MITIGATION PLAN

June 11, 2025

Al Helenberg Memorial Boat Launch Maintenance Dredging

Castle Rock, Washington

Prepared for

City of Castle Rock
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SIGNATURE PAGE

The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.

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INTRODUCTION

Ecological Services, Inc. (ELS) has completed report on behalf of the City of Castle Rock, Washington, for maintenance dredging at the existing Al Helenberg Memorial Boat Launch on the Cowlitz River. Figures and photoplates are attached.

PROPONENT AND LOCATION

The project is located within the Castle Rock city limits in Cowlitz County, Section 20 of Township 6 North, Range 1 West of the Willamette Meridian (see Sheet 1), and the 170800050904 Whittle Creek-Cowlitz River 6th field Hydraulic Unit Code and Water Resources Inventory Area 26 (Cowlitz watershed). The site is at River Mile 17.4 of the Cowlitz River, and the site address is 240 North County Drive.

PROJECT PURPOSE AND NEED

The structures are located on the west bank of the Cowlitz River, approximately 2.5 miles downstream of the confluence of the Toutle River and the Cowlitz River. During some high water/high flow events, the launch, dock, and log boom accumulate significant amounts of sediment and woody debris. The sediment and debris must be removed to prevent structural damage and maintain water depth at the ramp and dock and to allow its continued use for recreation and emergency services (see Sheet 2). To maintain this boat launch, permits for maintenance dredging need to be updated.

EXISTING CONDITIONS

LANDSCAPE POSITION

The project is within lower portion of Watershed Resource Inventory Area (WRIA) 26 – Cowlitz Watershed, and is within the 12-digit Hydrologic Unit Code (HUC) 170800050904, within the Whittle Creek-Cowlitz River subwatershed and within Water Resources Inventory Area 26 (Cowlitz River). The Toutle River is one of the largest tributaries to the Cowlitz River, with the confluence approximately 2.4 miles upstream of the site, and the confluence of the Cowlitz River and Columbia River is approximately 16.5 miles downstream of the site.

Dam construction upstream of the project on the Cowlitz River changed many of the baseline conditions, including habitat-forming processes, habitat types, primary productivity, the food web, access to habitats, and predation. In the 1970s, artificial levees were constructed on both sides of the Cowlitz River through the City of Castle Rock, Kelso, and Longview to prevent flooding.

The 1980 Mount St. Helens eruption changed the nature of the river below the Toutle River. The mudflow that was conveyed down the Toutle River and into the Cowlitz raised the bottom depth by up to 15 feet in some areas, greatly reducing the flood-carrying capacity. Since the eruption, the Toutle River has continued to move sediment-laden water into the Cowlitz and Columbia rivers. The sediment retention dam on the Toutle River is full and no longer holds back sediment that is continually eroding from the Mount St. Helens eruption deposits in 1980.

Land Uses in and around the Project Area

The property is zoned for "Parks, Recreation, and Open Space". It currently consists of a parking lot, boat launch, floating docks, various outbuildings, and walking trails. The land adjacent to the Cowlitz River had been used for dredged material placement from the emergency dredging after the Mount St. Helens eruption in 1980. The area to the north and west of the site is property owned and used by the Castle Rock School District. Properties to the south consist of small residential lots with single-family dwellings. Across the river is the City of Castle Rock.

The general vicinity west of the Cowlitz River was used by the U.S. Army Corps of Engineers for placing dredged material from the emergency dredging in the Cowlitz River in the early 1980s after the Mount St. Helens eruption of 1980. The project is bordered to the north and west by property owned by the Castle Rock School District. Properties to the south consist of small residential lots containing single-family dwellings, and the site is accessed from the West Side Highway, west of the boat launch.

The property has generally flat topography with an approximately 35 percent slope along the shoreline of the Cowlitz River. Riprap is present along the toe of the stream banks upstream and downstream of the project area. Vegetation consists of mowed grass with a thin stand of black cottonwood trees along the shoreline.

The Al Helenberg Memorial Boat Launch was constructed in 2010 within Castle Rock city limits approximately 1,300 feet upstream of the State Route 411 Bridge (see Sheet 1) to provide safe and reliable access to the Cowlitz River. The facility consists of a parking lot, various outbuildings, walking trails, two-lane boat ramp, fully grated boarding floats on each side of the ramp, and a floating dock on the downstream side of the ramp parallel to the shoreline. Upstream of the ramp is a log-boom anchored with piling to deflect debris from the boat ramp and dock (see Sheets 2, 3, and photoplate).

Aquatic Habitat

There is no aquatic vegetation in or near the proposed dredging prism. Sediment near the project site consists mostly of sand with some gravel and finer material. The deepest river depth at the boat launch in the bathymetric survey (WEST 2016) was about 20 feet below the OHWM at the thalweg. The riverbank at the boat launch and on both sides of the river has a layer of rock at its base to prevent erosion. There are no active areas of bank erosion near the boat launch.

Hydrology

A WEST Consultants memorandum (WEST 2016) to the City of Castle Rock discusses hydrology in the project area. The memorandum states that there is a U.S. Geological Survey river gage 142430000 Cowlitz River at Castle Rock located approximately 1,400 feet downstream of the boat launch at the Highway 411 Bridge (A Street) with a records beginning in 1926. Mean daily flow data for 2006 through 2016 were determined as follows:

- 30,000 cfs – approximate upper limit of usability of the boat launch.
- 9,000 cfs – typical winter flow rate.
- 5,000 cfs – typical summer flow rate.

Water Quality

The latest approved 303(d) list shows no listings for Category 5 water-quality impairments in the area (Ecology 2025a).

Sediment Transport, Deposition, and Disposal

High concentrations of suspended sediments occur in the Cowlitz River at the project site, especially during heavier rainfall events. The project is approximately 2.4 river miles downstream from the Toutle River confluence with the Cowlitz River. The sediment retention dam on the Toutle River is full and no longer holds back sediment that is continually eroding from the Mount St. Helens eruption in 1980.

The following information about sedimentation at the boat launch was provided in a technical memorandum by WEST Consultants, Inc. (WEST 2016).

> Sediment transport conditions in the Cowlitz River are highly influenced by the delivery of sediment from the Toutle River, which flows into the Cowlitz River about 2.4 miles upstream of the project site. The Toutle River continues to deliver significant quantities of silt- and sand-sized sediment as a result of continued erosion of the debris avalanche created by the eruption of Mount Saint Helens in May 1980. The U.S. Army Corps of Engineers has continued to manage sediment in the Toutle River, most recently raising the spillway elevation at the Sediment Retention Structure to improve the sediment trapping efficiency. They have also dredged the lower portion of the Cowlitz River near the confluence with the Columbia River. However, significant quantities of sand-sized material will continue to be transported through the project reach as both bed load and suspended load.
>
> Much of the fine sediment in the Cowlitz River is transported as suspended load during high flow events. As a result, sediment deposition occurs in areas of low velocity and low shear stress such as the areas along the banks, the inside of channel bends, and near obstructions to flow. During the December 2015 high water event (Q = 83,700 cfs), significant sedimentation occurred at the boat launch. The surface of the ramp was buried in as much as 2.5 feet of sand-sized material. Post-flood photographs indicate that some amount of the deposited sediment located near the base of the ramp was eroded as the river's discharge decreased. However, a significant amount of sediment remained in the immediate vicinity of the transverse floats, causing them to be partially grounded during low water conditions. A significant portion of the sediment that was deposited at the ramp was likely conveyed by the river as suspended load.

The spillway at the Sediment Retention Structure was raised in 2012, and there are plans to raise it again although there has not been a date set for construction. The Corps' 2024 report states that sediment trapping efficiencies were down to 16%. Because of this situation and the resulting bank erosion along the Toutle and Cowlitz rivers upstream of the boat launch, there will be increasingly more sediment settling in the dredging prism.

Sediment Quality

Under DMMP guidelines, projects for which upland disposal is planned do not ordinarily require testing the dredged material but do require evaluation under the Department of Ecology's antidegradation standard. Much of the sediment load carried by the Cowlitz River is of volcanic origin, emanating from the Mount St. Helens impact area. Chemical testing of Cowlitz River sediment by the Corps' Portland District has shown it to be of low concern for chemical contamination (USACE 2007). An Environmental Information Management database (EIM)

query shows that no sediment data have been collected from within or near the project area, which may be an indication that there are no sediment contaminant issues in the vicinity of the project. A review of EPA's *Cleanups in My Community* database and Ecology's *Integrated Site Information System* did not reveal any cleanup sites within or near the project area. In August 2015, the DMMP agencies provided a no-test determination for sediment removal from the project site with adjacent upland disposal (DMMP 2015, see Appendix A).

Terrestrial Habitat

There is no native terrestrial habitat within the proposed dredging prism or upland placement areas. Placement areas are flat with either nearly bare ground or herbaceous vegetation that includes non-native plants. Staging areas will be on the ramp, paved areas, and a dewatering area.

Previous Sediment Removal Events

Since the boat launch was constructed in 2010, previous dredging permits allowed sediment removal above the waterline on the boat ramp and dock with a skid steer, excavator, or hand tools for up to 200 cubic yards per year. Dredged material was transferred into dump trucks and placed in upland areas near the site. In August 2015, the DMMP agencies provided a no-test determination for the removal of sediment from the project site with adjacent upland disposal (DMMP 2015). The table below summarizes volumes of sediment removed since 2018. No records are available before 2018.

Table 1. Dredged Material Removed in Previous Dredging Events since 2018.

Date	Volume Removed (cubic yards)
February 8, 2018	20
March 14, 2018	10
May 3, 2018	40
January 2, 2019	5
December 30, 2019	10
February 11, 12, 2020	90
February 20, 2020	5
2021	68
2022	105
2023	47
2024	49

Project Description

Proposed Sediment Removal

For the new 10-year permit, the City proposes to remove a total of approximately 500 cubic yards per year of accumulated sediment in up to six events each year from two areas: above the waterline on the boat ramp and floating dock and from hydraulic dredging below the waterline from areas

shown on Sheets 2 and 3. The term "dredging" in this report will refer to removing sediment below the waterline.

ABOVE THE WATERLINE

Sediment above the water line deposited on the ramp and dock will be allowed to dewater in-place and then will be removed with a skid steer, excavator, or hand tools. The material will be placed in the adjacent uplands within the park. This sediment removal typically occurs during the fall, winter, and occasionally in the spring and will take 1 to 5 days.

During periods of high water and associated high turbidity, the City proposes to flush accumulated sediment from the ramp and floating docks back into the river using a pump with a hose and a spray nozzle. Sediment deposited in these areas typically occurs during the fall, winter, and early spring.

BELOW THE WATERLINE

The proposed dredging prism is approximately 0.68 acres (about 29,600 square feet). This volume and area are larger than the original dredging prism that was proposed before the boat-launch facility was constructed because sediment accumulation has occurred over a larger dredging prism than was anticipated. A larger prism is necessary to maintain usable depths for boaters and to remove enough sediment so less frequent dredging is required. Also, the time that most of the sediment is deposited in the dredging prism is during the late fall and winter months during high river flows. Unfortunately for the City and boaters, dredging has to wait until the in-water work window in August to remove accumulated sediment.

Dredging below the water line will be performed during the in-water work window of August 1 through August 31. Sheet 3 shows cross sections of the proposed dredging prism. The deepest proposed dredging elevation is 23 feet NAD83. Existing riverbed contours were obtained from the Corps bathymetric survey in April 2025; however, there were no survey points near the dredging prism. Therefore, the 2016 survey of the dredging prism has been used for the cross sections.

The time to offload and dewater the material and load trucks will be about 4 to 5 days, and the volume of sediment removed will be reported based on the number of truckloads taken to upland disposal areas and not based on a subsequent survey.

Hydraulic dredging may be performed with divers, a vacuum truck, or from a barge; any method will use a pump and hose with a fish screen. During dredging, material will be pumped into a dewatering facility constructed with Ecology blocks and a liner. Dredged material will be passively dewatered by allowing the sediment to settle, and then the water will pass through geotextile fabric or hay bales before draining back into the Cowlitz River through a hose. Consistent with the authorized dredging for other projects, visual water-quality monitoring for turbidity will be conducted.

The estimated volume of material to be removed initially is approximately 500 cubic yards. During a site visit on June 2, 2025, it was noted that a significant sediment build-up has occurred between

the dock and the shoreline, as shown on the photoplate. It compares a photograph taken in June 2020 with photographs taken on June 2, 2025.

Upland Material Placement

After material is dewatered, an excavator will move the material onto dump trucks and place it in areas indicated on Sheets 1, 4, and 6. There are no wetland or riparian buffers in these proposed placement areas. After the material has been dewatered, trucks will haul it to the placement areas and used in landscaped areas around the park. Native seed mixes do not grow in this sandy material; it does not erode and is not a source of blowing dust, so no seeding is necessary after material placement.

Debris Removal

The City proposes to relocate large woody material from the log boom, ramps, or docks to the river or remove it using mechanical methods with skid steer, excavator, or hand tools. Small debris will be swept off, or it will be washed off with river water using a pump, hose, and spray nozzle. Any artificial debris will be properly disposed as solid waste. Large material will be removed using chains and an excavator located above the water.

Secondary Project Features

Interdependent Activities

Interdependent activities are part of a larger action, have no independent purpose, and would only occur if the project occurs. The dewatering structure and moving dredged material to upland areas of the property are interdependent activities.

Interrelated Activities

Interrelated activities are a part of a larger action; however, they could be performed separately from the larger action. The City proposes to enhance the riparian buffer in areas of lower Whittle Creek (see Sheet 5) that currently has only herbaceous vegetation (see Sheets 6, and 7), which is an interrelated activity. The in-water dredging prism is 0.68 acres, and the enhancement areas are a total of 0.69 acres).

Impact Avoidance and Minimization Measures

The project has been designed to avoid and minimize impacts to habitats and species that may potentially occur in the vicinity of the project. This will be accomplished by using the following measures:

1. Conditions in local, state, and federal permits will be followed.
2. Avoids exposing dredged material because the Dredged Material Management Program has determined this site does not require sediment testing due to its geographic location.
3. Avoids contamination from heavy equipment working in the water because equipment will have vegetable-based hydraulic fluid.
4. Avoids contamination from refueling because heavy equipment will be fueled at least 150 feet from any waterbody.
5. Avoids peak juvenile salmon outmigration; in-water work will occur within the approved work window of August 1 through August 31.

6. Avoids entraining fish because hoses used for hydraulic dredging will be fitted with a fish screen.
7. Minimizes suspended sediments - dewatering will occur in an upland structure to settle out and be filtered through geofabric and/or hay bales.
8. Minimizes suspended sediments by visually monitoring turbidity during sediment removal below the waterline because hydraulic dredging produces relatively little turbidity. The point of compliance will be 300 feet downstream of in-water dredging. If significant turbidity is observed, dredging will stop until a plume is no longer visible.

UNAVOIDABLE IMPACTS

DIRECT EFFECTS

Direct effects are those effects that take place at or near the time of construction. The following aquatic and terrestrial habitat effects are anticipated.

AQUATIC HABITAT

Underwater Noise and Disturbances

Underwater disturbances during August dredging will occur near the ramp and dock in shallow water. However, this area frequently experiences these effects from boating activities, so dredging is not expected to create noise or disturbance above background levels.

Elevated Suspended Sediment Concentrations

Sediment removal on the ramp, dock, and by hydraulic dredging is expected to temporarily increase suspended sediment concentrations (measured by turbidity) in the project area for a minimal distance downstream. Washington Administrative Code allows a temporary area of mixing during and immediately after necessary in-water construction activities that result in the disturbance of in-place sediments. The point of compliance for water volumes above 100 cubic feet per second flow at the time of construction is 300 feet downstream of the activity causing the turbidity exceedance.

The Ecology water quality standard for turbidity in the project vicinity is based on aquatic life for salmon and steelhead use in the area that includes spawning, rearing, and migration. It states that turbidity shall not exceed the following levels:

- 5 nephelometric turbidity units (NTU) over background when the background is 50 NTU or less; or
- A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

Sediment Removal above the Waterline

When water velocities and turbidity are high, which typically occurs in late fall, winter, or spring, material deposited above the waterline will be swept from the ramp and dock back into the water or washed off with river water. This occurs during high turbidity conditions in the river and is not expected to create significantly higher turbidity levels in this river reach because background turbidity levels below the Toutle River mouth are estimated to be in the hundreds of NTUs. Under

these conditions, it will not likely exceed water quality standards or noticeably raise suspended sediment concentrations above background levels.

Sediment Removal below the Waterline
In-water hydraulic dredging in August is expected to increase elevated suspended sediment concentrations somewhat, but they are expected to return to background levels before reaching the 300-foot point of compliance. This also applies to return water entering the river from the dewatering structure that will allow sediments to settle and be filtered prior to being released.

TERRESTRIAL HABITAT
There will be no direct effects to terrestrial habitat from in-air noise or disturbances above typical background noises in the area that include vehicle traffic, boat launching, and boat operations. Dredged material will be placed in developed upland areas of the site and are outside of wetland or riparian buffers. These areas are mowed frequently and have no woody vegetation, so they have low levels of habitat functions.

DELAYED CONSEQUENCES
Delayed consequences were formerly referred to as indirect effects. They are defined as those effects resulting from the proposed action and are later in time but are still reasonably certain to occur. The only potential delayed consequence would be to the aquatic food web from temporarily reduced benthic invertebrate populations in sediments after dredging. Benthic populations typically recover within 6 months of disturbance.

The river's bedload moves in this high-velocity reach, so sediments are often being buried and exposed by the current as the river velocity increases or decreases. Dredging will have no effect on the benthic communities above naturally occurring sediment dynamics in this river reach. For these reasons, dredging will have no long-term impact to the food web or riverbed composition.

EFFECTS FROM INTERDEPENDENT ACTIONS
The dewatering structure will be temporary and will be disassembled after the dredging event. Dredged material will be placed in upland areas. There will be no effects from these interdependent activities because the material will not be placed in natural upland habitats that have low habitat functions, and will not be placed in waterbodies, riparian buffers, or wetland buffers.

EFFECTS FROM INTERRELATED ACTIONS
Interrelated actions include activities involved with enhancing the riparian buffer along lower Whittle Creek. No negative impacts are anticipated from mitigation plantings or maintenance.

Mitigation Approach

Mitigation Sequencing

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable habitat impacts was taken into consideration during the project design process; however, due to the nature of the project, certain impacts are unavoidable.

The project has been designed to avoid and minimize impacts to habitats and species that were previously described in the *Project Description* section.

Proposed Mitigation

Mitigation Goal

The mitigation goal is to compensate for unavoidable project impacts to aquatic and riparian habitats that affect juvenile, ocean-type salmon (fall Chinook and chum) and their designated critical habitats near the project site.

Mitigation Strategy

Although agencies prefer to use a mitigation bank for mitigation projects, ELS proposed to purchase mitigation credits at the Coweeman River Mitigation Bank for a previous project in the Cowlitz River, and this concept was approved by the WDFW area habitat biologist and the Corps. However, when the National Marine Fisheries Service (NMFS) biologists reviewed the biological assessment and bank-use plan, they expressed concern that juvenile fall Chinook and chum are from stocks so important to the existence and recovery of the large Evolutionarily Significant Units (ESUs) that any compensatory mitigation not close to the impact site would not provide appropriate mitigation for project effects to these stocks or to their designated critical habitats. Therefore, a bank-use plan will not alleviate impacts to the affected fish stocks, and mitigation near the site must be proposed. The mitigation approach described in this plan uses a watershed approach.

There is no reasonable way to avoid, minimize, or provide compensatory mitigation for these small juvenile salmon at the project site because there are no existing off-channel habitats or areas of slow-moving water immediately downstream of the site to enhance for the affected fish stocks to use. The closest place for mitigation that can benefit these stocks is in Whittle Creek, approximately 2,500 feet downstream of the site. The City is proposing to enhance riparian buffers for these small juveniles to use the lower reaches of Whittle Creek as resting habitat during their downstream migration. Riparian plantings are proposed upstream of this area in a reach with no shrubs or trees to support the aquatic food web and to provide water-quality improvement, bank stabilization, and shade the water.

Existing Conditions – Whittle Creek

The Whittle Creek watershed is shown on Sheet 5 and is primarily used by coho and winter steelhead for spawning, rearing, and migration. It is designated critical habitat for the Lower

Columbia River Coho ESU and the Lower Columbia River Steelhead DPS. Other species migrating down the Cowlitz River may use the lower areas of Whittle Creek as refugia.

The watershed is about 1 mile wide and 4 miles long from its mouth to the headwaters in hills to the northwest (about 1,000 feet in elevation) that are under private and industrial forest ownership. This upper half of the watershed is used to grow timber, and most of the riparian buffers in timberland are not harvested. The middle section of the watershed has riparian buffers with trees, and there are wetlands associated with the stream. The lower half of the watershed consists of agricultural land used for pastures and hay, as well as for single-family homes.

Lower Whittle Creek below the West Side Highway was re-routed by the Corps soon after the 1980 eruption of Mt. St. Helens. Significant amounts of dredged material from the Cowlitz River were placed in the areas shown on Sheet 1 as "Sand". The Corps also re-routed the Whittle Creek channel in these areas to its current location and increased the height of the surrounding dredged material around the creek banks so that the creek is approximately 10 to 15 feet below the level of the surrounding dredged material that primarily consists of sand. The stream substrate in these areas are mainly sand with some gravel. Riparian buffers in these areas were not planted with trees or shrubs after the dredged material was placed. In a typical year, Whittle Creek has seasonal flows in its lower reaches from when the fall rains begin between late September to mid-October and continues flowing until about June.

The lower quarter of the watershed is on flat land with more development and open pastures, and it generally had no riparian buffer vegetation until the early 2000s when riparian plantings were installed along portions of the creek to mitigate impacts from other local projects. The lowest reach of Whittle Creek was stabilized in 2005 with willows and pillows because the banks of dredged material were sloughing into the creek. The City, in partnership with the high school, planted the west bank with native trees and shrubs after it was stabilized. Other riparian planting projects have been completed in lower Whittle Creek. One was compensatory mitigation for the Lexington Bridge project and the other was for constructing the boat launch that was planted in 2009. Tree plantings in these areas are beginning to provide improved riparian functions.

Rationale for Mitigation in Whittle Creek

There are several reasons for selecting permittee-responsible mitigation in Whittle Creek:

- It is the closest tributary downstream of the mitigation site on the same side of the river.
- It is designated as critical habitat for coho and steelhead from the same ESUs/DPSs as occur at the project site.
- The lower portion of Whittle Creek can be used as refugia for the small juveniles that may be most affected by the project as well as other listed juvenile salmonids.
- Previous mitigation projects in lower Whittle Creek have been restoring the riparian buffers since the 1980s when Whittle Creek was re-routed by the Corps so that dredged material could be placed in very large areas.
- Most of the watershed has forested riparian buffers, but the lower reaches still need to be restored.
- Proposed riparian plantings for this project are in a reach that has not had riparian-buffer restoration, so there will be significant improvement to riparian functions in the lower

watershed.

- Shade provided at project site cannot lower water temperature in the lower Cowlitz River because of the large width and water volume. Shade provided along lower Whittle Creek where there is no existing shade will lower water the temperature in Whittle Creek where impacted juvenile fall Chinook and chum will find refugia
- There is a low risk of failure and high likelihood of success for riparian plantings because it has partnered with the high school to install the riparian plantings as part of their ongoing partnership with other City projects. There are plans for students to monitor and maintain the planting areas, and their previous planting areas have been a success.

An additional benefit will be the opportunity to use this as an "outdoor classroom" which will involve high school students in the practical application of environmental sciences as it relates to these mitigation efforts. Students will have onsite instruction by professionals in this field followed by involvement in the planting, maintenance, and future monitoring of these planted areas under the direction of the City.

MITIGATION PROPOSED

The City proposes to mitigate riparian impacts at the project site by installing native trees and shrubs along two lower portions of Whittle Creek that does not have trees or shrubs (see Sheet 7). Approximately 860 linear feet of streambank 35 feet wide will be planted on the streambank (0.69 acres). These plantings will improve riparian functions such as providing organic input, preventing erosion, filtering stormwater runoff to protect and improve water quality, and eventually, providing instream woody material.

MITIGATION GOAL, OBJECTIVES, AND PERFORMANCE STANDARDS

The mitigation goal is to provide refugia downstream of the project site for juvenile fall Chinook during their migration.

Objective 1: **Improve riparian habitat functions along 860 linear feet of lower Whittle Creek.**

Performance Standard 1a: Install native trees and shrubs in 0.69 acres in the riparian buffer of lower Whittle Creek.

This performance standard will be met when the as-built report showing that these areas have been planted with native trees and shrubs is submitted to the City of Castle Rock, Washington Department of Fish and Wildlife, Washington Department of Ecology, and the U.S. Army Corps of Engineers within 3 months of project completion.

Performance Standard 1b. In Year 1 and Year 2 (Year 1 begins after the first full growing season after planting) native trees and shrubs will achieve 100 percent survival.

If dead plants are replaced, this performance standard will be met.

Performance Standard 1c. In Years 3 through 5, there will be at least 80 percent survival of planted shrubs and trees.

This performance standard will be met if dead plants are replaced to achieve this survival requirement - or if natural colonization results in an 80 percent stem count of the original number of plants.

Planting-Area Protections

One of the planting area is owned by the City and one is owned by the Mt. St. Helens Motorcycle Club. These areas are within riparian buffers protected under the critical areas ordinance and are in the inner riparian buffers, so deed restrictions are not necessary.

Planting Plan

Native species were selected based on their ability to grow in sandy dredged material along the Whittle Creek banks that can provide shade, organic material input into the creek, and food and shelter for terrestrial wildlife. Conifers will provide these functions and will eventually provide large wood to the creek to create instream habitat complexity. Native shrub species were selected that will grow in the sun before the tree species produce shade and that can tolerate more shade as the trees grow. This will create a multi-layered canopy.

Any garbage and invasive blackberries in planting areas will be removed prior to planting and will continue to be controlled during the maintenance and monitoring period. Approximately 0.69 acres of trees will be planted on 10-foot centers (100 square feet per plant) and shrubs will be planted on 5-foot centers (25 square feet per plant). Each species will be planted in groups of between five and 12 plants to mimic natural colonies. Planting details are summarized in the following table.

Table 2. Plant Specifications (total of 0.69 acres planted).

Species	Spacing (feet)	Minimum Size and Type	Quantity
Plant Near the Water – lower 10' (0.09 acres – 3,920 sf)			
Sitka Willow (*Salix sitchensis*)	5	3' cuttings	**86**
Red-Osier Dogwood (*Cornus sericea*)	5	3' cuttings or 1-gallon container or larger	**86**

Plant In Drier Soils Higher up the Bank – upper 25' (0.21 acres – 9,148 sf)			
Black Cottonwood (*Populus balsamifera*)	10' from other trees	3' cuttings, bareroot, or 1-gallon container or larger	**27**
Douglas Fir (*Pseudotsuga menziesii*)	10' from other trees	Bareroot or 1-gallon container minimum	**27**
Grand Fir (*Abies grandis*)	10' from other trees	Bareroot or 1-gallon container or larger	**27**
Vine Maple (*Acer circinatum*)	10' from other trees	Bareroot or 1-gallon container or larger	**27**
Oceanspray (*Holodiscus discolor*)	5' from other shrubs and trees	1-gallon container or larger	**80**
Snowberry (*Symphoricarpos albus*)	5' from other shrubs and trees	1-gallon container or larger	**80**
Serviceberry (*Amelanchier alnifolia*)	5' from other shrubs and trees	1-gallon container or larger	**80**
		Total Plants	**520**

Notes:

1. If a shrub species listed above is not available at the time of planting, it can be substituted with another shrub; however, it must match the same wet or dry soil requirements as the shrub that was not available.
2. Plant numbers above represent final live plant numbers. Order some extra of each species to account for damaged or missing plants from the order.

PLANT MATERIALS AND PLANTING SPECIFICATIONS

The native trees and shrubs will be installed during the late fall to early spring (October-March) when the plants are dormant and the soil moisture conditions are favorable for planting. Native plants specified for mitigation are designed to enhance riparian and aquatic habitats. Plants are best installed in the late fall but can also be installed into early spring when the site conditions are wettest and the cuttings are dormant.

General Plant Specifications

- Plant the native trees and shrubs during the late fall to early spring (October-March) at the spacing identified in the planting table.
- Group the plants in uneven patches of 5 to 12 plants of a single species, with patches interspersed among one another.
- All plant materials will be kept cool and moist prior to installation.
- All plant materials will have well developed roots and sturdy stems, with an appropriate root to shoot ratio.
- No damaged or desiccated roots or diseased plants will be accepted.

Cuttings

- Cuttings will be purchased from a native-plant nursery or cut from a local source.
- Cuttings will be a minimum of 3-feet long and between ½- to 1-inch in diameter.
- Cuttings will be kept cool and moist prior to being planted.
- Cutting stock should be installed within 1 to 2 days of cutting.
- Unplanted cutting stock will be properly stored at the end of each planting day to prevent desiccation.
- The cutting stock should be inspected by a person experienced in determining high-quality stock, and they should reject unacceptable plant materials.
- At least two-thirds of each cutting will be inserted into the soil, and at least two buds will be above ground.
- A planting bar may be necessary to install the cutting to the correct depth.

Plant Bareroot/Containerized Trees and Shrubs

- Dig the hole several inches wider than the size of the root system.
- Position the planted species' root collar so that it is at or slightly above the level of the surrounding soil to allow for settling.
- Backfill the hole with soil.
- Gently compact the soil around the planted species to eliminate air spaces.
- Irrigate all newly installed plants as site and weather conditions warrant.

MONITORING AND REPORTING, MAINTENANCE PLAN, CONTINGENCY PLAN, AND IMPLEMENTATION SCHEDULE

MONITORING

The City anticipates that high school students will conduct, maintain, monitor, and report for this project, so vegetative monitoring will be conducted in May or September once each of the five years between late spring and late summer to allow students to accomplish this work during the school year. When a month is selected for monitoring, preferably within a 2-week period every year to obtain comparable results. The following information will be gathered during each monitoring event:

- Determine the percent survival.
- Determine the general health of plants in the monitoring plot, noting specific problems and potential causes.
- Document area with photographs of vegetative changes over time from photopoints that will be established during plant installation. Photograph locations will be shown on a map and will be included in each monitoring report.

AS-BUILT REPORT

An as-built report submitted within three months of planting completion to the U.S. Army Corps of Engineers, the Washington Department of Ecology, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, and the City of Castle Rock. It will include the following items:

- Completed as-built report approximately one page long (see Appendix) and summarizing any deviations from the plan.
- A site plan showing changes that occurred to the planting area during plant installation and establishes permanent locations (photopoints) from which photographs will be taken to document plant growth. The drawing will be labeled "as-built" and will include the as-built monitoring date(s).
- Photos of the installed plants at photopoints that include all mitigation planting areas.

Monitoring Report

Monitoring reports will be submitted no later than December 31 for 5 years to the U.S. Army Corps of Engineers, the Washington Department of Ecology, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, and the City of Castle Rock. Reports will discuss how performance standards are being met. The following items will be included in the report:

- One page monitoring report that includes content required by the Corps (see Appendix).
- The as-built site plan updated to show any changes that have occurred to the mitigation planting area since the last report, such as plants that have died and been replaced.
- Photographs taken from established photopoints during monitoring.

Maintenance Plan

Planted trees and shrubs will be maintained as often as necessary to ensure that the performance standards are met. Maintenance includes performing the following actions:

- Inspect the plantings at least twice annually, or more often as appropriate to control invasive species and to achieve the performance standards specified in the subsection titled "Mitigation Goals, Objectives, and Performance Standards."
- Irrigate planted trees and shrubs during the dry season for the first 2 to 3 years after planting. Water should be delivered at a minimum rate of 1 gallon per plant every 4 weeks. Adjust as necessary based on site and weather conditions.
- Remove competing vegetation from around the base of plant species during first 2 to 3 years after planting and as needed thereafter.
- Replace dead or failed plants to meet the minimum performance standards. Replaced plants will be installed as described for the original installation.

Contingency Plan

If mitigation areas are failing or the performance criteria are not met, steps will be taken to correct 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 such as irrigating and replanting.
4. Document the activities and include this data in the monitoring reports.
5. In the event that a routine corrective action will not correct the problem, immediately consult with the appropriate agencies.
6. Evaluate recommendations from resource agency staff and implement recommendations in a timely manner.

RESPONSIBLE PARTY

Funding for corrective actions will be the responsibility of the City of Castle Rock.

MITIGATION SCHEDULE

The following schedule shows anticipated timing for completing the tasks outlined in this plan.

First Dredging Year (estimated to be August 2026)

October 2026 to - March 2027	Plant shrubs and trees.
May - November	Ongoing maintenance and watering, as needed.
January 2026 to June 2026	As-built report (see Appendix) submitted within 3 months from planting date.

Year 1 (2027)

May or September	Vegetative monitoring.
May - November	Ongoing maintenance and watering, as needed.
December 31	Monitoring report submitted (see Appendix).

Year 2 (2028)

May or September	Vegetative monitoring during the same month as in Year 1.
May - November	Ongoing maintenance and watering, as needed.
December 31	Monitoring report submitted (see Appendix).

Year 3 (2029)

May or September	Vegetative monitoring during the same month as in Year 1.
May - November	Ongoing maintenance and watering, as needed.
December 31	Monitoring report submitted (see Appendix).

Year 4 (2030)

May or September	Vegetative monitoring during the same month as in Year 1.
May - November	Ongoing maintenance and watering, as needed.
December 31	Monitoring report submitted (see Appendix).

Year 5 (2031)

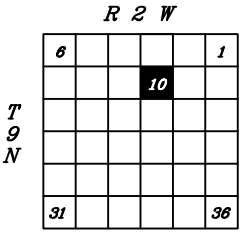
May or September	Vegetative monitoring during the same month as in Year 1.
May - November	Ongoing maintenance and watering, as needed.
December 31	Monitoring report submitted (see Appendix).

FIGURES

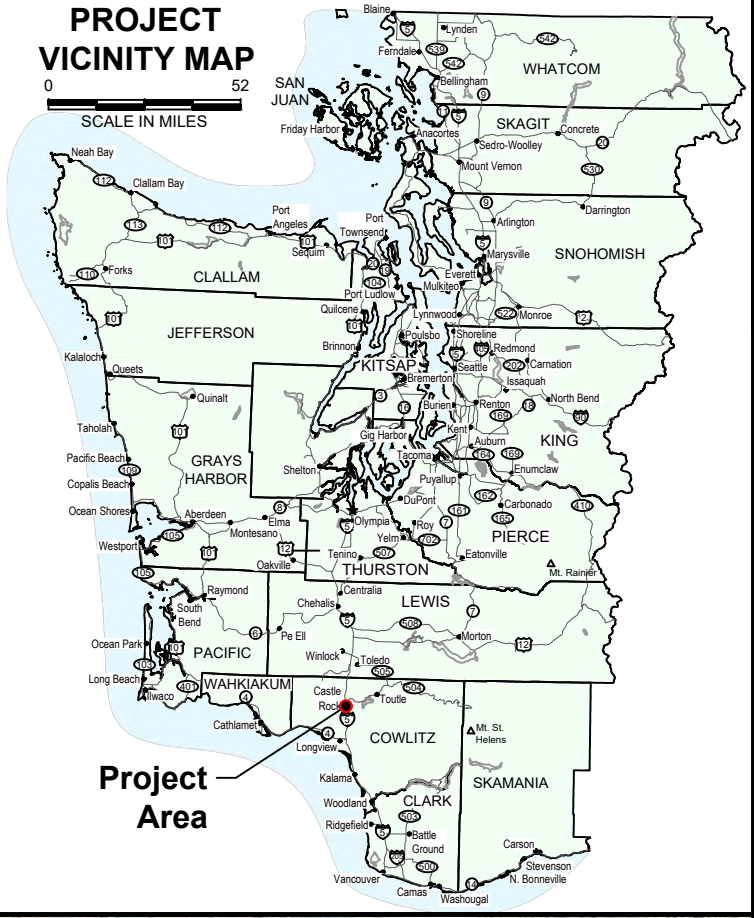
WASHINGTON

46.2784° Latitude
-122.9125° Longitude

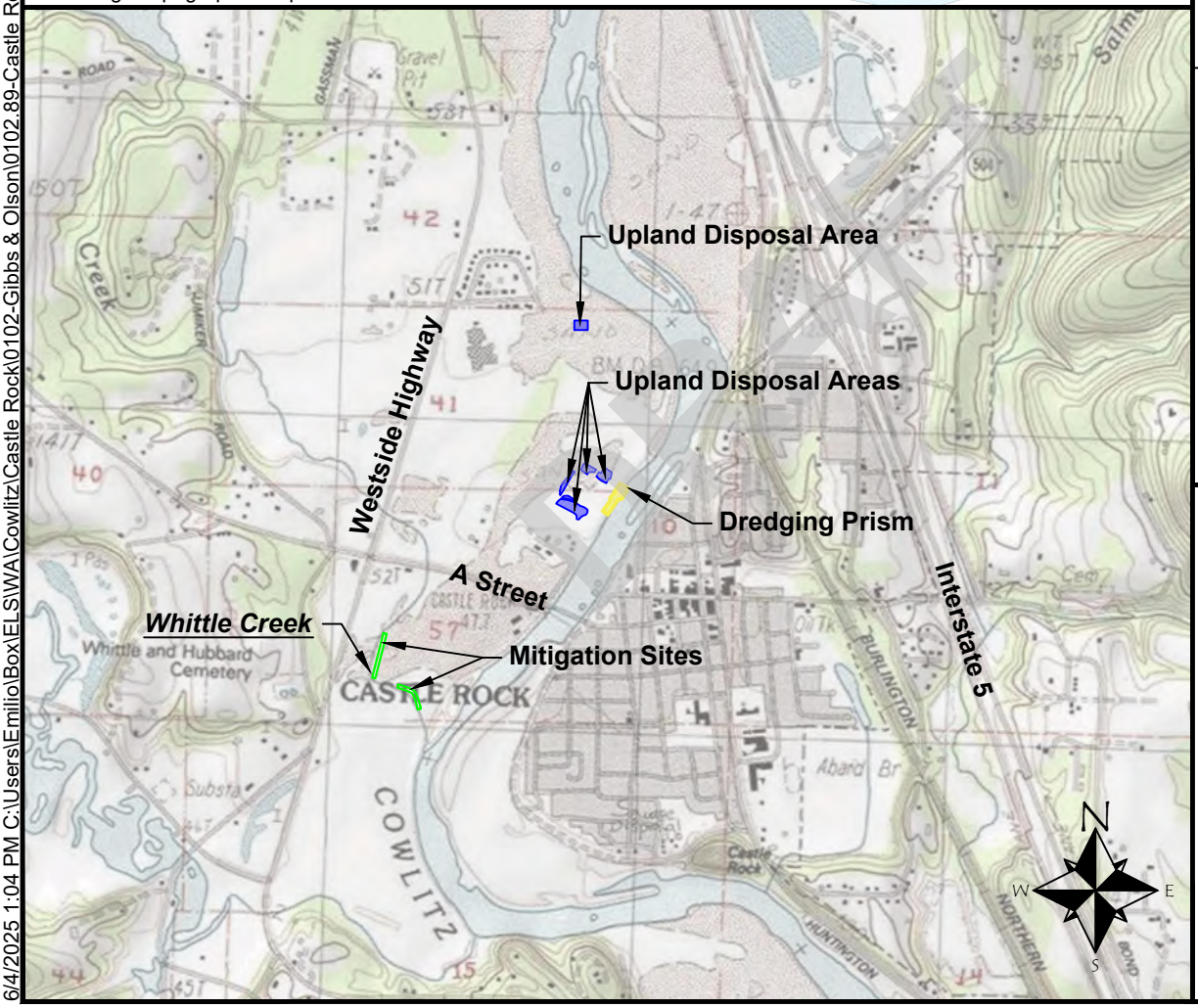
LOCATION MAP



PROJECT VICINITY MAP



NOTE:
Quadrangle topographic map from USGS.



PROPOSED: Maintenance Dredging

IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 1 **OF** 7
DATE: 6/4/25

VICINITY MAP
APPLICANT: City of Castle Rock
PROJECT NAME: Castle Rock Boat Launch Dredging
REFERENCE #: Not Yet Assigned.
SITE LOCATION ADDRESS:
RM 17.6 - Access Rd 5040 Westside Hwy

PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83
ADJACENT PROPERTY OWNERS:
See JARPA

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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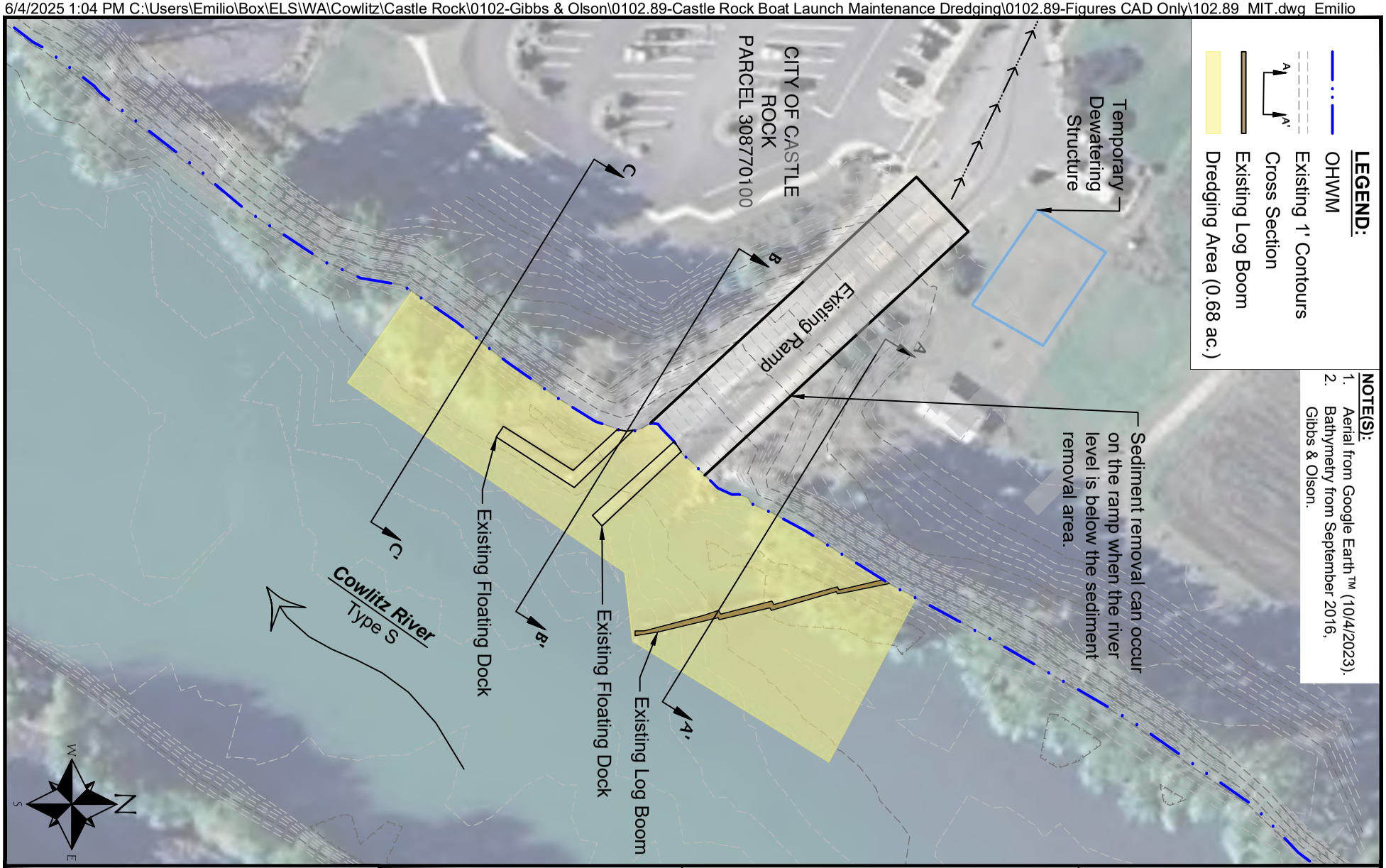

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SCALE IN FEET

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

PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83

ADJACENT PROPERTY OWNERS: See JARPA

DREDGING PRISM

APPLICANT: City of Castle Rock

PROJECT NAME: Castle Rock Boat Launch Dredging

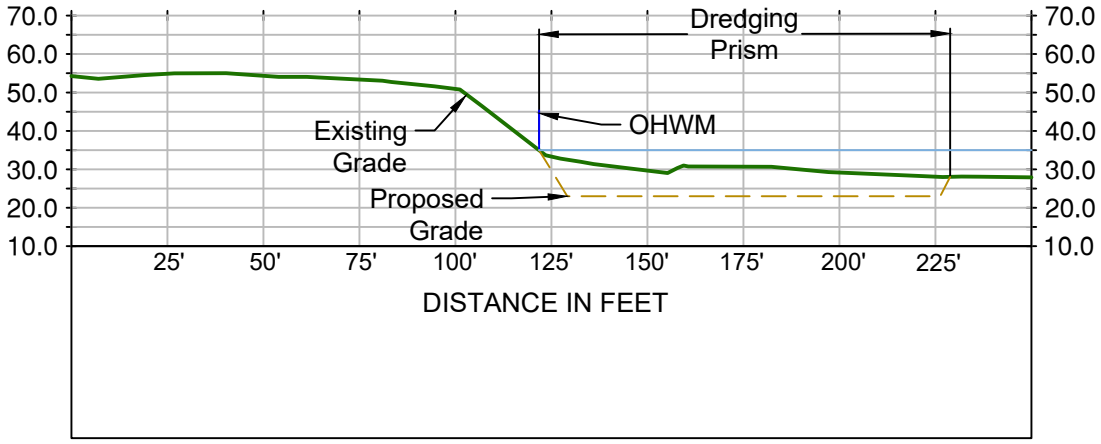
REFERENCE #: Not Yet Assigned.

SITE LOCATION ADDRESS: RM 17.6 - Access Rd 5040 Westside Hwy

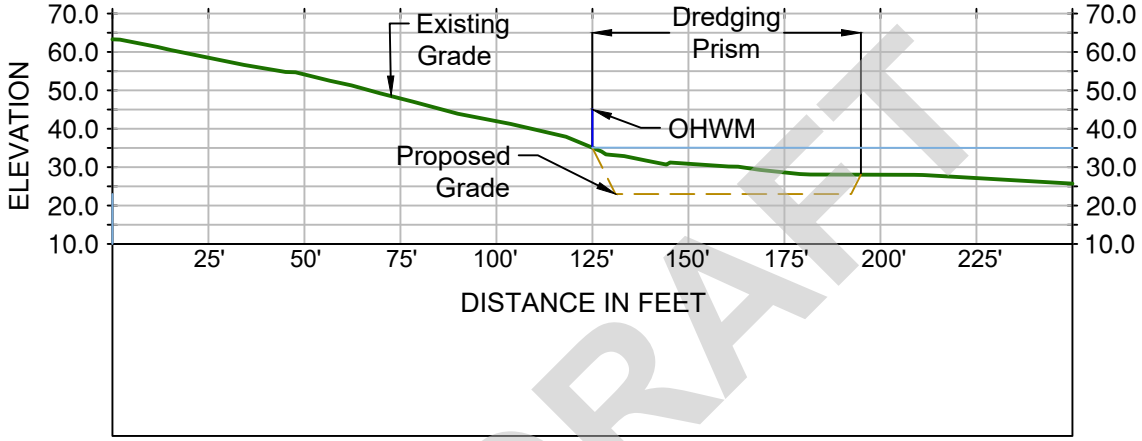
PROPOSED: Maintenance Dredging

IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 2 **OF** 7
DATE: 6/4/25

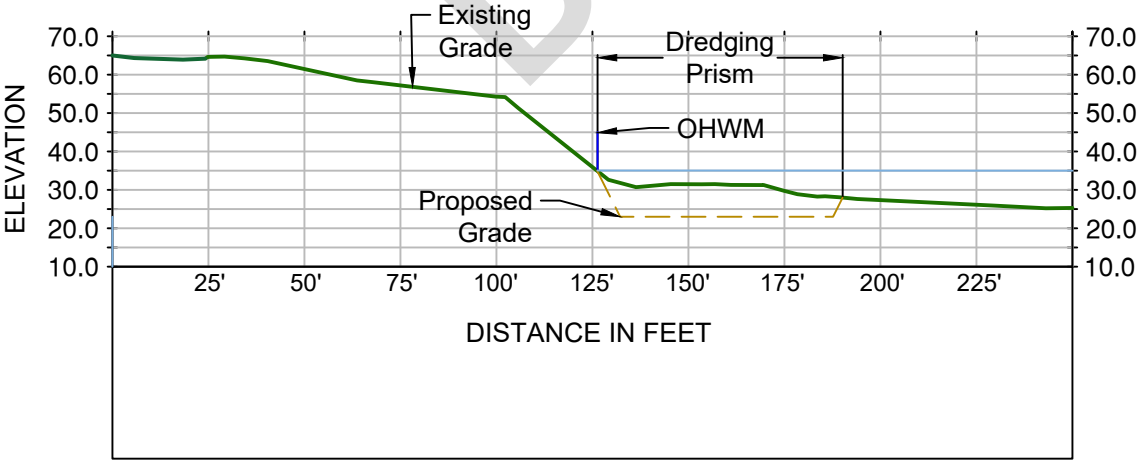
Cross Section A-A'



Cross Section B-B'



Cross Section C-C'



NOTE(S):

1. Green lines indicate existing grade from 2016 bathemetric survey.

CROSS SECTIONS

APPLICANT: City of Castle Rock
PROJECT NAME: Castle Rock Boat Launch Dredging
REFERENCE #: Not Yet Assigned.
SITE LOCATION ADDRESS: RM 17.6 - Access Rd 5040 Westside Hwy

PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83
ADJACENT PROPERTY OWNERS: See JARPA

PROPOSED: Maintenance Dredging
IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 3 **OF** 7
DATE: 6/4/25

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SCALE IN FEET

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

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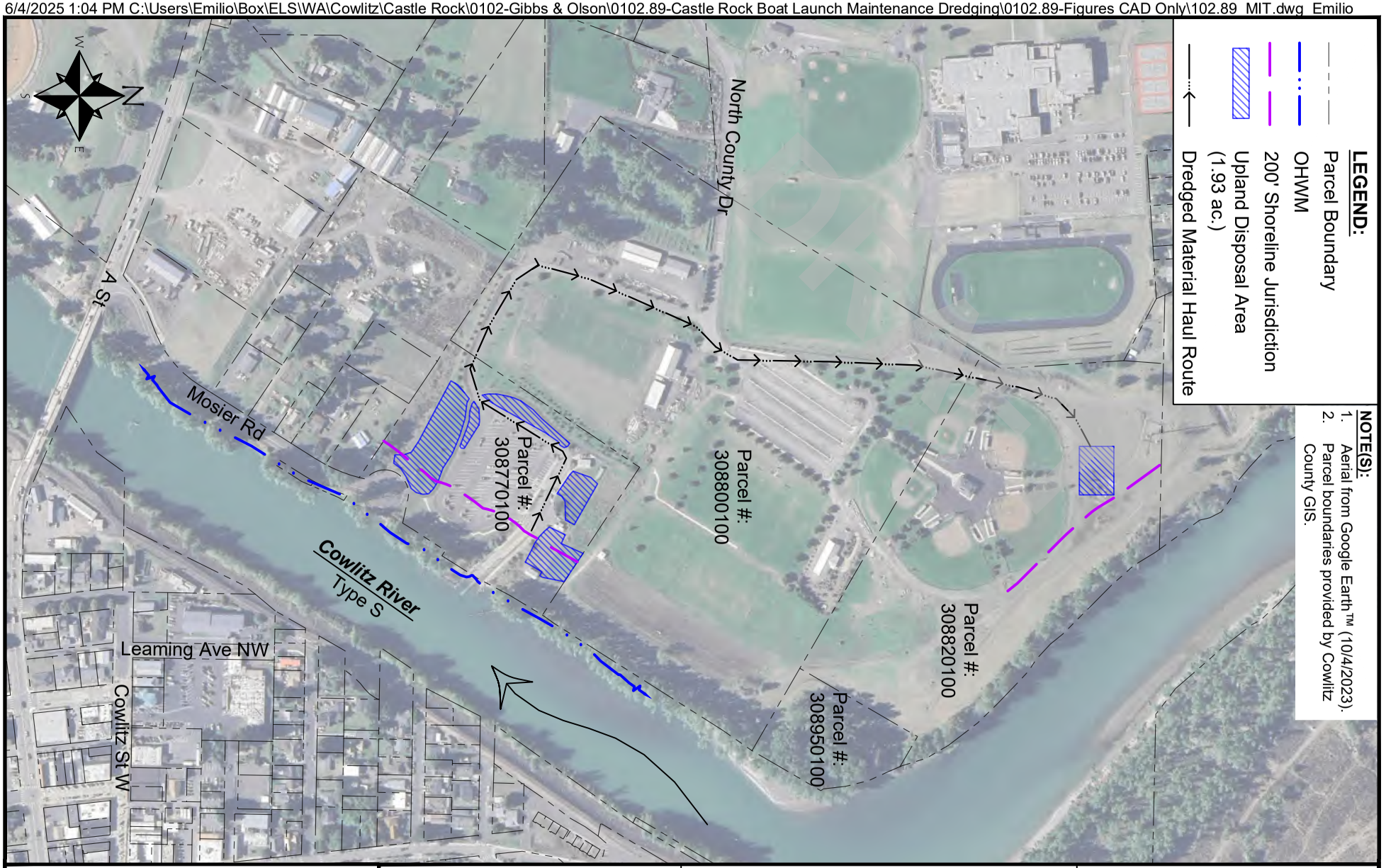

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SCALE IN FEET

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

PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83

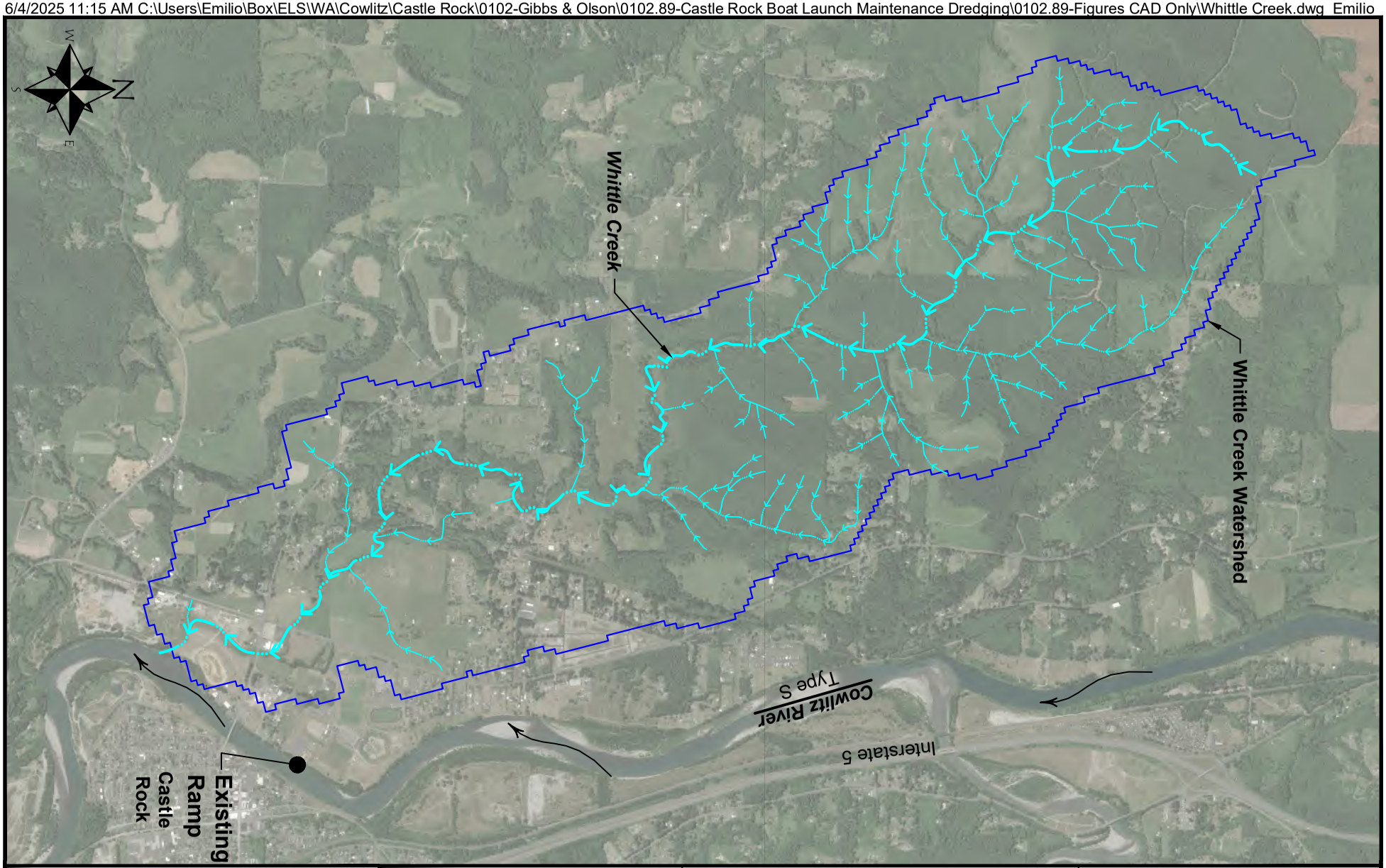
ADJACENT PROPERTY OWNERS: See JARPA

UPLAND DISPOSAL AREAS

APPLICANT: City of Castle Rock
PROJECT NAME: Castle Rock Boat Launch Dredging
REFERENCE #: Not Yet Assigned.
SITE LOCATION ADDRESS: RM 17.6 - Access Rd 5040 Westside Hwy

PROPOSED: Maintenance Dredging

IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 4 **OF** 7
DATE: 6/4/25



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SCALE IN FEET

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

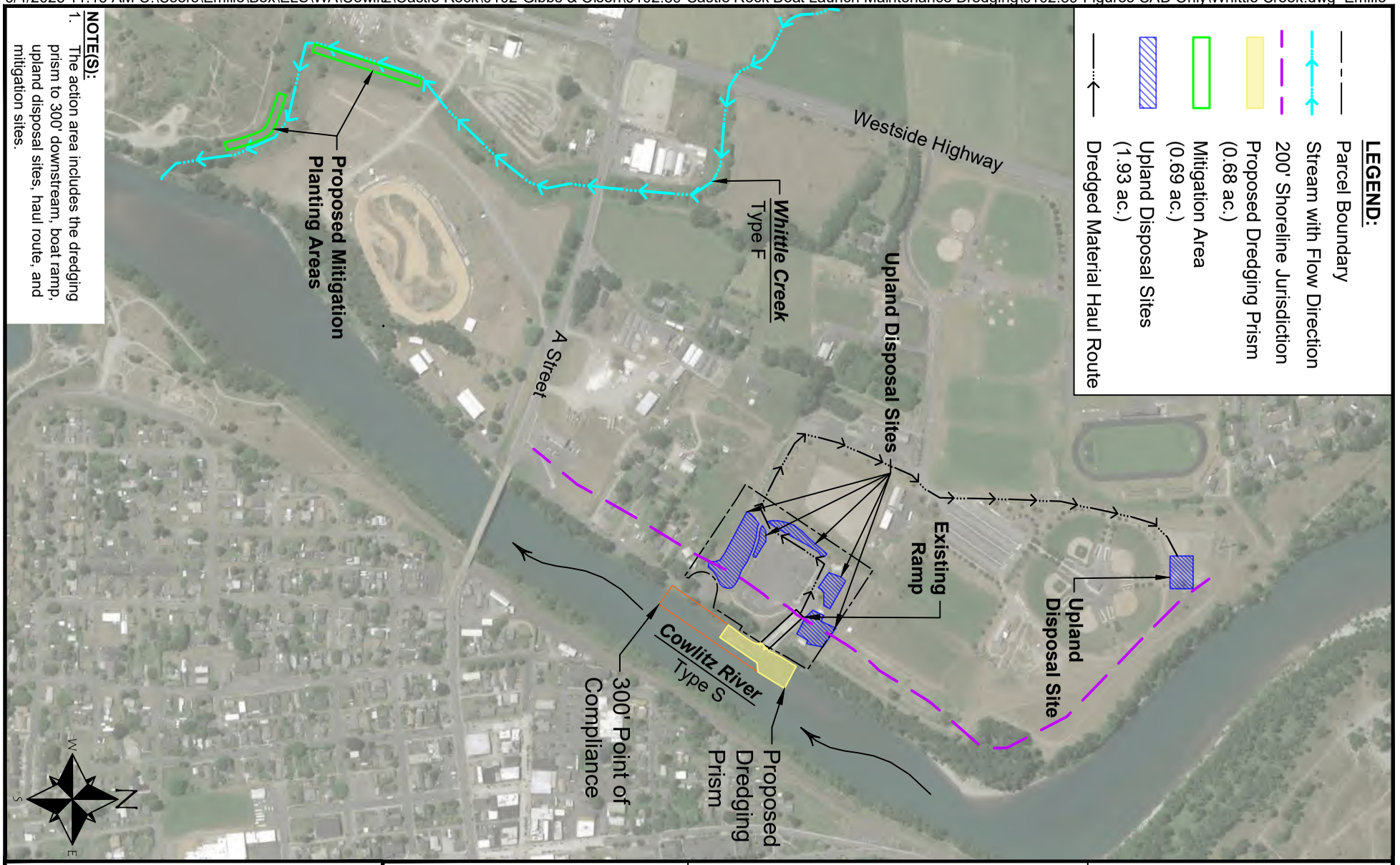
PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83
ADJACENT PROPERTY OWNERS: See JARPA

WHITTLE CREEK WATERSHED
APPLICANT: City of Castle Rock
PROJECT NAME: Castle Rock Boat Launch Dredging
REFERENCE #: Not Yet Assigned.
SITE LOCATION ADDRESS: RM 17.6 - Access Rd 5040 Westside Hwy

PROPOSED: Maintenance Dredging

IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 5 **OF** 7
DATE: 6/4/25



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SCALE IN FEET

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

PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83
ADJACENT PROPERTY OWNERS: See JARPA

ACTION AREA MAP
APPLICANT: City of Castle Rock
PROJECT NAME: Castle Rock Boat Launch Dredging
REFERENCE #: Not Yet Assigned.
SITE LOCATION ADDRESS: RM 17.6 - Access Rd 5040 Westside Hwy

PROPOSED: Maintenance Dredging

IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 6 **OF** 7
DATE: 6/4/25

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Plant Specifications (0.69 acres).

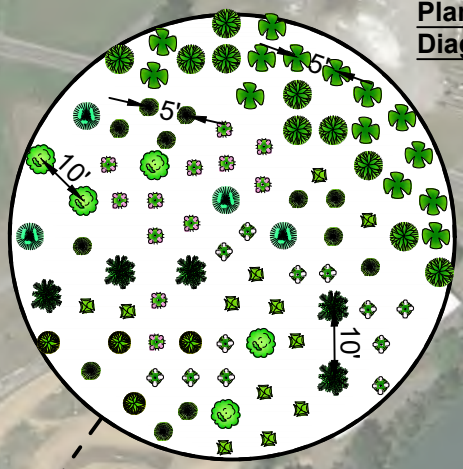
Species	Spacing (feet)		Minimum Size and Type	Quantity
Plant Near the Water – lower 11' (0.23 acres – 10,019 sf)				
Sitka Willow (*Salix sitchensis*)	5		3' cuttings	200
Red-Osier Dogwood (*Cornus sericea*)	5		3' cuttings or 1-gallon container or larger	200
Plant In Drier Soils Higher up the Bank – upper 24' (0.46 acres – 20,038 sf)				
Black Cottonwood (*Populus balsamifera*)	10' from other trees		3' cuttings, bareroot, or 1-gallon container or larger	67
Douglas Fir (*Pseudotsuga menziesii*)	10' from other trees		Bareroot or 1-gallon container minimum	67
Grand Fir (*Abies grandis*)	10' from other trees		Bareroot or 1-gallon container or larger	67
Vine Maple (*Acer circinatum*)	10' from other trees		1-gallon container or larger	67
Oceanspray (*Holodiscus discolor*)	5' from other shrubs and trees		1-gallon container or larger	150
Nootka Rose (*Rosa nutkana*)	5' from other shrubs and trees		1-gallon container or larger	150
Snowberry (*Symphoricarpos albus*)	5' from other shrubs and trees		1-gallon container or larger	150
Salal (*Gaultheria shallon*)	5' from other shrubs and trees		1-gallon container or larger	150
			Total Plants	1,286

LEGEND:

- Parcel Boundary
- Stream with Flow Direction
- Mitigation Area (0.69 ac.)

Whittle Creek
Type F

Planting Diagram:



490' x 35'
17,150 sq.ft.
0.39 ac.

370' x 35'
12,950 sq.ft.
0.30 ac.

Cowlitz River
Type S

N
W
E
S

0 400 800
SCALE IN FEET

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

Ecological Land Services

PURPOSE: Maintain Water Depth at Boat Launch.

DATUM: NAD83

ADJACENT PROPERTY OWNERS: See JARPA

PLANTING PLAN

APPLICANT: City of Castle Rock

PROJECT NAME: Castle Rock Boat Launch Dredging

REFERENCE #: Not Yet Assigned.

SITE LOCATION ADDRESS: RM 17.6 - Access Rd 5040 Westside Hwy

PROPOSED: Maintenance Dredging

IN Cowlitz River
NEAR: Castle Rock
COUNTY: Cowlitz **STATE:** WA
SHEET 7 **OF** 7
DATE: 6/4/25

Photo 1. Taken June 2020. Dock at boat launch on the Cowlitz River facing downstream.

Photo 2. Taken June 2025. Looking downstream at dock shown in Photo 1. Both photos were taken at similar river levels. Photo 2 shows significant sediment accumulation.

Photo 3. Taken June 2025 from end of dock looking upstream at ramp and log boom.

Photo 4. Looking upstream at log boom. Photo taken June 2025.

Ecological Land Services

1157 3rd Avenue, Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305

DATE: 06/02/25
DWN: LS
PRJ. MGR: LS
PROJ.#: 102.89

Photoplate 1
Castle Rock Boat Launch Maintenance Dredging
Castle Rock, Washington
Section 10, Township 9N, Range 2W, W.M.

APPENDIX

Mitigation As-Built Report for Riparian Plantings
Mitigation Planting Monitoring Report for Riparian Plantings

Status / As-built Report for Mitigation Work Completion

Within one (1) year, or earlier if indicated on this form, of the date of permit issuance, submit this completed form to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, WA 98124-3755. For riparian planting mitigation, you must complete and submit a Mitigation Planting Monitoring Report annually after the Corps accepts your as-built drawings of the mitigation construction.

Corps Reference Number: NWS-_____

Date the Corps Issued Your Permit: _____

Date this Report is Due: _____

Permittee Name: _____

Address: _____

City/State/Zip Code: _____

Phone Number:

_____

Email:

_____

Type of Mitigation:

_____

☐ Riparian plantings

Attachment: ☐ Photographs of the mitigation area (preferably taken during June – August).

Conditions of your Corps permit require 100% survival of all planted trees and shrubs during the first and second years after planting. During the third through fifth years after planting, 80% survival is required. Individual plants that die must be replaced with Corps approved native species. You must protect your mitigation area—fencing is recommended.

Date of Installation	Species Name of Plants	Number of Plants Installed

Mitigation Planting Monitoring Report For Riparian Plantings

A completed form must be submitted 1, 2, 3, 4 and 5 years after the Corps accepts your as-built drawing of the mitigation planting area. Submit this completed form to:
U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, WA 98124-3755

Corps' Reference Number: NWS-__
Date This Report is Due: ___
Mitigation Monitoring Year (1-5): __
Permittee's Name: __
Address: ____
City/State/Zip Code: _
Phone Number: _____
Email:

You Must Attach to This Form:
1) Photographs of the mitigation area taken during the growing season.
2) As-built map with photo location points.

Photos must be provided at designated points; photo documentation must include a panoramic view(s) of the entire mitigation site. Submitted photos must be formatted on standard 8 ½" x 11" paper, dated with the date the photo was taken, and clearly labeled with the direction from which the photo was taken. Photo location points must be identified on as-built map(s).

Date of Inspection	Species Name of Dead Plants	Number of Dead Plants	Name of Species Replanted	Number Replanted

If there are multiple sites, fill out a separate table for each planting site.

Conclusions[1]:

[1] *If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the permittee or sponsor, including a timetable, must be provided. For any potential remedial actions identified, the permittee or sponsor must specify which remedial actions will be implemented. The Corps will ultimately determine if the mitigation site is successful for a given monitoring period.*