Soundview Consultants LLC
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Technical Memorandum

To: **Greg Helle, Ash Development** **File Number: 2544.0001**

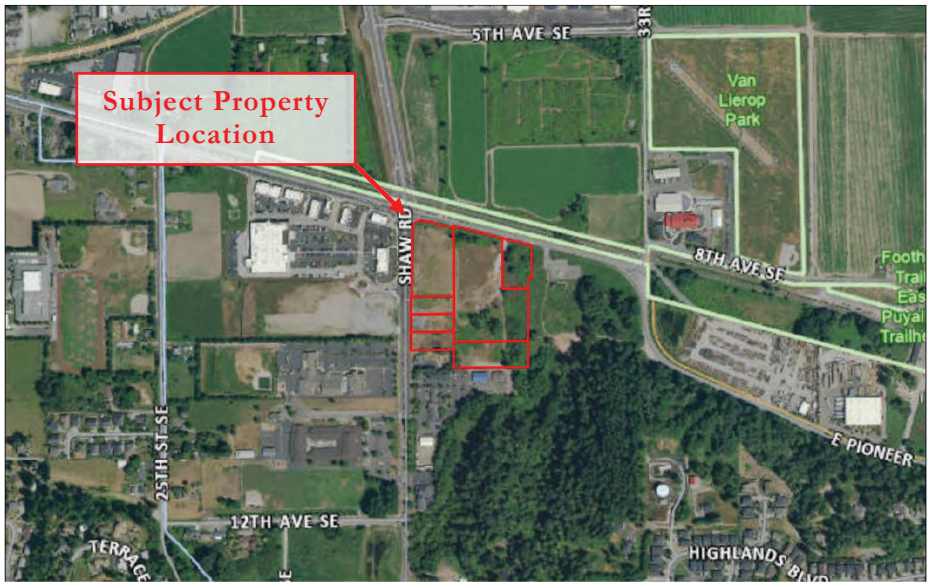
From: Alex Murphy, Soundview Consultants LLC **Date: April 13, 2023**

Re: Offsite Wetland Assessment
2902, 13102, and 3104 East Pioneer Avenue and 813, 901, and 911 Shaw Road East, Puyallup, Washington 98374

Mr. Helle,

Soundview Consultants LLC (SVC) conducted a wetland assessment along the eastern boundary of an approximately 10.93-acre site located at 2902, 13102, and 3104 East Pioneer Avenue and 813, 901, and 911 Shaw Road East in the City of Puyallup, Washington (Figure 1). The site consists of seven parcels located in the in the Southeast ¼ of Section 26 and the Northeast ¼ of Section 35, Township 20 North, Range 04 East, W.M. (Pierce County Tax Parcel Numbers 0420264021, 0420264053, 0420264054, 0420351030, 0420351029, 0420351026 and 0420351066). This assessment was conducted to support mixed-use development of the subject property. SVC investigated areas along the eastern boundary of the subject property to determine whether potentially regulated wetlands are present.

Figure 1. Subject Property Location.



Background Data

Prior to the site investigation, SVC staff conducted background research using Pierce County and City of Puyallup Geographic Information System (GIS) data, Washington Department of Fish and Wildlife Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) mapping tools, WDFW and Northwest Indian Fisheries Commission (NWIFC) Statewide Washington Integrated Fish Distribution (SWIFD) database, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), Washington Department of Natural Resources (DNR) stream typing map, and Natural Resource Conservation Service (NRCS) soil survey. Onsite determinations were made using observable vegetation, hydrology, and soils in conjunction with the sources listed above, U.S. Geological Survey (USGS) topographic maps, local precipitation data, and various orthophotographic resources.

The City of Puyallup Stream and Wetland Inventory Map (Attachment A1) identifies two potential wetlands in the northwest corner and in the central portion of the subject property. One stream is also identified by the City of Puyallup map as originating in the southeast corner of the subject property and extending offsite to the south. The USFWS NWI Map (Attachment A2) and the WDFW PHS Map (Attachment A3) also identify one potential wetland in the southeast corner of the subject property that extends offsite to the south. No other potential wetlands are identified by the Pierce County Stream & Wetland Inventory Map (Attachment A4) or the DNR Rare Plant and Wetland Inventory Map (Attachment A5). In addition, no fish and wildlife habitat conservation areas are documented in the subject property. The WDFW & NWIFC SWIFD Map (Attachment A6) and DNR Stream Typing Map (Attachment A7) do not identify any streams, salmonid presence, or other priority habitat or species on the site. No other wetlands, streams, or fish and wildlife habitat conservation areas are documented within 300 feet of the subject property.

The NRCS Soil Survey Map (Attachment A8) identifies two soil series on the subject property: Puyallup fine sandy loam (31A) and Briscot loam (6A). Puyallup fine sandy loam is a non-hydric soil; however, up to 2 percent of the soil map unit contains inclusions of the hydric Briscot undrained soil. Briscot loam, 6A, is considered a hydric soil in Pierce County (NRCS, N.d.). However, hydric soils are common in valley floors associated with historical floodplains, such as in the Puyallup area. Briscot loam is noted as occurring on floodplains, per the NRCS list of hydric soils for the Pierce County Area. Small 100-year floodplain areas are present along the mapped streams on the eastern and northern property boundaries (Attachment A9).

Previous Wetland and Fish and Wildlife Habitat Assessments

The subject property was previously investigated by John Comis Associates, LLC in 2008 and 2009 for the presence of potentially regulated wetlands, waterbodies, and fish and wildlife habitat conservation areas, with follow-up investigations in 2020 to verify initial findings. More recently, Habitat Technologies investigated the site in 2021 and again in 2022. Using current methodology, John Comis Associates (2020) and Habitat Technologies (2021) confirmed the absence of onsite wetlands. However, Habitat Technologies identified two streams on the eastern and northern portions of the site and one potential wetland offsite to the east of the site. The potential offsite wetland to the east was vegetated with very dense reed canarygrass (*Phalaris arundinacea*) intermixed with blackberries (*Rubus* spp.). Habitat Technologies did not identify any wetland hydrology indicators during July through early November 2022 site investigations; additional assessments to document hydrology conditions were recommended to determine whether the area met wetland criteria. The east stream (herein referred to as Stream Y) is classified as a Type IV water, and the north stream (herein referred to as Stream Z) is classified as a Type III water per Puyallup Municipal Code (PMC)

21.06.1010(3)(a). Type III streams are subject to a standard 50-foot buffer, and Type IV streams are subject to a standard 35-foot buffer per PMC 21.06.1050(2). The potential wetland identified offsite to the east was preliminarily classified as a Category III wetland with an associated 80-foot buffer under PMC 21.06.930(2) (Habitat Technologies, 2022). In addition, John Comis Associates identified and delineated one wetland (previously Wetland A, herein referred to as Wetland 1) offsite to the south, as previously delineated by Herrera Environmental Consultants in 2000. Wetland 1 was classified as a Category II wetland subject to a standard 100-foot buffer per PMC 21.06.930(2) (Comis, 2020).

Methods

An investigation of areas along the subject property's eastern boundary, including the potential wetland area identified by Habitat Technologies, was performed during the winter of 2023 by qualified SVC staff. The investigation consisted of a walk-through survey and data collection to identify potentially regulated wetlands.

Wetlands are regulated features per Puyallup Municipal Code (PMC) Chapter 21.06 (Critical Areas) and subject to restricted uses/activities under the same title. Wetland presence/absence was determined in accordance with PMC 21.06.910(1) and outlined 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). Pink surveyor's flagging was labeled alpha-numerically and tied to 3-foot lath or vegetation at formal sampling locations to mark the points where detailed data was collected (DP-1 to DP-4). Additional test pits were excavated at regular intervals throughout the investigation area to further confirm wetland presence/absence. A total of four formal data plots were collected throughout the site, documenting the absence of wetland criteria (Attachments C and D).

Precipitation

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

Table 1. Precipitation Summary[1].

Site Visit 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[3]
02/24/2023	0.00	trace	0.58	0.94	2.08/4.46	20.49/24.96	47/82

1. Precipitation volume provided in inches. Data obtained from NOAA (http://w2.weather.gov/climate/xmacis.php?wfo=sew) for Sea-Tac Airport.
2. Year-to-date precipitation is for the water year from October 1 to the onsite date.
3. Percent of normal shown is for the prior 30 days/year.

Precipitation levels during the February 2023 site visit were lower than the statistical normal for the prior 30 days (47 percent of normal) and within the normal range for the 2022/2023 water year (82 percent of normal). Overall, this data suggests that hydrologic conditions encountered during the time of the site investigation may have been slightly drier than normal. Such conditions were considered in making professional wetland determinations.

Results

The 10.93-acre subject property is located in an area of mixed land use (residential, agricultural, industrial, and commercial) within the City of Puyallup. The topography on the site is generally flat at an elevation of approximately 60 feet above mean sea level (Attachment A10). Based on a review of historical aerial imagery, the subject property and portions of the adjacent parcels to the east were under agricultural use for several decades following 1940. Historical aerial imagery indicates the lack of agricultural activity onsite since 2006 following clearing and grading. Since at least 2002, active agricultural use of the offsite areas to the east appears to have ceased, and the prior fields appear to have revegetated. The offsite investigation area is dominated by non-native, invasive reed canarygrass (*Phalaris arundinacea*) surrounded by Himalayan blackberry (*Rubus armeniacus*) and Scotch broom *(Cytisus scoparius*). Patches of black cottonwood (*Populus balsamifera*) and red alder (*Alnus rubra*) are scattered along Stream Y. The ditched, historic channel of Stream Y runs along the subject property's eastern boundary; Stream Y is currently diverted into an onsite stormwater pond and piped beneath the subject property prior to discharging into Stream Z along the northern property boundary. The historic channel of Stream Y is adjacent to a large, offsite depressional swale identified as a potential wetland by Habitat Technologies (Habitat Technologies, 2022).

No potentially regulated wetlands were identified during the offsite investigation. Formal data plots were collected at four locations in the historic Stream Y channel and the large depressional swale to document the absence of wetlands. Photographs of each data plot and site conditions are included in Attachment B. None of the data plots met for all three required wetland criteria (i.e., vegetation, soils, and hydrology) according to current wetland delineation methodology. All data plots exhibited hydrophytic vegetation; however, only one data plot (DP-2) within the historic Stream Y channel exhibited hydric soils. All data plots were excavated to a depth of at least 18 inches and left open for a minimum of 2 hours to allow adequate time for the groundwater table to equilibrate. However, no water tables were observed in any data plots. No other indicators of primary wetland hydrology were observed. Due to the lack of wetland hydrology indicators, and the lack of hydric soil indicators in three out of the four formal data plots, no wetlands were observed.

The soils in the large swale (DP-3 and DP-4) did not meet any hydric soil indicators due to the lack of depleted layers, redox concentrations, and/or dark surface layers at depths required for hydric soil indicators. One of the two data plots (DP-1) collected in the historic Stream Y channel also did not meet hydric soil indicators, lacking a depleted matrix.

The existing vegetation onsite is not diagnostic of wetland conditions. The four data plots exhibited hydrophytic vegetation due to the presence of invasive, non-native reed canarygrass (*Phalaris arundinacea*). Reed canarygrass is an aggressive perennial grass that often invades sites after a disturbance. This grass is known to being present in roadside ditches and highly disturbed areas, such as old agricultural fields. It grows quickly in positive nutrient inputs environments, especially in nonpoint agricultural runoff. The presence of reed canarygrass is consistent with the prior agricultural use of the offsite investigation area and subsequent revegetation.

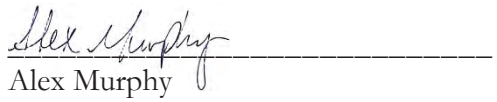
Conclusions

SVC conducted a comprehensive investigation of offsite areas adjacent to the subject property's eastern boundary, including the potential wetland previously identified by Habitat Technologies. The investigation included the collection of four formal data plots during the wet season. While the offsite investigation area was dominated by hydrophytic vegetation, no wetland hydrology was observed, and

the area did not meet all three criteria required for a positive wetland determination. No additional wetland encumbrances should therefore be present along the subject property's eastern boundary.

If you have any further questions, please contact me at your earliest convenience.

Sincerely,



Alex Murphy
Planner and Project Manager

April 13, 2023
Date

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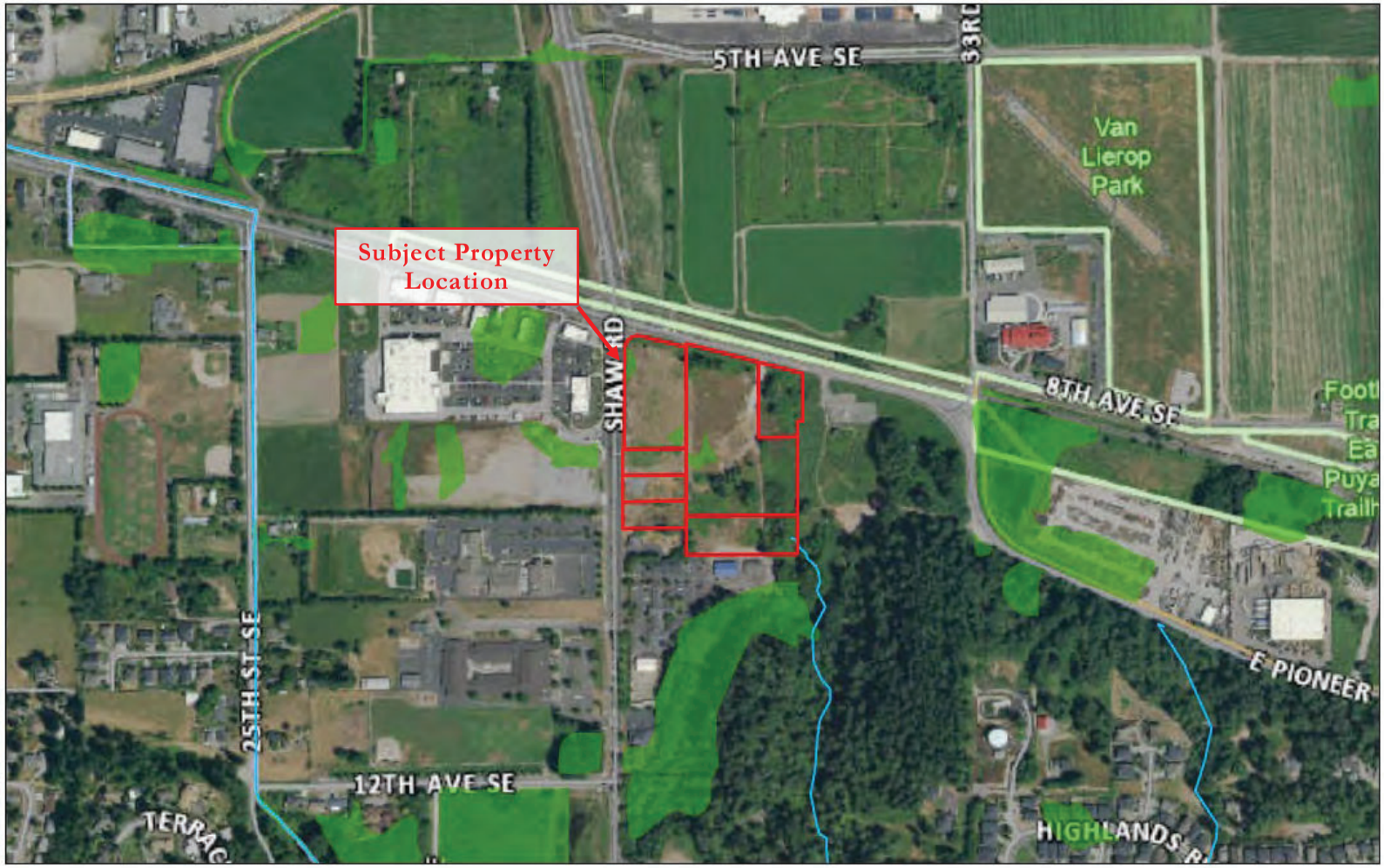
Zulauf, A.S. 1979. *Soil Survey of Pierce County, Washington.* United States Department of Agriculture, Soil Conservation Service in cooperation with Washington State Department of Natural Resources, and Washington State University, Agriculture Research Center. Washington, D.C.

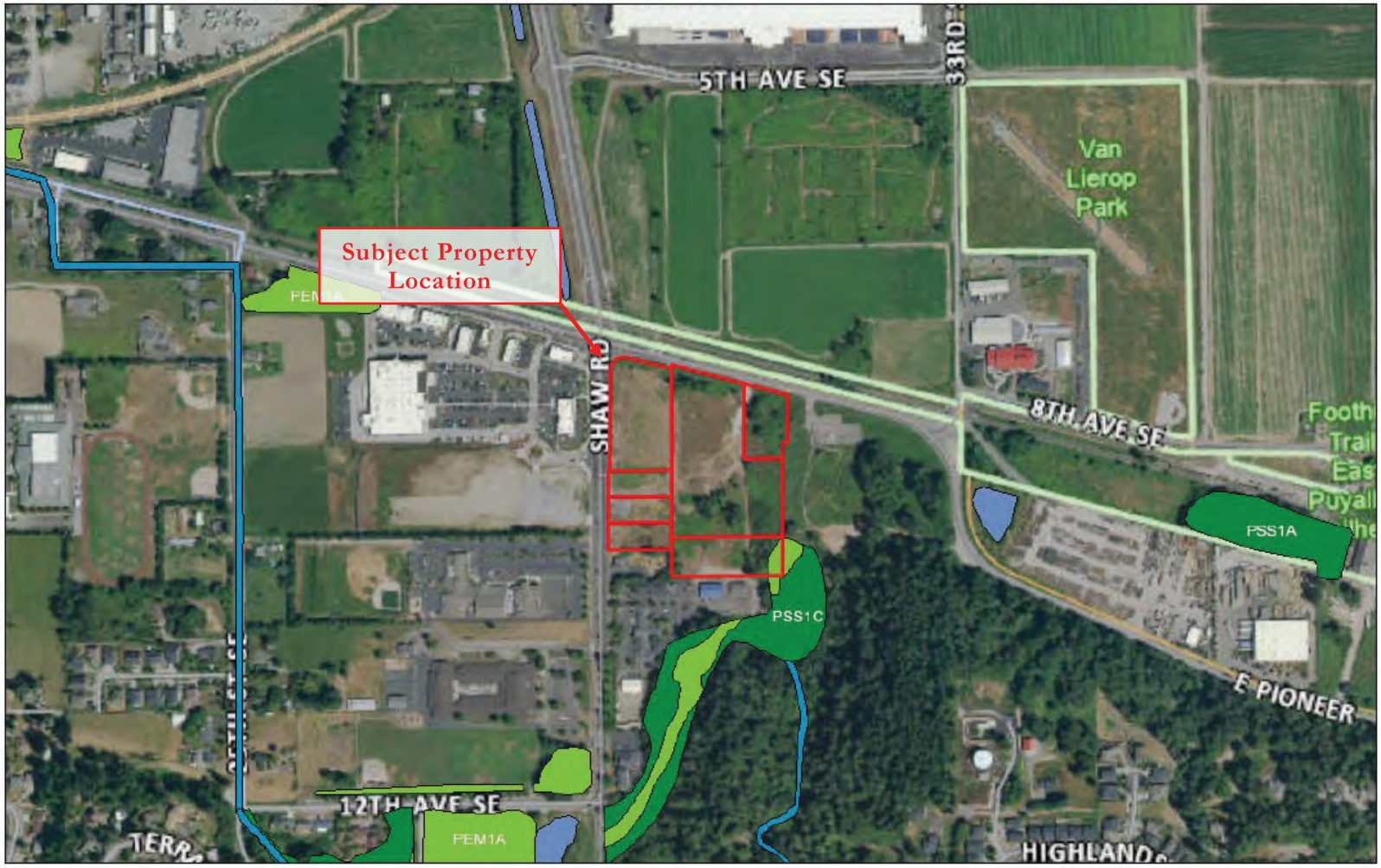
Attachment A – Background Information

This attachment includes a City of Puyallup Stream and Wetland inventory Map (A1); USFWS NWI Map (Attachment A2); WDFW PHS Map (Attachment A3); Pierce County Stream and Wetland Inventory Map (Attachment A4); DNR Rare Plant and Wetland Inventory Map (Attachment A5); WDFW & NWIFC SWIFD Map (Attachment A6); DNR stream typing Map (Attachment A7); NRCS soil survey Map (Attachment A8); FEMA Floodplain Map (A9); Topographic Map (Attachment A10).

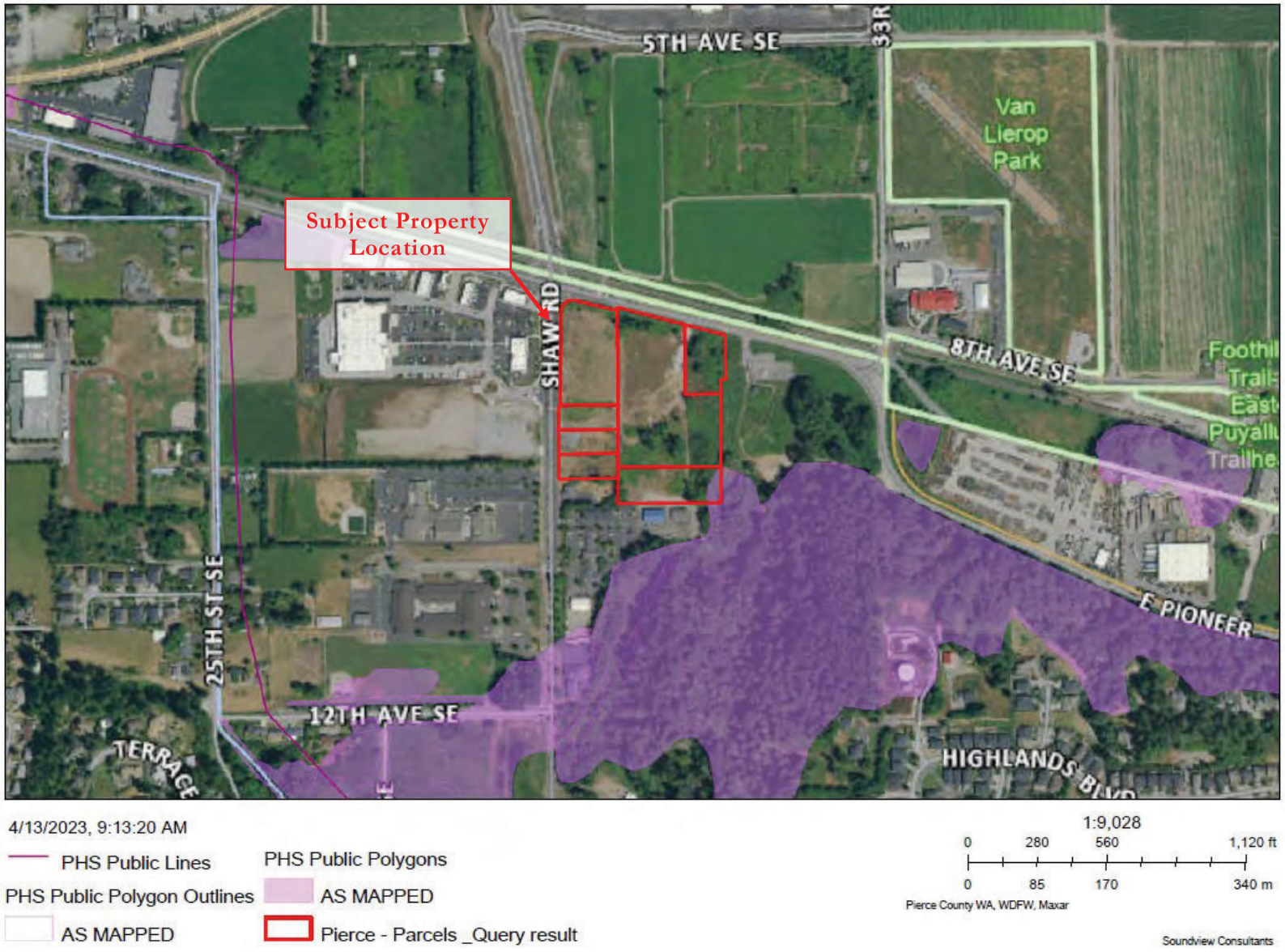
Attachment A1 – City of Puyallup Stream and Wetland Inventory Map



Attachment A2 – USFWS NWI Map



Attachment A3 – WDFW PHS Map and Report



PHS Species/Habitats Overview:

Occurence Name	Federal Status	State Status	Sensitive Location
Biodiversity Areas And Corridor	N/A	N/A	No
Freshwater Emergent Wetland	N/A	N/A	No
Freshwater Forested/Shrub Wetland	N/A	N/A	No

PHS Species/Habitats Details:

Biodiversity Areas And Corridor	
Priority Area	Terrestrial Habitat
Site Name	CARBON RIVER OPEN SPACE
Accuracy	1/4 mile (Quarter Section)
Notes	STEEP SLOPES ALONG THE VALLEY TERRACE COVERED WITH NATIVE MIXED FOREST.
Source Record	903848
Source Dataset	PHSREGION
Source Name	TED MULLER WDFW
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00023
Geometry Type	Polygons

Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1C
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

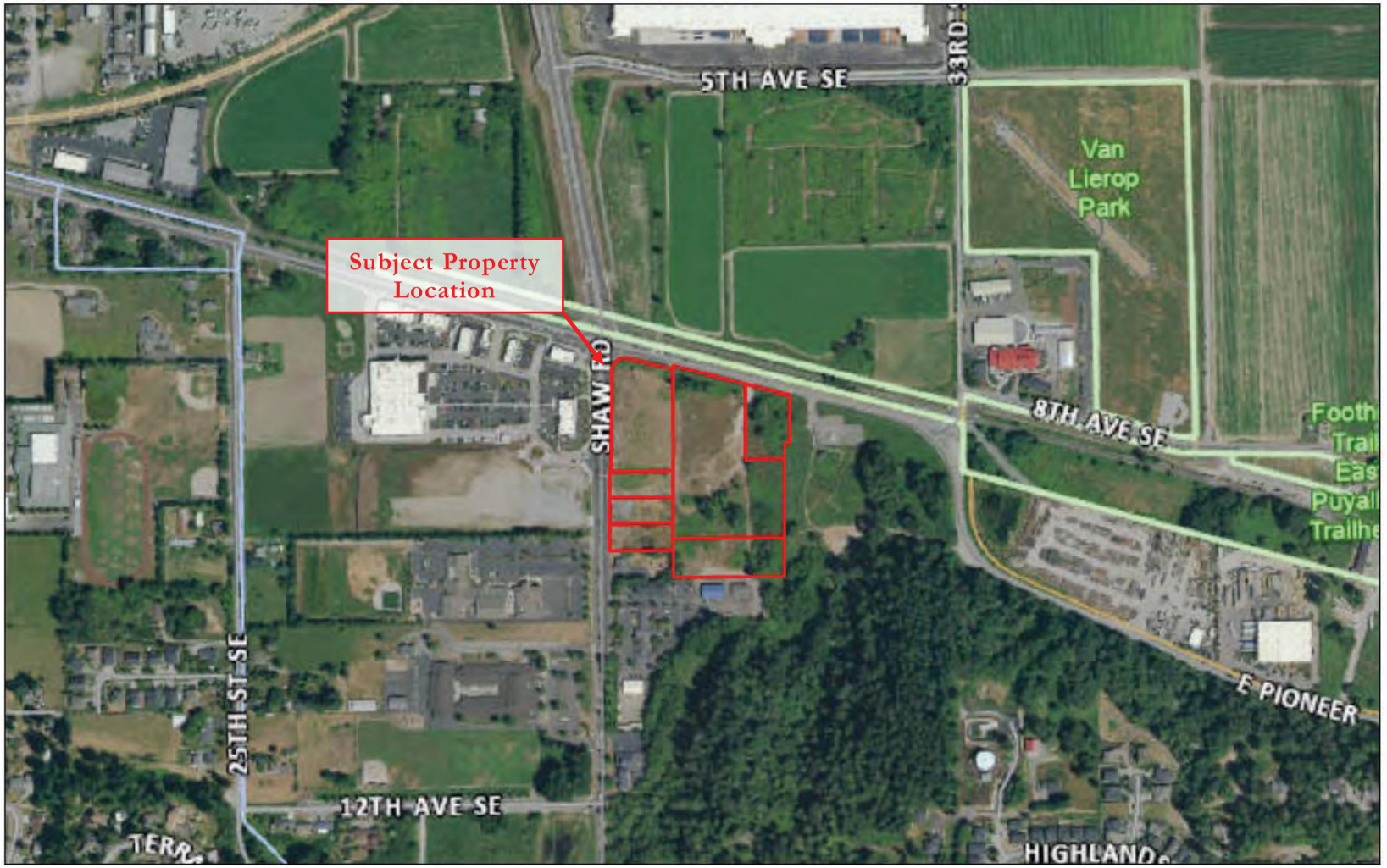
Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS 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

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSS1C
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

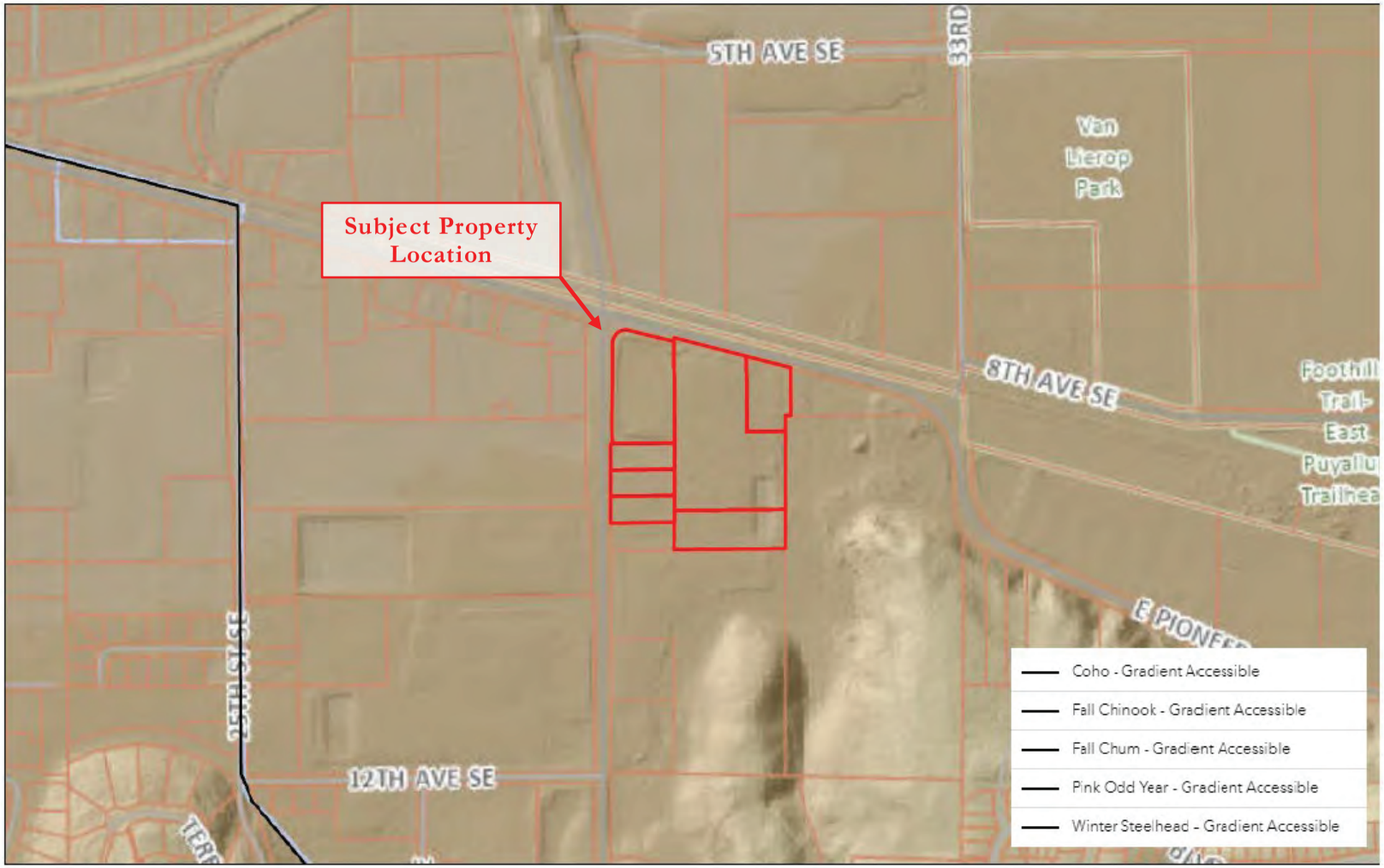
Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSS1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing 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

Attachment A4 –Pierce County Stream and Wetland Inventory Map

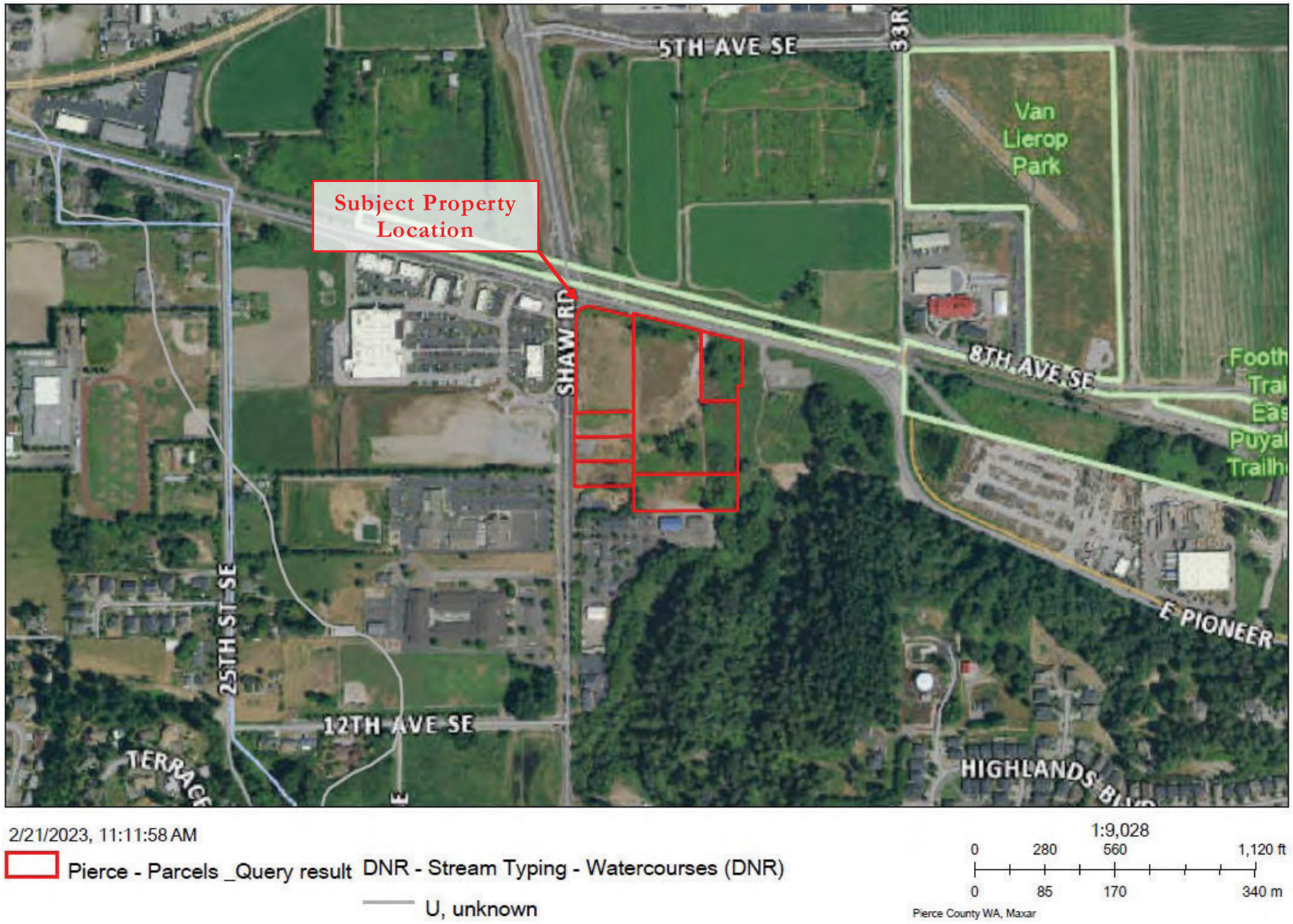
Attachment A5 – DNR Rare Plant and Wetland Inventory Map



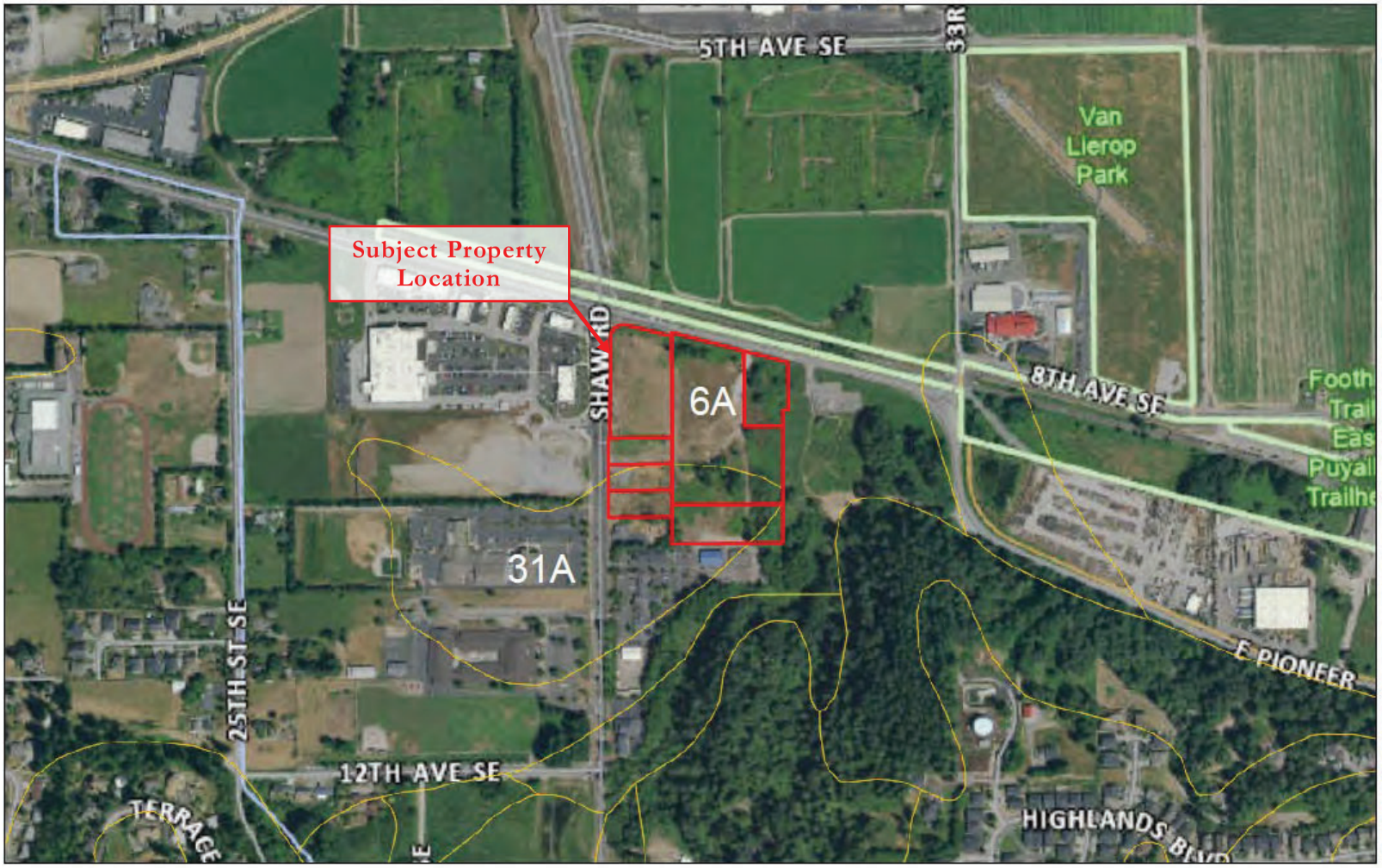
Attachment A6 – WDFW & NWIFC SWIFD Map



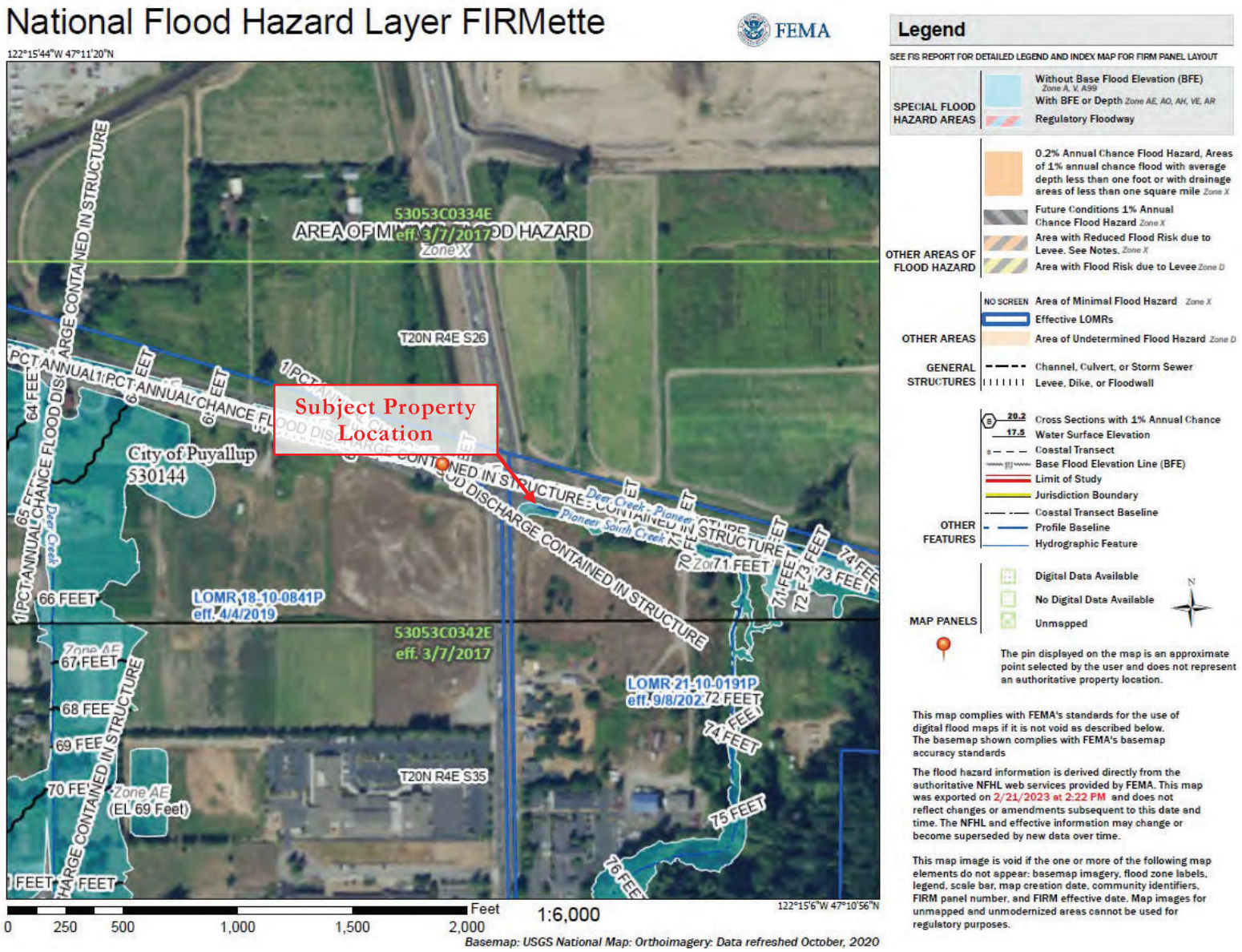
Attachment A7 – DNR Stream Typing Map



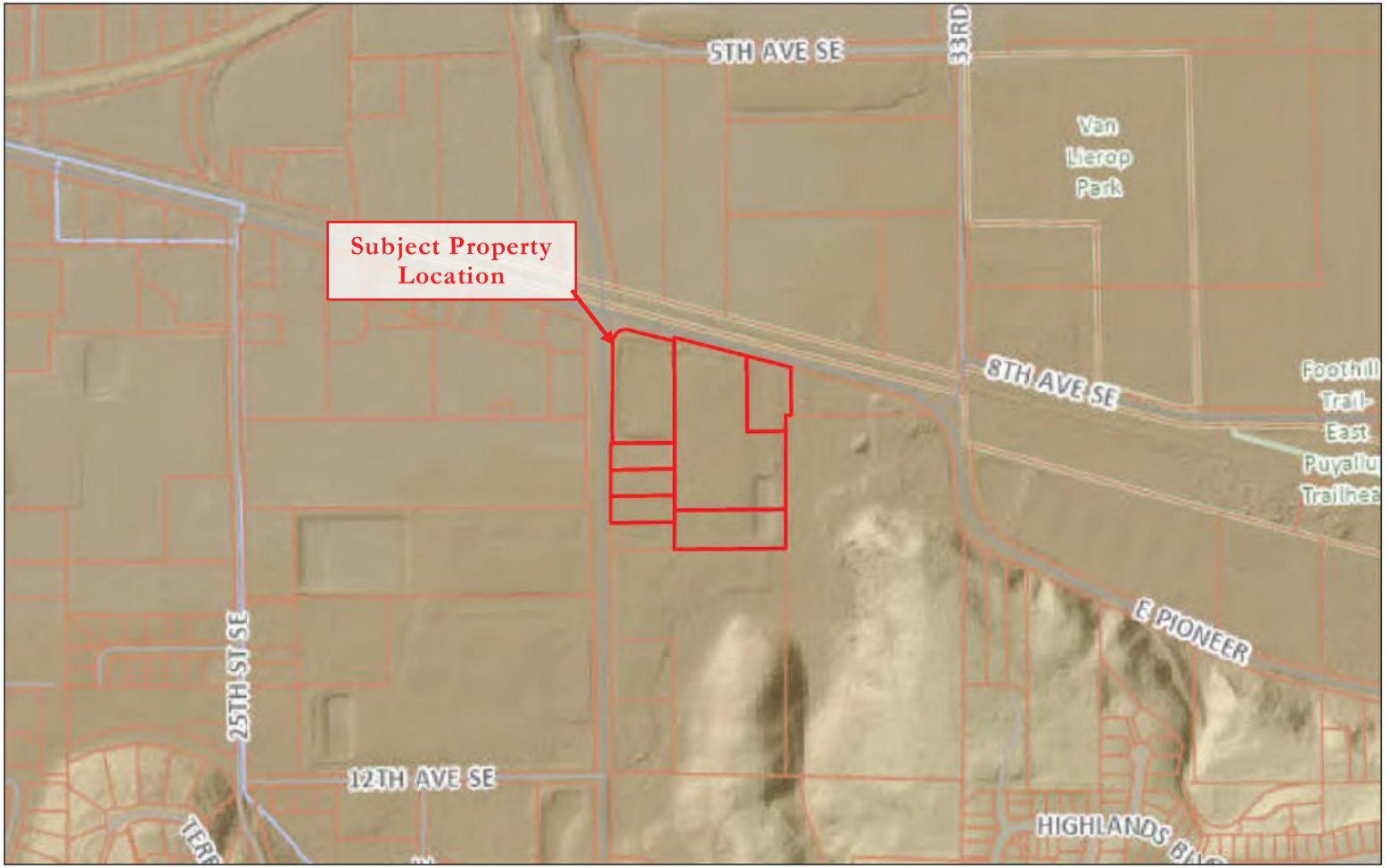
Attachment A8 – NRCS Soil Survey Map



Attachment A9 – FEMA Floodplain Map



Attachment A10 – Topographic Map



Attachment B – Site Photographs

DP-1 Soil

DP-1 Soil Pit

General View of DP-1

DP-2 Soil

DP-2 Soil Pit

General View of DP-2

DP-3 Soil

DP-2 Soil Pit

General View of DP-3

DP-4 Soil

DP-4 Soil Pit

General View of DP-4

Attachment C – Data Plot Exhibit

EXISTING CONDITIONS

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EAST TOWN CROSSING

2902 E PIONEER ROAD
PUYALLUP, WA 98374
PIERCE COUNTY PARCEL NUMBER:
0420264021, 0420264053, 0420264054,
0420351030, 0420351029, 0420351026
& 0420351066

DATE:	3/20/2023
JOB:	2544.0001
BY:	DLS
SCALE:	1 " = 120 '
FIGURE NO.	1

Attachment D – Non-Wetland Data Forms

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

Project/Site: 2544.0001 East Town Crossing City/County: Puyallup/Pierce Sampling Date: 2/24/2023

Applicant/Owner: Ash Development - Greg Helle State: WA Sampling Point: DP-1

Investigator(s): Casey Lanier, Ryan Krapp Section, Township, Range: SE/NE 26/35 20N, 4E

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

Subregion (LRR): A Lat: 47.183764 Long: -122.25347529 Datum: WGS-84

Soil Map Unit Name: Briscot loam - 6A 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 observed. Data plot located in historic ditched stream.

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: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 10 ft)			
1. Phalaris arundinacea	97	Yes	FACW
2. Equisetum arvense	2	No	FAC
3. Galium aparine	1	No	FACU
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: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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-1

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
0-9	10YR 2/2	100	-	-	-	-	SiLo	Silt Loam
9-15+	10YR 2/2	95	7.5YR 3/3	5	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:_____

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): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No wetland hydrology criteria met. Test pit excavated to a depth of 18 inches and left open for 2+ hours.

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

Project/Site: 2544.0001 East Town Crossing City/County: Puyallup/Pierce Sampling Date: 2/24/2023

Applicant/Owner: Ash Development - Greg Helle State: WA Sampling Point: DP-2

Investigator(s): Casey Lanier, Ryan Krapp Section, Township, Range: SE/NE 26/35 20N, 4E

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

Subregion (LRR): A Lat: 47.184273 Long: -122.25348544 Datum: WGS-84

Soil Map Unit Name: Briscot loam - 6A 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 ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks:
Not all three wetland criteria met. Data plot located within historic ditch.

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: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 10 ft)			
1. Phalaris arundinacea	100	Yes	FACW
2.			
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: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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-2

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 4/1	90	7.5YR 4/4	10	C	M	SiSaLo	Silt Sand Loam
12+	10YR 2/2	96	7.5YR 4/4	4	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:

Depth (inches):

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Hydric soil criteria met through indicator F3 (Depleted Matrix).

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

Wetland hydrology criteria not met. No hydrology observed to 20 inches. Test pit open 2+ hours.

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

Project/Site: 2544.0001 East Town Crossing City/County: Puyallup/Pierce Sampling Date: 2/24/2023

Applicant/Owner: Ash Development - Greg Helle State: WA Sampling Point: DP-3

Investigator(s): Casey Lanier, Ryan Krapp Section, Township, Range: SE/NE 26/35 20N, 4E

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

Subregion (LRR): A Lat: 47.183819 Long: -122.25329215 Datum: WGS-84

Soil Map Unit Name: Briscot loam - 6A 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 ☐ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks:
Not all three wetland criteria met. Only hydrophytic vegetation observed.

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: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 10 ft)			
1. Phalaris arundinacea	100	Yes	FACW
2.			
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: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 2/2	100	-	-	-	-	SiLo	Silt Loam
13-16	10YR 3/2	97	7.5YR 4/4	3	C	M	SaLo	Sand 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:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

Hydric soil criteria not 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): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

Wetland hydrology criteria not met. No hydrology observed to 18+ inches. Test pit open 2.5 hours.

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

Project/Site: 2544.0001 East Town Crossing City/County: Puyallup/Pierce Sampling Date: 2/24/2023

Applicant/Owner: Ash Development - Greg Helle State: WA Sampling Point: DP-4

Investigator(s): Casey Lanier, Ryan Krapp Section, Township, Range: SE/NE 26/35 20N, 4E

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

Subregion (LRR): A Lat: 47.184072 Long: -122.25329752 Datum: WGS-84

Soil Map Unit Name: Briscot loam - 6A 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 ☐ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks:
Not all three wetland criteria met. Only hydrophytic vegetation observed.

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: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 10 ft)			
1. Phalaris arundinacea	100	Yes	FACW
2.			
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: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (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-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100	-	-	-	-	SiLo	Silt Loam
10-13	10YR 2/2	99	7.5YR 4/4	1	C	M	SiLo	Silt Loam
13+	10YR 4/1	92	7.5YR 4/4	8	C	M	SaLo	Sand 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:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

Hydric soil criteria not met. Depleted layer started too deep.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

Wetland hydrology criteria not met. No hydrology observed to 18 inches. Test pit open for 2.5 hours.

Attachment E – Qualifications

All field inspections, jurisdictional wetland determinations, habitat assessments, and supporting documentation, including this ***Wetland Assessment Technical Memorandum*** prepared for the ***East Town Crossing Site***, were prepared by, or under the direction of, Alex Murphy of SVC. In addition, the site inspections were completed by Cassey Lanier and Ryan Krapp. Report preparation was completed by Carolina Lizana. Final quality assurance was performed by Laura Livingston.

Alex Murphy, AICP

Planner & Project Manager
Professional Experience: 7 years

Alex Murphy is a Planner and Project Manager with a background in land use planning, site planning & design, permitting, and project management. He has over 7 years of experience working for local jurisdictions in the Intermountain West and Pacific Northwest with an emphasis on maximizing opportunities for culturally and environmentally sensitive projects.

Alex earned a Bachelor of Landscape Architecture degree from Utah State University. He is a Certified Planner through the American Institute of Certified Planners and has received formal training in climate adaptation planning for coastal communities from NOAA. Mr. Murphy currently assists in wetland, stream, and shoreline delineations and fish and wildlife habitat assessments; conducts environmental code analysis; and prepares environmental assessment and mitigation reports. He also manages development projects, supporting clients through the regulatory and planning process for various land use proposals.

Ryan Krapp

Environmental Scientist / Field Lead
Professional Experience: 10+ years

Ryan Krapp is an Environmental Scientist and Field Lead with a background in conducting wetland delineations, habitat assessments, botanical surveys, avian surveys, threatened & endangered species surveys, and fisheries studies. He has considerable experience in production of Environmental Assessments and Biological Assessments and Evaluations under NEPA guidelines for projects regulated by the U.S. Forest Service, U.S. Army Corps of Engineers, and Bureau of Indian Affairs as well as leading Section 7 ESA consultation with the U.S. Fish and Wildlife Service. Project planning, permitting, and compliance are all part of his professional experiences and practices at SVC.

Ryan has managed environmental investigation projects including wetlands, streams, and critical habitats data collection on large pipeline corridors, overhead electrical transmission corridors, and oil/natural gas drilling development. He has extensive experience in utilizing GIS to collect, manage, and analyze large volumes of spatial and temporal field data to aide in project management, monitoring, analysis, and mapping. In addition, he is a FAA trained recreational pilot and a PADI certified SCUBA diver with fresh and saltwater diving experience. Ryan is a USFWS-approved Mazama pocket gopher survey biologist.

Casey Lanier

Environmental Scientist
Professional Experience: 10 years

Casey Lanier is an Environmental Scientist with a varied background in fisheries, habitat assessments, water quality monitoring, data telemetry and habitat restoration. He has over 10 years of experience within the private sector and county level conducting surface water investigations, anadromous fish passage surveys, long-term water quality monitoring, mitigation design, installation and monitoring. He has experience conducting presence absence surveys for migratory and nesting birds, environmental compliance monitoring on construction and infrastructure maintenance projects for county and public utilities. Casey been formally trained in using the Washington Department of Ecology Wetland Rating Manual. He has also received 40-hour wetland delineation training utilizing the US Army Corps of Engineers Wetland Delineation Manual (Western Mtns, Valleys, & Coast and Arid West Regional Supplement). He is also a Pierce County Qualified Wetland Specialist.

Casey earned a Bachelor of Science degree in Environmental Science, Technology, and Policy with a specialization in Hydrology and Watershed Systems from California State University, Monterey Bay. In addition, Casey also has a graduate-level course work in Fisheries and Wildlife Management from Oregon State University. During his time at Cal State Monterey Bay, he worked as a research assistant conducting in depth analysis of steelhead habitats investigating potential impacts of post-wildfire sediment yields and fish passage restoration feasibility studies. He currently assists in wetland, stream, and shoreline delineations and fish and wildlife habitat assessments; conducts environmental code analysis; and prepares environmental assessment and mitigation reports, biological evaluations. Casey also manages small, and single-family residence projects to support clients through the regulatory and planning process for various land use projects.

Carolina Lizana, MS, WPIT

Environmental Scientist
Professional Experience: 5 years

Carolina Lizana is a Wetland Scientist with a background in Natural Resources Engineering in Chile and Washington State. Carolina earned her Bachelor of Science degree in Engineering with Environmental specialization from Universidad De Chile. She successfully completed the Certificate in Wetland Science and Management from University of Washington. In addition, she has a Master of Science degree in Civil and Environmental Engineering at University of Washington, Seattle. In Chile, she worked in a research lab, studying restoration processes in an old growth forest region and socio-ecological factors. She has published research articles in local and international peer-reviewed journals, with a focus on landscape ecology.

Her education and experience have provided her with extensive knowledge on watershed ecology, remote sensing, GIS, water quality modeling, fluvial geomorphology and wetland monitoring. Currently, Carolina assists in wetland, stream and shoreline delineations and fish and wildlife habitat assessments; conducts environmental code analysis; and prepares environmental assessment and mitigation reports, biological evaluations, and permit applications. Carolina has been formally trained through the Washington State Department of Ecology, Coastal Training Program, Using the Washington State Wetland Rating System, and she is also a Wetland Professional In-Training (WPIT) through the Society of Wetland Scientists.

Laura Livingston

Senior Environmental Planner
Professional Experience: 9 years

Laura Livingston is an Environmental Planner with a background in water quality monitoring, invasive species monitoring, wildlife monitoring, wilderness stewardship, and erosion control projects. Laura has field experience working on natural resources projects, with an emphasis on stream and river projects, in the Northwest, Northeast, and Southwest United States. She has also worked on a variety of environmental science research, grant, and teaching projects requiring scientific writing, science communication, laboratory work, and statistical analysis. She currently performs ordinary high water delineations; conducts environmental code analysis; and prepares environmental assessment and mitigation reports, biological evaluations, and permit applications to support clients through the regulatory and planning process. Laura has a particular interest in shoreline projects and has prepared a variety of application materials to support projects within Shoreline Master Program jurisdictions.

Laura earned a Master of Science degree in Environmental Science from Washington State University, Pullman. She has received training from the Washington State Department of Ecology in How to Administer Shoreline Development Permits in Western Washington's Shorelines, Determining the Ordinary High Water Mark, the revised Washington State Wetland Rating System, Puget Sound Coastal Processes, How to Conduct a Forage Fish Survey, and Using the Credit-Debit Method for Estimating Mitigation Needs. Laura 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. Laura is interested in stormwater management and has received a certificate in Low Impact Development Design from the Washington Stormwater Center.