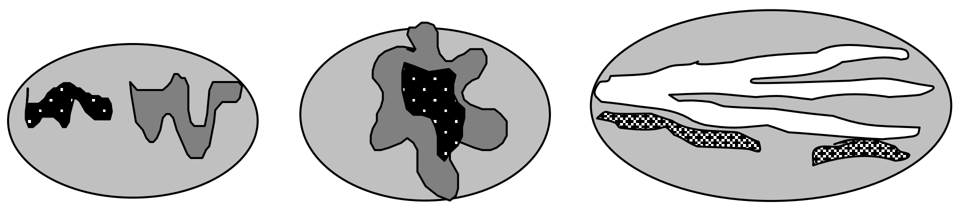
H 1.4. Interspersion of habitats

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



0

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)* ____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	2

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:* 0.00 % undisturbed habitat **+** [(% moderate and low intensity land uses) 12.35 /2] = 6.175 % 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:* 9.17 % undisturbed habitat **+** [(% moderate and low intensity land uses) 33.73 /2] = 26.034999999999 % 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	1
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	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** _X_**< 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 C

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.

— **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*).

— **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.

X **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.

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**	
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**	
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**	
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**	

Wetland name or number C

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**

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**

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**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form

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RATING SUMMARY – Western Washington

Name of wetland (or ID #): D Date of site visit: 04/07/21

Rated by Rachael Hyland, Jake Layman Trained by Ecology? ✔ Yes ___No Date of training______

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

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

Source of base aerial photo/map ESRI ArcGIS

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

1. Category of wetland based on FUNCTIONS

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

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

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	M	M	M	
Landscape Potential	M	M	L	
Value	H	M	H	**TOTAL**
Score Based on Ratings	7	6	6	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

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and 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 D

HGM Classification of Wetlands in Western Washington

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

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

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

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

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

☐**NO – Saltwater Tidal Fringe (Estuarine)** ☐**YES – Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

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

☒NO – go to 3 ☐**YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
   ☐The wetland is on a slope (*slope can be very gradual*),
   ☐The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as 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 D

☒ 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.*

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	3
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	4
Total for D 1 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 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*

NOTES and FIELD OBSERVATIONS:

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 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outletpoints = 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	4
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 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	3
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 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	3
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	2

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 • 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* ________________ points = 0 There are no problems with flooding downstream of the wetland. points = 0	1
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	0
Total for D 6 Add the points in the boxes above	1

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

Wetland name or number D____

These questions apply to wetlands of all HGM classes.

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.*

____Aquatic bed — 4 structures or more: points = 4
__×__Emergent — 3 structures: points = 2
__×__Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
__×__Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:
____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated — 4 or more types present: points = 3
__×__Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — 2 types present: points = 1
__×__Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
____Seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

1

H 1.3. Richness of plant species

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

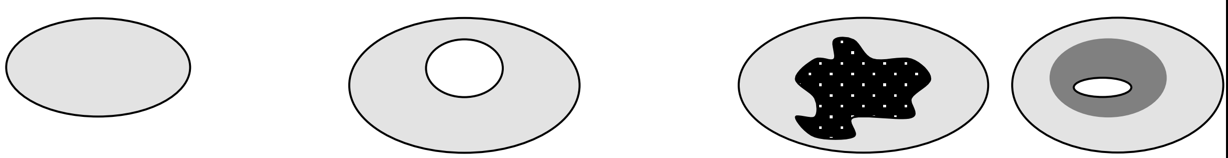
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

1

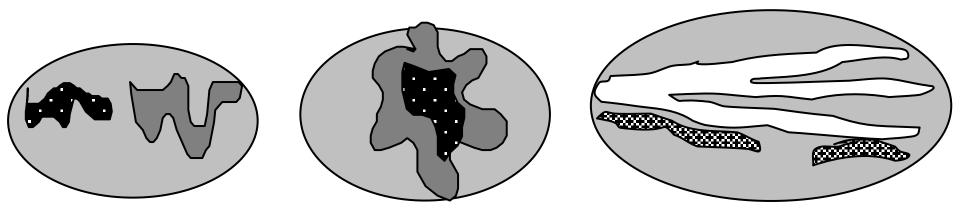
H 1.4. Interspersion of habitats

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



2

Wetland name or number D

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* _x_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)* ____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	7

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?

H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 0.00 % undisturbed habitat + [(% moderate and low intensity land uses) 12.35 /2] = 6.175 % 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:* 9.17 % undisturbed habitat + [(% moderate and low intensity land uses) 33.73 /2] = 26.0349999999999 % 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	1
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	-2
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** _X_**< 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 x 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	2

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

Wetland name or number D

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.

— **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*).

X **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.

X **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 D

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes –Go to **SC 1.1** ☒No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐Yes = **Category I** ☐No - Go to **SC 1.2**	
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**	
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**	
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**	

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**	
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**	
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**	
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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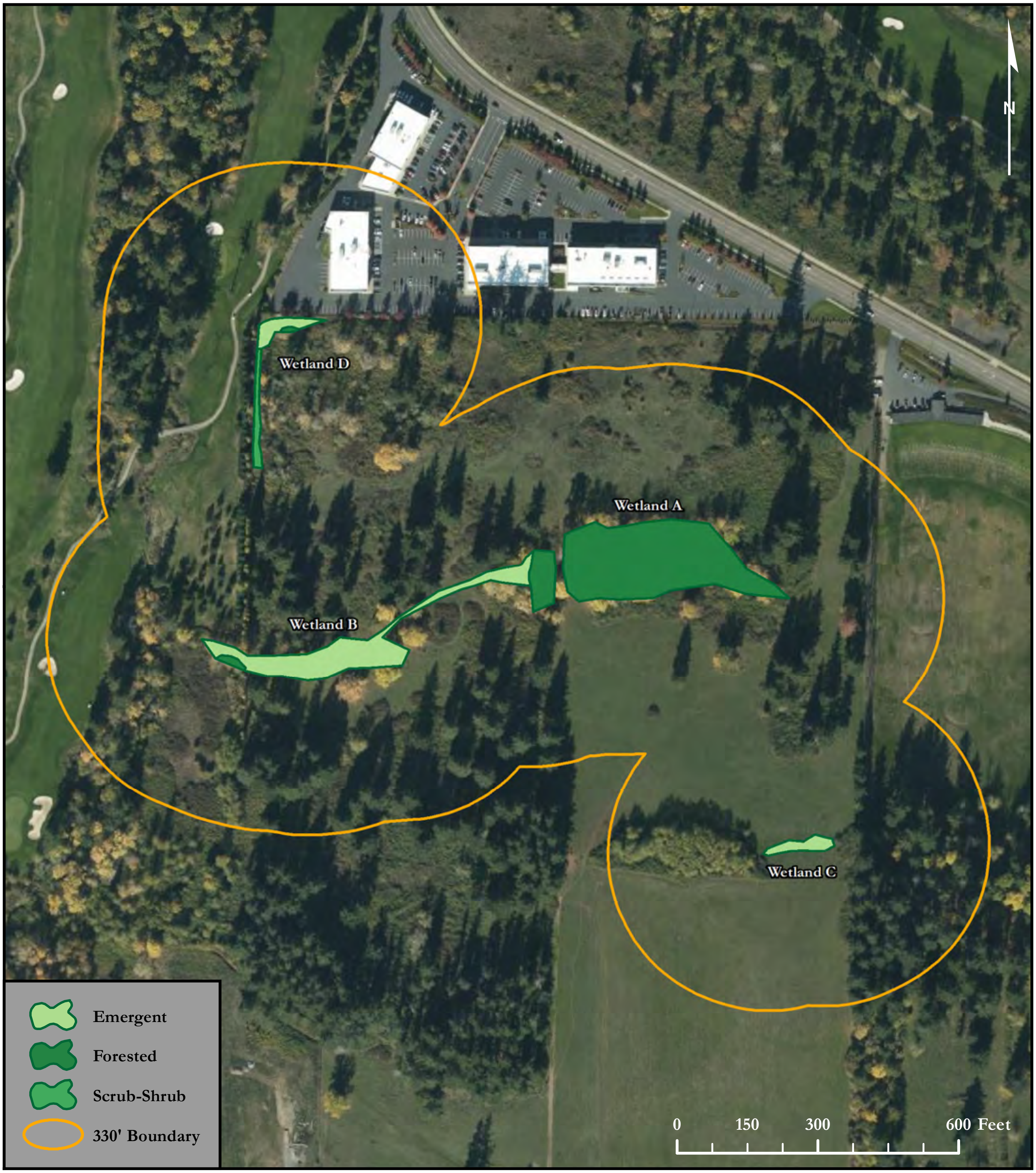
Appendix F — Wetland Rating Maps

CAMAS BUSINESS CENTER - COWARDIN MAP



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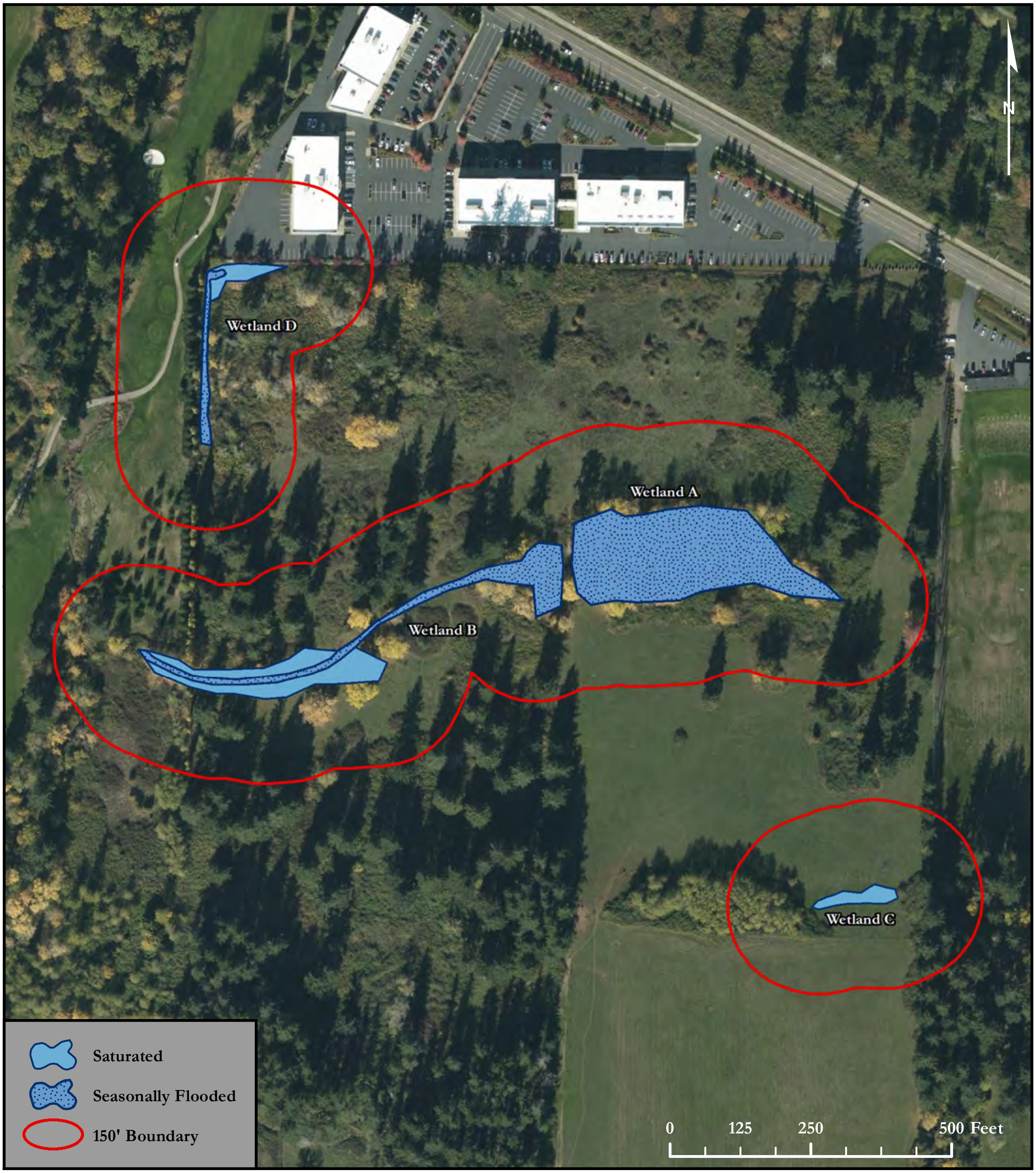
www.soundviewconsultants.com

CAMAS BUSINESS CENTER
4707 & 4723 NW LAKE ROAD CAMAS, WA 98607

CLARK COUNTY PARCEL NUMBERS: 176155000 and 176170000

DATE:	8/16/2021
JOB:	1144.0027
BY:	DDS
SCALE:	1 " = 300 '
FIGURE NO.	1 of 5

CAMAS BUSINESS CENTER - HYDROPERIOD MAP



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CAMAS BUSINESS CENTER

4707 & 4723 NW LAKE ROAD CAMAS, WA 98607

CLARK COUNTY PARCEL NUMBERS: 176155000 and 176170000

DATE: 8/16/2021

JOB: 1144.0027

BY: DDS

SCALE: 1 " = 250 '

FIGURE NO. 2 of 5

CAMAS BUSINESS CENTER - CONTRIBUTING BASIN MAP

D.4.0		
D.4.3		
	Area of Contributing Basin (SF)	1,852,722
	Area of Wetland A (SF)	57,197
	Percent of Wetland A within Contributing Basin	**3.087%**
D.5.0		
D.5.3		
	Area of Contributing Basin	1,852,722
	Area of Intensive Human Land Uses	104,292
	Percent of Intensive Human Land Use within Contributing Basin	**6%**

D.4.0		
D.4.3		
	Area of Contributing Basin (SF)	488,807
	Area of Wetland D (SF)	7,089
	Percent of Wetland D within Contributing Basin	**1.450%**
D.5.0		
D.5.3		
	Area of Contributing Basin	488,807
	Area of Intensive Human Land Uses	53,728
	Percent of Intensive Human Land Use within Contributing Basin	**11%**

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CAMAS BUSINESS CENTER

4707 & 4723 NW LAKE ROAD CAMAS, WA 98607

CLARK COUNTY PARCEL NUMBERS: 176155000 and 176170000

DATE: 8/16/2021

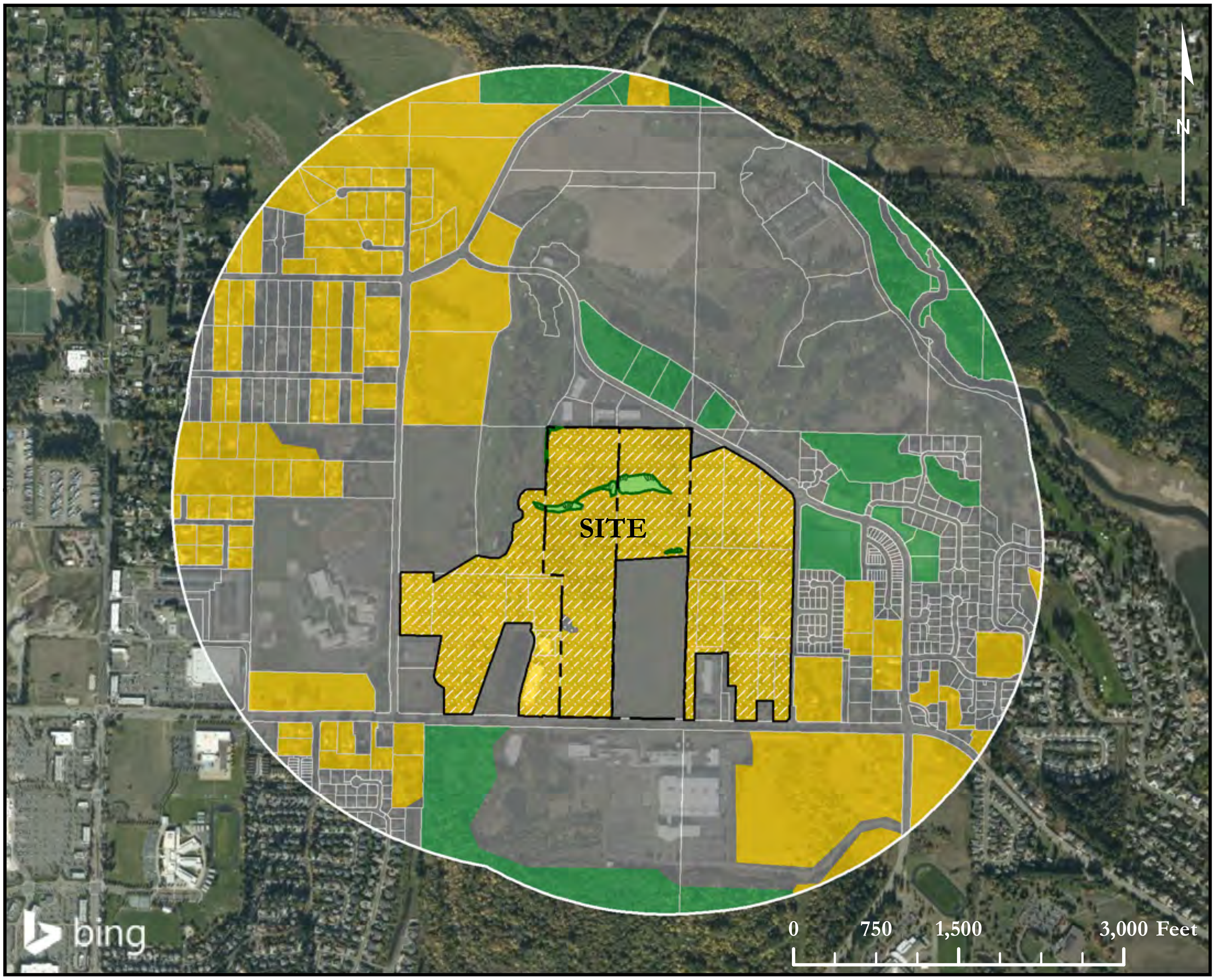
JOB: 1144.0027

BY: DDS

SCALE: 1 " = 450 '

FIGURE NO. 3 of 5

CAMAS BUSINESS CENTER - HABITAT MAP



H.2.0 Wetland A		
H.2.1		
	Abutting Undisturbed Habitat	0.00%
	Abutting Moderate & Low Intensity Land Uses	12.35%
	Accessible Habitat	**6.18%**
H.2.2		
	Undisturbed Habitat	9.17%
	Moderate & Low Intensity Land Uses	33.73%
	Undisturbed Habitat in 1 KM Polygon	**26.03%**
H.2.3		
	High Intensity Land Use in 1 KM Polygon	**57.10%**

1 KM Polygon
Accessible Habitat
High Intensity
Moderate & Low Intensity
Undisturbed Habitat

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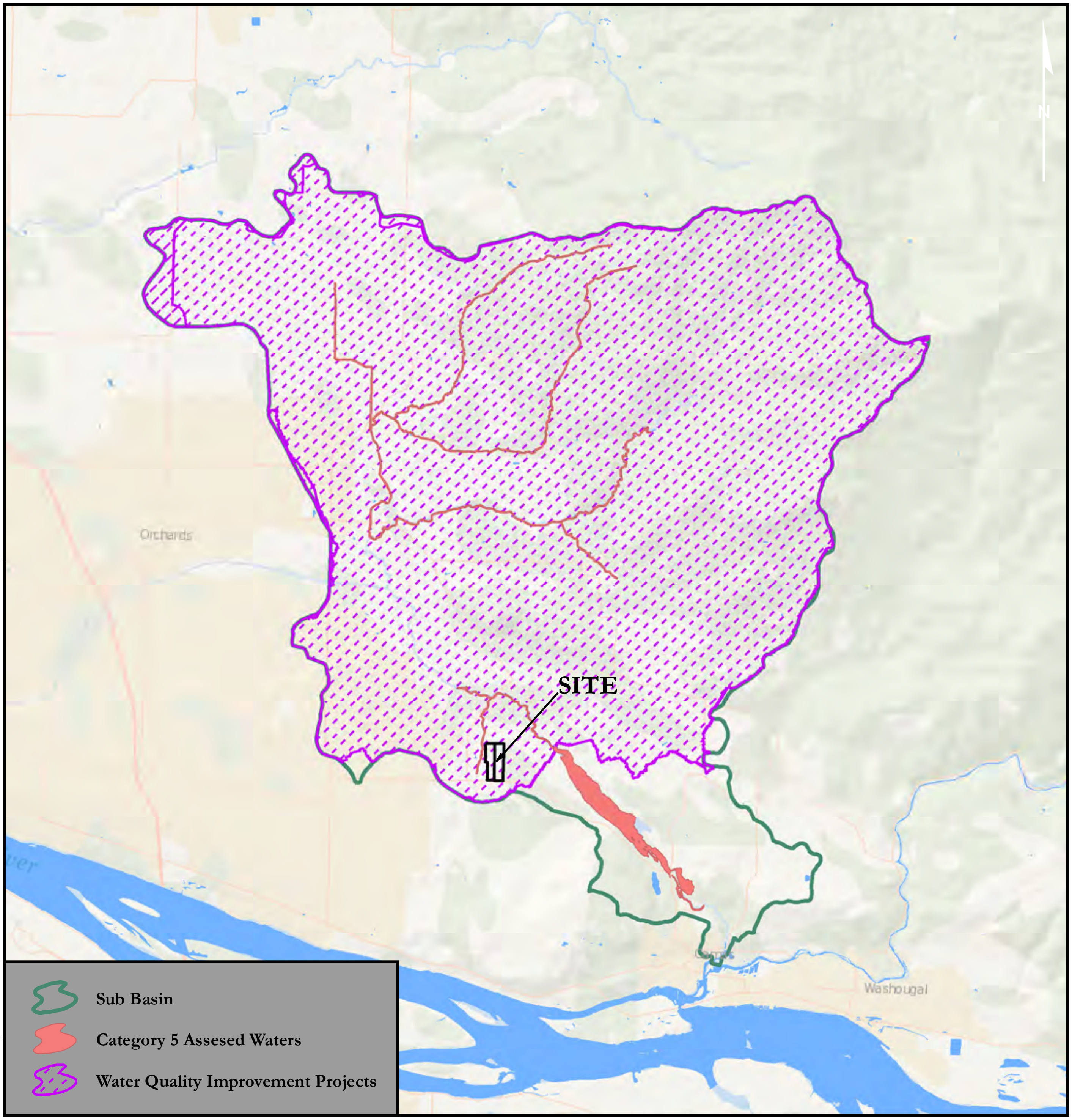
JOB: 1144.0027
BY: DDS
SCALE: 1 " = 1,500 '
FIGURE NO. 4 of 5

CAMAS BUSINESS CENTER CENTER - 303D MAP



Name	Pollutants	TMDL ID	WRIA	Year Approved
Salmon Creek Bacteria and Turbidity TMDL	Bacteria, Turbidity	33	28	2001
Salmon Creek Watershed Temperature TMDL	Temperature	123	28	2011

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BY: DDS

SCALE: 1 " = 2 mi

FIGURE NO. 5 of 5

Appendix G – Qualifications

All field inspections, wetland determinations, habitat assessments, and supporting documentation, including this ***Wetland and Fish and Wildlife Habitat Assessment Report*** prepared for the ***Camas Commerce Center*** property were prepared by, or under the direction of, Matt DeCaro of SVC. In addition, the site investigations were performed by Rachael Hyland and Jake Layman, and report preparation was completed by Casey Lanier and Kelly Kramer

Matt DeCaro

Associate Principal
Professional Experience: 13 years

Matt DeCaro is an Associate Principal and Senior Scientist with a diverse background in environmental planning, wetland science, stream ecology, water quality, site remediation, NEPA compliance, and project management. He manages a wide range of industrial, commercial, and multi-family residential projects throughout Western Washington, providing environmental permitting and regulatory compliance assistance for land use projects from their planning stages through entitlement and construction. His local expertise, diverse professional background, and positive relationships with regulatory personnel are integral components of his successful project outcomes.

Matt earned a Bachelor of Science degree with a focus in Environmental Science from the Evergreen State College in Olympia, Washington, with additional graduate-level coursework and research in aquatic restoration and salmonid ecology. Matt has received 40-hour wetland delineation training (*Western Mountains, Valleys, & Coast and Arid West Regional Supplements*) and regularly performs wetland, stream, and shoreline delineations. Matt has been formally trained in the use of the *2014 Washington State Wetland Rating System* and *Determination of Ordinary High Water Mark* by WSDOE, and he is a Pierce County Qualified Wetland Specialist and Wildlife Biologist. He has attended USFWS survey workshops for multiple threatened and endangered species, and he is a Senior Author of WSDOT Biological Assessments. Matt holds 40-hour HAZWOPER training and has managed Phase I Environmental Site Assessments, subsurface investigations, and contaminant remediation projects throughout the Pacific Northwest. His diverse experience also includes NEPA compliance for federal permitting projects; noxious weed abatement; army ant research in the Costa Rican tropical rainforest; spotted owl surveys on federal and private lands; and salmonid spawning and migration surveys.

Jake Layman

Environmental Scientist
Professional Experience: 12+ years

Jake Layman is an Environmental Scientist with a varied background in fisheries, wildlife, and aquatic invertebrate biology and stream and lake ecology. Jakes's expertise includes endangered species monitoring, lake limnology assessments, water chemistry profiles, off-channel habitat characterization, laboratory management, and terrestrial and aquatic amphibian identification with associated habitat assessments. Jake also has experience in fish population assessments, stream typing, spawning escapement, environmental disaster recovery, and amphibian toxicology research. Jake has over 10 years of experience at the federal and state levels conducting ecological monitoring surveys throughout Eastern and Western Washington. He worked with the National Park Service to conduct environmental compliance monitoring on park construction projects, infrastructure maintenance projects, and federal highways projects. This position also included environmental spill response, fish exclusion surveys in support of construction, and effectiveness monitoring on Engineered Log Jam (ELJ) projects. Jake has worked with the Washington Department of Fish and Wildlife (WDFW) to assess and inventory fish passage barriers and monitor culvert removal projects throughout Western Washington. While working for WDFW, Jake managed the daily operation for the intensive habitat study, on off-channel wetlands, for the Chehalis Aquatic Resources Protection Plan (ASRP).

Jake earned bachelor's degrees in both Biology, with an Ecology specialization, and Geography, with a Natural Resource Management specialization, from Central Washington University. In addition, Jake has a Minor in Environmental Studies and a Certificate in Geographic Information Systems (GIS) and Cartography form Central Washington University. Jake has received a 40-hour wetland delineation training (Western Mtns, Valleys, & Coast and Arid West Regional Supplement) and training from the Washington State Department of Ecology in Environmental Negotiations; Navigating SEPA; Conducting Forage Fish Surveys; Puget Sound Coastal Processes, Shoreline Modifications, and Beach Restoration; Using the Marine Shoreline Design Guidelines for Marine Shoreline Stabilization; How to Determine the Ordinary High Water Mark; and Using the Revised Washington State Wetland Rating System (2014) in Western Washington.

Rachael Hyland

Environmental Scientist & Certified Ecologist
Professional Experience: 7 years

Rachael Hyland is a Wetland Professional in Training (WPIT) through the Society of Wetland Scientists and a Certified Ecologist through the Ecological Society of America. Rachael has a background in wetland and ecological habitat assessments in various states, most notably Washington, Connecticut, Massachusetts, Rhode Island, and Ohio. She has experience in assessing tidal, stream, and wetland systems, reporting on biological evaluations, permitting, and site assessments. She also has extensive knowledge of bats and white nose syndrome (*Pseudogymnoascus destructans*), a fungal disease affecting bats which was recently documented in Washington.

Rachael earned a Bachelor of Science degree in Ecology and Evolutionary Biology from the University of Connecticut, with additional ecology studies at the graduate level. Rachael has completed 40-hour wetland delineation training for Western Mountains, Valleys, & Coast and Arid West Regional Supplement, in addition to formal training for the Northcentral and Northeast supplement, and experience with the Eastern Mountains and Piedmont and Atlantic and Gulf Coast supplements. She has also received formal training from the Washington State Department of Ecology in the Using the Revised 2014 Wetland Rating System for Western Washington, How to Determine the Ordinary High Water Mark, Navigating SEPA, and Selecting Wetland Mitigation Sites Using a Watershed Approach. Rachael has also received training from the Washington State Department of Transportation in Biological Assessment Preparation for Transportation Projects and is listed by WSDOT as a junior author for preparing Biological Assessments.