Exhibit 19

RESTORATION AND BUFFER MITIGATION PLAN

January 2019

Lacamas Creek Sewer Pump Station

Camas, Washington

Prepared for

City of Camas
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EXECUTIVE SUMMARY

Ecological Land Services, Inc. (ELS) has completed this Restoration and Buffer Mitigation Plan for the City of Camas to address the unavoidable critical area impacts within a shoreline of a state resulting from the Lacamas Creek Sewer Pump Station project in Camas, Washington. The project site is located north and south of NE 3rd Avenue in Camas, within Section 12, Township 1 North, and Range 3 East of the Willamette Meridian in Camas, Washington (Sheet 1). The project area spans nine Clark County parcels, identified as 089800000, 089871000, 089872000, 089873000, 090910000, 090744000, 090924000, 091029000, and 124486000 (Figure 1). This restoration plan was prepared according to the 2018 Camas Shoreline Master Program (*CSMP*) *Chapter 5.3, Critical Areas Protection*, and *Appendix C* (CSMP 2015), and the Washington Department of Ecology (Ecology) *Wetland Mitigation in Washington State – Parts 1 & 2* (2006).

PROJECT DESCRIPTION

Phase I of the proposed project is to remove a sewer pump station and associated piping in and near Lacamas Creek in Camas, Washington. The existing Lacamas Creek Pump Station was constructed in 1958 and is nearing its design capacity, and many of its components have reached their useful life. Phase I also consists of construction of two new pump stations and associated piping that will be constructed in uplands above the ordinary high water mark (OHWM) of Lacamas Creek. One pump station is proposed in the Lacamas Creek Trailhead Park north of NE 3rd Avenue and a new satellite pump station is proposed in nearby Baz Park to serve homes and businesses. Demolition of a portion of the existing pump station and removal of portions of suspended pipes, associated piles, manholes, and buried pipes will occur below the OHWM and likely within a tidally influenced area approximately 0.3-miles from the Columbia River. A portion of the construction for the Lacamas Creek Trailhead Park pump station, associated access road, and the Lacamas Creek Trailhead Park improvements will occur within the Lacamas Creek buffer. Both the removal of existing structures and piping and the construction of the two new pump stations will occur wholly or partially within shoreline jurisdiction of Lacamas Creek. Phase II of the project consists of park improvements to the Lacamas Creek Trailhead Park. A portion of the Phase II park improvements will occur within the outer portion of the Lacamas Creek buffer and within the outer portion of the shoreline jurisdiction of Lacamas Creek. A detailed description of the proposed project may be found in the section titled "Proposed Project".

Although the majority of the structure and piping removal in Phase I will occur below the OHWM, no mitigation is required for this portion of Phase I, as the removal of the existing pump station and associated piping will restore the area to natural conditions, resulting in an overall ecological lift. Impacts from structure and piping removal have been minimized by utilizing existing trails for excavator access and using native seed mix to re-seed disturbed areas and areas backfilled with native fill following removal. As construction of the Baz Park pump station will occur landward of a functionally isolated buffer, impacts from the construction have been completely avoided. One of the new pump stations, Lacamas Creek Trailhead Park pump station, will occur within the Lacamas Creek buffer; however, complete avoidance of this buffer was not feasible, as the location of the pump station is constrained by slopes on the western and eastern portions of the site and requires the least vegetation removal in its current location. Impacts from this pump station have been minimized by locating it in the outer portion of the buffer and utilizing existing gravel/pavement footprints where feasible for construction. Park improvements

within Phase II will also occur in the outer portion of the Lacamas Creek buffer, adjacent to the Lacamas Creek Trailhead Park pump station. Impacts from the project include 5,428-square feet of temporary impacts from the removal of pipes and piling in and near the OHWM of Lacamas Creek and Wetland A. As the removal of the existing pump station and its associated piping and piles will restore the project area to its natural conditions, the project is proposed to be self-mitigating; temporary impacts will be mitigated through seeding of native seed mix in disturbed areas. Impacts from the construction of one new pump station in Phase I and park improvements in Phase II include 4,362-square feet of permanent buffer impacts and 2,576-square feet of temporary impacts to the Lacamas Creek buffer. Mitigation for permanent impacts to the Lacamas Creek buffer includes 2,259-square feet of stream buffer enhancement and 2,103-square feet of stream buffer restoration. A detailed description of the mitigation approach may be found in the section titled “Restoration and Buffer Mitigation Approach” (Sheet 7).

PROPOSED PROJECT

PUMP STATION REMOVAL (PHASE I)

A portion of the existing pump station is located below the OHWM of Lacamas Creek. Prior to any demolition below the OHWM, best management practices (BMPs) will be installed to prevent debris from entering Lacamas Creek. These BMPs may include construction of a floating boom to collect any floating material that may enter the creek and installation of erosion control fencing to prevent sediment from being carried into the stream. Work will be completed when water levels are low, to avoid direct impacts to Lacamas Creek, such as an increase in turbidity. Equipment will be staged above the creek bank. The building structure will first be removed and the pump station equipment will be removed and salvaged as appropriate. The concrete structure will be broken inwards towards the pump station wet well, then pieces will be lifted out and loaded into trucks. The structure will be removed 2-feet to 3-feet below ground level, and the remaining subsurface portion of the wet well filled with gravel. The western bank of Lacamas Creek, where demolition will occur, will then be stabilized with soil and reseeded. Demolition will likely require an excavator with a hoist, claw, and/or hammer point (Sheet 6).

PIPE, MANHOLE, AND PILE REMOVAL (PHASE I)

A portion of the existing pump station's piping is above ground and below the OHWM and a portion of the existing pump station's piping is underground. Pipes will be flushed with water into the existing pump station wet well prior to work to clean out potential contaminants. Suspended pipe will be cut into sections with a torch or saw and lifted out by an excavator. Where underground piping is encased in concrete and exposed, the concrete encased pipe will be removed and the area backfilled with native fill and seeded with native seed mix. Underground pipe will be filled with grout and abandoned in place. Three manholes are located within Wetland A. These manholes will be abandoned in place, their top cones removed, and the area filled with native backfill and seeded with native seed mix. There are thirteen (13) 17-foot long piles located beneath the OHWM of Lacamas Creek that serve to anchor the existing pipes in place. These piles will be removed with a vibratory hammer that uses 30 to 45 second bursts. After piling is removed, streambed material will be allowed to naturally fill in the remaining holes, restoring the streambed to its natural conditions.

Pipe, manhole, and pile removal will likely require an excavator equipped with a vibratory hammer and/or claw. The excavator will be staged at the gravel bar within the project area and will access the gravel bar using the pathway at Baz Park. In addition to seeding that will occur following the removal of the concrete-encased piping, areas disturbed from the excavator or project related work will be re-seeded with native seed mix (Sheet 6).

NEW PUMP STATION CONSTRUCTION (PHASE I)

Two new pump stations will be constructed in uplands; one will be constructed within Lacamas Creek Trailhead Park, located north of NE 3rd Avenue and west of the existing trailhead parking area, and a second will be constructed in nearby Baz Park, south of NE 3rd Loop. Piping associated with the new pump stations will also be constructed within uplands; the majority of piping will be buried beneath roads surrounding the project area. A new access road will also be constructed for the Lacamas Creek Trailhead Park pump station. Construction will likely require an excavator, dump truck, bulldozer, and hand tools (Sheets 7 and 8).

LACAMAS CREEK TRAILHEAD PARK IMPROVEMENTS (PHASE II)

Park improvements, including parking lot improvements, pedestrian sidewalks, a stormwater swale, a restroom facility, landscaping, and a picnic area, will be constructed within Lacamas Creek Trailhead Park following construction of the pump station in this location. Parking lot improvements will occur within the existing gravel/pavement parking lot, while the rest of the improvements will impact the Lacamas Creek buffer temporarily and permanently. Construction will likely require an excavator, dump truck, bulldozer, and hand tools (Sheet 7).

EXISTING CONDITIONS

EXISTING LAND USES

The project area is currently used as open space. Existing structures include a gravel parking lot for trail access north of NE 3rd Avenue, and a paved trail and boardwalk, as well as the existing pump station and associated piping, south of NE 3rd Avenue. Topography is relatively flat, then slopes steeply down towards Lacamas Creek and Wetland A.

SURROUNDING LAND USES

Surrounding land uses include single-family residences and recreational parks to the west and east. Land to the north and south is undisturbed and undeveloped, save the land directly north of Baz Park, which is commercial use.

EXISTING WETLANDS, STREAMS, AND BUFFERS

Wetlands and Streams

ELS conducted a site visit on July 19, 2018 to delineate critical areas onsite. The OHWM of Lacamas Creek was delineated where it intersected with the proposed project area, and the boundary of one wetland, identified as Wetland A, was delineated where it intersected the proposed project area. Lacamas Creek flows north to south through Study Area A, flows beneath a half-round culvert located beneath NE 3rd Avenue, and continues east to west through Study Area B. Wetland A, encompassed within the southern portions of Study Areas B and C, continues offsite to the south and east (Sheets 2 through 5). The *Critical Areas Report for Lacamas Creek Sewer Pump Station, Camas, Washington* (ELS 2018) contains detailed information regarding delineation methodology and field observations of the critical areas, as well as wetland ratings for each wetland. The wetlands were rated using the *Washington State Wetlands Rating System for Western Washington, Updated 2014* (Rating System) (Hruby 2014). Critical areas are described below and are summarized in Table 1.

Wetland A

Wetland A is a Category II, riverine, forested, and emergent wetland, with two hydroperiods (seasonally flooded and saturated only). Sources of hydrology include overbank flooding from Lacamas Creek, the Washougal River, and the Columbia River, as well as precipitation and runoff from surrounding uplands. The wetland provides habitat functions, as well as water quality functions through filtration and sediment and pollutant trapping.

Dominant vegetation includes black cottonwood (*Populus balsamifera*, FAC), Oregon ash (*Fraxinus latifolia*, FACW), Pacific willow (*Salix lasiandra*, FAC), Himalayan blackberry

(*Rubus armeniacus*, FAC), Nootka rose (*Rosa nutkana*, FAC), reed canarygrass (*Phalaris arundinacea*, FACW), and trailing blackberry (*Rubus ursinus*, FACU). The wetland was found within Sauvie silt loam, sandy substratum, 0 to 3 percent slopes soils (SnA), which is considered a hydric soil, and Olympic stony clay loam, 3 to 30 percent slopes (OmE), which is not considered a hydric soil (NRCS 2016). Soils within the wetland test pits met hydric soil indicators Depleted Matrix (F3) and Redox Dark Surface (F6) (Corps 2010).

Lacamas Creek

Lacamas Creek is a Type S (shoreline of the state) waterbody. It flows north to south within Study Area A, flows beneath a half-round culvert located beneath NE 3rd Avenue, and flows east to west within Study Area B before continuing offsite.

Buffers

The buffers of Lacamas Creek and Wetland A are comprised of forested, scrub-shrub, and herbaceous vegetation. South of NE 3rd Avenue, Wetland A's buffers are functionally isolated to the north by NE 3rd Avenue and vertical separations. Dominant vegetation includes black cottonwood, Himalayan blackberry, and reed canarygrass (*Phalaris arundinacea*, FACW). These buffers provide water quality functions through sediment and pollutant trapping, as well as habitat functions through vegetative protection from surrounding land uses.

Habitat

There are listed salmonids mapped within Lacamas Creek, and there is a biodiversity area mapped by the Washington Department of Fish and Wildlife Priority Habitat and Species website. As the portion of the project consisting of structure removal will restore the project area to its natural conditions, the Baz Park pump station will occur landward of functionally isolated buffers, and the buffer impacts from the Lacamas Creek Trailhead Park pump station will be mitigated, there are no anticipated long-term impacts to the habitats or species listed in and near the project area. A detailed discussion of fauna affected by the proposed project may be found in the Biological Evaluation (BE) for this project.

Table 1. Summary of critical areas within and adjacent to the project site

Critical Area Name	Category[1]/Type[2]	Cowardin Classification[3]	HGM Classification[1]	Buffer Width (feet)[4]
Wetland A	II	Forested and Emergent	Riverine	220
Lacamas Creek	Type S (shoreline)	N/A	N/A	150

[1]*Washington State Wetlands Rating System for Western Washington 2014 Update* (Hruby 2014).
[2]According to *WAC 222-16-030, Water typing system.*
[3]Cowardin's *Classification of Wetlands and Deepwater Habitats of the United States* (1979).
[4]According to *CMSP Table 16.53.040-2* and *CSMP 16.61.040(D).*

IMPACTED FUNCTIONS

Wetlands and Streams

Wetland A

Temporary impacts to Wetland A total 2,136-square feet. Approximately 136-square feet of temporary impacts will occur to Wetland A to remove a section of concrete-encasement over an existing pipe. The section of pipe within Wetland A will be abandoned in place and filled with grout. Its concrete encasement will be removed, the area backfilled with native fill, and re-seeded with native seed mix. Approximately 2,000-square feet of temporary impacts will occur to Wetland A to accommodate equipment access during the removal process. The access roads utilized by equipment will be re-seeded with native seed mix following the completion of removal work. Temporary impacts to water quality functions within Wetland A will occur due to concrete-encasement removal and disturbance from construction equipment within an approximately 2,136-square foot area (Sheet 6). Impacts are summarized in Table 2.

Lacamas Creek

Temporary impacts to Lacamas Creek total 2,904-square feet. Approximately 49-square feet of temporary impacts will occur below the OHWM of Lacamas Creek to demolish the existing pump station. Following the removal of the pump station, the western bank of Lacamas Creek will be stabilized with soil and re-seeded with native seed mix. Approximately 25-square feet of temporary impacts will occur below the OHWM of Lacamas Creek to remove a portion of buried pipe adjacent to the existing pump station. Buried pipe will be removed and the disturbed area re-seeded with native seed mix. Approximately 9-square feet of temporary impacts will occur below the OHWM of Lacamas Creek to remove suspended piping and thirteen 17-foot steel piles. Suspended piping will be flushed with water into the existing pump station wet well prior to work to clean potential contaminants, and then lifted out with an excavator. Steel piles will be removed using an excavator equipped with a vibratory hammer using 30 to 45 second pulses. After piling is removed, streambed material will be allowed to naturally fill in the remaining holes. Approximately 2,821-square feet of temporary impacts will occur below the OHWM of Lacamas Creek to accommodate equipment access during the removal process. The access roads utilized by equipment will be re-seeded with native seed mix following the completion of the removal work. Temporary impacts will occur to Lacamas Creek due to disturbance from structure demolition, buried pipe removal, pile removal, and construction equipment in an approximately 2,904-square foot area (Sheet 6). Impacts are summarized in Table 2.

Buffers

South of NE 3rd Avenue

Temporary impacts to the buffers of Lacamas Creek and Wetland A total 388-square feet (349-square feet in the Lacamas Creek buffer south of NE 3rd Avenue, and 39-square feet in the Wetland A buffer). Approximately 236-square feet of temporary impacts will occur in the buffer of Lacamas Creek to demolish the existing pump station and to remove its associated reinforced concrete walkway, steps, and footing. Following the removal of the pump station and the concrete walkway, the western bank of Lacamas Creek will be stabilized with soil and re-seeded with native seed mix. Approximately 74-square feet of temporary impacts will occur in the buffer of Lacamas Creek to remove a section of buried pipe. Following the removal of buried

pipe, the area will be re-seeded with native seed mix. Approximately 39-square feet of temporary impacts will occur in the buffer of Lacamas Creek to remove two manholes, and approximately 39-square feet of temporary impacts will occur in the buffer of Wetland A to remove two additional manholes. The top cones of the four manholes will be removed, backfilled with native fill, and re-seeded with native seed mix. Temporary impacts will occur to water quality and habitat functions within the buffers of Lacamas Creek and Wetland A due to vegetation removal in the approximately 388-square foot area (Sheet 6). Impacts are summarized in Table 2.

North of NE 3rd Avenue

Impacts to the buffer of Lacamas Creek north of NE 3rd Avenue total 2,576-square feet of temporary impacts and 4,362-square feet of permanent impacts to construct the Lacamas Creek Trailhead Park pump station, associated access road, and park improvements north of NE 3rd Avenue. Approximately 2,576-square feet of temporary impacts will occur to re-grade portions of the park and will be reseeded with native seed mix. Approximately 4,362-square feet of permanent impacts will occur in the buffer of Lacamas Creek due to the placement of impervious surfaces. Impacts will occur to the water quality functions of the Lacamas Creek buffer in this area, but little impact will occur to the habitat functions of the buffer in this area, as the proposed location for the trailhead park pump station is within a mowed, herbaceous area containing ten non-native, ornamental trees. Impacts are summarized in Table 2.

Habitat

A minimal amount of habitat functions will be temporarily impacted through the removal of vegetation within the project area and are encompassed in the impact areas described above and summarized in Table 2.

Table 2. Proposed impacts

Impact Area	Category/ Type	Cowardin Class	HGM Class	Impact Type/Jurisdiction	Impact (square feet)
Wetland A	II	Forested/ Emergent	Riverine	Temporary impact	2,136
Lacamas Creek	Type S (shoreline)	N/A	N/A	Temporary impact	2,904
Wetland A Buffer	N/A	N/A	N/A	Temporary impact	39
Lacamas Creek Buffer	N/A	N/A	N/A	Temporary impact	2,925
				Permanent impact	4,362
			Total Temporary Impacts		**8,004**
			Total Permanent Impacts		**4,362**

RESTORATION AND BUFFER MITIGATION APPROACH

AVOIDANCE AND MINIMIZATION OF IMPACTS

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable temporary and permanent wetland and riparian impacts was taken into consideration. Complete avoidance of critical areas was not feasible for the demolition of the existing pump station and its associated piping and piles, as all are in or near the OHWM of Lacamas Creek or Wetland A. Additionally, complete avoidance of critical area buffers was not feasible for the construction of the Lacamas Creek Trailhead Park pump station, as the site was constrained by slopes on its western and eastern sides and its proposed location avoided substantial vegetation removal. However, multiple steps have been taken to avoid impacts where possible, and to minimize impacts where avoidance is not possible. These steps are summarized in the following list:

- Impacts to Lacamas Creek's buffer cannot be avoided to demolish the pump station and to remove the concrete path, steps, and footings located adjacent to the pump station; however, to minimize impacts, demolition equipment will utilize an existing access road situated above the pump station to conduct work and the concrete structure will be broken inwards toward the pump station wet well to contain impacts within the existing footprint of the pump station.
- Following the removal of the pump station structure and the concrete path, steps, and footings, the bank of Lacamas Creek will be stabilized with soil and re-seeded with native seed mix.
- Prior to work, piping will be flushed with water into the existing pump station wet well to prevent potential contaminants from entering Lacamas Creek, Wetland A, or their buffers during the pipe removal process.
- Initially, the project proposed cutting the steel piles underground and allowing streambed material to cover the structures; however, it was later determined that a vibratory method of removing the steel piles would minimize impacts by requiring less equipment near critical areas and reduce the time span of disturbance.
- To minimize disturbance from the movement of equipment, excavators and any other work equipment will utilize existing access roads and trails east of Lacamas Creek and south of NE 3rd Avenue to the extent feasible, and any areas disturbed by construction equipment will be reseeded with native seed mix.
- Best Management Practices (BMPs) are in place to prevent debris from entering Lacamas Creek, including construction of a floating boom to collect any floating material that may enter the creek and installation of erosion control fencing to prevent sediment from being carried into the stream.
- Though impacts cannot be avoided to remove the buried pipes and manholes, impacts have been minimized through backfill of native fill where necessary and re-seeding of disturbed areas with native seed mix.
- Construction of the new Baz Park pump station and its associated piping is all proposed to occur either in the footprint of existing impervious surfaces or structures, or landward of existing functionally isolated buffers; in this way, the construction of the Baz Park pump station and its associated piping will completely avoid impacts to nearby critical areas and their buffers.

- Complete avoidance of the Lacamas Creek buffer for the construction of the new Lacamas Creek Trailhead Park pump station, associated access road, and park improvements was not possible due to slope and vegetation constrains; however, impacts have been minimized by locating construction in the outer portion of the buffer and utilizing the existing gravel/pavement footprint to the extent feasible.
- The project conducted a redesign of the picnic area to move it west, outside of the Lacamas Creek buffer, to reduce overall permanent buffer impacts.

COMPENSATION MEASURES

As the Baz Park pump station will occur landward of existing functionally isolated buffers per *CMC 16.53.040(B)(4)(b)(i)*, impacts from their construction have been completely avoided. Impacts from the project include 5,428-square feet of temporary impacts from the removal of the existing pump station and the removal of pipes and piling in and near the OHWM of Lacamas Creek and Wetland A, and 4,362-square feet of permanent buffer impacts and 2,576-square feet of temporary buffer impacts from the construction of the Lacamas Creek Trailhead Park pump station, associated access road, and park improvements. As the removal of the existing pump station and its associated piping and piles will restore the project area to its natural conditions prior to the installation of these structures, this portion of the project is proposed to be self-mitigating and requires only compensation for temporary impacts through the use of native backfill where necessary and seeding of native seed mix in areas of fill and disturbance (Sheet 6). Compensatory buffer mitigation for the permanent Lacamas Creek buffer impacts is detailed in the section titled "Buffer Mitigation Plan". Buffer impacts and temporary impacts are summarized in Table 2.

BUFFER MITIGATION PLAN

A total of 4,362-square feet of the Lacamas Creek buffer will be impacted for construction of the Lacamas Creek Trailhead Park pump station (Sheet 7). This impact will be mitigated through 2,259-square feet of stream buffer enhancement and 2,103-square feet of stream buffer restoration within the Lacamas Creek buffer, west and east of the new Lacamas Creek Trailhead Park pump station parking lot. The area of stream buffer enhancement and stream buffer restoration will total 4,362-square feet, a 1:1 ratio, and will be equal to the amount of buffer impacts from construction of the pump station. Enhancement includes the installation of native trees and shrubs and restoration includes removal of any invasive species and installation of native trees and shrubs in bare areas. The proposed enhancement and restoration will create a multi-strata vegetative community. This multi-strata vegetation community will be more suitable for wildlife use, will increase habitat and plant diversity within the mitigation areas, and will help shield Lacamas Creek from the western park uses.

IMPACTED BUFFER FUNCTIONS

The western portion of the Lacamas Creek buffer that extends into the trailhead park pump station project area is dominated by mowed herbaceous species and eight non-native cypress trees. Buffer functions include filtration, soil stabilization, and reduction of sediment and nutrient input. The buffer provides limited water quality functions through sediment and pollutant trapping, and little wildlife habitat function, because it largely consists of mowed grasses and non-native, ornamental trees.

Planting Plan

The planting plan proposes to compensate for impacted buffer functions through stream buffer enhancement and stream buffer restoration. Stream buffer enhancement consists of installation of native trees and shrubs in the stream buffer enhancement area located adjacent to the proposed parking lot improvements and is detailed in the *Lacamas Creek Sewer Pump Station Landscaping Plan* prepared by GreenWorks. Thus, this planting plan only focuses on the proposed stream buffer restoration area. However, the monitoring plan will focus on both the stream buffer enhancement and the stream buffer restoration areas.

The stream buffer restoration consists of invasive species removal, including but not limited to Himalayan blackberry (*Rubus armeniacus*), English holly (*Ilex aquifolium*), and English ivy (*Hedera helix*), and the installation of native trees and shrubs in bare areas of the restoration area following invasive species removal. The native trees and shrubs selected for installation within the stream buffer restoration area include bigleaf maple (*Acer macrophyllum*) and western red cedar (*Thuja plicata*), snowberry (*Symphoricarpos albus*), tall Oregon grape (*Mahonia aquifolium*), western serviceberry (*Amelanchier alnifolia*), and thimbleberry (*Rubus parviflorus*). Plants will be installed in the late fall to early spring when the site conditions are wettest and the plants are dormant. Plants in the stream buffer restoration area will be installed following invasive species removal in this area, where bare areas exist. One gallon container stock was selected over bare root stock due to better developed root systems and planting mediums. The following table summarizes the plant species and stock proposed for the stream buffer restoration area (Table 1).

Table 3. Plant Specifications for the stream buffer restoration area

Common Name	Scientific Name	Stock
Trees		
Bigleaf maple	*Acer macrophyllum*	Gallon
Western red cedar	*Thuja plicata*	
Shrub		
Snowberry	*Symphoricarpos albus*	
Western serviceberry	*Amelanchier alnifolia*	
Tall Oregon grape	*Mahonia aquifolium*	
Thimbleberry	*Rubus parviflorus*	

Plant Material Specifications

1. 1-gallon potted species will be purchased from a native plant nursery.
2. 1-gallon potted plants will be a minimum size of 18- to 36-inches tall.
3. 1-gallon potted stock will be kept cool and moist prior to being planted.
4. 1-gallon potted stock will have well-developed roots and sturdy stems, with an appropriate root-to-shoot ratio.
5. Unplanted potted stock will be properly stored at the end of each day.
6. The environmental consultant will be responsible for inspecting potted plant stock prior to and during planting, culling unacceptable plant materials.

Site Preparation

1. Mechanically remove non-native species, namely Himalayan blackberry, English holly, and English ivy within the stream buffer restoration area. Selectively apply herbicide by hand as necessary to control regrowth of invasive plants.
2. Preserve existing native species where feasible.

Planting Implementation

1. Plant the specified trees and shrubs in the fall (October-November) or early spring (March-April) at the intervals listed in Table 1. Space the plants somewhat irregularly and in groups within bare areas following invasive species removal. Plant the 1-gallon potted stock with a tree shovel or comparable tool.
2. Remove the plant from the pot and work the roots free from majority of potted soil.
3. Place the potted plant species in the planting holes so that their roots are able to extend down entirely and do not bend upward or circle inside the hole (no "J" or "U" roots).
4. Position the root crowns so that they are at or slightly above the level of the surrounding soil.
5. Compact the soil around the planted species to eliminate air spaces.
6. Irrigate all newly installed plants as site and weather conditions warrant.

Goals, Objectives, and Performance Standards

The goal of this stream buffer mitigation is to provide an ecological functional lift to the stream buffer enhancement and restoration areas to replace buffer functions lost due to insufficient buffer from the Phase I Lacamas Creek Trailhead Park pump station, associated access road, and Phase II parking lot improvements. Enhancement will occur through planting of native trees and shrubs and is detailed in the landscaping plan. Restoration will occur through removal of invasive species and the planting of native trees and shrubs in bare areas to achieve overall higher functions than those provided by the existing buffer conditions. To accomplish this goal, the following objectives and performance standards are appropriate to ensure the success of the stream buffer enhancement and restoration areas.

Objective 1: Control invasive species.

Performance Standard 1(a): During monitoring Years 1 through 10, invasive species will be removed and suppressed in the stream buffer enhancement and restoration areas as often as necessary to meet a performance standard of no greater than 10 percent cover by invasive species. Invasive species include, but are not limited to, Himalayan blackberry, English holly, and English ivy. Percent cover will be recorded annually and included in monitoring reports.

Objective 2: Improve native plant cover and buffer function.

Performance Standard 2(a): Native trees and shrubs will be installed in the stream buffer enhancement area at the specifications listed in the landscaping plan. Native trees and shrubs will be installed within the bare areas in the 2,103 square foot stream buffer restoration area. Species detailed in Table 1 will be used to plant the stream buffer restoration area, and planted species count will be determined during installation and recorded in the as-built report. This

performance standard will be met when invasive removal and planting is completed for the stream buffer enhancement and restoration areas and documented in the as-built report.

Performance Standard 2(b): In Year 1, planted species in the stream buffer enhancement and restoration areas will achieve 90 percent survival. If dead plants are replaced, this performance standard will be met.

Performance Standard 2(c): In Year 2, planted species in the stream buffer enhancement and restoration areas will achieve 80 percent survival. If dead plants are replaced, this performance standard will be met.

Performance Standard 2(c): In Year 3, planted trees and shrubs will achieve 10 percent cover in the stream buffer enhancement and stream buffer restoration areas individually.

Performance Standard 2(d): In Year 5, planted trees and shrubs will achieve 25 percent cover in the stream buffer enhancement and stream buffer restoration areas individually.

Performance Standard 2(e): In Year 7, planted trees and shrubs will achieve 35 percent cover in the stream buffer enhancement and stream buffer restoration areas individually.

Performance Standard 2(f): In Year 10, planted trees and shrubs will achieve 50 percent cover in the stream buffer enhancement and stream buffer restoration areas individually.

Plant survival will be recorded in the Year 1 and Year 2 monitoring reports and native cover will be recorded in subsequent monitoring reports and compared with as-built conditions to determine overall success of the plantings. Existing native plants and native volunteers will be included in the percent cover estimates.

Objective 3: Record a conservation covenant with the County Auditor or similar legal protection measure

Performance Standard 3(a): Establish and record a permanent and irrevocable conservation covenant or similar legal protection measure for the stream buffer enhancement and restoration areas. Provide a copy of the document demonstrating that the mitigation area has been legally preserved from future development.

Table 4. Survival and Cover of Stream Buffer Enhancement and Restoration Plantings

	Percent Survival and Cover					
	Year 1	**Year 2**	**Year 3**	**Year 5**	**Year 7**	**Year 10**
Tree and Shrub Strata						
Survival	≥90%	≥80%	--	--	--	--
Cover[1]	--	--	≥10%	≥25%	≥35%	≥50%
Invasive Plants						
Cover of non-native, invasive species	<10%	<10%	<10%	<10%	<10%	<10%

Monitoring Plan

The enhancement and restoration areas will be monitored for a 10-year period following implementation of the plan, in Years 1, 2, 3, 5, 7, and 10. Monitoring reports will be submitted to City of Camas by December 31 of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The planting plan will serve as a baseline for the Year 1 monitoring to assess whether its performance standards have been met, and will be called either Year 0 or as-built. The enhancement and restoration areas will be monitored once during the growing season, preferably during the same two-week period each monitoring year to better compare the data.

During plant installation, monitoring plots and photo stations will be established to track changes in plant species composition and density over time and to document the establishment of planted species over time, respectively. During Year 1 and Year 2 monitoring, planted species will be counted and their survival rate determined. During Year 3 and Year 5 monitoring, native cover will be recorded. Observations about their overall health and size will also be noted. Cover of invasive species, including but not limited to English holly, English ivy, and Himalayan blackberry present in the buffer area will also be documented for maintenance purposes. Photographs will be taken at the established photo stations.

Monitoring Report Contents

A monitoring report is required for stream buffer enhancement and restoration, and may be supplied by the applicant or a qualified expert. The annual monitoring reports will contain at least the following:

- Location map and as-built drawing,
- Historic description of project, including dates of plant installation, current year of monitoring, and restatement of mitigation goals, objectives, and performance standards,
- Description of monitoring methods,
- Documentation of plant survival or native cover (depending on the monitoring year) and overall development of the plant communities,
- Assessment of non-native, invasive plant species and recommendations for management,
- Observations of wildlife, including invertebrates, amphibians, reptiles, fish, birds, and mammals,
- Photo documentation from permanent photo points, and
- Summary of maintenance and contingency measures proposed for the next season and completed for the past season.

Site Protection

The stream buffer enhancement and restoration areas will be owned, maintained, and managed by the applicant, unless otherwise assigned. They will be responsible for maintenance and monitoring of the stream buffer enhancement and restoration areas for the 10-year period. Signage may be installed along the buffer boundary to raise awareness and help limit access disturbances.

Maintenance and Contingency Plans

Maintenance Plan

Maintenance of the buffer enhancement area will involve removing invasive plant species, watering, and re-installing failed plants as necessary. The maintenance will include the following:

1. The removal and control of non-native vegetation as needed during the growing season for the first ten years or as site conditions warrant. During the entire monitoring period Himalayan blackberry, English holly, English ivy, and any other invasive species will be removed and suppressed as often as necessary to meet the performance standard of no greater than 10 percent invasive cover of the enhancement and restoration areas.
2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15.

If the enhancement and restoration area plantings are failing or the performance standards are not met, steps will be taken to rectify the situation in a timely manner. The following steps will be implemented when an area is identified as failing or potentially failing:

1. Identify the cause(s) of the failure or potential failure.
2. Identify the extent of the failure or potential failure.
3. Implement corrective actions by replanting.
4. Document the activities and include this data in the annual monitoring and maintenance reports.
5. Consult with the appropriate agencies in the event that a routine corrective action will not correct the problem.
6. Evaluate recommendations from resource agency staff and implement recommendations in a timely manner.

Contingency Plan

If the performance standards are not met by the third year following project completion, or at an earlier time if specified above, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from City of Camas. This project will be required to complete a contingency plan that describes: (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

ANTICIPATED FUNCTIONAL LIFT

The removal of the existing pump station, piping, and piles will ecologically restore the study area to its pre-pump station conditions. Therefore, the removal of the existing pump station and associated piping and piles will be self-mitigating, as the removal will restore these areas to their natural conditions prior to the construction of the original pump station in 1958. Construction of the Baz Park pump station will occur in uplands where critical area buffers are functionally isolated from the construction sites. Additionally, there will be an overall net reduction in the amount of impervious surfaces within the study area, as existing structures will be removed and structures abandoned in place will be covered with native backfill and re-seeded. All temporarily disturbed areas due to project work or equipment tracks will be re-seeded with native seed mix to return them to their pre-disturbance conditions.

The construction of the Lacamas Creek Trailhead Park pump station, associated access road, and park improvements will permanently and temporarily impact the Lacamas Creek buffer functions. Following temporary impacts, the areas will be reseeded with native seed mix to restore the area to its pre-disturbance conditions. Following invasive species removal and planting within the stream buffer enhancement and restoration areas north of NE 3rd Avenue, the Lacamas Creek stream buffer will provide improved sediment and pollutant filtration, habitat, and water velocity slowing functions than its pre-mitigation conditions. The mitigation areas are currently populated with non-native species and invasive species, and the proposed plantings will increase diversity and enhance habitat within the area. The proposed plantings will also aid to shield critical areas from human and pet disturbance and nearby roads, resulting in a net ecological lift.

LIMITATIONS

ELS personnel base the conclusions contained within this report on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with the findings presented in this report.

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. There are no other warranties, express or implied. The services preformed were consistent with our agreement with our client. This report is prepared solely for the use of our client and may not be used or relied upon by a third party for any purpose. Any such use or reliance will be at such party's risk.

The opinions and recommendations contained in this report apply to conditions existing when services were performed. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report. ELS does not warrant the accuracy of supplemental information incorporated in this report that was supplied by others.

REFERENCES

Camas Shoreline Master Program (CSMP). 2015. *CSMP Chapter 5.3, Critical Areas Protection*, and *Appendix C*.

Cowardin, L.M., C. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-78/31. U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington D.C.

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Hruby, T. 2014. *Washington State Wetlands Rating System for Western Washington, Updated 2014*. Washington State Department of Ecology Publication #93-74. Olympia, Washington.

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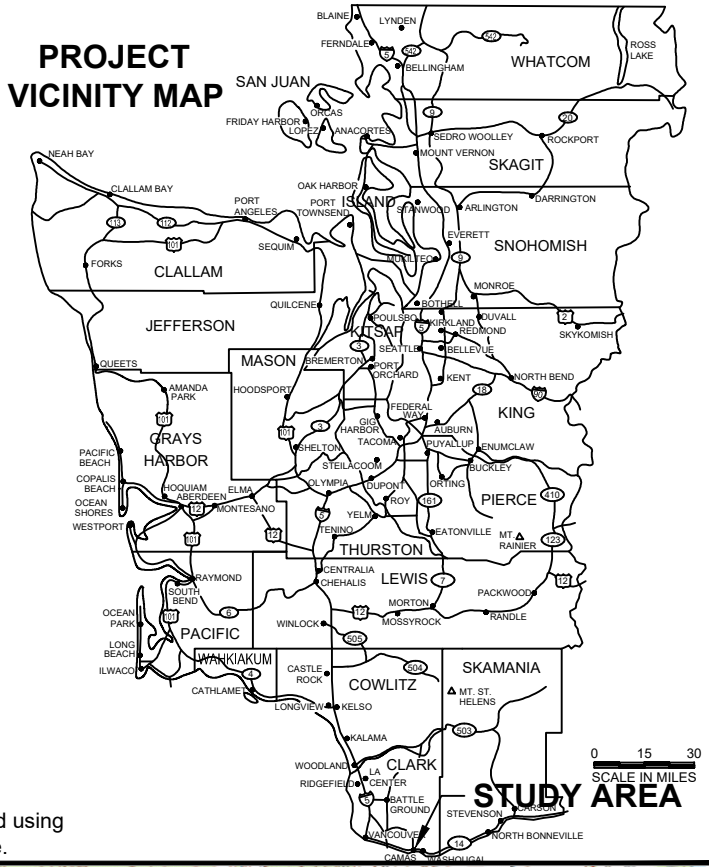
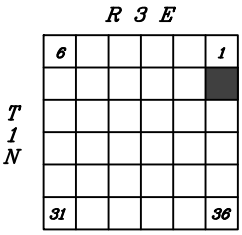
Washington Department of Ecology (Ecology), U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. March 2006. *Wetland Mitigation in Washington State - Parts 1 & 2*. Washington Department of Ecology Publications #06-06-011a and #06-06-011b. Olympia, Washington.

SHEETS

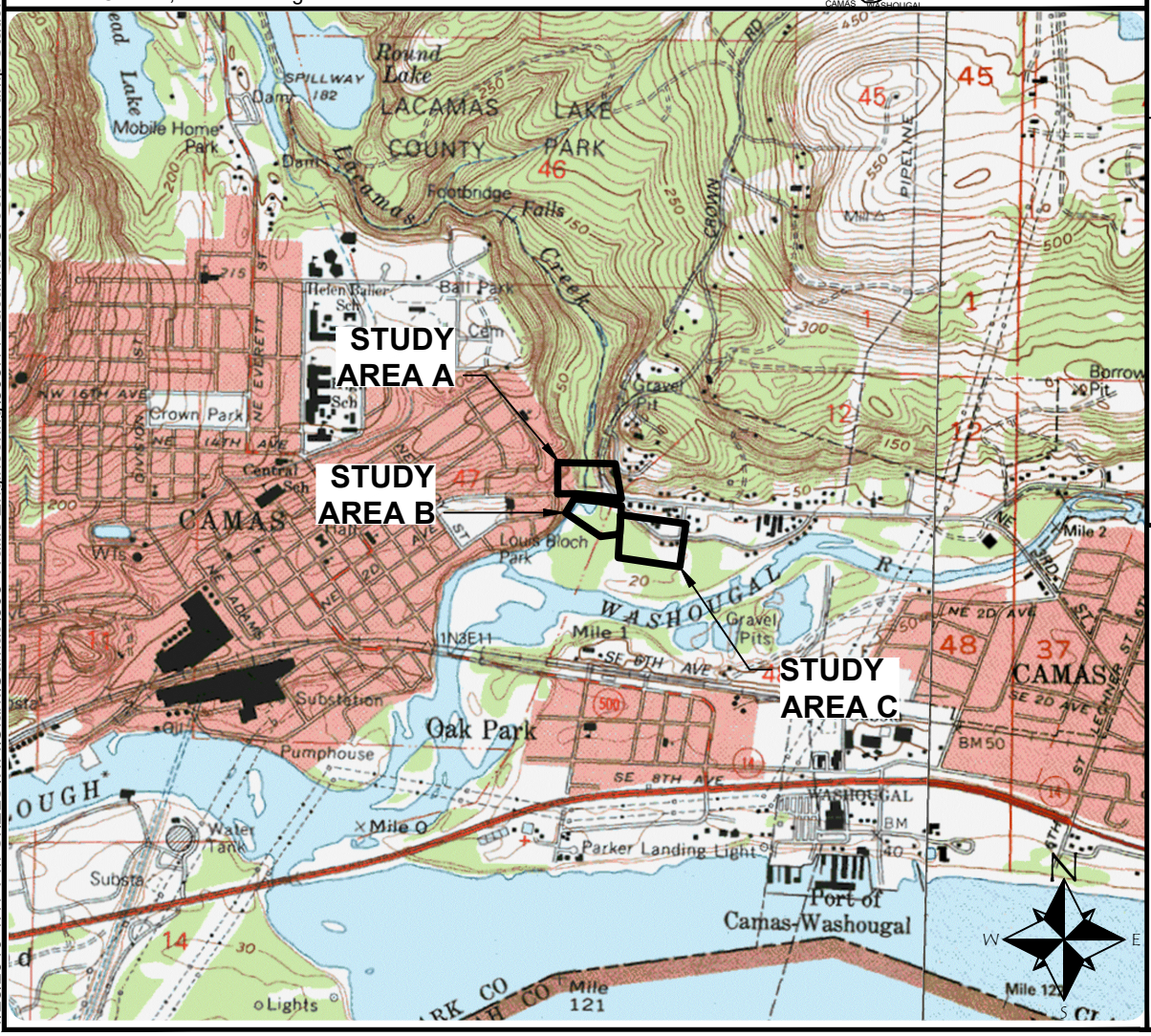
45.5885° Latitude
-122.3901° Longitude

LOCATION MAP





NOTE:
USGS topographic quadrangle map reproduced using MAPTECH Inc., Terrain Navigator Pro software.



PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 1 **OF** 8
DATE: 1/28/19

VICINITY MAP
APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

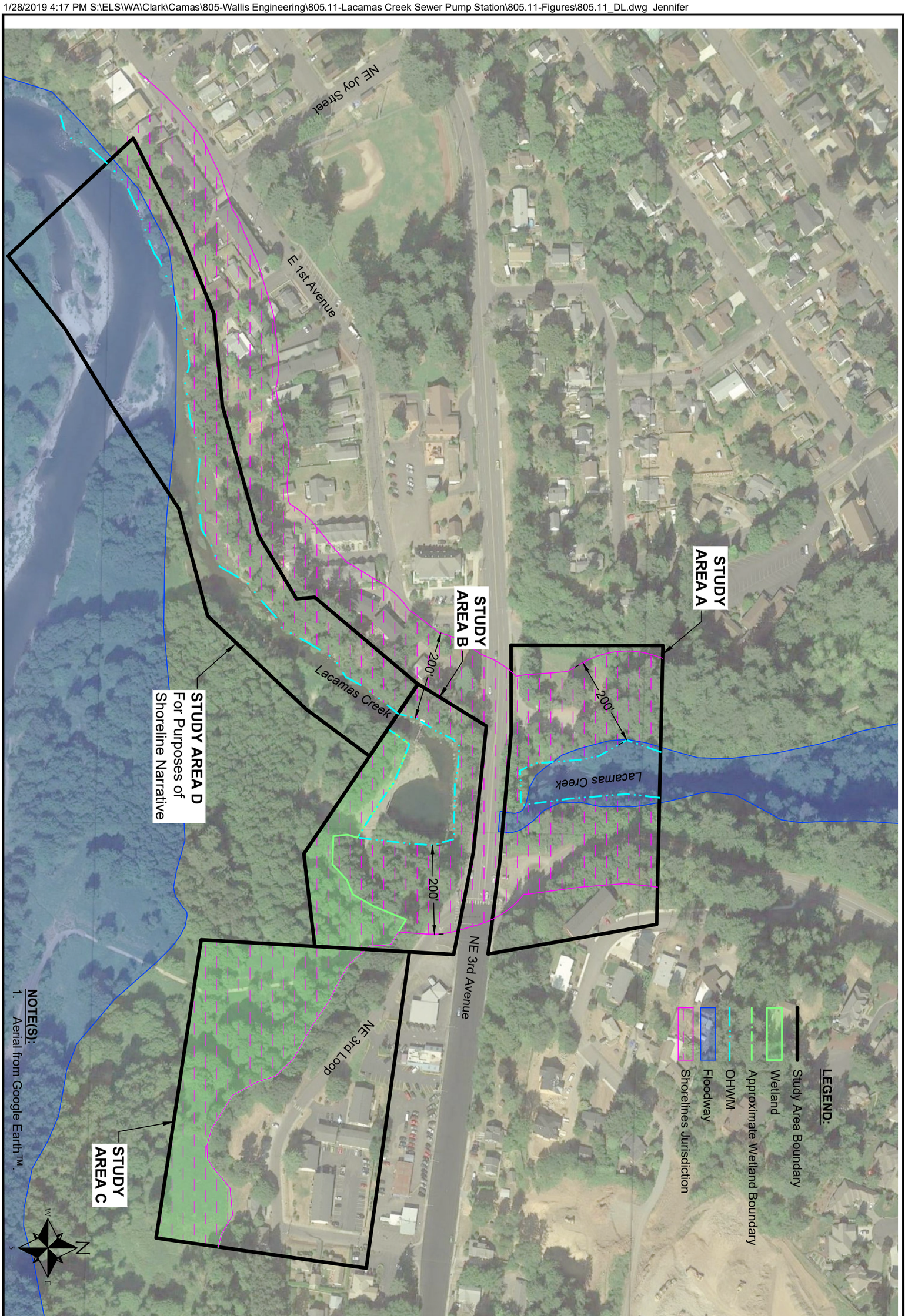
PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83
ADJACENT PROPERTY OWNERS:

SCALE IN FEET
0 2000 4000

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services



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SCALE IN FEET

Ecological Land Services
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Longview, WA 98632
Phone: (360) 578-1371

PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83

ADJACENT PROPERTY OWNERS:

SITE MAP OVERVIEW

APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 2 **OF** 8
DATE: 1/28/19

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NOTE(S):
1. Aerial from Google Earth™.
2. OWHM flagged by ELS, Inc. biologists and surveyed by KC Development, July, 2018.
3. Floodway from FEMA.

LEGEND:
- Study Area Boundary
- OHWM
- Stream Buffer
- Existing Edge of Pavement/Gravel
- Floodway
- Shorelines Jurisdiction

0 60 120
SCALE IN FEET

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Longview, WA 98632
Phone: (360) 578-1371

PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83

ADJACENT PROPERTY OWNERS:

SITE MAP - STUDY AREA A

APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 3 **OF** 8
DATE: 1/28/19

NOTE(S):

1. Aerial from Google Earth™.
2. OWHM and wetland boundary flagged by ELS, Inc. biologists and surveyed by KC Development, July, 2018.
3. Floodway from FEMA.

LEGEND:

- Study Area Boundary
- Wetland
- Approximate Wetland Boundary

LEGEND (cont.):

- OHWM
- Functionally Isolated Buffer
- Stream Buffer

LEGEND (cont.):

- Wetland Buffer
- Existing Edge of Pavement/Gravel
- TP-1 ● Test Plot Location

LEGEND (cont.):

- Shorelines Jurisdiction

SITE MAP - STUDY AREA B

APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 4 **OF** 8
DATE: 1/28/19

PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83
ADJACENT PROPERTY OWNERS:

SCALE IN FEET
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NOTE(S):

1. Aerial from Google Earth™.
2. Wetland boundary flagged by ELS, Inc. biologists and surveyed by KC Development, July, 2018.
3. Wetland A buffer functionally isolated due to roads/existing impervious surfaces and in the case of Baz Park, vertical separations, per CMC 16.53.040(B)(4)(b)(i) and CSMP Appendix C.

0 60 120
SCALE IN FEET

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Phone: (360) 578-1371

PURPOSE: Construct new pump station and replace pipeline elsewhere

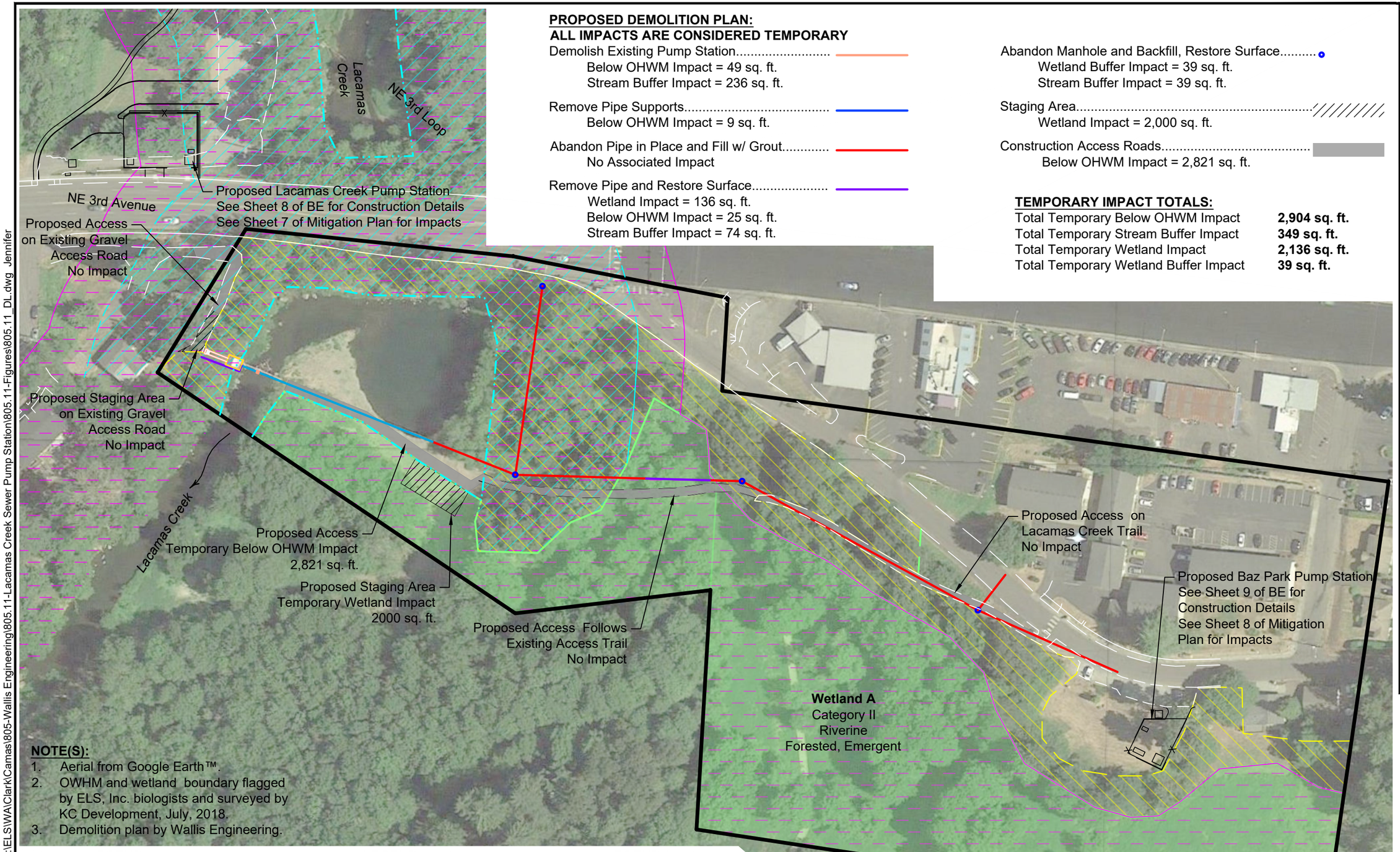
DATUM: NAD83

ADJACENT PROPERTY OWNERS:

SITE MAP - STUDY AREA C

APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 5 **OF** 8
DATE: 1/28/19



PROPOSED DEMOLITION PLAN:
ALL IMPACTS ARE CONSIDERED TEMPORARY

Demolish Existing Pump Station.....
Below OHWM Impact = 49 sq. ft.
Stream Buffer Impact = 236 sq. ft.

Remove Pipe Supports.....
Below OHWM Impact = 9 sq. ft.

Abandon Pipe in Place and Fill w/ Grout.....
No Associated Impact

Remove Pipe and Restore Surface.....
Wetland Impact = 136 sq. ft.
Below OHWM Impact = 25 sq. ft.
Stream Buffer Impact = 74 sq. ft.

Abandon Manhole and Backfill, Restore Surface.....
Wetland Buffer Impact = 39 sq. ft.
Stream Buffer Impact = 39 sq. ft.

Staging Area.....
Wetland Impact = 2,000 sq. ft.

Construction Access Roads.....
Below OHWM Impact = 2,821 sq. ft.

TEMPORARY IMPACT TOTALS:

Total Temporary Below OHWM Impact	**2,904 sq. ft.**
Total Temporary Stream Buffer Impact	**349 sq. ft.**
Total Temporary Wetland Impact	**2,136 sq. ft.**
Total Temporary Wetland Buffer Impact	**39 sq. ft.**

NOTE(S):
1. Aerial from Google Earth™.
2. OWHM and wetland boundary flagged by ELS, Inc. biologists and surveyed by KC Development, July, 2018.
3. Demolition plan by Wallis Engineering.

LEGEND:
- Study Area Boundary
- Wetland
- Approximate Wetland Boundary

LEGEND (cont.):
- OHWM
- Functionally Isolated Buffer
- Stream Buffer

LEGEND (cont.):
- Wetland Buffer
- Existing Edge of Pavement/Gravel
- Shorelines Jurisdiction

PROPOSED DEMOLITION PLAN
APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83
ADJACENT PROPERTY OWNERS:

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 6 **OF** 8
DATE: 1/28/19

SCALE IN FEET
0 100 200

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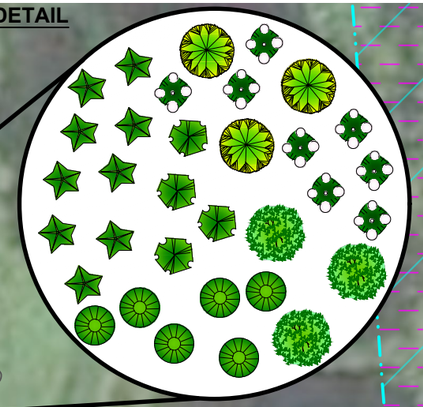
Plant Specifications for the Stream Buffer Restoration area

Species	Size
Tree Stratum	
Western red cedar (*Thuja plicata*, FAC)	1 gal
Bigleaf maple (*Acer macrophyllum*, FACU)	
Shrub Stratum	
Snowberry (*Symphoricarpos albus*, FACU)	1 gal
Tall Oregon grape (*Mahonia aquifolium*, FACU)	
Western serviceberry (*Amelanchier alnifolia*, FACU)	
Thimbleberry (*Rubus parviflorus*, FACU)	

PLANTING DETAIL
N.T.S.



NOTE: Plants are not to scale and locations are approximate as shown. Actual planting locations will be determined in the field to produce the most natural appearance possible.

Lacamas Creek Trailhead
Existing Parking Area
Proposed Lacamas Creek Park Parking
Stream Buffer Enhancement Planting to be Provided in Landscaping Plan
Proposed Rain Garden
Proposed Lacamas Creek Pump Station
Proposed Access Drive
Existing Access Drive
NE 3rd Avenue
Lacamas Creek
8" & 12" OAK (GROUP OF 2 TREES)
8" MAPLE (AT TOP OF BANK)
BUSHY TREE (AT TOP OF BANK)
(2) 15" MAPLE (DOUBLE TRUNK)
30" FIR
42"
62"
22"
26"
32"
15" SS
8" SS FM

LEGEND:
- OHWM
- Stream Buffer
- Existing Edge of Pavement/Gravel
- Existing Trees
- Shorelines Jurisdiction
- Proposed Edge of Grading

LEGEND (cont.):
- Stream Buffer Impact (4,362 sq. ft.)
- Temporary Stream Buffer Impact (2,576 sq. ft.)
- Stream Buffer Enhancement (2,259 sq. ft.)
- Stream Buffer Restoration (2,103 sq. ft.)

NOTE(S):
1. Aerial from Google Earth™.
2. OWHM flagged by ELS, Inc. biologists and surveyed by KC Development, July, 2018.
3. Plan by Wallis Engineering.
4. Stream buffer restoration plantings will be installed post-invasive species removal in areas of bare ground. Exact plant counts will be recorded in the as-built report and used as a baseline for subsequent monitoring reports.

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 7 **OF** 8
DATE: 1/28/19

PROPOSED CONDITIONS-LACAMAS CK. PUMP STATION
APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83
ADJACENT PROPERTY OWNERS:

SCALE IN FEET: 0, 30, 60

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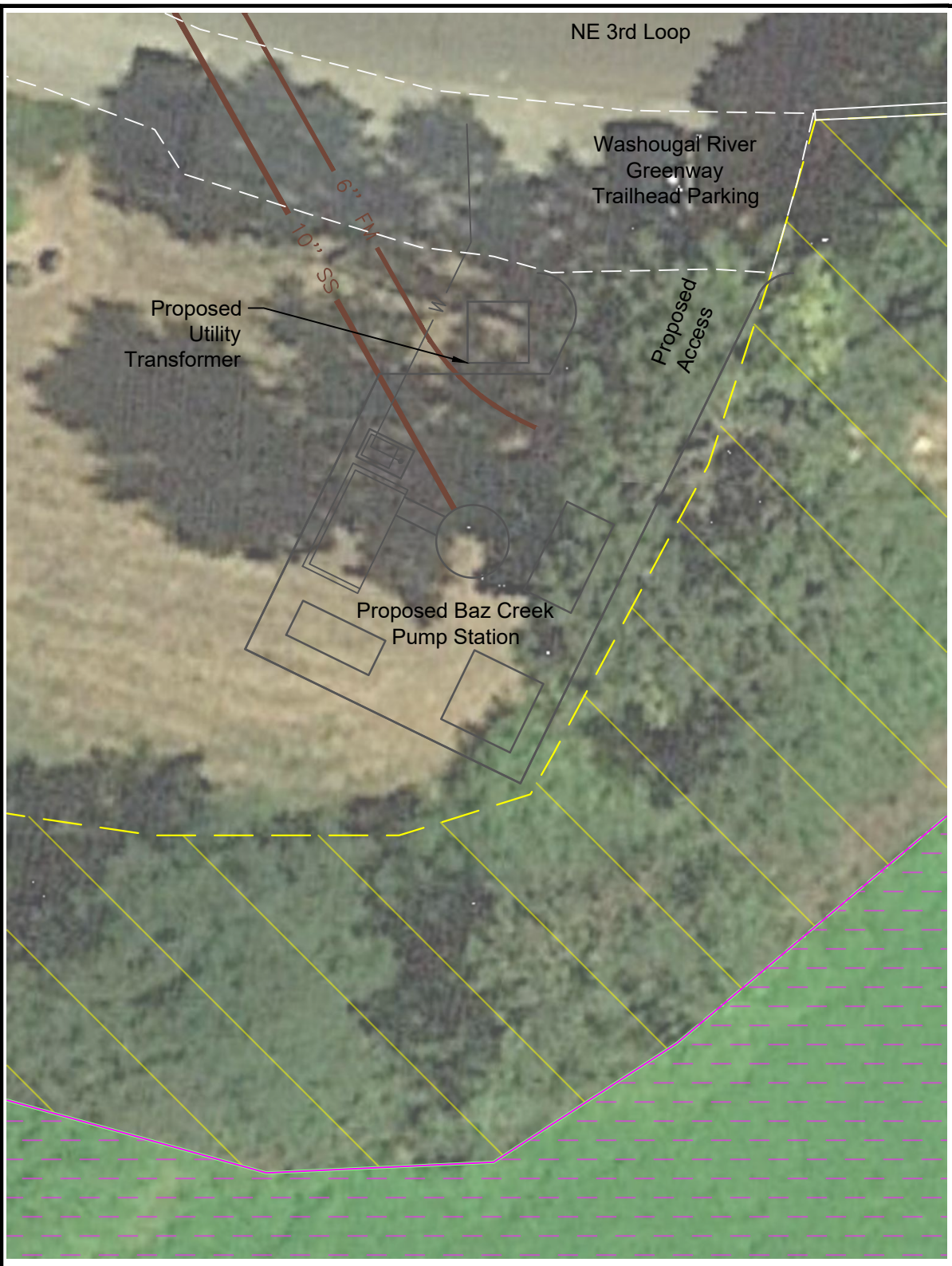

LEGEND:

- Wetland
- Approximate Wetland Boundary
- Wetland Buffer
- Functionally Isolated Buffer
- Existing Edge of Pavement/Gravel
- Shorelines Jurisdiction

NOTE(S):

1. Aerial from Google Earth™.
2. Wetland flagged by ELS, Inc. biologists and surveyed by KC Development, July, 2018.
3. Plan by Wallis Engineering.

PROPOSED: In-water infrastructure removal
IN Lacamas Creek
NEAR: Camas
COUNTY: Clark **STATE:** WA
SHEET 8 **OF** 8
DATE: 1/28/19

PROPOSED CONDITIONS-BAZ PARK PUMP STATION
APPLICANT: Wallis Engineering
PROJECT NAME: Lacamas Creek Sewer Pump Station
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:

PURPOSE: Construct new pump station and replace pipeline elsewhere

DATUM: NAD83
ADJACENT PROPERTY OWNERS:

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