Critical Areas and Mitigation Report

Public Works Operation Center

La Center, Washington

May 2025

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A. Introduction

The City of La Center proposes to expand the Public Works Operation Center, located adjacent to Holley Park. The City of La Center Public Works Department currently owns and operates the property, where an existing maintenance shed and storage facility is located. The project includes demolition of existing storage structures and replacement with a new maintenance building. The proposed building includes 3,400 square feet (SF) of interior workspace, and 2,400 SF of new covered parking area. A proposed lean-to will be constructed along the existing shop building to remain, creating an additional 800 SF of covered parking. Portions of the site will be raised by importing fill material. Retaining walls will be constructed to reduce the project footprint and limit impacts to critical areas. Surface improvements include new asphalt pavement and concrete approaches to the new building. The project also includes onsite utility extensions, stormwater management improvements, and the relocation of fences and gates. Prior to any construction, a property boundary line adjustment will be completed to ensure the entirety of the new building will be on the Public Works property. The Natural Resources staff from Harper Houf Peterson Righellis (HHPR) conducted a site visit on February 18, 2025, to determine if any critical areas are present within the Study Area (SA). The boundaries of one potentially jurisdictional non-fish bearing intermittent stream (Stream 1) were delineated within the SA. According to the City of La Center's Municipal Code (LCMC) Critical Areas Ordinance (LCMC Table 18.300.090.2.f), Type Ns streams require a 75-foot-wide fish and wildlife habitat conservation area riparian buffer. An existing buffer enhancement area was established as part of the development south of Stream 1 (AKS 2019)

The project is designed to avoid impacts to the stream and minimize impacts to the riparian buffer. The project requires a 50% buffer reduction, in accordance with LCMC 18.300.090 (2)(I), to a portion of the 75-foot riparian buffer associated with Stream 1 to accommodate 1,818 SF of permanent and 1,712 SF of temporary encroachment from the building expansion footprint. On-site enhancement of remaining "degraded condition" riparian buffer is proposed to ensure the reduced buffer will not have an adverse impact on the buffer's water quality and habitat functions.

This report addresses the City of La Center's Chapter 18.300 Critical Areas code report and mitigation plan requirements.

B. Background Mapping and Site Information

B.1 Office Review

HHPR staff reviewed the following resources to assess the presence of critical areas in the study area:

- Agricultural Applied Climate Information System (AgACIS) (2025) precipitation and climate data from the La Center, WA and Battle Ground. WA weather station;
- Clark County (2025) GIS data and imagery from 1955 to 2024;
- City of LaCenter's Critical Areas Hazard Map (La Center 2025)
- Google Earth Pro (2025) imagery from 1990 to 2025;
- The National Earthquake Hazards Reduction Program (NEHRP) (Clark County GIS 2025)

- National Wetlands Inventory (NWI) Online Mapper (2025);
- USDA Natural Resources Conservation Service (NRCS) Soil Survey Staff (2025) Web Soil Survey;
- Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species map on the web (PHS 2025);
- Washington Department of Natural Resources (DNR) Stream Typing Mapper (2025);
- Washington Natural Heritage Program (WNHP 2025)

B.2 Results of Office Review

B.2.1 Topography and Hydrology

The topography within the SA slopes from northeast to southwest, ranging from low to moderate slopes. North of the operations center is Holley Park, a flat grassy area with ball fields and tennis and basketball courts. South of the operations center the slopes are generally moderate ranging from 17% to 20%, sloping down towards the south (Stream 1). One roadside ditch (Ditch 1) draining north to south located in the western portion of the SA conveys water parallel to NE Ivy Avenue, draining to Stream 1. Stream 1 originates east of the SA and flows west at the bottom of a ravine in the southernmost edge of the SA. Stream 1 drains through a vertical culvert under NE Ivy Avenue, draining west out of the SA.

The project is located entirely within the Lockwood Creek-East Fork Lewis River (HUC12 #170800020507).

B.2.2 Wetlands and Waterways

The NWI data maps no wetland or water features within or adjacent to the SA (Appendix A, Figure 3). WA DNR maps one Type N watercourse consistent with the path of Stream 1 (Appendix A, Figure 7). Clark County identifies many modeled wetlands within and adjacent to the SA (Appendix A, Figure 5). Modeled wetlands are mapped in the existing Public Works Operation Center and Holley Park and were determined not to be present. Modeled wetlands are mapped in an area consistent with Stream 1.

B.2.3 Mapped Priority Habitats

According to PHS database, no state listed species or habitat conservation areas are mapped within the SA. However, little brown bat (*Myotis lucifugus*) and Yuma myotis (*Myotis yumanensis*) are mapped within the township.

According to review of WNHP mapping, there are no documented occurrences of rare plants or species of high conservation value listed as threatened or endangered under the ESA mapped on-site. Nor were any threatened or endangered species observed during the February site visit.

Clark County does not map any priority habitats within the SA (Clark County 2025). Oak woodland habitat areas and buffers are mapped to the east and north of the SA (Appendix A, Figure 6).

B.2.4 Soils

The Natural Resources Conservation Service (NRCS) map depicts three soil map units within the SA (Appendix A, Figure 4). The soils include:

- Gee silt loam, 0 to 8 percent slopes (map unit symbol GeB). This map unit occurs in the southern portion of the SA. Gee silt loam, 0 to 8 percent slopes is moderately well drained and is not rated as hydric.
- Gee silt loam, 30 to 60 percent slopes (map unit symbol GeF). This map unit occurs in the central and southern portion of the SA. Gee silt loam, 30 to 60 percent slopes is moderately well drained and is not rated as hydric.
- Odne silt loam, 0 to 5 percent slopes (map unit symbol OdB). This map unit occurs in the northern portion of the SA. Odne silt loam, 0 to 5 percent slopes is poorly drained and is rated as hydric.

B.2.5 Precipitation

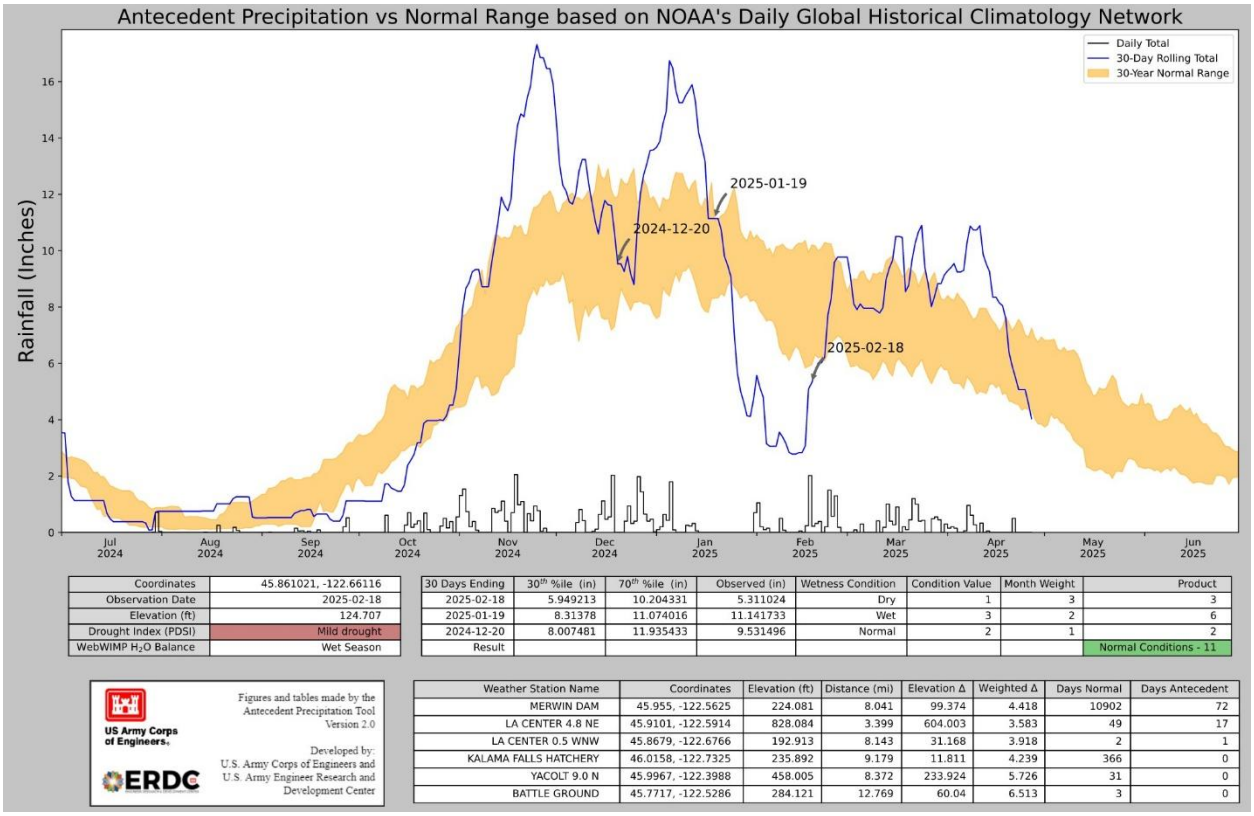
The field reconnaissance and Ordinary High-Water Mark (OHWM) delineation was conducted on February 18, 2025.

Precipitation for the current water prior to the delineation (October 2024 through January 2025) was 25.7 inches measured at the Battle Ground weather station (AgACIS 2025). The recorded amount is less than normal (0.96 inches below normal) for the same 4-month period based on WETS data from 1995 to 2025 (AgACIS 2025).

The Antecedent Precipitation Tool (APT) developed by the United States Army Corps of Engineers (USACE) was used to conduct a three month (90 days) precipitation analysis using weighted values from the same date range over the preceding 30 years (EPA 2025). Available precipitation data from local weather stations was used to represent climatic conditions in the project vicinity. The Antecedent Precipitation versus Normal Range is shown below for the field date (Graph 1).

According to the WETS table, there is a 50% chance the growing season is 232 days long from March 19 to November 16th.

Table 1: Summary of precipitation (inches) at the Battle Ground, WA weather station for the three months prior to the February 18, 2025 delineation, compared to normal ranges (AgACIS 2025).



Coordinates	45.861021, -122.66116
Observation Date	2025-02-18
Elevation (ft)	124.707
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-02-18	5.949213	10.204331	5.311024	Dry	1	3	3
2025-01-19	8.31378	11.074016	11.141733	Wet	3	2	6
2024-12-20	8.007481	11.935433	9.531496	Normal	2	1	2
Result							Normal Conditions - 11

US Army Corps of Engineers.
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
MERWIN DAM	45.955, -122.5625	224.081	8.041	99.374	4.418	10902	72
LA CENTER 4.8 NE	45.9101, -122.5914	828.084	3.399	604.003	3.583	49	17
LA CENTER 0.5 WNW	45.8679, -122.6766	192.913	8.143	31.168	3.918	2	1
KALAMA FALLS HATCHERY	46.0158, -122.7325	235.892	9.179	11.811	4.239	366	0
YACOLT 9.0 N	45.9967, -122.3988	458.005	8.372	233.924	5.726	31	0
BATTLE GROUND	45.7717, -122.5286	284.121	12.769	60.04	6.513	3	0

Results indicate that the total weighted precipitation for the period prior to the February 18, 2025, field date was within the normal range.

Daily precipitation during the delineation and the 14 days prior to the site visit is reported in Table 2.

Table 2: Precipitation recorded at the Battle Ground, WA station prior to and during wetland delineation fieldwork on February 18, 2025 (AgACIS 2025). Gray shading indicates days of field visits.

Day	Recorded Precipitation (inches)	Plots Completed
February 4	0.01	
February 5	0.17	
February 6	0.01	
February 7	0.21	
February 8	0.05	
February 9	0.00	
February 10	0.00	
February 11	0.00	
February 12	0.00	
February 13	0.32	
February 14	0.03	
February 15	0.21	
February 16	0.61	
February 17	0.29	
14 days prior to field visit = 1.91 inches		
February 18	0.23	SP1-U
Overall Total = 2.14 inches		

The three-month prior analysis concluded that the hydrologic conditions were within the normal range. Direct observations of hydrology can be assumed to be accurate representations of wetland conditions.

B.2.6 Other Delineations

The wetland delineation completed by AKS in 2019 included the ravine south of Holley Park and the subdivision south of that ravine. AKS identified one Type Ns stream within the Project's SA that corresponds to the location of Stream 1.

C. Methods

HHPR followed the three-parameter wetland delineation method described in the U.S. Army Corps of Engineers Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (USACE 2010). Vegetation, soil, and hydrologic data was

recorded on USACE Western Mountains, Valleys, and Coast data forms (Version 2.0). Plant names and wetland indicator status on the data forms follow the 2022 National Wetland Plant List (USACE 2024). Vegetation classification follows Classification of Wetlands and Deepwater Habitats of the United States (Federal Geographic Data Committee [FGDC] 2013).

The OHWM was delineated based on characteristics described in the 2025 USACE Technical Report on National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams, Final Version. Sequentially numbered pin flags, labeled alpha-numerically, were inserted along the OHWM of the stream within the SA. Similarly labeled pin flags marked the points where test pits and detailed data was collected. The pin flags were professionally surveyed.

D. Description of all Wetlands and Non-Wetland Waters

One stream (Stream 1) and one ditch (Ditch 1) were the only features identified within the SA (Appendix A, Figure 8). No wetlands were present within the SA. A single test plot (SP1-U) was collected in the area most likely to contain wetlands and confirmed upland conditions onsite (Appendix B). The location and characteristics for each non-wetland water are described in the following section.

D.1 Stream 1

Stream 1 is an intermittent, non-fish bearing stream (DNR Water Type Ns) which flows to the west along the southern boundary of the SA. Stream 1 extends beyond the SA to the west via a 18-inch diameter culvert under NE Ivy Avenue and eventually flows into the East Fork Lewis River, approximately 0.45 miles east of the SA.

Within the SA, OHWM was approximately four to forty-five feet wide and had an average of one- to two-foot-tall banks. Approximately two to five inches of flowing water was present during the February field visit. The channel was mostly bare with a silt substrate and scattered gravel. The banks of the channels were dominated by Himalayan blackberry (*Rubus armeniacus*) and western swordfern (*Polystichum munitum*), with occasional English holly patches (*Ilex aquifolium*), big leaf maple (*Acer macrophyllum*) saplings, fringe cup (*Tellima grandiflora*), and English ivy (*Hedera helix*).

D.2 Ditch 1

Ditch 1 is an artificially created roadside ditch located in the western portion of the SA, east of NE Ivy Avenue. Ditch 1 flows from north to south and drains into Stream 1. Ditch 1 is approximately 140 feet long, between 2-3 feet wide, and is approximately 4-5 inches deep.

The channel bed of Ditch 1 is vegetated north of the driveway to the operations center, dominated by Kentucky blue grass (*Poa pratensis*) with some tall fescue (*Schedonorus arundinacea*). This portion of the ditch receives storm water runoff from a stormwater swale that receives water from the operations center via a PVC pipe. Below the driveway, the ditch is lined with riprap in several places but is mostly unvegetated and extremely down cut. This portion of the ditch had 2 to 3 inches of water flowing in it at the time of the site visit.

E. Fish and Wildlife Habitat Conservation Areas

One stream, Stream 1, with a riparian buffer, was identified within the SA. Fish and wildlife habitat conservation buffers (riparian buffer) will be applied to Stream 1 in accordance with LCMC Table 18.300.090(2)(f). Stream 1 was determined to have an intermittent flow regime and is considered a Type Ns stream, and therefore, has a riparian buffer of 75 feet.

Fish and wildlife habitat conservation areas do not include artificial features such as drainage ditches per definitions in LCMC 18.300.30 (26). Ditch 1 does not have a buffer and will not require compensatory mitigation for permanent impacts.

No PHS habitats or Endangered Species were identified within the SA. No Oregon white oak (*Quercus garryana*) individual priority trees were found within the SA. No other PHS habitats are mapped in the immediate vicinity of the SA.

F. Critical Aquifer Recharge Areas

The SA overlays a Category II Critical Aquifer Recharge Areas (CARAs) (Clark County GIS 2025). LCMC 19.300.090(1) regulates Category I CARAs. The proposed project will not impact any Category I CARAs. Therefore, no impacts to CARAs are required to be addressed in this report.

G. Flood hazard Areas

Flood Hazard Areas include all areas of special flood hazards (commonly referred to as the 100-year floodplain) identified by Federal Emergency Management Agency (FEMA) and shown on the most current Flood Insurance Rate Map (FIRM) and the National Flood Hazard Layer (NFHL) Viewer interactive map. No areas of special flood hazards are located on or adjacent to the SA (FEMA 2023).

H. Geologic Hazards

La Center municipal code defines the three land classifications that qualify as Geologically Hazardous Areas (LCMC 18.300.030(4)) as:

- Erosion Hazard Areas
- Landslide Hazard Areas
- Seismic Hazard Areas

Erosion Hazard Areas and potential Landslide Hazard Areas were evaluated through field reconnaissance, Clark Country GIS (2025), the City of La Center's Critical Areas GeoHazard Map (La Center 2025), and survey contours.

This evaluation found mapped severe Erosion Hazard Areas in portions of the SA adjacent to Stream 1, as well as areas mapped as potentially unstable slopes adjacent the stream corridor.

(NEHRP) rating for the majority of the site is Class C, (Clark County GIS 2025). Class C is considered intermediate relative hazard potential for enhanced or amplified ground shaking. The liquefaction hazard for the site is Very Low (Clark County GIS 2025).

The proposed development will be more than 15 feet away from the top of slope of the steep slope near Stream 1. The project engineers determined this to be a safe distance to avoid any Erosion Hazard Areas.

I. Proposed Project

The site plan requires a buffer reduction adjacent to Stream 1, a Type Ns stream in the southern portion of the SA. Reduction of the riparian buffer width is necessary to accommodate expansion of the building footprint above the ravine that Stream 1 flows through. The site plan was designed to minimize impacts to critical areas including riparian buffers and steep slopes by minimizing area of vegetation disturbance and utilizing areas of previous disturbance as much as is feasible.

Even with minimization to impacts, the proposed project will encroach into the standard 75-foot riparian buffer. The proposed project will require 1,818 SF of permanent encroachment and 1,712 SF of temporary encroachment into the standard buffer (Appendix A, Figure 9).

A buffer reduction up to 50 percent of the required buffer width (up to 37.5 feet wide) is allowed per LCMC 08.300.090(2)(I). The project proposes a 50 percent buffer reduction along Stream 1 and will be required to enhance a portion of the remaining riparian buffer.

La Center municipal code does not specify required enhancement ratios for stream buffers but requires no net loss of buffer function. La Center municipal code does not specify required enhancement ratios for stream buffers but requires no net loss of buffer function. The existing buffer can be described as “degraded” with a dying canopy and an understory dominated by invasive species that do not provide diverse habitat niches within the buffer.

Due to the temporary encroachment being located adjacent to the proposed building, the project proposes to treat temporary encroachment as permanent encroachment to avoid creating a conflict with hazard trees or create plant mortality due to shading from the building. The applicant will mitigate for encroachment into the standard buffer by creating an enhancement area within the reduced buffer at a ratio of 1.5:1 per SF of buffer encroachment. The applicant proposes an enhancement area totaling 5,300 SF within the reduced buffer (Appendix A, Figure 10).

The reduced buffer will not significantly reduce the water quality and habitat functions of the remaining buffer. Enhancement to a portion of the remaining buffer, including removal of non-native invasive species and planting of native tree, shrubs, and ferns, is proposed to ensure an increase in net function and values of the remaining buffer.

J. Riparian Buffer Enhancement Plan

The proposed buffer plantings will uplift habitat function and value by creating a diverse understory of native shrubs and ferns. The existing conditions of the riparian buffer adjacent to Stream 1 includes a red alder (*Alnus rubra*) and big leaf maple canopy with an understory dominated by invasive species (English ivy, English holly, and Himalayan blackberry). These invasive species are crowding out native shrubs, ferns, and herbaceous species identified elsewhere on the hillslope above Stream 1 within the SA. Portions of the big leaf maple canopy appeared to be diseased and dying during the site visit.

To ensure no net loss of riparian buffer function, the site plan includes enhancement to a minimum of 5,300 square feet (0.12 acres) of remaining on-site riparian buffer adjacent to Stream 1 within property owned by the City (riparian buffer enhancement area shown on attached Figure 10, Appendix A).

The proposed enhancement will not be between the proposed building and Stream 1 as there is already an existing riparian buffer enhancement area (AKS 2019) that occupies the reduced buffer in this area. Therefore, the proposed enhancement planting area is within the SA where HHPR staff determined there was the most potential uplift to the buffer.

The proposed riparian buffer enhancement will transform a degraded riparian buffer from a canopy with dying trees and an understory dominated by invasive species to a diverse, native-dominated forest. The proposed conditions will provide better habitat for native species by creating more niches within the riparian buffer, creating a diverse understory to provide shade for the stream, and by removing aggressive invasive species that provide little benefit to native ecological systems.

After the removal of invasives, all bare areas should be planted with the recommended enhancement planting species and quantities. Plantings will consist of native trees, shrubs and ferns. Below is a recommended plant list for the enhancement mitigation plan.

Table 3: Recommended Enhancement Mitigation Planting List

Habit	Scientific Name	Common Name	Form	Size	Quantity	Spacing
Tree	*Acer macrophyllum*	Bigleaf Maple	Bare Root	24” min.	18	12’ O.C.
Tree	*Pseudotsuga menziesii*	Douglas Fir	Plug	12” min.	18	12’ O.C.
Total Trees: 36						
Shrub	*Corylus cornuta*	Beaked Hazelnut	Bare Root	18” min.	83	4’ O.C.
Shrub	*Mahonia nervosa*	Dull Oregon Grape	Bare Root	6” min.	83	4’ O.C.
Shrub	*Rubus parviflorus*	Thimbleberry	Bare Root	18” min	83	4’ O.C.
Shrub	*Symphoricarpus albus*	Common Snowberry	Bare Root	18” min.	83	4’ O.C.
Total Shrubs: 331						
Fern	*Polystichum munitum*	Western Swordfern	Container	1 gallon	396	Clusters of 3 plants spaced 6’ O.C.
Total Ferns: 396						

J.1 Performance standards

The goal of the buffer enhancement is to ensure no net loss of water quality and habitat function to Stream 1. Specific performance standards to ensure that the project is successfully meeting prescribed goals and objectives should be monitored in years 1, 2, 3, and 5 will include:

Invasive species, including Class A-C noxious weeds listed by Clark County and Himalayan blackberry, English ivy and English Holly, will not exceed 20% cover in enhancement areas during all monitoring years.

Tree, shrub, and fern survival rates:

Year 1: 80% Survival

Year 2: 65% survival

Year 3: 60% survival

Years 4 and 5: 60% survival or 65% combined cover of native trees, shrubs, and fern or herbaceous species (planted and volunteer)

Performance standards should be considered achieved in Year 5 if standards are met in Year 3 or 4 and native plant establishment is considered satisfactory by a qualified biologist.

J.2 Buffer Enhancement Monitoring Plan

Enhancement areas will be monitored and maintained for a minimum of five full growing seasons beginning after installation of plantings. Monitoring will consist of establishing an appropriate number of monitoring plot locations within the enhancement area to be assessed in Years 1, 2, 3, and 5. At each plot, the survivorship of planted native species; cover of planted or naturally recruited native trees, shrubs, ferns, or herbaceous species; cover of invasive and nonnative species; and general site observations will be recorded. Representative site photographs will be taken from established photo points across the enhancement area. Vegetation monitoring plot and photo point locations will be determined during the first monitoring year.

J.3 Buffer Enhancement Maintenance Plan

To support plant establishment, the City will provide five years of maintenance on City-owned property. Maintenance for this site will include:

- Watering. Maintenance of the enhancement areas will include irrigation of the plantings. A watering schedule will be established during the dry months (typically June through September) so plants are watered a minimum of twice per month for the first two summers after planting. Watering will be done from a water truck. Watering should be done at a rate of 3 gallons per plant.
- Weed Suppression. Maintenance of the enhancement areas will include maintaining a 2-foot diameter ring surrounding each planted species that is cleared of competing vegetation. This can be accomplished by maintaining a thick ring of mulch, burlap, or circle spraying.
- Invasive Species Control. Foliar application on an as-needed basis to eliminate resprouts and new occurrences of target species. Anticipated 2 times annually.

- Caging to Exclude Beaver. If beaver herbivory is impacting performance standards, impacted species should be enclosed in wire cages 36-48” high and staked in place.
- Replanting. Replanting should be performed as needed to meet performance standards, as documented in annual monitoring reports.
- Plant Availability –Species substitutions may be made based on plant availability or if specified species appear unsuitable for the site based on site inspections and annual monitoring. Substitutions are limited to site-appropriate native species and require approval from a qualified professional.
- Adaptive Management. Adaptive management measures should be used as needed in response to observed site conditions and monitoring results.

J.4 Planting Specifications

J.4.1 Source of Plants

Plants will be procured by a reputable nursery(s) having a similar climate as the La Center area and specializing in plants native to the Pacific Northwest.

J.4.2 Planting Time

Dormant, bare-root shrubs, trees and live stakes will be planted when the plants are dormant, typically between November 1 and March 31. Containerized plants should be used if planting occurs outside this time period.

J.5 Planting Guidelines

For bare root stock, excavations need to be large enough to accommodate the plant’s roots without restriction. For container stock, an excavation 1.25 times the diameter/depth of the root ball will be excavated. Plants will be held upright in the excavation, so the top of the root mass is level with the ground surface. Soil will be backfilled around the roots and gently tamped firm so each plant stands erect, and roots are fully covered.

A weed control area 2-foot in diameter around the root collar will be established and kept free of herbaceous vegetation until plants are well established. If mulch is used, mulch rings should be 4-inches deep minimum, mulch should be pulled away from the root collars to prevent burning.

If the soil is not saturated at the time of planting, then each plant will be watered when planted.

K. Conclusion

HHPR staff identified two non-wetland waters within the SA, one roadside ditch (Ditch 1), likely non-jurisdictional, and one Type Ns Stream (Stram 1).

The project is designed to avoid impacts to delineated features on site and minimize impacts to the riparian buffer associated with the stream. The project requires a 50 percent buffer reduction, in accordance with LCMC 18.300.090 (2)(I), to a portion of the 75-foot riparian buffer associated with Stream 1, a Type Ns stream. In accordance with LCMC 18.300.090 (2)(I)(iv), when buffer reduction is allowed, the applicant will provide a buffer enhancement plan for the city to review.

Onsite enhancement in accordance with LCMC 18.300.120 is proposed for the encroachment into the 75-foot riparian buffer, which will result in a total of 1,818 of permanent and 1,712 of temporary impacts, to ensure no net loss of habitat function within the remaining stream buffer. To compensate for the permanent and temporary impacts at the proposed mitigation ratio of 1.5:1, a total of 5,300 SF of onsite enhancement is proposed for no net loss in functions and values within the remaining stream buffer. All enhancement will occur within the remaining reduced buffer and will include removal of non-native invasive species and dense planting of native tree, shrubs, and ferns. This will ensure compliance with La Center municipal code by improving water quality and habitat functions within the riparian buffer.

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Appendix A: Figures

Figure 1: Vicinity Map

Public Works Operation Center Improvements
La Center, Washington

HHPR Harper Houf Peterson Righellis Inc.
ENGINEERS • PLANNERS
LANDSCAPE ARCHITECTS • SURVEYORS

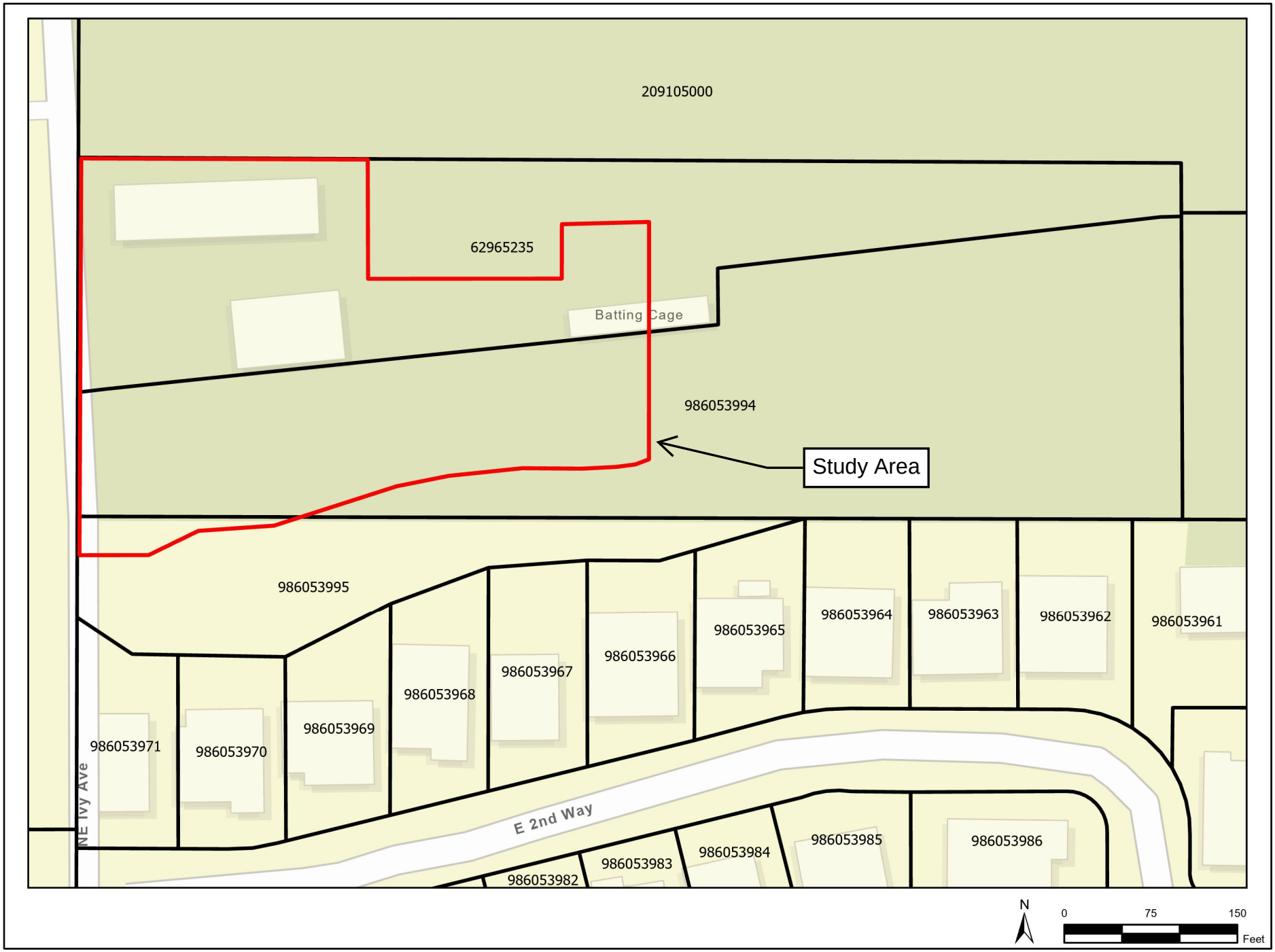

Figure 2: Parcel Map

Public Works Operation Center Improvements
La Center, Washington

Harper Houf Peterson Righellis Inc.
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Figure 3: NWI Map

Public Works Operation Center Improvements
La Center, Washington

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

Map Unit Symbol	Map Unit Name
GeB (Not Hydric)	Gee silt loam, 0 to 8 percent slopes
GeF (Not Hydric)	Gee silt loam, 30 to 60 percent slopes
OdB (Hydric)	Odne silt loam, 0 to 5 percent slopes

Figure 4: Soils Map

Public Works Operation Center Improvements
La Center, Washington

Harper Houf Peterson Righellis Inc.
ENGINEERS ◆ PLANNERS
LANDSCAPE ARCHITECTS ◆ SURVEYORS

Legend

- Taxlots
- Permitted Wetland
- NWI Wetland
- Modeled Wetland
- Stream
- Lake
- Stream/Fish Habitat
  - Shoreline
  - Fishbearing
  - Non-fishbearing
  - Unknown
  - Waters with no type designation
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other

Notes:

376.2 0 188.08 376.2 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

Figure 5: Clark County Online Map

Public Works Operation Center Improvements
La Center, Washington

Harper Houf Peterson Righellis Inc.
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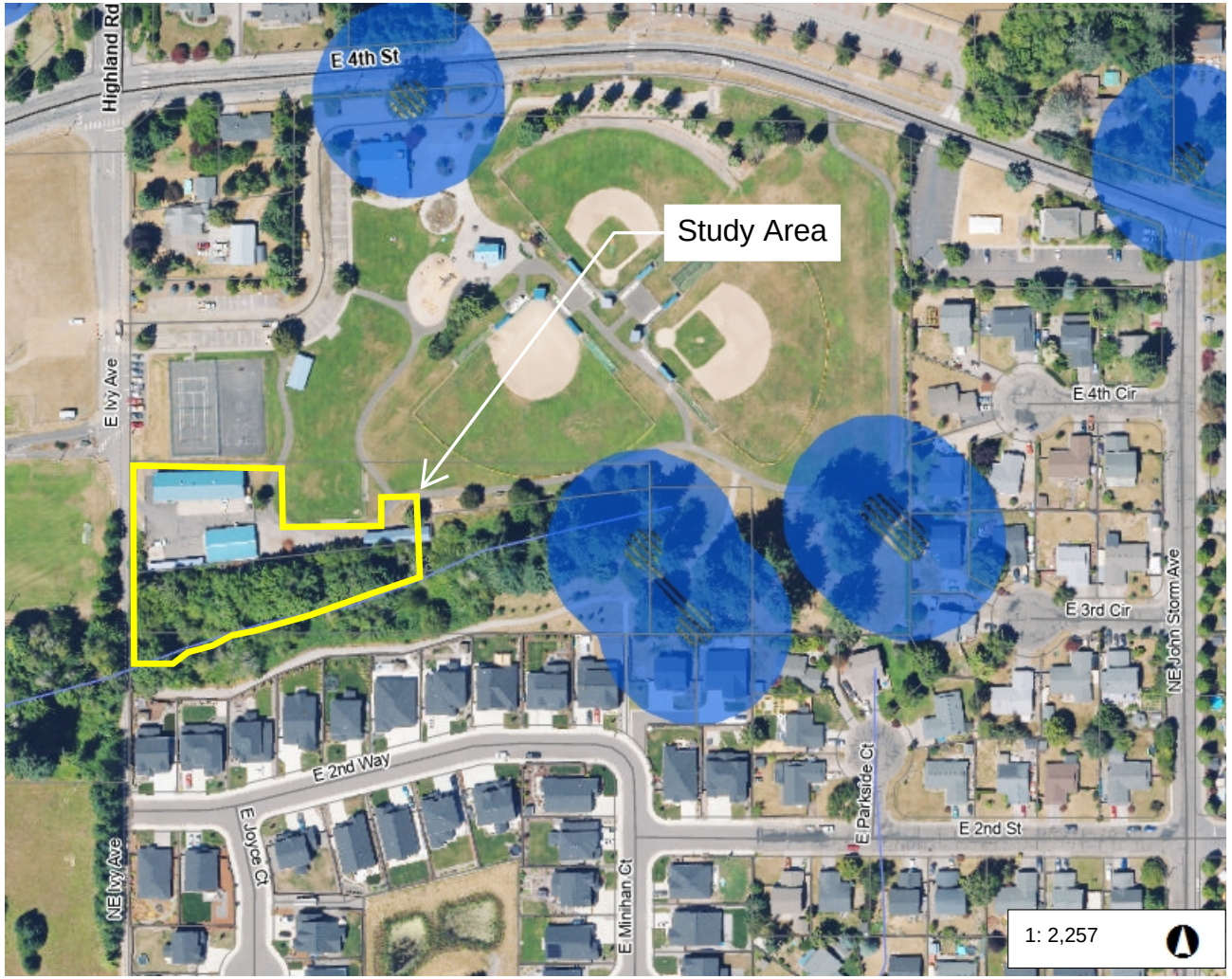
LANDSCAPE ARCHITECTS ◆ SURVEYORS



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Stream - DNR
- Lake - DNR
- All Roads
  - Interstate
  - State Route
  - Arterial
  - Forest Arterial
  - Minor Collector
  - Forest Collector
  - Private or Other

Notes:

376.2 0 188.08 376.2 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

Figure 6: Clark County Online Priority Habitat Species and Department of Natural Resources Waterbody Map

Public Works Operation Center Improvements
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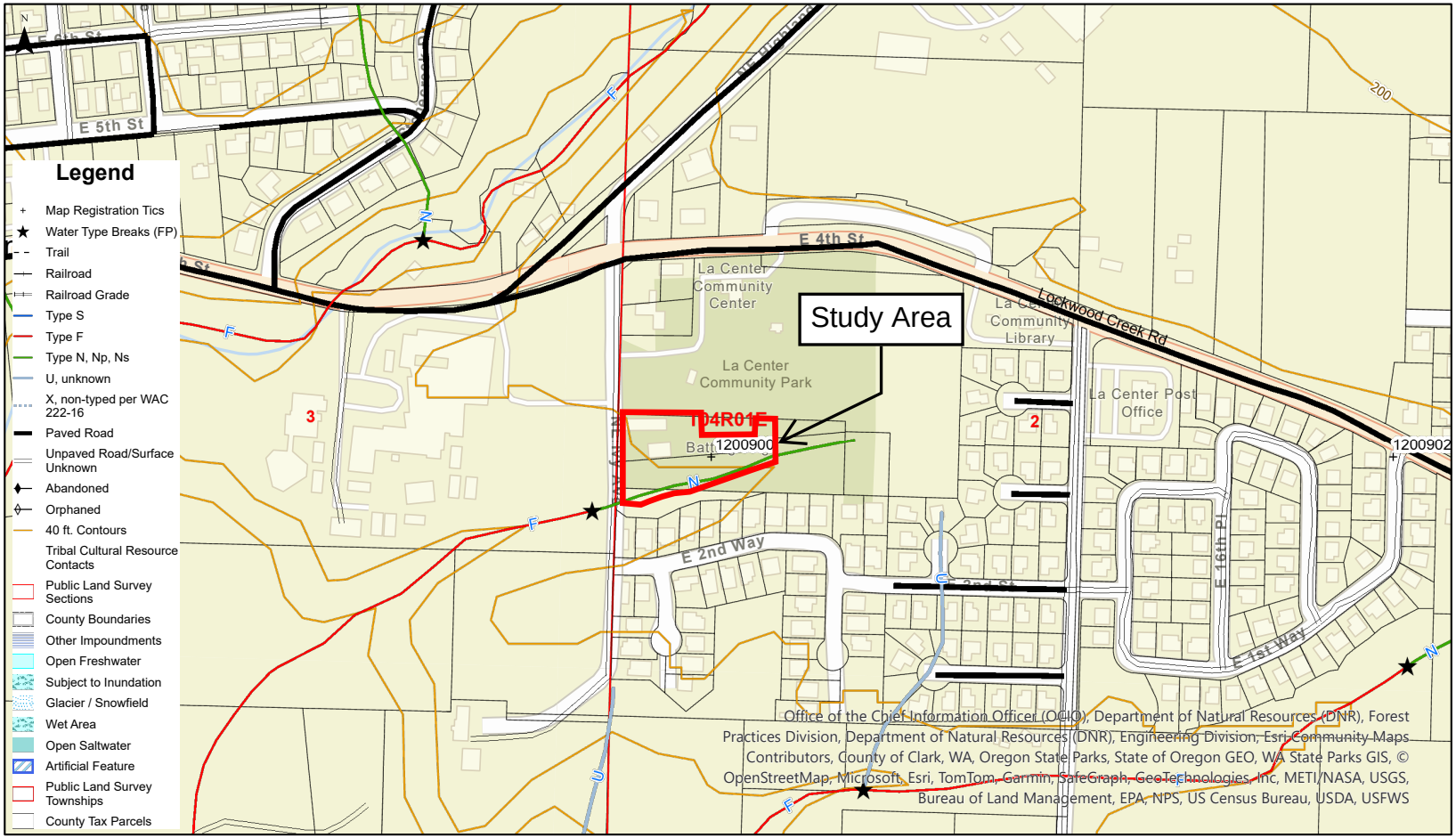

Map Symbols

- Harvest Boundary
- Road Construction
- Stream
- RMZ / WMZ Buffers
- Rock Pit
- Landing
- Waste Area
- Clumped WRTS/GRTS
- Existing Structure

Additional Information

Legal Description
S02 T04.0N R01.0E, S03 T04.0N R01.0E

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

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

Approximate Scale :1:4,800
0 200 400 800 Feet
Date: 5/22/2025 Time: 2:52 PM

Figure 7: Department of Natural Resources Waterbody Map

Public Works Operation Center Improvements
La Center, Washington

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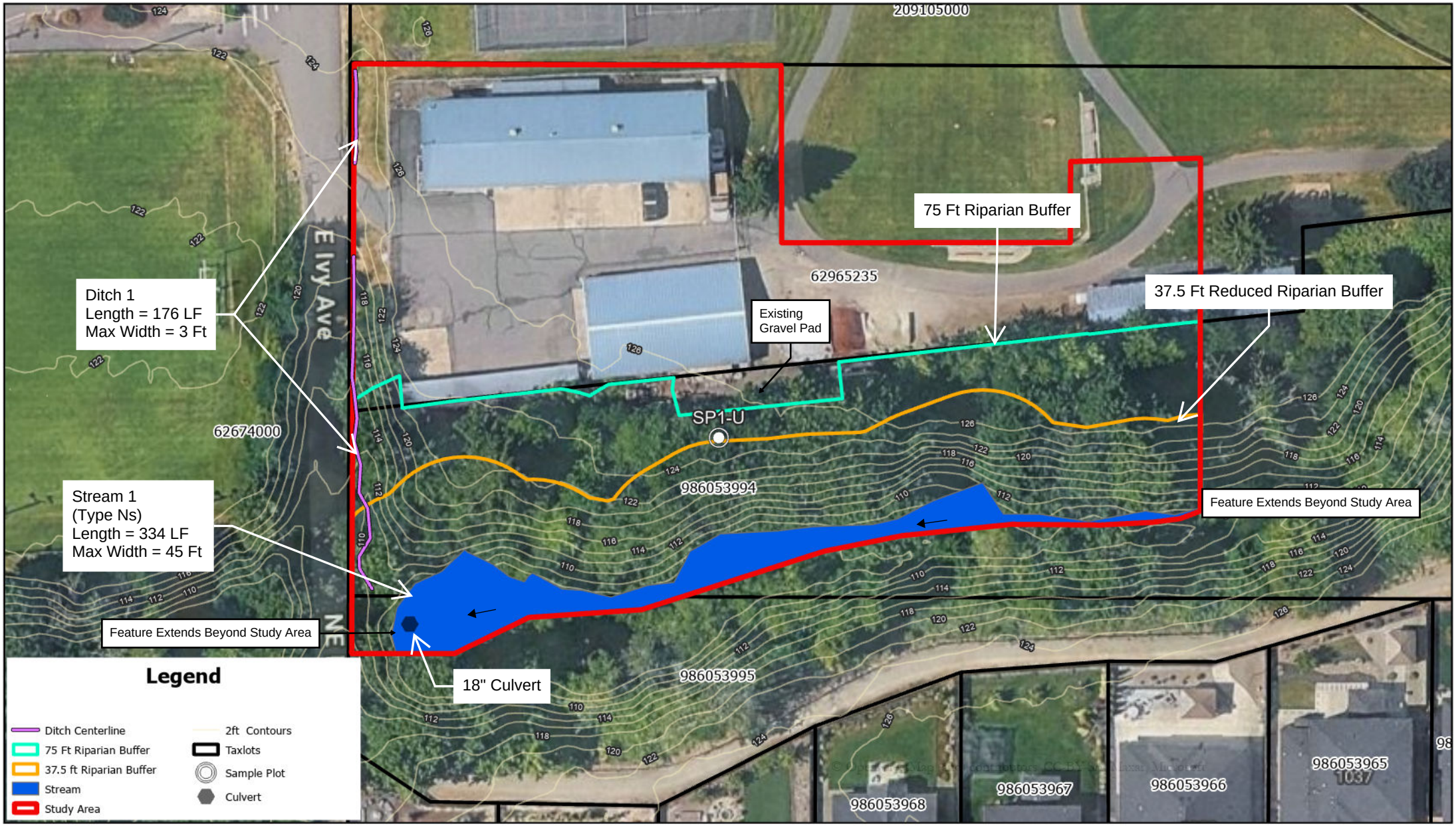


Note: GNSS located using Eos Arrow 100 Plus to sub-meter accuracy by HHPR

SHEET NO.

MAP

JOB NO. CLC-07

DATE	NO.	DESCRIPTION

REVISIONS

DESIGNED: HHPR

DRAWN: HHPR

CHECKED: HHPR

DATE: 5/12/25

N

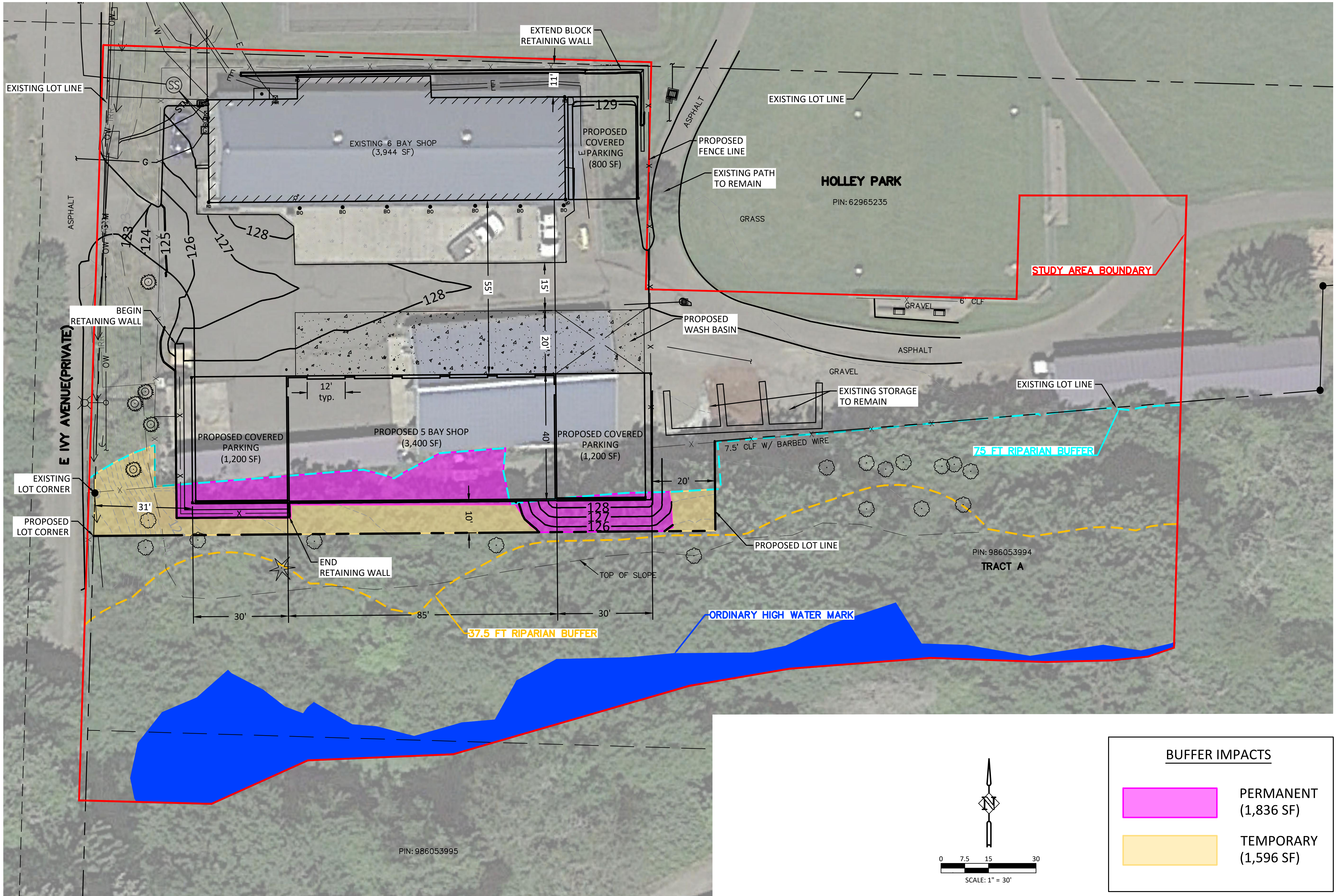
0 50 100 Feet

Harper Houf Peterson Righellis Inc.
ENGINEERS♦PLANNERS
LANDSCAPE ARCHITECTS♦SURVEYORS
1220 Main Street, Suite 150, Vancouver, WA 98660
phone: 360.750.1131 www.hhpr.com fax: 360.750.1141

Figure 8: Critical Areas Exhibit

Public Works Center Operation Improvements

La Center, Washington



P:\02-Vancouver\CLC (City of La Center)\CLC-07 (Public Works Operation Center)\CLC07-DWGS\Exhibits\ CLC07-Buffer.dwg

FIGURE 9: BUFFER IMPACTS

PUBLIC WORKS SITE IMPROVEMENTS

LA CENTER, WASHINGTON

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LANDSCAPE ARCHITECTS • SURVEYORS
1220 Main Street, Suite 150, Vancouver, WA 98660
phone: 360.750.1131 www.hhpr.com fax: 360.750.1141

DESIGNED: | DRAWN: | CHECKED: | DATE:

REVISIONS
DATE | NO. | DESCRIPTION

SHEET NO.
B1.0

JOB NO.
CLC-07

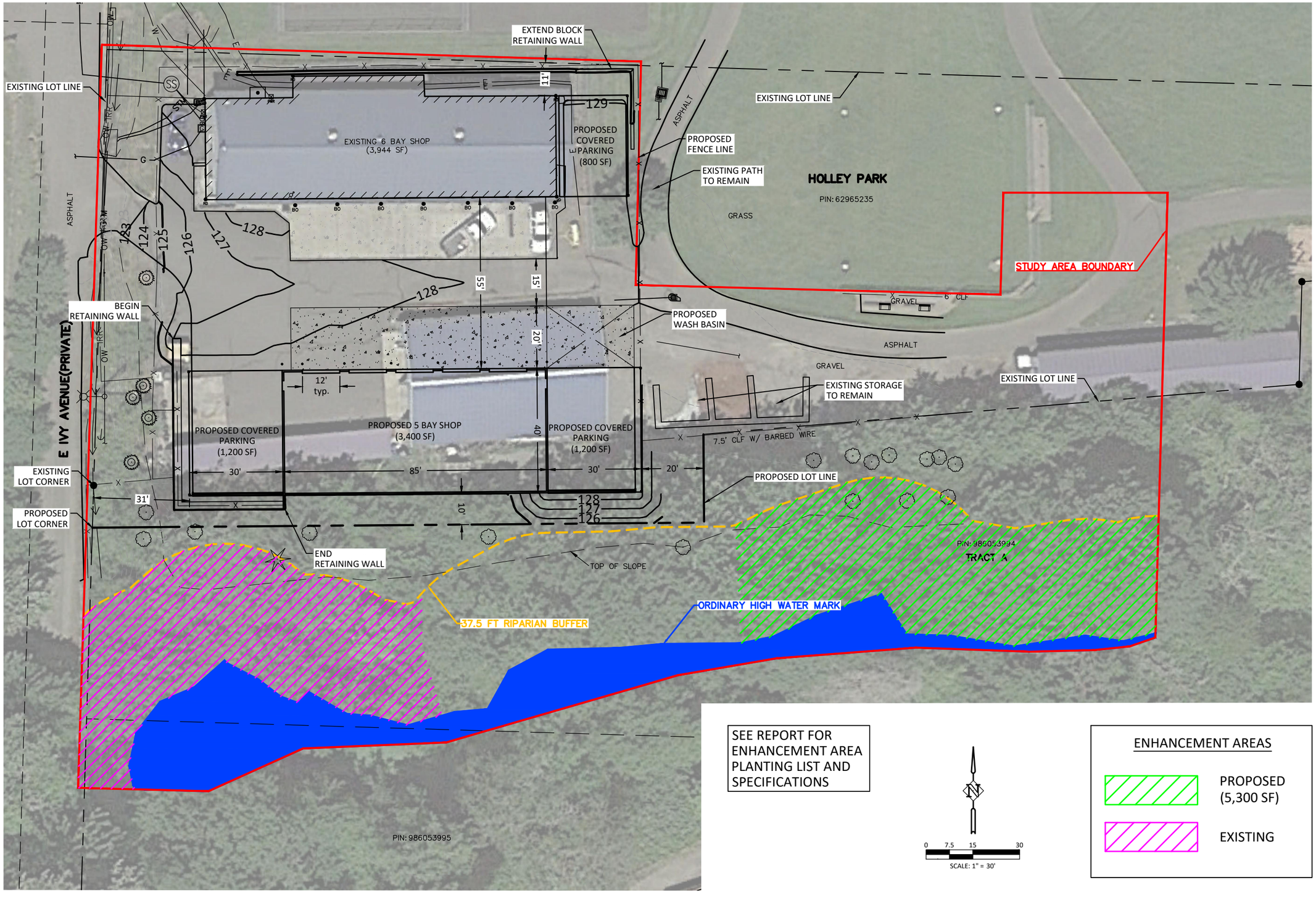

FIGURE 10: PROPOSED CONDITIONS AND PLATING PLAN

PUBLIC WORKS SITE IMPROVEMENTS

LA CENTER, WASHINGTON

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phone: 360.750.1131 www.hhpr.com fax: 360.750.1141

DESIGNED:	HHPR
DRAWN:	HHPR
CHECKED:	HHPR
DATE:	5/16/202

REVISIONS

NO.	DESCRIPTION	DATE

SHEET NO.

M1.0

JOB NO. CLC-07

P:\02-Vancouver\CLC (City of La Center)\CLC-07 (Public Works Operation Center)\CLC07-DWGS\Exhibits\ CLC07-Mitigation.dwg

Appendix B: Photo Log

Photo 1: View of impervious portion of the SA including the building that is proposed for expansion. Photo facing east. February 18, 2025

Photo 2: Photo looking at Ditch 1 along E Ivy Ave. Facing south. February 18, 2025

Photo 3: The confluence of Ditch 1 and Stream 1. E Ivy Ave is in the background of the photo. Photo facing west. February 18, 2025

Photo 4: Pink OHW flags along the edge of water. Stream 1 draining into a vertical culvert under E Ivy Ave. Photo facing north. February 18, 2025

Photo 5: Typical conditions in the eastern portion of Stream 1 within the SA. Photo facing west. February 18, 2025

Photo 6: Typical conditions of slope between Stream 1 and the proposed development. Upland shrubs, both native and invasive with native tree canopy. Photo facing southwest. February 18, 2025

Photo 7: Upland conditions above Steam 1. Photo facing west. February 18, 2025

Photo 8: Area of dense English holly on the northern side of the riparian buffer. Enhancement is proposed in this area. Photo facing west. February 18, 2025.

Appendix C: Wetland Datasheets

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

Project/Site: Public Works Center | City/County: La Center/Clark | Sampling Date: 02/18/25
Applicant/Owner: City of La Center | State: WA | Sampling Point: SP1-U
Investigator(s): Dan Thew, Kim Koller | Section, Township, Range: Section 02 T04N R01E, WM
Landform (hillslope, terrace, etc.): hilltop | Local relief (concave, convex, none): none | Slope (%): 1
Subregion (LRR): NW Forests and Coast | Lat: 45.861021 | Long: -122.66116 | Datum: WG84
Soil Map Unit Name: Gee silt loam, 30 to 60 percent slopes | NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	___	No	X
Hydric Soil Present?	Yes	___	No	X
Wetland Hydrology Present?	Yes	___	No	X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks: Top of slope between fence line and slope break on flat portion of SA that will be within the proposed expanded footprint.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer macrophyllum*	60	Y	FACU
2.			
3.			
4.			
5.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. *Crataegus monogyna*	20	Y	FAC
2. *Symphoricarpos albus*	15	Y	FACU
3. *Oemleria cerasiformis*	5	N	FACU
4. *Ilex aquifolium*	5	N	FACU
5. *Calocedrus decurrens*	3	N	NL*
6. *Prunus emarginata*	2	N	FACU
	50	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Hedera helix*	15	Y	FACU
2. *Rubus ursinus*	10	Y	FACU
3. *Polystichum munitum*	2	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	27	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1. none			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 73

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** x

Remarks: *NL treated as UPL per USACE Wetland Delineation Manual, *Calocedrus decurrens* planted along fence line

SOIL

Sampling Point: SP1-U

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/2	100					sil	

[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** **x**

Remarks: Roots to 12”

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 X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ____ **No** **x**

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

Remarks:

Appendix D: AKS Wetland Delineation Report (2019)

11. Wetland & Habitat

Holley Park Subdivision
La Center, Washington
Critical Areas Assessment

Date: March 14, 2019

Applicant:
Compass Group, LLC
Contact: Kevin Tapani
1904 SE 6th Place
Battle Ground, WA 98604

Prepared By:
Stacey Reed, PWS, Senior Wetland Scientist
Taya K. MacLean, PWS, Senior Biologist

Site Information:
Parcel No. 209059-000, 62965-242, 209055-
Section 02, T4N, R1E, W.M.
45.860301, -122.660134
La Center, Clark County, Washington

AKS ENGINEERING & FORESTRY
9600 NE 126th Avenue, Ste 2520
Vancouver, WA 98682
(360) 882-0419

Table of Contents

Tables

Appendices

Introduction

AKS Engineering & Forestry, LLC (AKS) was contracted by Compass Group, LLC (Applicant) to conduct a critical areas assessment on a 14.52 acre site located at 33105 NE Ivy Avenue in La Center, Clark County, Washington (Figures 1 and 2 of Appendix A). The project includes a single-family residential subdivision, including stormwater, a public trail, and open space tracts.

AKS Engineering & Forestry, LLC (AKS) conducted a site visit on November 14, 2018 to determine whether any critical areas (i.e. potentially jurisdictional wetlands, waters, and/or priority habitats) were present in the study area. The on-site boundaries of three potentially jurisdictional non-fishbearing intermittent streams (referred to as Waters 1, 2, and 3; Type Ns streams) were delineated within the study area. According to the City of La Center's Municipal Code (LCMC) Critical Areas Ordinance (LCMC Table 18.300.090.2.f), Type Ns streams require a 75-foot wide fish and wildlife habitat conservation area (ie riparian) buffer.

Oregon white oak (*Quercus garryana*) individual priority trees that meet the Washington Department of Fish and Wildlife's (WDFW) definition of a priority habitat feature were also identified within the study area. These individual priority habitat trees are protected by the City (LCMC Table 18.300.090.2.a). AKS met with WDFW on-site on February 21, 2019 to verify the priority status of all oaks on the site.

The project avoids impacts to individual priority oaks and waters delineated on the site. The project also avoids encroachment within the 75-foot wide riparian buffers associated with Waters 2 and 3. The project requires a 50% buffer reduction, in accordance with LCMC 18.300.090 (2)(l), to a portion of the 75 foot wide buffer associated with Water 1 to accommodate an 8 foot wide gravel trail and a portion of rear lots. On-site enhancement of remaining "degraded condition" riparian buffer is proposed to ensure the reduced buffer will not have an adverse impact on the buffer's water quality and habitat functions.

This report addresses the City of La Center's Chapter 18.300 Critical Areas Code report and mitigation plan requirements. This study does not include an assessment of other critical areas defined under La Center's (City) Critical Areas Ordinance (CAO), including aquifer recharge areas, frequently flooded areas, or geologic hazard areas.

Background Mapping and Site Information

AKS reviewed existing literature, maps, and other materials to identify critical areas having the potential to occur on the subject property or within 300 feet. AKS reviewed the following background information databases:

- Clark County MapsOnline
- Historical aerial imagery from Clark County
- Natural Resources Conservation Service (NRCS) Web Soil Survey
- USFWS National Wetland Inventory (NWI)
- Washington Department of Ecology 2011 Wetlands Inventory
- WDFW Priority Habitats and Species
- Washington National Heritage Program (WNHP) Wetlands of High Conservation Value Map Viewer (Rare Plants and High-Quality Wetlands)
- DNR Water Typing
- DNR SalmonScape

The NRCS, NWI, Clark County wetlands, DNR waters, and priority habitat and species maps are provided as Figures 3, 4, 5, 6, and 7 in Appendix A.

The study area mainly consists of a grazed horse pasture, with non-grazed forested areas along the northern and southern boundaries of the site. The site includes a house and small detached farm structures. Vegetation observed within the pasture includes bentgrass (*Agrostis* sp.; FAC), meadow foxtail (*Alopecurus pratensis*; FAC), hairy cat's ear (*Hypochaeris radicata*; FACU), Queen Anne's lace (*Daucus carota*; FACU), bluegrass (*Poa* sp.; FAC), and Tyrol knapweed (*Centaurea nigrescens*; NOL). The forested area along the northern boundary is dominated by Douglas-fir (*Pseudotsuga menziesii*; FACU), big- leaf maple (*Acer macrophyllum*; FACU), and red alder (*Alnus rubra*; FAC) with scattered Oregon white oak (FACU) trees. Himalayan blackberry (*Rubus armeniacus*; FAC) was dominant in the forest understory.

Site topography gently slopes southwest with the highest elevation in the northeastern corner at 132 feet to the lowest elevation at 95 feet in the southwestern corner. The East Fork Lewis River is located approximately 0.5 mile to the south of the site.

According to the Natural Resources Conservation Service (NRCS) Soil Survey Map for Clark County (Figure 3), the following soils are mapped within the study area (Figure 3 in Appendix A):

- Gee silt loam (0% to 8% slopes, Unit GeB; non-hydric)
- Gee silt loam (30%-60% slopes, Unit GeF; non-hydric)
- Odne silt loam (0% to 5% slopes, Unit OdB; hydric)

According to the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) online mapping, there are no wetlands or riverine features mapped on-site (Figure 4, Appendix A).

According to Clark County's online mapping, there are mapped modeled wetlands adjacent to Water 1 in the northwestern portion of the site. The County map does not show any other wetlands mapped on the site (Figure 5, Appendix A). There was no hydrophytic vegetation observed above the OHWM of Water 1.

According to the DNR online mapping tool, a Type N stream is mapped along the northern portion of the site. AKS identified this stream as Water 1, a Type Ns stream (Figure 6, Appendix A). Two "unknown" streams are mapped by DNR, including one immediately off-site to the east and one in the southeastern portion of the study area (Figure 6, Appendix A). AKS identified these features as Water 2 and 3, Type Ns streams.

Based on Clark County's online mapping, there is mapped riparian habitat in the vicinity of Water 1 (Figure 7, Appendix A). We generally agree with the riparian habitat mapping adjacent to Water 1. The County maps also illustrates a portion of the 200 foot riparian buffer associated with an off-site Type F stream extending onto the southeast portion of the study area. This stream is located greater than 200 feet from the project site; therefore, riparian habitat buffer associated with the off-site mapped stream does not appear to extend onto the site.

According to WDFW's PHS mapping, Oregon white oak woodland priority habitat is mapped within 300 feet of the study area, but priority oak habitat is not mapped on the project site (Figure 8 of Appendix A). No other priority habitat species are mapped on the site. According to DNR's SalmonScape mapping,

on-site waters do not support fish listed as threatened or endangered under the Endangered Species Act (ESA).

Based on a review of the Washington Natural Heritage Program (WNHP) mapping, there are no documented occurrences of rare plants or species of high conservation value listed as threatened or endangered under the ESA mapped on-site, nor were any observed by AKS during the November 2018 site visit.

Historical aerial photographs dating from 1955 to 2018 were reviewed from Google earth and Clark County Online Mapping. The site has remained relatively unchanged since the 1994 aerial. Per the property owner, the site has been actively grazed by cattle, sheep, and horse for decades. According to review of aerials, there are no consistent evidence of potential hydrology signatures on the site.

Methodology

Taya MacLean, Senior Biologist and Sonya Templeton, Natural Resource Specialist, conducted the critical areas assessment site visit on November 14, 2018. A follow up site visit was conducted by Stacey Reed, PWS, Senior Wetland Scientist on March 11, 2019 to confirm lack of wetland hydrology indicators during the early portion of the growing season.

The methodology used to determine the presence of wetlands followed *the Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (Wakeley et al. 2010). *The National Wetland Plant List 2016* (Lichvar 2016) was used to assign wetland indicator status for the appropriate region. Plots 1-4 were recorded on standardized data forms. Their locations were flagged in the field and were professionally land surveyed.

The OHWM were delineated using methodology described in ECY's *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (2016).

Streamflow duration assessments Waters 1, 2 and 3 were determined using the US Environmental Protection Agency's *Streamflow Duration Assessment Method for the Pacific Northwest* (Nadeau, 2015; Appendix B). Water typing was assigned using DNR's water typing system (Washington Administrative Code (WAC) 222-16-031).

The locations of oaks were professionally land surveyed. The dripline of individual priority oaks were digitized using 2012 and 2018 aerials.

The critical areas map, including surveyed topography, water boundaries, plot locations, and trees by AKS, is included as Figure 9. Representative ground-level site photographs and a photograph location map are included in Appendix C.

Precipitation Prior to Site Visit

Observed precipitation data were obtained from the Battle Ground, Washington weather station via the National Oceanic Atmospheric Administration (NOAA) Applied Climate Information System (AgACIS). The closest wetlands climate analysis (WETS) station to the project site is the Battle Grounds station.

According to the AgACIS Battle Ground station, 0.03 inches of rainfall was received the day of the site visit and 1.75 inches of rainfall was received for the two weeks prior to the November 14, 2018 site visit.

According to the National Weather Service (NWS) Vancouver station, 0.26 inches of rainfall was recorded on the day of the site visit, and 0.27 inches of rainfall was received for the two weeks prior to March 11th, 2019. Data from the NWS Vancouver weather station was used to calculate precipitation for March 11th and two weeks prior, as current AgACIS Battle Ground station data was unavailable.

Tables 1 and 2 and show antecedent rainfall according to the WETS for the three months prior to the site visits.

Table 1. Precipitation Data Prior to November 14, 2018 Site Visit (Battle Ground WETS)

Prior Months	Observed Precipitation (Inches)	30% Chance Will Have		Condition Dry, Wet, Normal	Condition Value (1=dry, 2=normal, 3=wet)	Month Weight	Multiply Previous Two Columns
		Less Than	More Than				
October 2018	5.52	2.26	5.17	Wet	3	3	9
September 2018	1.51	1.16	2.97	Normal	2	2	4
August 2018	0.40	0.48	1.37	Dry	1	1	1
						Sum	**14**
							Normal
Rainfall of prior period was: **drier** than normal (sum is 6-9), **normal** (sum is 10-14), **wetter** than normal (sum is 15-18)							

Table 2. Precipitation Data Prior to March 11, 2019 Site Visit (Battle Ground WETS).

Prior Months	Observed Precipitation (Inches)	30% Chance Will Have		Condition Dry, Wet, Normal	Condition Value (1=dry, 2=normal, 3=wet)	Month Weight	Multiply Previous Two Columns
		Less Than	More Than				
February 2019	6.87	4.43	7.16	Normal	2	3	6
January 2019	4.43	4.40	8.27	Normal	2	1	2
December 2018	8.03	5.76	8.94	Normal	2	1	2
						Sum	**10**
							Normal
Rainfall of prior period was: **drier** than normal (sum is 6-9), **normal** (sum is 10-14), **wetter** than normal (sum is 15-18)							

Observed precipitation for the area prior to our site visit was within the normal range according to WETS; however, the site visit was conducted at the end of the growing season. Therefore, a follow up site visit was conducted on March 11, 2019 to document hydrology in the pasture during the early portion of the growing season. The soil temperature recorded during the March 11, 2019 site visit was 42 degrees Fahrenheit at 12-inches below the ground surface, indicating the site visit was conducted during the early growing season.

Results

Water 1

Water 1 is an intermittent, non-fishbearing (DNR Water Type Ns) stream which flows westerly along the northern boundary. Water 1 extends off-site to the west via an 18-inch diameter culvert under NE Ivy Avenue, where it appears to have a direct hydrologic connection to wetlands adjacent to the East Fork Lewis River. Water 1 originates immediately off-site to the northeast.

Within the study area, the upper reach of the channel bed averages approximately 4-feet wide with 2-foot tall banks. Approximately 4-inches of continuous flow was present in the entire on-site channel reach during the November 2018 site visit. The downstream end contained scour at the culvert inlet under NE Ivy Avenue. The channel is generally unvegetated with scattered giant horsetail (*Equisetum telmateia*; FACW), western lady fern (*Athyrium cyclosorum*; FAC), and Himalayan blackberry growing along the banks. Dominant channel bed substrate consisted of silt loam with scattered gravels and cobbles with some large wood debris.

Water 1 was determined to have an intermittent flow regime (lacks continuous year-round flow), Type Ns stream and therefore has a riparian buffer of 75 feet (LCMC Table 18.300.090.2.f).

Water 2

Water 2 is an intermittent, non-fishbearing (DNR Water Type Ns) stream which is mapped in the south-central portion of the study area. Water 2 extends off-site to the south and appears to have a direct hydrologic connection to wetlands adjacent to the East Fork Lewis River. Within the study area, the channel bed averages approximately 5-8-feet wide and had approximately 2-inches of continuous flow during the November 2018 site visit. The channel bed was unvegetated with scattered giant horsetail, western lady fern, and stinging nettle (*Urtica dioica*; FAC) growing along the banks and below the OHWM.

Water 2 was determined to be have an intermittent flow regime, Type Ns stream and therefore has a riparian buffer of 75 feet.

Water 3

Water 3 is an intermittent, non-fishbearing (DNR Water Type Ns) stream which originates on-site at the bottom of a ravine in the southeastern portion of the study area. Water 3 extends off-site to the south and appears to have a direct hydrologic connection to wetlands adjacent to the East Fork Lewis River. The channel bed is approximately 4-feet wide with 1 foot tall channel banks. Approximately 0.25-inch deep of continuous flow was observed within Water 3 during the November 2018 site visit. The channel is generally unvegetated with western lady fern and Himalayan blackberry growing along the banks.

Water 3 was determined to be an intermittent, Type Ns stream and therefore has a riparian buffer of 75 feet.

Uplands

Plots 1-4 document conditions within pasture located in NRCS mapped hydric soils. Only Plot 2 met hydric soil indicator F6, Redox Dark Surface. Other plots lacked hydric soil indicators. Soils documented on the site did not meet the typical soil profile for the hydric Odne series, which typically consists of a very dark gray (10YR 4/1) chroma containing common, coarse redox concentrations.

The groundwater table at Plots 1-4 was below 12-inches during both the November 14, 2018 and March 11, 2019 site visits, which were conducted during normal rainfall periods. The soil temperature recorded during the March 11, 2019 site visit was 42 degrees Fahrenheit at 12-inches below the ground surface, indicating the site visit was conducted during the early growing season.

The pasture field is relatively flat, lacking topography likely to hold water sufficient to develop wetland characteristics. According to the Geotech report conducted for the site by GeoDesign, January 14, 2019, groundwater in the pasture was encountered between depths of 10 and 14 feet below the surface during their December 2018 site visit. According to their report, based on their experience, the perched groundwater table may rise to only within 5 feet of the ground surface during the wet season.

A small scattered patch of pennyroyal (*Mentha pulegium*) was observed near Plot 2. Pennyroyal is a stoloniferous, creeping plant that is not deeply rooted. The pennyroyal appears to have sustained in areas where the surface soil was compacted from grazing, and not indicative of a high groundwater table. Pennyroyal did not appear to be dominant on the site.

Priority Oregon White Oaks

AKS biologist Taya MacLean met on-site with WDWF biologists David Howe and Julie Grobelny, on February 21, 2019 to verify priority individual oaks on the site. AKS observed six Oregon white oaks with diameters at breast height (DBH) varying from 10 inches to 30 inches throughout the study area that meet WDFW's definition of a priority individual oak tree. The locations of the surveyed priority oaks and associated driplines are shown on attached Figure 9, Appendix A.

WDFW confirmed the large oak located immediately adjacent to the existing house does not meet the definition for a priority oak tree because of its location within a highly disturbed area (residence, nonnative landscaping).

Per LCMC Table 18.300.090.2.a, with consultation with WDFW, the City may allow for a reduced protective buffer around individual priority oak. WDFW confirmed during the February 2019 site visit, 300 foot wide buffers are not required adjacent to on-site priority oaks. The oaks are only priority to the dripline, as delineated by AKS.

Riparian Habitat Area

The riparian buffer adjacent to Water 1 was dominated by a cluster of Douglas fir trees in the northeast. The remainder of the buffer lacked closed tree canopy, with scattered red alder trees. The understory was generally dominated by invasive English ivy (*Hedera helix*) and Himalayan blackberry. Lesser amounts of western sword fern (*Polystichum munitum)* was present scattered throughout the understory. The riparian buffer adjacent to Waters 2, and 3 are predominantly forested, dominated by Douglas fir and bigleaf maple trees. The understory was generally dominant in Himalayan blackberry.

Project

The project avoids impacts to the drainages delineated on the site and the 75-foot riparian buffer associated with Waters 2 and 3. The project also avoids impacts to individual priority oaks mapped on the site. To avoid impact to priority oaks, the drip lines of oaks will be marked in the field with construction fencing prior to the start of construction. The Site Plan is depicted on Figure 10 of Appendix A.

The stormwater pond will avoid encroachment into the 75 foot riparian buffer associated with Water 2. The stormwater outfall pipe will be buried within the riparian buffer to discharge above Water 2. Below ground utilities, such as storm systems, are considered allowed uses within buffers per 18.300.050 (4)(b) of LAMC. The temporary ground disturbance within buffer to install the storm pipe will be replanted with native shrubs to ensure no net loss of buffer functions. No native trees with greater than 6-inch

diameter breast height will be removed to install the storm line. The temporary buffer impacts planting specification table is included in Appendix E.

The site plan requires a buffer reduction adjacent to Type Ns Water 1 in the northern portion of the site. Reduction of the riparian buffer width is necessary to accommodate a well-laid out site plan that meets density requirements and provides a public trail which connects to the City's trail system. A buffer reduction up to 50% of the required buffer width (up to 37.5 feet wide) is allowed per LCMC 18.300.090 (2)(l). The existing condition of the riparian buffer adjacent to Water 1 requiring reduction is primarily dominated by nonnative invasive vegetation (English ivy and Himalayan blackberry). Portions of the buffer reduction area contains gravel driveway and a shop. The reduced buffer width will not significantly reduce the water quality and habitat functions of the remaining buffer. Enhancement to a portion of the remaining buffer, including removal of non-native invasive vegetation species and densely planting with native tees and shrubs, will occur to ensure compliance with City code.

Riparian Buffer Enhancement Plan

To ensure no net loss of riparian buffer function, the site plan includes enhancement to a minimum 0.34 acres of remaining on-site riparian buffer adjacent to Water 1 (riparian buffer enhancement area shown on attached Figure 10, Appendix A). The enhancement area ratio is approximately 1.5 times the riparian habitat buffer encroachment.

The existing condition of the buffer proposed for enhancement can be described as being "degraded", lacking closed canopy of native trees and native shrubs in the understory. The proposed buffer enhancement includes removal of non-native invasive vegetation and densely planting native trees and shrubs to provide a higher quality functioning buffer. The addition of native trees and shrubs will provide shading to improve thermoregulation water quality function, as well as structural diversity to increase wildlife habitat functional opportunity.

A buffer enhancement planting specification table, including recommended plant species and quantities is provided in Appendix D. Appropriate native plant substitutions should be approved by a qualified professional with expertise in native plants.

The buffer enhancement shall occur within the same growing season as the buffer encroachment.

If required, the applicant shall provide a financial security mechanism acceptable to the City.

Performance Standards

The goal of the buffer enhancement is to ensure no net loss of water quality and habitat functions to Water 1. Specific performance standards to ensure that the project is successfully meeting prescribed goals and objectives should be monitored in Years 1, 2, 3, and 5 and will include:

1. Invasive plants, including Class A-C noxious weeds listed by Clark County and Himalayan blackberry, will not exceed 20% cover in enhancement areas during all monitoring years.
2. Tree and Shrub plant survival rates:
    - Year 1: 90% survival
    - Year 2: 80% survival
    - Year 3: 75% survival OR at least 70% combined cover of native shrubs and trees (planted and volunteer)
    - Years 4 and 5: 75% survival OR 80% combined cover of native shrubs and trees (planted and volunteer)

Buffer Enhancement Monitoring Plan

Woody enhancement plantings will be monitored and maintained for a minimum of 5 full growing seasons beginning after installation of plantings. Monitoring will consist of establishing an appropriate number of monitoring plot locations across the enhancement area to be assessed in Years 1, 2, 3, and 5. At each plot, the survivorship of planted shrubs and trees; cover of planted or naturally recruited native shrubs and trees; cover of invasive and nonnative vegetation species; and general site observations will be recorded. Representative site photographs will be taken from established photo points across the enhancement area. Vegetation monitoring plot and photo point locations will be determined during the first monitoring year.

Monitoring reports will be submitted to the City by November 1 following the growing seasons of Years 1, 2, 3, and 5. The monitoring report will consist of photographs and a discussion of performance standards, maintenance activities, problems and successes, and any maintenance needs or contingency actions necessary to ensure success of the mitigation project. Success will be achieved when monitoring results indicate that performance standards are being met at the end of the five year monitoring period.

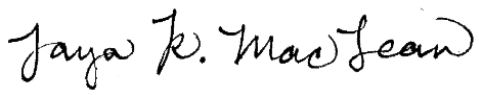
Buffer Enhancement Maintenance Plan

Routine maintenance of the site is necessary to ensure the integrity and success of the mitigation plan. Maintenance and management of the site may include replacement woody plantings, invasive plant management, irrigation (if needed), and garbage removal. Maintenance activities will be guided by scientific results of annual monitoring, corrective measures, and adaptive management recommendations. Adaptive management measures, such as selecting different species for replacement plantings, may be considered if plantings appear to have massive failures.

Statement of Preparation

The information in this report was compiled and prepared under the supervision and direction of the undersigned, qualified professionals per applicable City regulations, including the La Center Critical Areas Ordinance. Information contained in this document should be considered preliminary and used at your own risk until it has been reviewed and approved in writing by the appropriate agencies with jurisdiction over potentially jurisdictional features within the study area.

Fieldwork and report preparation were conducted by the following individuals:



Taya K. MacLean, MS, PWS
Senior Biologist
Fieldwork, Report Preparation

Stacey Reed, PWS
Senior Wetland Scientist
Site Visit and Report QA/QC

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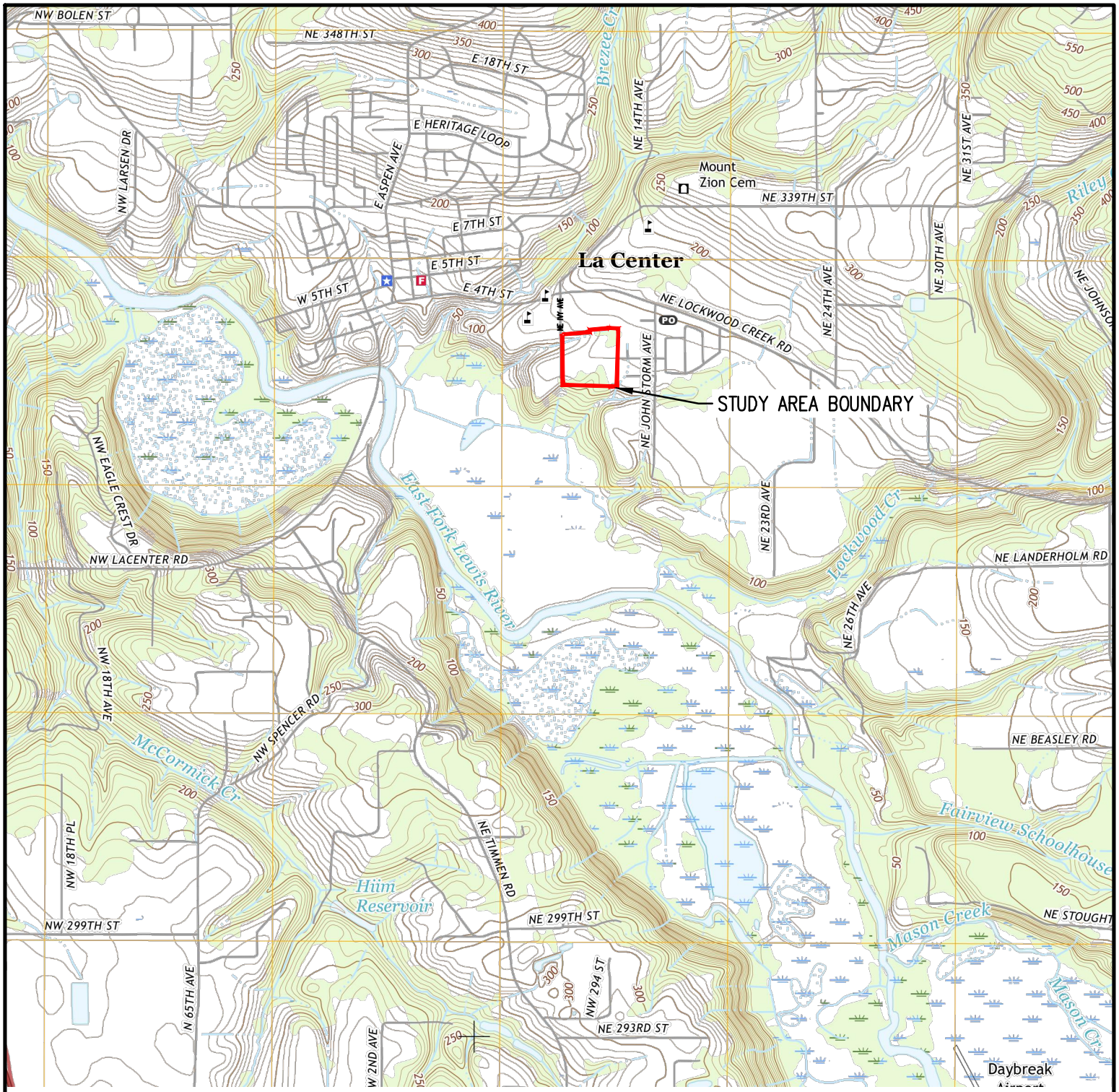
Appendix A: Figures



N

SCALE: 1"= 2000 FEET

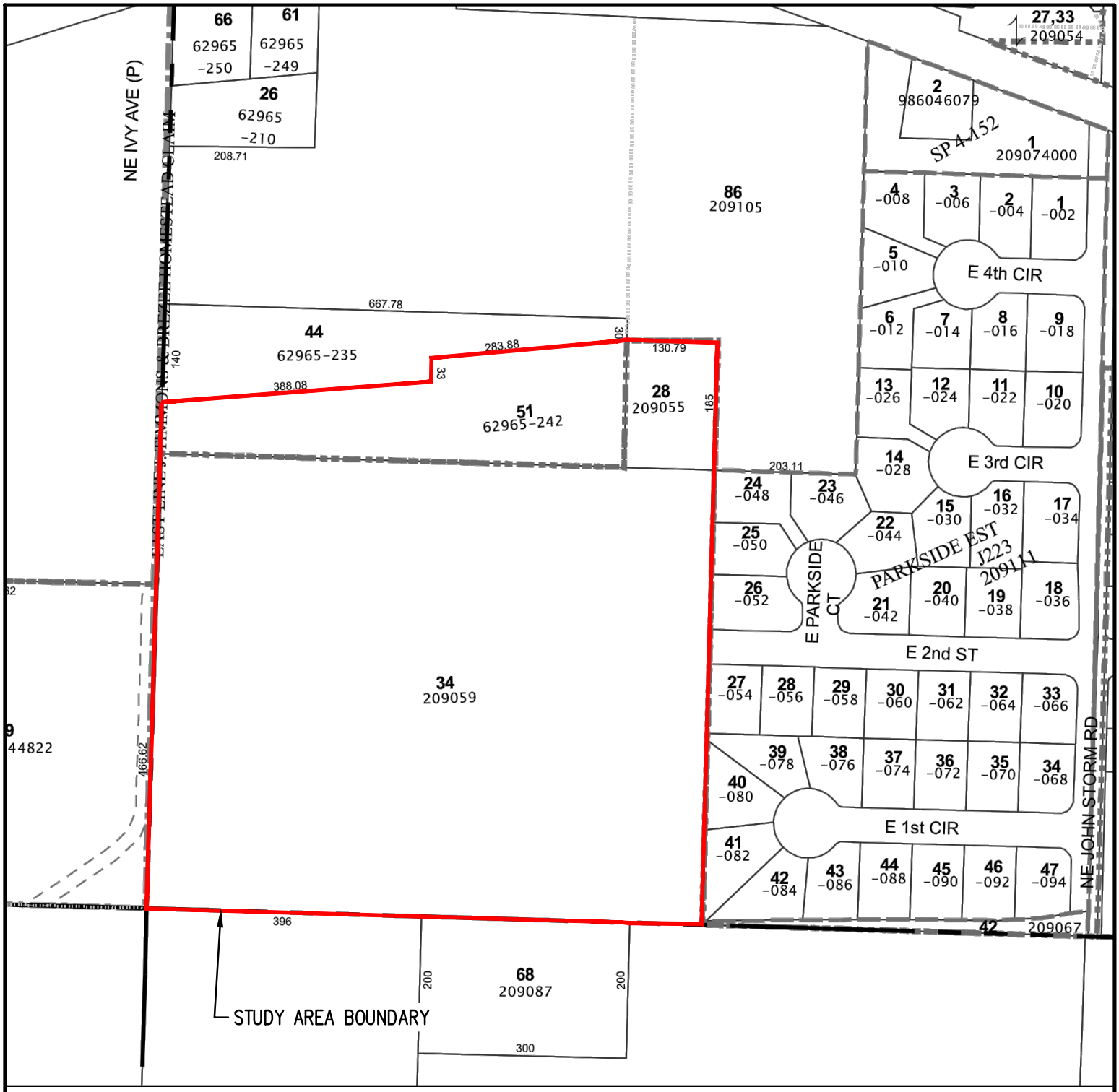
2000 0 800 1200 1600 2000

USGS 7.5' TOPOGRAPHIC SERIES
QUADRANGLE: RIDGEFIELD, WA (2017)

DATE: 12/26/2018

USGS VICINITY MAP HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT	FIGURE 1
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 P: 503.563.6151 F: 503.563.6152 aks-eng.com	DRWN: SKT CHKD: SAR AKS JOB: 6962

DWG: 6962 BACKGROUND FIGURES | FIGURE 1



N

SCALE: 1"= 200 FEET

200 0 80 120 160 200

CLARK COUNTY
NW QTR OF SEC. 02, T. 4N., R. 1E., W.M.
PARCEL NO. 209059-000, 209055-000,
AND 62965242

DATE: 12/26/2018

PARCEL MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 2

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
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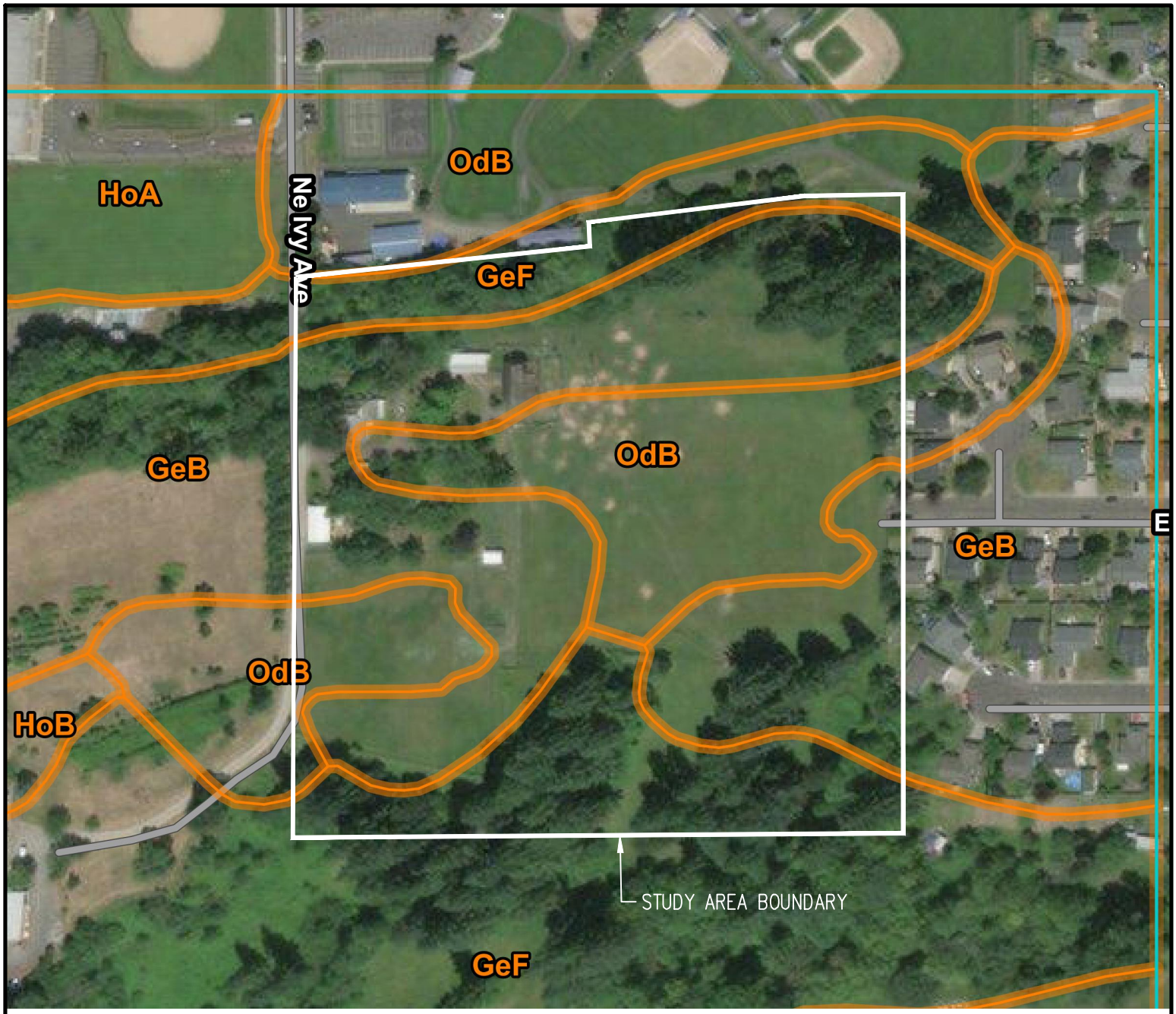
DRWN: SKT
CHKD: SAR
AKS JOB: 6962



MAP UNIT SYMBOL	MAP UNIT NAME
GeB	GEE SILT LOAM, 0% TO 8% SLOPES; NON-HYDRIC
GeF	GEE SILT LOAM, 30% TO 60% SLOPES; NON-HYDRIC
OdB	ODNE SILT LOAM, 0% OT 5% SLOPES; HYDRIC

NRCS WEB SOIL SURVEY FOR
CLARK COUNTY

N

SCALE: 1"= 200 FEET

200 0 80 120 160 200

DATE: 12/26/2018

NRCS SOIL SURVEY MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 3

AKS ENGINEERING & FORESTRY, LLC
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CHKD: SAR
AKS JOB: 6962

US FISH & WILDLIFE SERVICE
NATIONAL WETLAND INVENTORY (2017)

N

SCALE: 1"= 200 FEET

200 0 80 120 160 200

DATE: 12/26/2018

NATIONAL WETLAND INVENTORY MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 4

AKS ENGINEERING & FORESTRY, LLC
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DRWN: SKT
CHKD: SAR
AKS JOB: 6962

CLARK COUNTY MAPS ONLINE (2018)

N

SCALE: 1"= 200 FEET

200 0 80 120 160 200

DATE: 12/26/2018

MODELED AND PRESENT WETLANDS MAP HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT	FIGURE 5
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 P: 503.563.6151 F: 503.563.6152 aks-eng.com	DRWN: SKT CHKD: SAR AKS JOB: 6962

DWG: 6962 BACKGROUND FIGURES | FIGURE 5

Water Bodies
- Flats/Gravel Bars
- Ice
- Man Made Features
- Open Water
- Wet Area

Streams
Streams
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

Roads
Roads
- Unpaved Road/Surface Unknown
- Paved Road

Water Type Break
Water Type Break

WASHINGTON DEPARTMENT OF NATURAL RESOURCES (2018)

N

SCALE: 1"= 200 FEET

200 0 80 120 160 200

DATE: 12/26/2018

DNR WATERS MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 6

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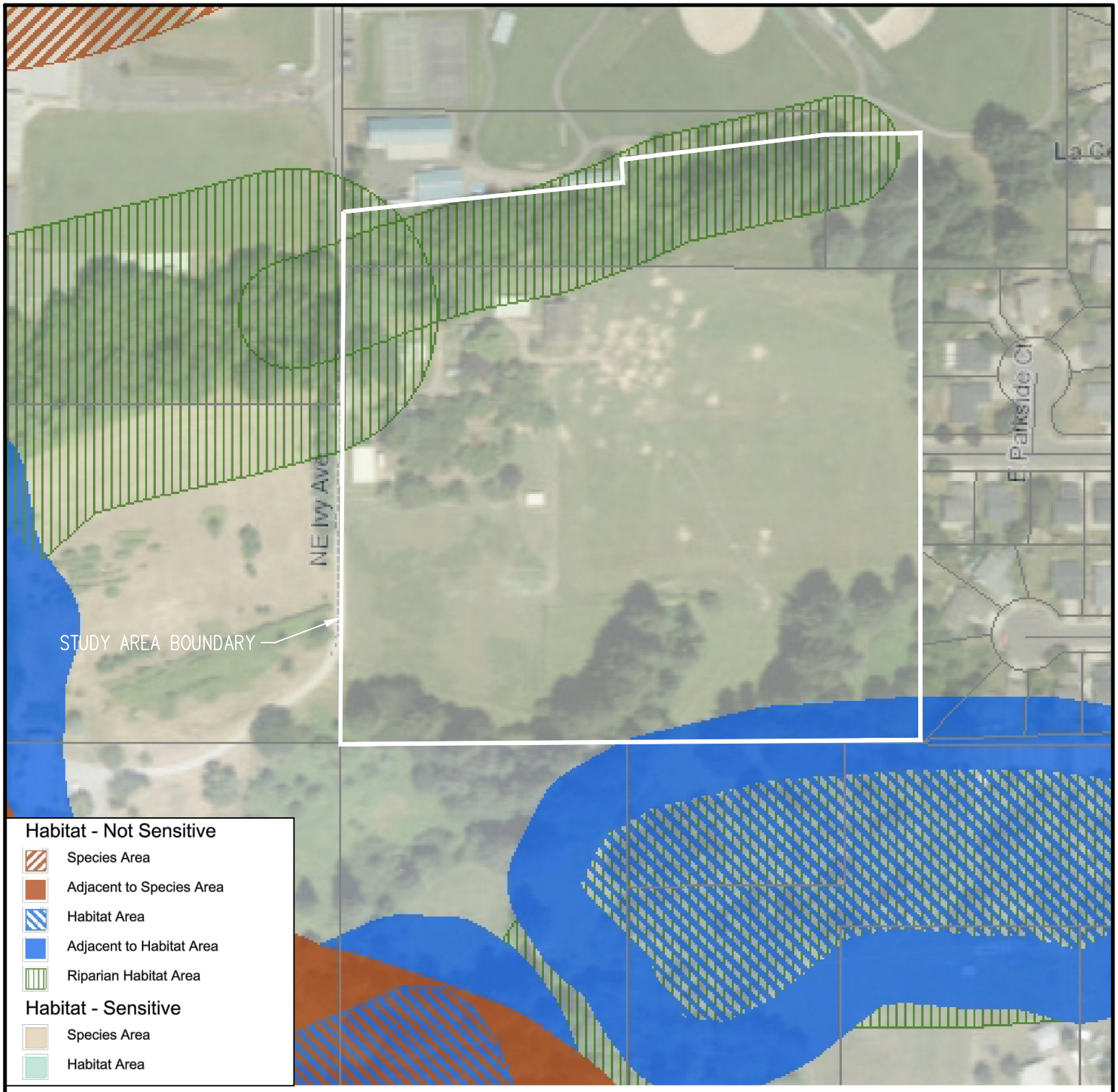

CLARK COUNTY MAPS ONLINE (2018)

N

SCALE: 1"= 200 FEET

200 0 80 120 160 200

DATE: 12/26/2018

PRIORITY HABITAT AND SPECIES MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 7

AKS ENGINEERING & FORESTRY, LLC
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CHKD: SAR
AKS JOB: 6962

WDFW PHS MAPS ONLINE (2018)

N

SCALE: 1"= 500 FEET

500 0 200 300 400 500

DATE: 12/26/2018

WDFW PRIORITY HABITAT AND SPECIES MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 8

AKS ENGINEERING & FORESTRY, LLC
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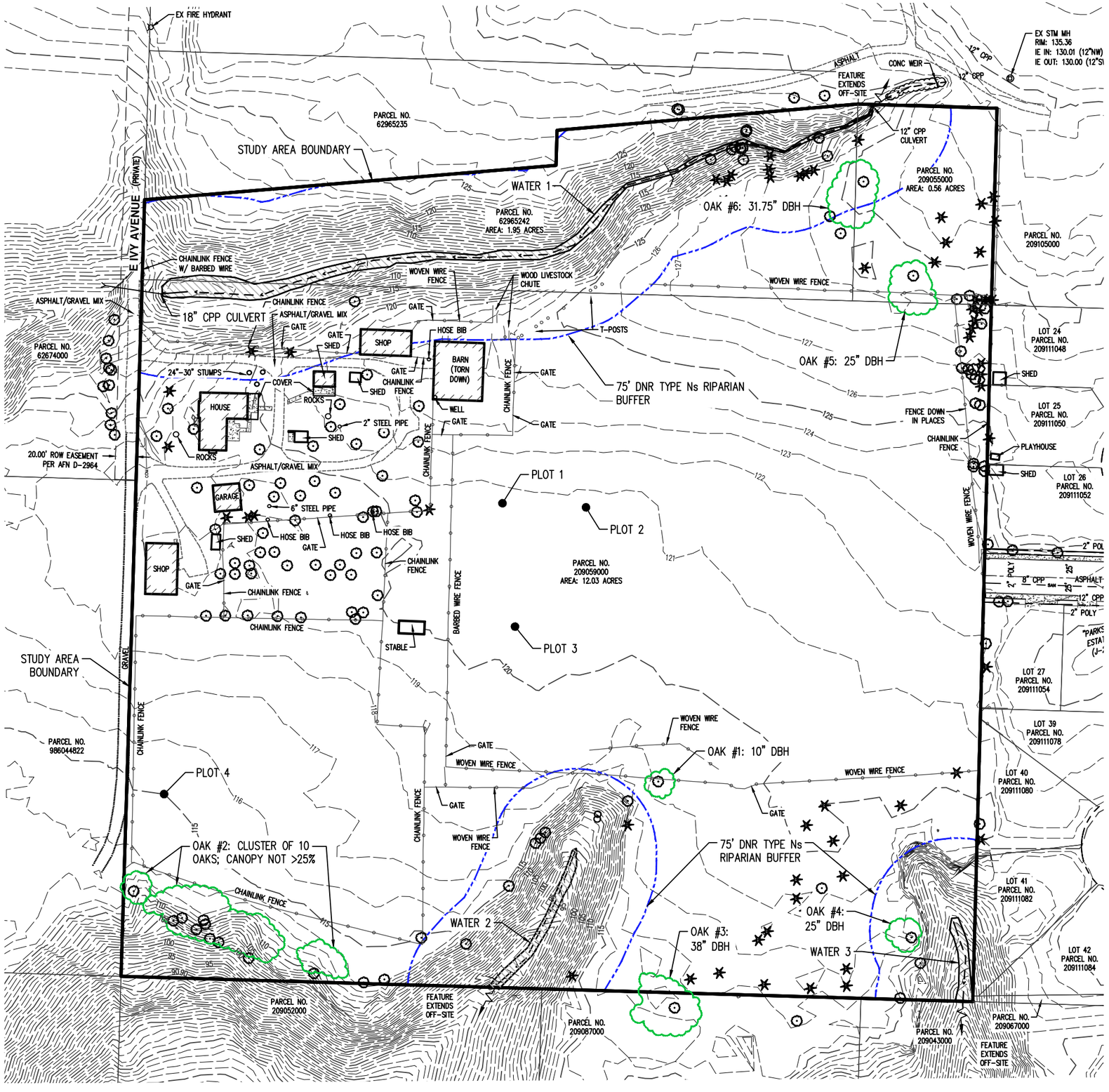


LEGEND

TOTAL ON-SITE WATER AREA: 7,911 SF± (0.18 ACRES±)

WATER 1 (NS): 5,753 SF± (0.13 ACRES±)
WATER 2 (NS): 1,271 SF± (0.03 ACRES±)
WATER 3 (NS): 887 SF±

TOTAL ON-SITE 75' RIPARIAN BUFFER: 146,943 SF± (3.37 ACRES±)

TOTAL INDIVIDUAL PRIORITY OREGON WHITE OAK DRIPLINE- BASED OFF OF SUMMER 2012 AERIAL: 15,148 SF± (0.35 ACRES±)

N

SCALE: 1"=100 FEET

100 0 40 60 80 100

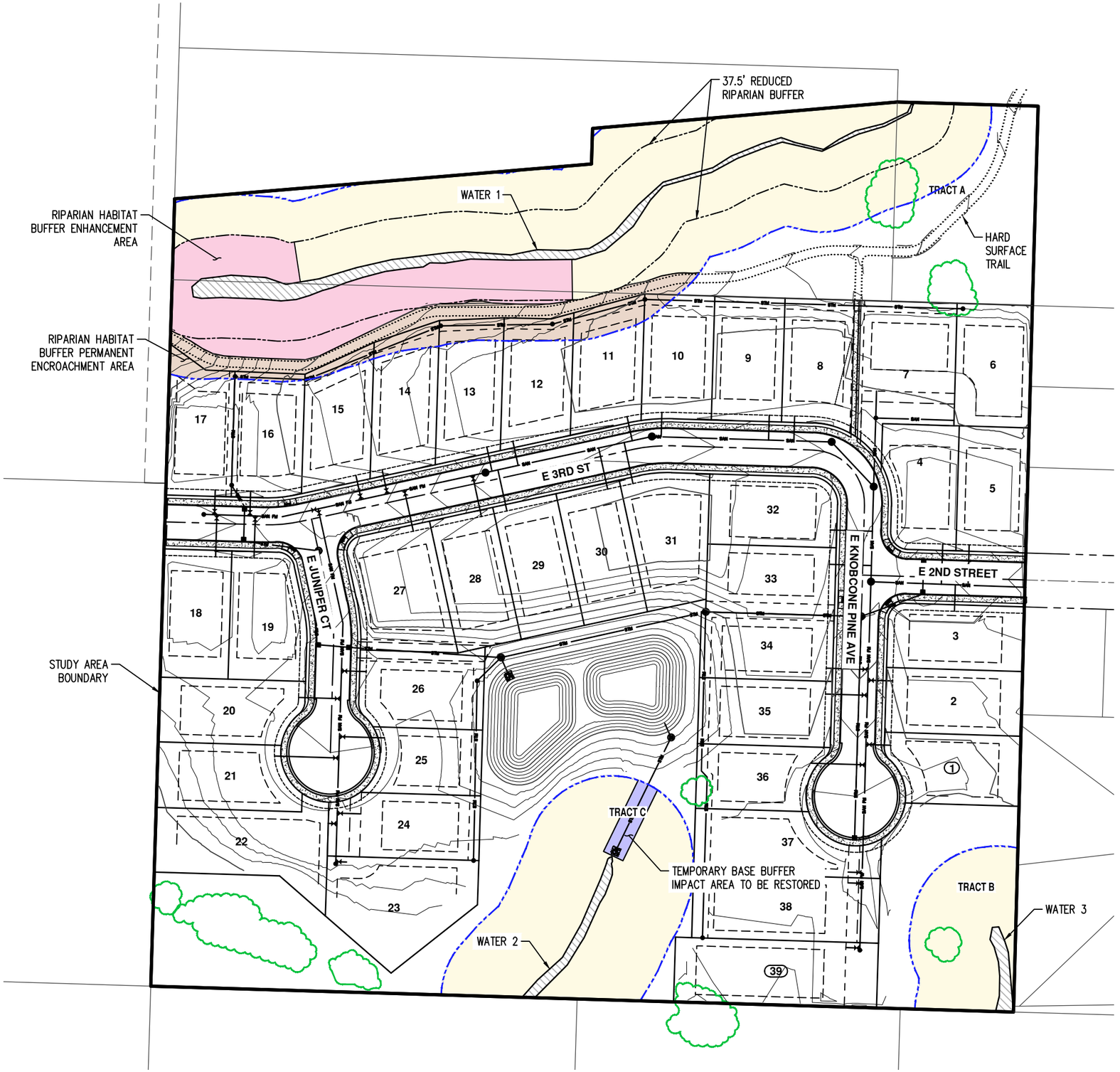
SCALED 11 X 17"

DATE: 03/14/2019

CRITICAL AREAS MAP	FIGURE 9
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT	

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: KMK
CHKD: SAR
AKS JOB: 6962



LEGEND

- TOTAL ON-SITE WATER AREA: 7,911 SF± (0.18 ACRES±)
- 75' BASE RIPARIAN BUFFER
- TOTAL INDIVIDUAL PRIORITY OREGON WHITE OAKS TO BE PRESERVED: 15,148 SF± (0.35 ACRES±)
- RIPARIAN HABITAT BUFFER ENHANCEMENT AREA: 22,038 SF± (0.51 ACRES±)
- RIPARIAN HABITAT BUFFER ENCROACHMENT INTO BASE BUFFER AREA: 14,691 SF± (0.34 ACRES±)
- TEMPORARY IMPACTS TO BASE BUFFER AREA TO BE RESTORED: 1,475 SF± (0.03 ACRES±)
- TOTAL REMAINING ON-SITE RIPARIAN BUFFER (NOT INCLUDING ENHANCEMENT AREA): 108,740 SF± (2.50 ACRES±)

NOTE: OAK DRIPLINE AVOIDANCE AREAS WILL BE NOTED ON CONSTRUCTION DRAWINGS.

N

SCALE: 1"=100 FEET

100 0 40 60 80 100

SCALED 11 X 17"

DATE: 03/14/2019

SITE PLAN	FIGURE
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT	**10**

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: KMK
CHKD: SAR
AKS JOB: 6962

Appendix B: Wetland Determination Data Sheets

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

Project/Site: Holley Park Subdivision | City/County: La Center / Clark | Sampling Date: 11/14/2018

Applicant/Owner: Compass Group LLC | State: WA | Sampling Point: 1

Investigator(s): Taya MacLean and Sonya Templeton | Section, Township, Range: Sect 02, T4N, R3E

Landform (hillslope, terrace, etc.): Shoulder Slope | Local relief (concave, convex, none): None | Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: Unit OdB, Odne silt loam, 0-5% slopes | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Precipitation:
According to the AgACIS Battle Ground station, 0.03 inches of rainfall was received the day of the site visit and 1.75 inches of rainfall was received for the two weeks prior

Remarks:
Plot is located in grazed pasture.

VEGETATION

Tree Stratum (Plot Size: 30' r or)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot Size: 10' r or)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot Size: 5' r or)			
1. *Agrostis species*	40%	Yes	FAC ?
2. *Alopecurus pratensis*	25%	Yes	FAC
3. *Trifolium repens*	15%	No	FAC
4. *Hypochaeris radicata*	5%	No	FACU
5. *Daucus carota*	5%	No	FACU
6. *Mentha pulegium*	5%	No	OBL
7. *Geranium molle*	5%	No	NOL
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot Size: 10' r or)			
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	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	10	x 4 =	40
UPL species	5	x 5 =	25
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:
- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation (Explain)[1]

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: 1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	98	7.5YR 3/4	2	C	M	SiL	

[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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches): ___	
Water Table Present?	Yes ___ No X	Depth (inches): >16"	**Wetland Hydrology Present?** **Yes** ___ **No** X
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches): >16"	

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

Remarks:

Follow up site visit on 3/11/2019- No groundwater or saturation within 16-inches below ground surface. Left test pit open for 15-20 minutes. No ORZ. No evidence of prior ponding.

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

Project/Site: Holley Park Subdivision | City/County: La Center / Clark | Sampling Date: 11/14/2018

Applicant/Owner: Compass Group LLC | State: WA | Sampling Point: 2

Investigator(s): Taya MacLean and Sonya Templeton | Section, Township, Range: Sect 02, T4N, R3E

Landform (hillslope, terrace, etc.): Shoulder Slope | Local relief (concave, convex, none): None | Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: Unit OdB, Odne silt loam, 0-5% slopes | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Precipitation:
According to the AgACIS Battle Ground station, 0.03 inches of rainfall was received the day of the site visit and 1.75 inches of rainfall was received for the two weeks prior

Remarks:
Plot located in pasture.

VEGETATION

Tree Stratum (Plot Size: 30' r or)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot Size: 10' r or)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot Size: 5' r or)			
1. *Agrostis species*	70%	Yes	FAC ?
2. *Poa species*	20%	Yes	FAC ?
3. *Hypochaeris radicata*	5%	No	FACU
4. *Mentha pulegium*	5%	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot Size: 10' r or)			
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	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	100 (A)		295 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:
- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation (Explain)[1]

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: 2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	95	7.5YR 3/4	5	C	M	SiL	
8-16	10YR 3/2	95	7.5YR 4/4	5	C	M	SiL	

[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)
- X 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** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___	
Water Table Present?	Yes ___	No X	Depth (inches): >16"	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >16"	

Wetland Hydrology Present? **Yes** ___ **No** X

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

Remarks:

Follow up site visit on 3/11/2019- No groundwater or saturation within 16-inches below ground surface. Left test pit open for 30 minutes. No ORZ. No evidence of prior ponding. No pugged soils.

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

Project/Site: Holley Park Subdivision | City/County: La Center / Clark | Sampling Date: 11/14/2018

Applicant/Owner: Compass Group LLC | State: WA | Sampling Point: 3

Investigator(s): Taya MacLean and Sonya Templeton | Section, Township, Range: Sect 02, T4N, R3E

Landform (hillslope, terrace, etc.): Shoulder Slope | Local relief (concave, convex, none): None | Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: Unit OdB, Odne silt loam, 0-5% slopes | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Precipitation:
According to the AgACIS Battle Ground station, 0.03 inches of rainfall was received the day of the site visit and 1.75 inches of rainfall was received for the two weeks prior

Remarks:

VEGETATION

Tree Stratum (Plot Size: 30' r or)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot Size: 10' r or)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot Size: 5' r or)			
1. *Agrostis species*	80%	Yes	FAC ?
2. *Hypochaeris radicata*	20%	Yes	FACU
3. *Trifolium species*	2%	No	FAC ?
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	102% = Total Cover		
Woody Vine Stratum (Plot Size: 10' r or)			
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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	82	x 3 =	246
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	102 (A)		326 (B)

Prevalence Index = B/A = 3.20

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation (Explain)[1]

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No** X

Remarks:

SOIL

Sampling Point: 3

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

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

[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 X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches): ___	
Water Table Present?	Yes ___ No X	Depth (inches): >16	
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches): >16	

Wetland Hydrology Present? Yes ___ No X

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

Remarks:

Follow up site visit on 3/11/2019- No groundwater within 16-inches. Saturation at 14-inches below ground surface. Left test pit open for 30 minutes. No ORZ. No evidenc of prior ponding.

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

Project/Site: Holley Park Subdivision | City/County: La Center / Clark | Sampling Date: 11/14/2018

Applicant/Owner: Compass Group LLC | State: WA | Sampling Point: 4

Investigator(s): Taya MacLean and Sonya Templeton | Section, Township, Range: Sect 02, T4N, R3E

Landform (hillslope, terrace, etc.): Shoulder Slope | Local relief (concave, convex, none): None | Slope (%): <3

Subregion (LRR): A, Northwest Forests and Coast | Lat: | Long: | Datum:

Soil Map Unit Name: Unit OdB, Odne silt loam, 0-5% slopes | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes **X**	No
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**

Is the Sampled Area within a Wetland? **Yes** **No X**

Precipitation:
According to the AgACIS Battle Ground station, 0.03 inches of rainfall was received the day of the site visit and 1.75 inches of rainfall was received for the two weeks prior

Remarks:
Plot located in pasture actively grazed by horse.

VEGETATION

Tree Stratum (Plot Size: 30' r or)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot Size: 10' r or)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot Size: 5' r or)			
1. *Agrostis species*	90%	Yes	FAC ?
2. *Poa species*	10%	No	FAC ?
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot Size: 10' r or)			
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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		300 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation (Explain)[1]

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X No**

Remarks:

SOIL

Sampling Point: 4

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	98	7.5YR 3/4	2	C	M	SiL	
8-14	10YR 3/2	100					SiL	

[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** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches): ___	
Water Table Present?	Yes ___ No X	Depth (inches): >16	
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches): >16	

Wetland Hydrology Present? **Yes** ___ **No** X

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

Remarks:

Follow up site visit on 3/11/2019- No groundwater or saturation within 16-inches below ground surface. Left test pit open for 15-20 minutes. No ORZ. No evidence of prior ponding. No pugged soils.

Appendix C: Streamflow Duration Assessment Forms

Appendix B: Streamflow Duration Field Assessment Form

Project # / Name 6962 Holley Park Subdivision	Assessor Sonya Templeton
Address NE Ivy Avenue, La Center, Washington	Date 11/14/2018
Waterway Name Water 1	Coordinates at downstream end (ddd.mm.ss) Lat. 45.861040 N
Reach Boundaries 60 feet downstream from rip-rap lined swale	Long. -122.660153 W
Precipitation w/in 48 hours (cm) 0.0762	Channel Width (m) 1
☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow 70%

% of reach w/any flow (surface or hyporheic) 70%

# of pools observed 4

Observations

Observed Wetland Plants (and indicator status):

giant horsetail
(Equisetum telmateia; FACW)

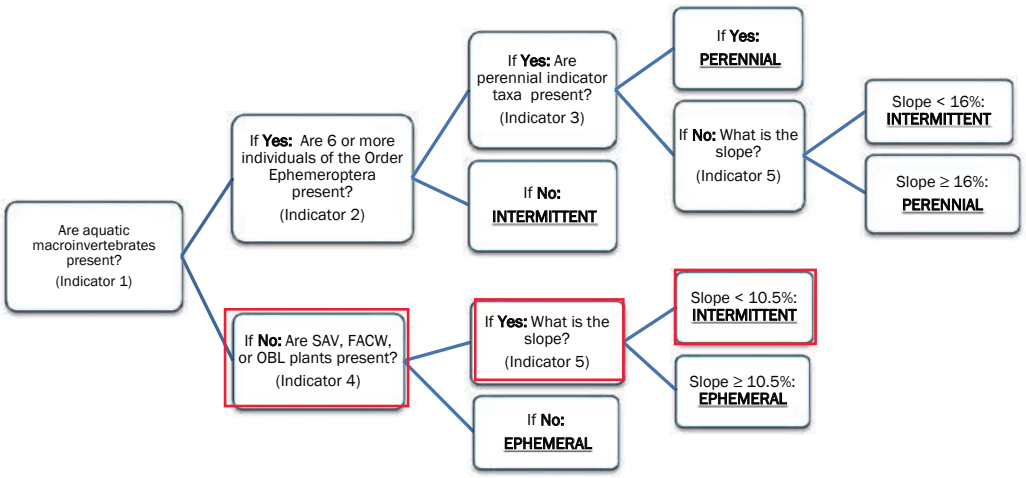
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
N/A			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☒ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



Single Indicators:
☐ Fish
☐ Amphibians

Finding:
☐ Ephemeral
☒ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

Channel bed is approximately 4-feet wide with 2-foot tall banks. Approximately 4 inches of continuous flow was present in the entire on-site channel reach during the November 2018 site visit.
Substrate in the channel is composed of a silt loam with gravels and cobbles and large wood debris.

Ancillary Information:

☒ Riparian Corridor Alnus rubra, Rubus armeniacus, Athyrium cyclosorum

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Appendix B: Streamflow Duration Field Assessment Form

Project # / Name 6962 Holley Park Subdivision		Assessor Sonya Templeton	
Address NE Ivy Avenue, La Center, Washington			Date 11/18/2018
Waterway Name Water 2		Coordinates at downstream end (ddd.mm.ss)	Lat. N
Reach Boundaries 20 feet upstream from study area boudary			Long. W
Precipitation w/in 48 hours (cm) 0.0762	Channel Width (m) 2.4	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow 20

% of reach w/any flow (surface or hyporheic) 20

# of pools observed 3

Observations

Observed Wetland Plants (and indicator status):

giant horsetail
(Equisetum telmateia; FACW)

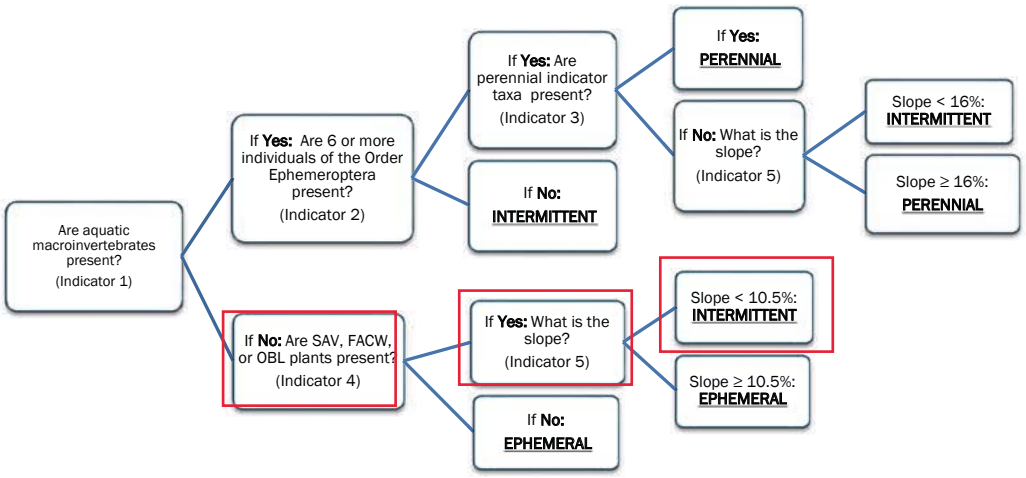
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
N/A			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☒ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	10 %	

Conclusions



Single Indicators:
☐ Fish
☐ Amphibians

Finding:
☐ Ephemeral
☒ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

channel bed is approximately 8-5 feet wide and had approximately 2 inches of water with flow present during the site visit. Substrate in the channel is composed of a silt loam.

Ancillary Information:

☒ Riparian Corridor Alnus rubra, Rubus armeniacus, Athyrium cyclosorum, Urtica dioica

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Appendix B: Streamflow Duration Field Assessment Form

Project # / Name 6962 Holley Park Subdivision		Assessor Sonya Templeton	
Address NE Ivy Avenue, La Center, Washington			Date 11/14/2018
Waterway Name Water 3		Coordinates at downstream end (ddd.mm.ss)	Lat. 45.861040 N
Reach Boundaries Headwaters			Long. -122.660153 W
Precipitation w/in 48 hours (cm) 0.0762	Channel Width (m) 1	☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow 70%

% of reach w/any flow (surface or hyporheic) 70%

# of pools observed 4

Observations

Observed Wetland Plants (and indicator status):

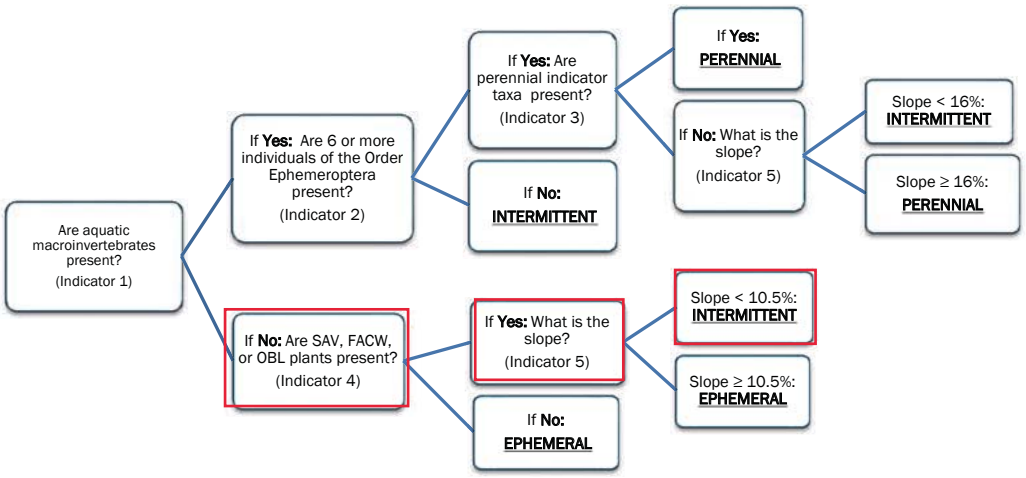
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
N/A			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	5 %	

Conclusions



Single Indicators:
☐ Fish
☐ Amphibians

Finding:
☐ Ephemeral
☒ Intermittent
☐ Perennial

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

☐ Prolonged Abnormal Rainfall / Snowpack

☐ Below Average

☐ Above Average

☐ Natural or Anthropogenic Disturbance

☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

Channel bed is approximately 4-feet wide with 1-foot tall banks. Approximately 0.25 inches of continuous flow was present in the on-site portion of the channel during the November 2018 site visit.
Bed substrate is composed of silt loam. Determined intermittent because at same elevation as Water 2 though no evidence of FACW or OBL veg growing adjacent to stream channel in study area.

Ancillary Information:

☒ Riparian Corridor Alnus rubra, Rubus armeniacus, Athyrium cyclosorum

☐ Erosion and Deposition

☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Appendix D: Representative Site Photographs

Photo A. View facing north up NE Ivy Avenue. Photo taken by AKS survey crew on 11/28/18.

Photo B. View facing east of Water 1 from NE Ivy Avenue.

Photo C. View southeast of gravel driveways and residential house. Photo taken by AKS survey crew on 11/28/18.

Photo D. View facing north of upland area surrounding barn. Photo taken by AKS survey crew on 11/28/18.

Photos taken by Taya MacLean November 14, 2018 and AKS Field Survey Crew

Photo E. View facing northwest of Water 1 riparian corridor. Photo taken by AKS survey crew on 11/28/18.

Photo F. View facing east of Water 1 riparian corridor. Photo taken by AKS survey crew on 11/28/18.

Photo G. View facing east of Water 1. Water flows west. Photo taken by AKS survey crew on 12/02/18.

Photo H. View facing northeast of rip-rap lined swale off-site where Water 1 originates. Photo taken by AKS survey crew on 12/02/2018.

Photos taken by Taya MacLean November 14, 2018 and AKS Field Survey Crew

Photo I. View facing southwest of open field.

Photo J. View south of open field looking toward Water 3.

Photo K. View north of open field toward Water 1.

Photo L. View north within open area between Water 2 and Water 3.

Photos taken by Taya MacLean November 14, 2018 and AKS Field Survey Crew

Photo M. View facing southeast of Water 3 corridor. Photo taken by AKS survey crew on 11/20/18.

Photo N. View south of Water 2 corridor. Photo taken by AKS survey crew on 11/20/18.

Photo O. View facing south of Water 2. No wetlands found above the OHWM

Photo P. View east of forested area with Oregon white oaks near Water 3. Photo taken by AKS survey crew on 11/20/18.

Photos taken by Taya MacLean November 14, 2018 and AKS Field Survey Crew

Photo Q. View facing east along edge of Oregon white oak forested habitat. Photo taken by AKS survey crew on 11/29/18.

Photo R. View facing west along edge of Oregon white oak forested habitat. Photo taken by AKS survey crew on 11/29/18.

Photo OS View northwest of horse pasture area. Photo taken by AKS survey crew on 11/29/18.

Photo T. View southeast of horse pasture area toward Water 2 and Oregon white oak habitat area. Photo taken by AKS survey crew on 11/29/18.

Photos taken by Taya MacLean November 14, 2018 and AKS Field Survey Crew

Appendix E: Riparian Buffer Enhancement Planting Specifications

Holley Park Subdivision
Riparian Habitat Buffer Enhancement Planting Specification

Riparian Buffer Enhancement Planting Area (adjacent Water 1) = 22,037 SF (0.51 AC)

Common Name	Scientific Name	Facultative Class	Spacing (feet; triangular pattern)	Size	Quantity
Douglas fir (tree)	*Pseudotsuga menziesii*	FACU	12'	1 gallon or bare root	51
bigleaf maple (tree)	*Acer macrophyllum*	FACU	12'	1 gallon or bare root	51
vine maple (tree)	*Acer circinatum*	FAC	12'	1 gallon or bare root	51
baldhip rose (shrub)	*Rosa gynmocarpa*	FACU	6'	1 gallon or bare root	102
common snowberry (shrub)	*Symphoricarpos albus*	FACU	6'	1 gallon or bare root	102
Lewis' mock orange (shrub)	*Philadelphus lewisii*	NOL	6'	1 gallon or bare root	102
oceanspray (shrub)	*Holodiscus discolor*	FACU	6'	1 gallon or bare root	102
serviceberry (shrub)	*Amelanchier alnifolia*	FACU	6'	1 gallon or bare root	102
tall Oregon grape (shrub)	*Mahonia aquifolium*	FACU	6'	1 gallon or bare root	102
				TOTAL:	**765**

**Any areas left bare should be seeded using an appropriate native upland grass seed mix.*

Temporary Riparian Buffer Impact Restoration Planting Area (Adjacent Water 2) = 1,475 SF (0.03 AC)

Common Name	Scientific Name	Facultative Class	Spacing (feet; triangular pattern)	Size	Quantity
common snowberry (shrub)	*Symphoricarpos albus*	FACU	6'	1 gallon or bare root	10
oceanspray (shrub)	*Holodiscus discolor*	FACU	6'	1 gallon or bare root	10
serviceberry (shrub)	*Amelanchier alnifolia*	FACU	6'	1 gallon or bare root	10
tall Oregon grape (shrub)	*Mahonia aquifolium*	FACU	6'	1 gallon or bare root	10
				TOTAL:	**40**

**Any areas left bare should be seeded using an appropriate native upland grass seed mix.*

Planting Notes

1) Plantings should preferably be installed between February 1 and May 1 for bare roots and seeds and between October 1 and November 15 for containers. Plants may be installed at other times of the year; however, additional measures may be necessary to ensure plant survival. Bare root plants must be installed during the late winter/early spring dormancy period.

2) All non-native invasive vegetation (except for existing pasture grasses) shall be removed from planting areas prior to installing native enhancement plantings.

3) Temporary irrigation may be necessary for the survival of the enhancement plantings. Irrigation is recommended during the first two years as the plants become established. Watering shall be provided at a rate of at least one inch per week between June 15 and October 15 or as needed.

4) Plantings shall be mulched a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.

5) Depending on nursery stock availability, appropriate plant substitutions must be approved by a qualified professional with expertise in wetland and habitat mitigation.