Otak

City of Washougal

Stormwater Management Action Plan

Final

Submitted to:

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DEPARTMENT OF ECOLOGY
State of Washington

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Submitted to

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Section 1. Introduction

The City of Washougal (the City) is located near the eastern edge of Clark County in southwest Washington State along State Route 14. The City sits on the banks of the Columbia River, and the City contributes runoff to three receiving waters that flow into the Columbia River: the Washougal River, Gibbons Creek, and Lacamas Creek (Figure 1).

The receiving waters that run through Washougal were once abundant with salmon, steelhead, and rainbow trout (Northwest Indian Fisheries Commission, 2022). Chinook, coho, chum, and steelhead are now listed as threatened under the Endangered Species Act and their populations in the City's receiving waters have dropped dramatically in recent years. There are many reasons for the decline, and among them was the change in land cover from forests and prairies to urban and suburban buildings and infrastructure (Lower Columbia Fish Recovery Board, 2010). Historically, forests and wetlands soaked up rain where it fell, and forests and wetlands absorbed nutrients and pollutants transported by stormwater runoff. As more people moved to Washougal, lands were cleared, and wetlands were filled in. Now when it rains, chemicals and particles from roads, vehicle tires, roofs, lawns, and outdoor storage areas are swept quickly into the nearest stream by stormwater runoff. These chemicals and particles include pollutants that harm ecosystems and make waters unsuitable for use by people such as heavy metals, petroleum products, pet waste, pesticides, fertilizers, and sediment (United States Environmental Protection Agency, 2022).

The City's municipal stormwater permit requires the City to develop a Stormwater Management Action Plan (SMAP). See Section 2 for more about the permit. The City developed this SMAP to improve water conditions for fish and human recreation in Campen Creek, a tributary of Gibbons Creek. This plan identifies stormwater facility retrofit projects, land management and development strategies, and customized stormwater management actions related to Permit requirements the City can implement to reduce the harmful effects of stormwater runoff in Campen Creek. This SMAP will help the City focus its efforts on water quality improvements in Campen Creek, align resources, and apply for grants to improve stream health.

This document is the final component of the SMAP process. The City has already completed the receiving water conditions assessment and receiving water prioritization steps. These steps assessed and compared the receiving waters in Washougal and identified the priority basin and catchment for this SMAP. The process and outcome of these steps is summarized in Section 3, Receiving Water Conditions Assessment, and Section 4, Summary of Receiving Water Prioritization. Section 5 describes the process used to develop the SMAP and the selected stormwater management actions (SMAs). This section includes the recommended stormwater management actions, implementation schedule, budget sources, and adaptive management.

FIGURE 1
WASHOUGAL CITY LIMITS AND WATERSHEDS
WASHOUGAL SMAP

City Limits
Streams
Watershed Boundaries

0 0.25 0.5 1 Miles

Date: 12/30/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Section 2. Regulatory Context

The City of Washougal is authorized to discharge stormwater runoff to surface waters of the State by the Washington State Department of Ecology (Ecology) under the Western Washington Phase II NPDES Municipal Stormwater Permit (Permit). The Permit regulates discharges from small municipal separate storm sewers (MS4s). Regulated small MS4s typically serve municipalities with populations greater than 10,000 and fewer than 100,000. The current Permit is effective August 1, 2019 through July 31, 2024.

SMAP is a new requirement of the current Permit. The SMAP requirements are described in more detail in Ecology's *Stormwater Management Action Planning Guidance* published in 2019 (2019 SMAP Guidance). Ecology uses SMAP as both a verb for the planning process and as a noun for the resulting plan. This plan complies with Permit condition S5.C.1.d, SMAP, by following the 2019 SMAP Guidance.

SMAP is focused on addressing the effects of cumulative development on a watershed under existing and future conditions. Therefore, a SMAP includes actions to protect and improve receiving water conditions while meeting the needs of future development. SMAP actions include stormwater facility retrofits, land management and development strategies, and customized stormwater management actions. The 2019 SMAP Guidance gives higher priority to protecting higher quality receiving waters and restoring highly degraded receiving waters. The 2019 SMAP Guidance also recommends focusing efforts on basins where jurisdictions have the most influence, either alone or in partnership with another jurisdiction.

The SMAP process consists of three major phases outlined in the Permit and described in detail in the 2019 SMAP Guidance:

- Phase 1 – Receiving Water Conditions Assessment. Document and assess existing information related to local receiving waters and contributing area conditions to identify which receiving waters are most likely to benefit from SMAP.
- Phase 2 – Receiving Water Prioritization. Develop and implement a prioritization process and select the receiving water that will receive the most benefit from implementation of SMAP actions.
- Phase 3 – SMAP. Develop a SMAP for at least one high priority catchment area that describes the SMAP actions, estimated implementation schedule, and potential budget sources.

The City received a grant from Ecology under the Water Quality Combined Funding Program to fund the development of this SMAP including the Receiving Water Conditions Assessment, Receiving Water Prioritization, and the completed SMAP. The grant agreement also established additional conditions on developing the SMAP (Appendix A). The grant required the City to conduct further outreach including an online map and required the City to gather more input than the base permit requirements. The Ecology grant team provided additional review of the Receiving Water Conditions Assessment, Receiving Water Prioritization, and the completed SMAP.

These additional conditions are incorporated into the in the Receiving Water Conditions Assessment – SMAP memorandum (Appendix B), the Receiving Water Prioritization – SMAP memorandum (Appendix C), the text of this SMAP, and the accompanying GIS web map.

Section 3. Summary of Receiving Water Conditions Assessment

The purpose of the receiving water conditions assessment was to identify basins and receiving waters that could benefit from stormwater management action planning. This phase resulted in a list of candidate basins that included the information needed to support the receiving water prioritization process

summarized in Section 4. The process followed the receiving water conditions assessment steps in the 2019 SMAP Guidance:

- Delineate basins and identify receiving waters,
- Assess receiving water conditions,
- Assess stormwater management influence, and
- Assess relative conditions and contributions.

In addition, the 2019 SMAP Guidance encourages cities to prioritize basins with a restoration or protection basin management strategy based on the "Management Matrix for Restoration and Protection", reproduced as Figure 2.

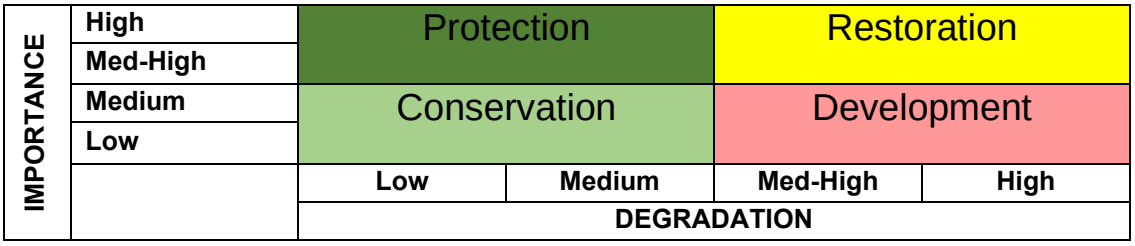

Figure 2 Watershed Management Matrix[1]

The receiving waters in the City of Washougal were identified using Clark County's watershed delineations and modified based on an analysis of topography, the City's storm sewer geographic information system (GIS), and recent levee construction. In this document, "watershed" refers to an entire contributing area to a receiving water both within and outside Washougal city limits. "Basin" is used to mean only the portion of the watershed within Washougal city limits. During this phase, existing information on each receiving water was compiled and reviewed to inform the receiving waters conditions assessment.

The relative conditions assessment was an assessment of historic conditions, current degradation, and stormwater management influence (SMI) which were used to develop the basin management strategy for each basin. Historic fish use and degree of recovery needed to meet regional fish recovery goals were used to determine the level of importance of the stream or river. Degradation was determined by considering urbanization, fish passage barriers, and documented water quality impairments. The SMI sought to discover the relative influence the City's development and storm system has on stream or river health. By concentrating resources in basins where the City has a higher SMI, the City can maximize the effect of the SMAP on watershed health. The SMI evaluation informed the selection of a catchment where the SMAP will be applied. The assessment also reviewed data from the Environmental Protection Agency's (EPA) Environmental Justice (EJ) Screening and the Washington Environmental Health Disparities Map (WEHDM) to evaluate the environmental health impact for each basin and identify inequity and overburdened communities (United States Environmental Protection Agency, 2022; Washington State Department of Health, 2022). The demographic factors used in the EPA EJ Screening did not significantly distinguish census block groups in Washougal. The WEHDM was used to compare the relative environmental health disparity of each basin. The WEHDM displays a combined index score for census tracts based on data for 19 indicators that include pollutant exposure, poverty, and health factors (Washington State Department of Health, 2022). To show the relative environmental health disparity, an area-weighted average of the combined index scores within each basin was calculated.

The outcome of this phase was a list of candidate basins that included the information needed to support a prioritization process. The full results of the assessment are summarized in the Receiving Water

[1] Reproduced from Figure 5c (Stanley, et al., 2016)

Conditions Assessment – SMAP memorandum (Appendix B). Table 1 summarizes the findings of the relative conditions assessment.

Table 1 Relative Conditions Assessment Summary

Basin Name	Gibbons Creek Basin	Washougal River Basin	Lacamas Creek Basin
Receiving Waters within Basin	Gibbons Creek; Campen Creek; Steigerwald Lake	Washougal River	Lacamas Creek
Watershed Area (Acres) [SqMi]	7,100 [11]	78,880 [123]	42,784 [67]
Area inside City (Acres)	1,721	1,918	203
Fraction of Watershed within City	24.20%	2.40%	0.50%
Percent of the City that is Occupied by the Basin	45%	50%	5%
SMI Score	High	Medium	Low
Basin Management Strategy	Restoration	Protection	Conservation
Relative Environmental Health Disparity	Medium (5.7)	Medium (5.4)	Low (3.2)

Gibbons Creek Basin and Washougal River Basin had higher relative SMI scores than Lacamas Creek Basin. Gibbons Creek Basin and Washougal River Basin were assigned restoration and protection management strategies, respectively. As a result, Gibbons Creek Basin and Washougal River Basin were selected to move into the receiving water prioritization step.

Section 4. Summary of Receiving Water Prioritization

The purpose of the receiving water prioritization was to determine which receiving water would receive the most benefit from implementation of stormwater facility retrofit projects, land management and development strategies, and customized stormwater management actions related to Permit requirements. This phase selected a basin and catchment for which a SMAP will be developed. Prioritization began with prioritizing a receiving water basin. Following selection of a receiving water basin, catchments within the selected receiving water basin were delineated, and a catchment within that basin was prioritized.

The receiving water prioritization criteria included numerous factors divided into three categories: receiving water condition information, SMI, and community factors. The receiving water conditions and the SMI were sufficient to identify the priority basin. Community factors were initially evaluated during the receiving water conditions assessment and became more influential as the City narrowed the geographic focus during the receiving water prioritization.

Community factors included the Relative Environmental Health Disparity data evaluated during the receiving water conditions assessment step and the results of a public engagement survey conducted during the receiving water basin prioritization step. The City invited the general public and interested

parties to participate in prioritizing a receiving water basin for two weeks in June and July 2022. A StoryMap website explained the SMAP process, presented the receiving water conditions assessment findings, and offered a two-question survey. The first question asked respondents to select a priority basin (Gibbons Creek Basin or Washougal River Basin). The second question asked respondents to plot a point within the City of Washougal where SMAP could address water quality, stream/river conditions, or uncontrolled stormwater runoff. Sixteen survey responses were collected. Eleven participants selected Gibbons Creek Basin, and five selected the Washougal River Basin for prioritization. Additionally, nine responses to the second question were located in the Gibbons Creek Basin and four in the Washougal River Basin.

Table 2 presents the criteria and scores for Gibbons Creek Basin and Washougal River Basin.

Table 2 Receiving Water Prioritization Criteria and Scores

Consideration	Basin Scoring*	
	Gibbons Creek Basin	Washougal River Basin
Receiving Water Conditions		
Fish passage barriers	High (0 barriers)	High (0 barriers)
Ability to Influence (SMI)		
Hydrologic Impact	High (high score)	Low (low score)
Pollutant Loading Impact	High (high score)	Medium (medium score)
Watershed Management Strategy	High (Restoration)	Medium (Protection)
Community Factors**		
Stakeholder/Community Feedback	High (9 community points)	Low (4 community points)
Relative Environmental Health Disparity	Medium (5.7)	Medium (5.4)

** Higher scores indicate the receiving water may benefit more from implementation of a SMAP.*
***Intended to be used as a tiebreaker, if needed*

Based on consideration of the above factors and scores, the City selected Gibbons Creek Basin as the priority receiving water. The full results of the prioritization process are described in the Receiving Water Prioritization – SMAP memorandum (Appendix C).

Following the selection of the priority basin, the consulting team delineated catchments in Gibbons Creek based on the SMAP Guidance which states catchments should be between 400-600 acres or a scale that is appropriate for the jurisdiction. Gibbons Creek Basin and its catchments are shown in Figure 3. City of Washougal is a smaller southwest Washington city, and the appropriate catchment size tended to be smaller. Catchments range from 282 to 661 acres and are based on drainage areas to stream channels, adjusted for stormwater infrastructure, and to some extent, uniformity in land uses and storm system type.

To select a catchment, the team evaluated many of the same factors as had been considered in prioritizing a receiving water. An additional category, collaboration factors, was added and evaluated for selection of the priority catchment. Collaboration factors looked at rehabilitation efforts by other regional and local entities and other capital projects planned by the City.

Table 3 presents the criteria and scores for the Gibbons Creek catchment. The City and consultant team also conducted a site visit in Gibbons Creek Basin in July 2022 to inform catchment selection by

identifying stormwater retrofit opportunities and stormwater management needs. The site visit indicated the greatest number of opportunities for water quality projects are in the Campen Creek Catchment.

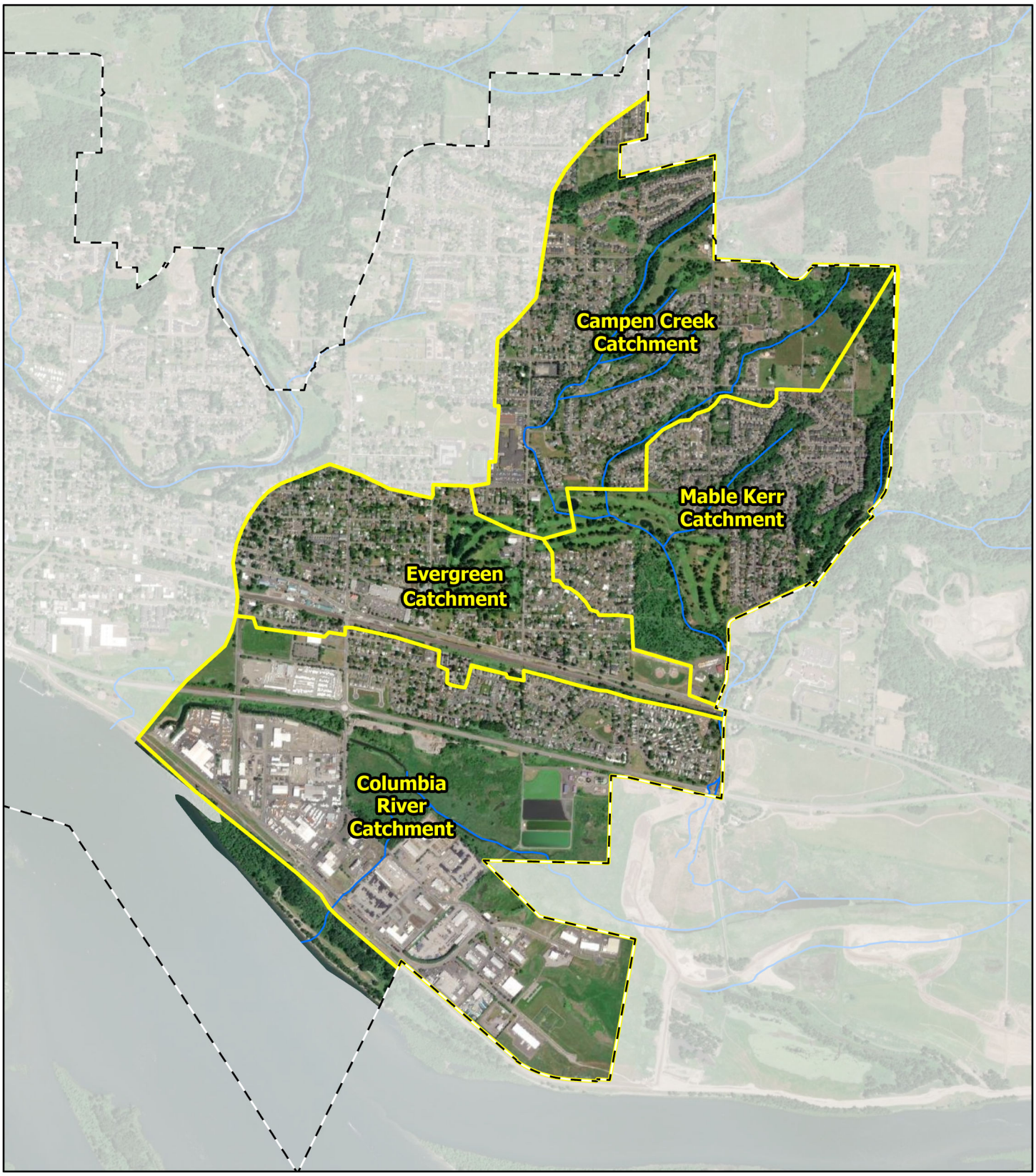

FIGURE 3

GIBBONS CREEK BASIN CATCHMENTS

WASHOUGAL SMAP

Washougal City Limits
Streams
Gibbons Creek Basin Catchments

0 0.25 0.5 1 Miles

Date: 12/30/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Table 3 Catchment Scores and Prioritization

Catchment Scoring				
Consideration	**Campen Creek**	**Mable Kerr**	**Evergreen**	**Columbia River**
Receiving Water Conditions				
Ratio of existing water quality facilities to pollution-generating land uses and large pollution-generating pervious surfaces*	Low (0.27)	High (0.09)	High (0.09)	High (0.05)
Ratio of existing flow control facilities to impervious surfaces*	Medium (0.13)	Medium (0.13)	High (0.05)	High (0.04)
Ability to Influence (SMI)				
Availability of publicly owned land (acres)	High (88.28)	Medium (31.15)	Low (8.37)	High (71.61)
Availability of right-of-way (miles / acre of catchment)	Neutral (0.02)	Neutral (0.02)	Neutral (0.02)	Neutral (0.02)
Community Factors				
Stakeholder feedback	High (4 community points)	Medium (2 community points)	Low (0 community points)	Medium (3 community points)
Washington Information System for Architectural and Archaeological Records Data (WISAARD) Predictive Model	Medium (Very high risk in approximately ½ of the catchment)	Medium (Very high risk in approximately ¾ of the catchment)	High (Very high risk throughout catchment)	High (Very high risk throughout catchment)
Relative Environmental Health Disparity **	Low (3.18)	Low (3.08)	Low (3.90)	High (9.00)
Collaboration Factors				
Regional and local rehabilitation and restoration efforts	Medium	Medium	None Identified	None Identified
City's Capital Improvement Projects	Hartwood Bridge Replacement	N/A	32nd Street Underpass; 39th Street/ Evergreen Way Realignment; J Street Water Main Installation	32nd Street Underpass; Biosolids Handling Facility
Final Selection				
Site visit / observations / engineering judgement	High	Medium	Medium	Low
Selection status	Catchment Selected for SMAP	Not Selected for SMAP – Second Choice	Not Selected for SMAP – Third Choice	Not Selected for SMAP – Fourth Choice

*****Some private stormwater facilities may not be documented in the City's GIS, particularly in the Columbia River Catchment.*

***Intended to be used as a tiebreaker, if needed.*

The City selected the Campen Creek Catchment as the priority catchment. The Campen Creek Catchment is 407 acres and consists primarily of residential development. The City is located in the downstream half of the drainage to Campen Creek which extends north into unincorporated Clark County.

The Campen Creek Catchment was selected for SMAP because of the ease of coordination for placing facilities in the ROW in underserved residential areas, the number of existing older publicly owned flow control facilities that are eligible for retrofit, the presence of a known erosion problem in the tributary at 39th Street, and the focus on this catchment demonstrated through public feedback and the efforts by the Lower Columbia Estuary Partnership.

Section 5. Action Plan

Section 5 describes a 20-year action plan to improve conditions in the Campen Creek Catchment of Gibbons Creek. Relevant characteristics of Campen Creek Catchment and the recommended stormwater management actions are presented in a web map. The URL is included in Appendix F.

Campen Creek Catchment

The Campen Creek Catchment consists of 407 acres of the City of Washougal. The catchment is located in the northwest portion of the city and consists primarily of residential development. The Campen Creek mainstem and the uppermost tributary pass through the catchment. The headwaters of the tributaries in this system are north of the City in unincorporated Clark County.

Hartwood Park, Eldridge Park, the Summer Slope subdivision open space, and portions of the Orchard Hills Golf Club are significant open spaces in the catchment. The Washougal High School is located at the western edge along 39th Street. Portions of the Orchard Hills Golf Course are also in the Evergreen and Mable Kerr Catchments, and part of the high school property is located in the Washougal River Basin. The northeastern corner of the catchment is currently agricultural and forested, and this area is expected to develop with residences.

Campen Creek is a tributary of Gibbon Creek. Gibbon Creek and Campen Creek are listed on Ecology's *Washington State Water Quality Assessment* as impaired for temperature and fecal coliform bacteria. High water temperatures prevent the creeks from attaining their designated uses for aquatic life, affecting salmonid spawning, rearing, and migration. High levels of fecal coliform bacteria prevent the creeks from attaining their designated uses for recreation (Washington State Department of Ecology, 2022). Gibbons Creek and its tributaries have a Total Maximum Daily Load (TMDL) for fecal coliform bacteria to address the impairment and attain water quality standards. Improving water quality in the catchment would also benefit Gibbon Creek (Post, 2000). Recommendations for decreasing fecal coliform bacteria in Gibbons Creek include focusing on Campen Creek within Washougal city limits, identifying illegal discharges, failing septic systems, and contributions from residential pet waste (Collyard, 2013).

City staff have observed that Campen Creek and its tributaries through this catchment are flashy, which means that stream levels rise very quickly after rainstorms. Flashiness is typical of streams that have been impacted by urban development.

Many residential subdivisions in the catchment were developed under Clark County regulations in the 1990s and 2000s which means most of them have older flow control and older water quality facilities, and many of these subdivisions have wider county road widths. The Summer Slopes subdivision drains to poorly functioning water quality and flow control facilities. These facilities are located in a large city-owned property. The property is a former wetland which is now dominated by invasive blackberry plants. The poor drainage in the Campen Creek Park-Rolling Meadows neighborhood has resulted in sinkholes, and

the area has little treatment with an older flow control facility. Additionally, old county roads in the area have no treatment or flow control; however, rights-of-way are wide and provide opportunities for retrofit. The Vintage Crest Estates Subdivision drains to an older public flow control facility and treatment facility. The facilities are in poor condition, and a downstream culvert experiences high flow. J Street, south of Washougal High School, has no treatment, and I Street, also south of Washougal High School, experiences street flooding. A potentially high-risk drywell exists on I Street and may be contributing to poor drainage. The City has also identified an erosion problem in Campen Creek at 39th Street.

During the site visit to Gibbons Creek Basin, the City and consultant team identified stormwater retrofit opportunities and stormwater management needs throughout the Campen Creek Catchment. These opportunities and needs include poorly functioning, older water quality and flow control facilities; potential high-risk drywells; residences on septic systems; and the erosion problem at 39th Street.

The Campen Creek Catchment was selected for action planning because of the water quality impairments and inadequate flow controls. Addressing these issues will require a combination of approaches. The City will address some factors directly with structural retrofits and new policy changes to stormwater management activities. Other factors will require the City to implement non-structural programs and outreach to change public behavior in the catchment.

Process

After selection of the Campen Creek Catchment, the consulting team proposed twelve stormwater management actions (SMAs) to improve water quality in Gibbons Creek. Seven of these were structural actions (capital improvements or construction projects) and five were non-structural actions or programs that change the way land or stormwater is managed. In order to have enough information to select preferred SMAs to include in the plan, each SMA was given a name and brief description, and the following characteristics were described: pollutants removed, relative initial cost (high / medium / low), relative ongoing cost (high / medium / low), and relative benefit based on number of acres served.

For two weeks in November 2022, a website, web map, and survey were available for public feedback on the twelve SMA options. The City advertised this engagement opportunity on social media and with a flyer posted at City Hall, Permit Center, Library, and other locations. See Appendix D for the survey and responses. See Figure 4 for screenshots of the website and web map.

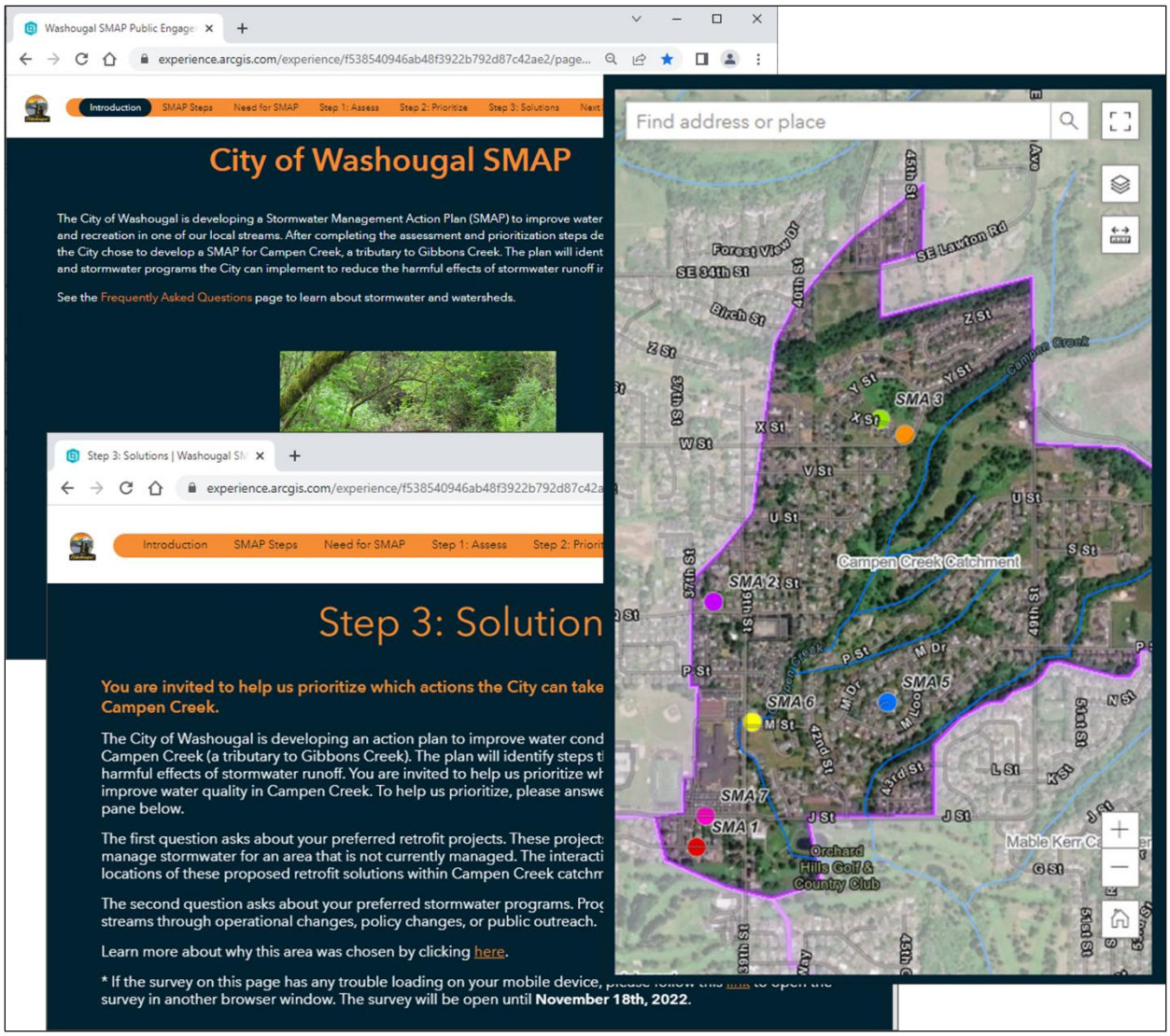

Figure 4 SMA Public Involvement Website Screencaps

Based on the relative benefits and costs, coordination opportunities, and feedback from the public, the City prioritized several SMAs for short-term action. All SMAs and their selection status are described in the section below.

Stormwater Management Actions

The City plans to implement a suite of SMAs in the Campen Creek Catchment. They are divided into structural projects (stormwater facility retrofit projects) and non-structural programs which include both land management and development strategies and customized stormwater management actions.

Structural Stormwater Management Actions

The SMAP includes six stormwater facility retrofit projects. These retrofit projects would address water quality or flow control deficiencies in existing infrastructure. Four retrofits are the recommended Capital Improvement Projects (CIPs) for short-term implementation. Two retrofits are additional CIPs the City may consider for long-term implementation. See Table 4 and Figure 5 for recommended and additional CIPs.

Table 4 Stormwater Facility Retrofit Projects

SMA ID	Project Name	Brief Description
Recommended Capital Improvement Projects		
SMA1	Washougal High School Stormwater Vicinity Retrofits	This project will renovate a bioretention swale that collects on Washougal High School property and retrofit the high school parking lot with bioretention planters. The project will retrofit portions of I and J Streets between 34th Street and 39th as well as 36th Street with bioretention planters. The project will also add a new drywell on I Street and reconfigure the existing drywell as a sedimentation manhole. This project will capitalize on an existing project at the Washougal High School property. Ecology rated the project highly and proposed the project for funding on the Draft Water Quality Funding List published in January 2023. The Final Funding List will be published in July 2023.
SMA2	Q Street Infiltration Pond Retrofit	Redirect stormwater in a 20-acre basin to drain to an existing, underutilized infiltration pond and add pre-treatment.
SMA3	X Street Water Quality Retrofit	Install a water quality vault upstream of the existing detention pipe.
SMA5	J Street and 42nd (Vintage Crest Estates) Water Quality Retrofit	Install bioretention planters for runoff treatment throughout the Vintage Crest Estates Subdivision.
Additional Capital Improvement Projects		
SMA4	Columbia View Flow Control and Water Quality Retrofit	Add detention pipe capacity to meet current flow control standards and retrofit or expand existing swale to improve treatment from the Columbia View neighborhood.
SMA6	M Street and 39th Street Channel Erosion Study	Evaluate the cause of erosion at the corner of M Street and 39th Street and prepare an alternatives analysis. Potential solutions to prevent erosion include addressing runoff upstream, realigning the channel, and retrofitting existing facilities.

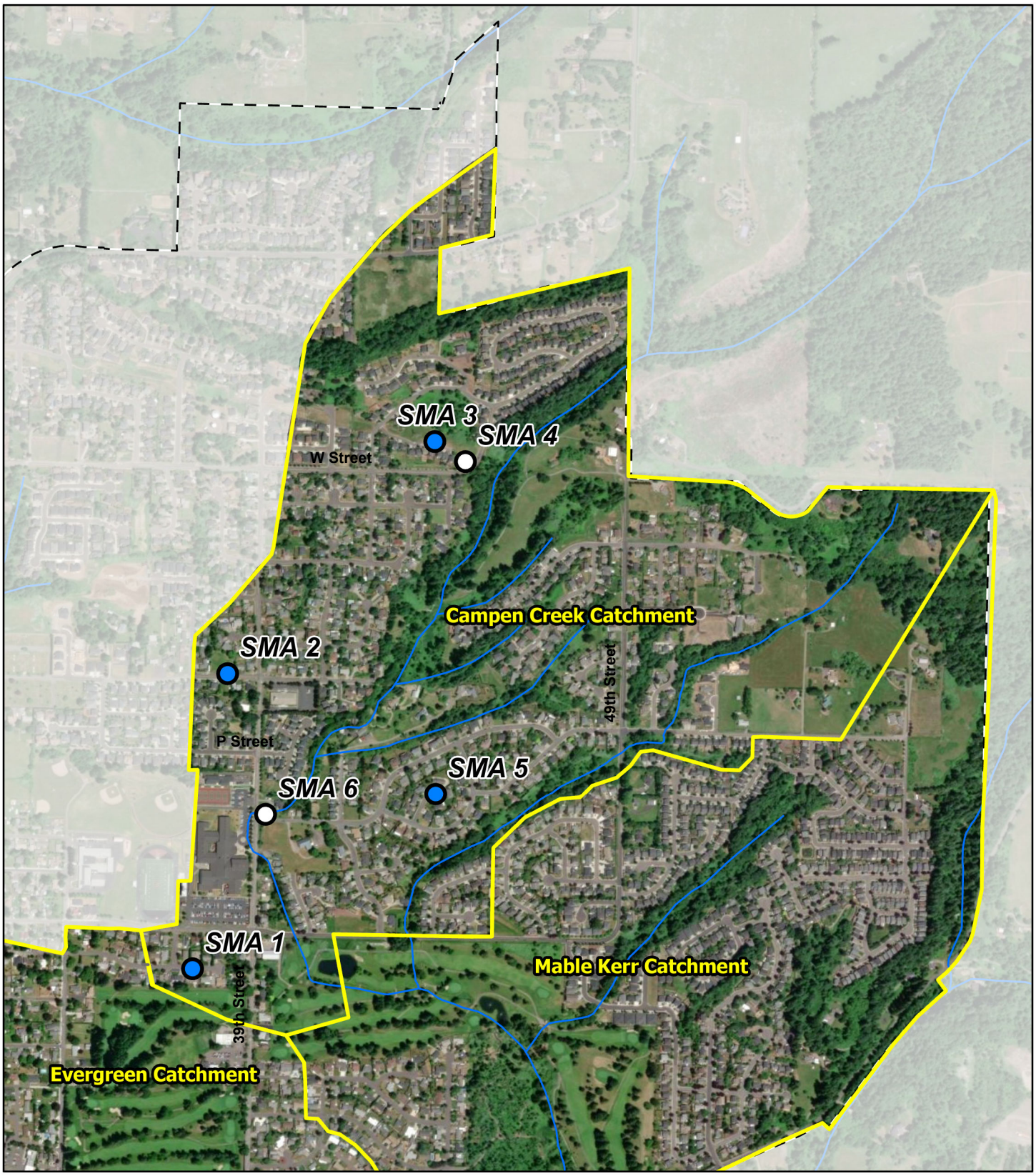

FIGURE 5

STORMWATER FACILITY RETROFIT PROJECTS

WASHOUGAL SMAP

Gibbons Creek Basin Catchments

Washougal City Limits

Streams

Stormwater Facility Retrofit Projects

Recommended CIP

Additional CIP

0 250 500 1,000

Feet

Date: 1/12/2023

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A factsheet for each recommended CIP is included in Appendix E with a description of the issue, a conceptual project solution, and a planning level cost opinion. Project concepts and costs for SMA 1 were developed by Juncus Studio consultants, and project concepts and costs for other projects to be implemented in the short-term planning horizon were developed by Otak. Each of the recommended CIPs is summarized below. Table 5 presents the total project costs.

SMA 1 Washougal High School Vicinity Stormwater Retrofits

The City developed SMA 1 and submitted the concept sketch as part of a grant application. This project will improve drainage and water quality of runoff from the high school and streets in the vicinity of the high school. The project will renovate a bioretention swale that collects runoff from a portion of the school roof and landscaping. The project will also retrofit an untreated parking lot with bioretention planters. Capitalizing on the renovations at the high school, the City will also retrofit about five blocks of City streets south of the school with bioretention planters or improved biofiltration swales. The project will add a new drywell on I Street and reconfigure the existing drywell as a sedimentation manhole to reduce clogging and increase infiltration. An existing sidewalk will be replaced with permeable pavement. This project is a partnership between the City, Washougal School District, and the Lower Columbia Estuary Partnership. Ecology rated the project highly and proposed the project for funding on the Draft Water Quality Funding List published in January 2023. The Final Funding List will be published in July 2023.

SMA2 Q Street Infiltration Pond Retrofit

The Q Street Infiltration Pond Retrofit project will redirect runoff from a large drainage area from Q Street to W Street and between approximately 37th Street and 41st Street to an existing, underutilized infiltration pond. The project will also install two proprietary pre-treatment facilities in Q Street to extend the life of the infiltration pond. The project will provide flow control and remove total suspended solids (TSS), phosphorus, and dissolved metals from runoff for 22 acres.

SMA 3 X Street Water Quality Retrofit

The X Street Water Quality Retrofit project will install two proprietary runoff treatment vaults upstream of the detention facility in the Summer Slope open space and evaluate the existing detention facility's function for potential repair or redesign. The proprietary treatment vaults will remove TSS and phosphorus from runoff for the entire drainage basin that is currently directed to the existing detention facility.

SMA 5 J Street and 42nd (Vintage Crest Estates) Water Quality Retrofit

The J Street and 42nd (Vintage Crest Estates) Water Quality Retrofit project will install bioretention planters for runoff treatment throughout the Vintage Crest Estates Subdivision. The bioretention planters will supplement the water quality treatment provided by an existing swale and remove TSS, dissolved metals, and 6PPD-quinone. The project will install approximately 14,000 square feet of stormwater planters in the rights-of-way of 42nd Street north of J Street, M Drive, M Loop, and Rolling Meadows Drive.

Table 5 Recommended CIP Costs

SMA ID	Project Name	Cost
SMA 1*	Washougal High School Vicinity Stormwater Retrofits (City Portion)	$978,000
SMA 2	Q Street Infiltration Pond Retrofit	$776,000
SMA 3	X Street Water Quality Retrofit	$400,000
SMA 5	J Street and 42nd (Vintage Crest Estates) Water Quality Retrofit	$2,360,000
Total Cost		**$4,514,000**

** Stated cost may omit improvements to the I Street drywell. The City will refine costs at the next steps.*

Non-Structural Stormwater Management Actions

In addition to stormwater facility retrofit projects, the SMAP recommends five non-structural SMAs (programs or policies) to reduce sources of pollutants and increase tree and native vegetation canopy. These programs are intended to increase water quality in the Campen Creek Catchment. These actions are categorized in the Permit and the 2019 SMAP Guidance into land management and development strategies and customized stormwater management actions which are related to Permit requirements. Table 6 below summarizes the non-structural actions, and Figure 6 shows the effective area of each one. Recommendations are described in greater detail starting on page 18.

Table 6 Non-structural SMA Summary

SMA ID	Program Name	Brief Description
SMA 8	Septic Elimination Program	This program will partially or fully fund connections to the City's sewer system for properties currently operating on septic systems in the catchment. The purpose is to reduce fecal coliform bacteria in streams.
SMA 9	Stream Shade Program	This program will incentivize homeowners to improve native trees and shrubs along Campen Creek, tributaries, and ditches. The purpose is to reduce temperature of streams.
SMA 10	Golf Course Voluntary Water Quality Program	The City would attempt to partner with Orchard Hills Golf Course to voluntarily adjust their turf management practices and landscaping along Campen Creek to reduce nutrients in runoff and increase tree and native vegetation canopy. The purpose is to reduce temperature of streams and improve water quality of runoff.
SMA 11	Targeted Pet Waste Reduction Program	The City will enhance the existing pet waste reduction program. The purpose is to reduce fecal coliform bacteria in runoff.
SMA 12	Urban Forestry Program	The City will implement an urban forestry program that includes community outreach; active tree management; and policies managing removal, pruning, and planting of trees. Purposes for this program related to SMAP are to reduce temperature of runoff and reduce runoff volume.

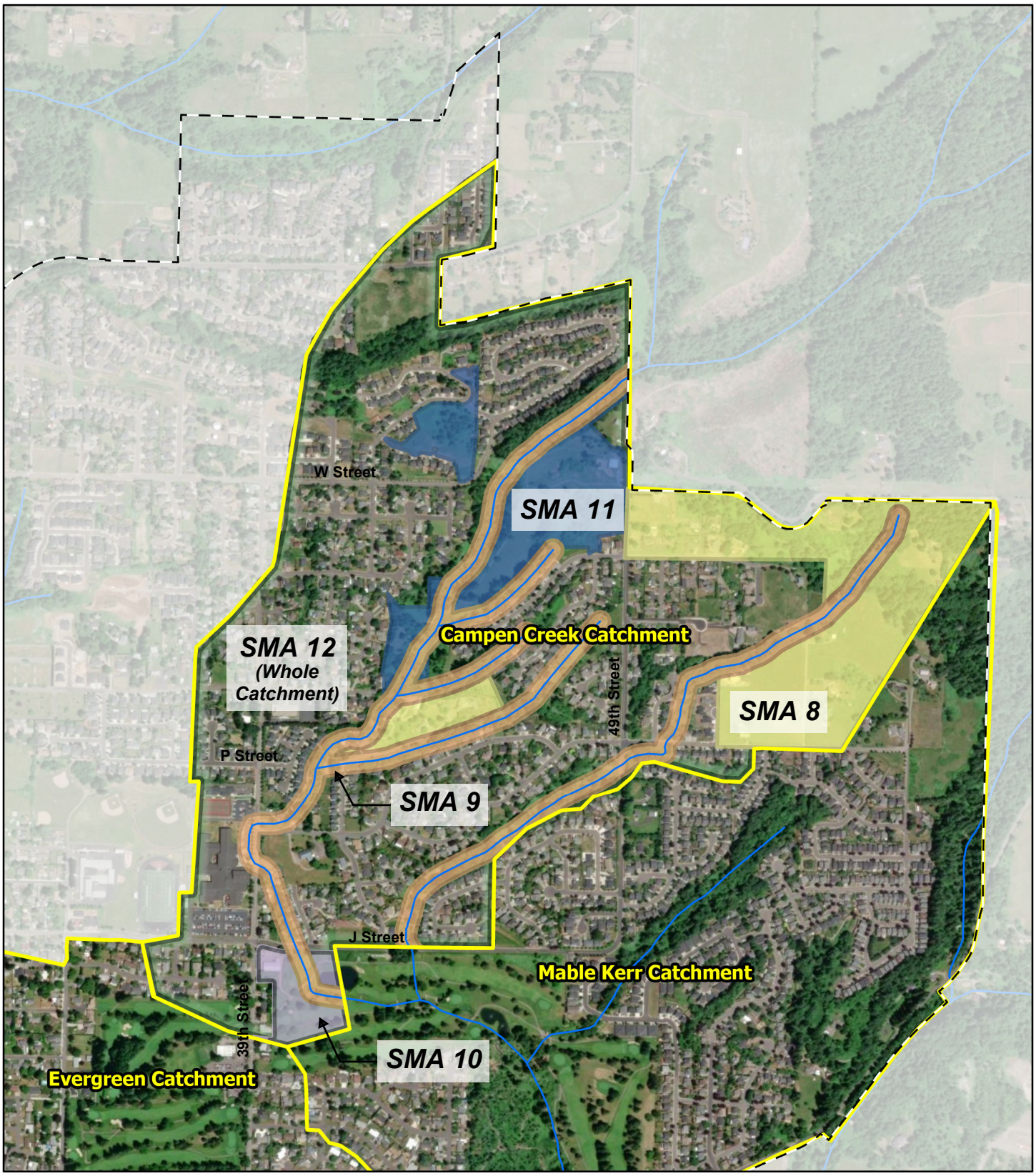

FIGURE 6
PROGRAM AND POLICY SMAs
WASHOUGAL SMAP

Gibbons Creek Basin Catchments
Washougal City Limits
Streams

Program

SMA 8	Septic Elimination
SMA 9	Stream Shade
SMA 10	Golf Course Water Quality
SMA 11	Targeted Pet Waste
SMA 12	Urban Forestry

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Feet

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Date: 1/16/2023
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Land Management and Development Strategies

Land management and development strategies entail identification of land that should be conserved or protected and the strategies to achieve this. The 2019 SMAP Guidance notes these strategies are most beneficial to undeveloped catchments which drain to a small stream or lake with good water quality and habitat conditions. In built-out areas such as the Campen Creek Catchment, the 2019 SMAP Guidance recommends implementing strategies to increase canopy cover. Tree and vegetation canopy intercepts rainfall and reduces erosion as well as providing surface area for rain to evaporate and creating soil conditions for infiltration (United States Environmental Protection Agency, 2022). If maintained or planted along streams, rivers, or lakes, trees and shrubs provide shade to reduce water temperatures. The following programs were identified to maintain or increase tree and native vegetation canopy in the Campen Creek Catchment.

SMA 9 Stream Shade Program

The SMAP recommends a stream shade program. Through the stream shade program, the City will incentivize homeowners to improve riparian habitat along Campen Creek, tributaries, and ditches. This program is modeled on the Watershed Alliance Washougal River Homeowner Incentive Program which provides technical assistance and financial reimbursement for installation of stormwater best management practices and planting native trees and shrubs on riverside properties. The City could partner with the Watershed Alliance or other non-profit to implement this program. Improving riparian habitat includes increasing canopy and shade which could reduce runoff volume and reduce temperatures of Campen Creek through approximately ten acres of contributing area.

SMA 12 Urban Forestry Program

The SMAP recommends a citywide urban forestry program. The urban forestry program will manage trees in Washougal to preserve and increase canopy cover citywide. The program could include community outreach, increased management of trees on City property and rights-of-way, and regulation of tree removal on private property. Urban forests help manage stormwater by breaking up impervious land cover. Trees reduce stormwater runoff and soil erosion by intercepting precipitation in their canopies and root zones. Trees also treat pollutants from runoff by filtering nutrients, sediment, and pesticides (US Environmental Protection Agency, 2021). Preservation or increase of canopy cover in Campen Creek Catchment could also reduce temperatures in Campen Creek by providing shade or reducing the temperature of runoff.

Urban forestry outreach could involve newsletters, informative signs and events, stewardship events such as pruning and planting, and tree care assistance (City of Portland, 2022). The City may also adopt a tree protection ordinance to conserve and protect tree resources and protect the community from potential risks by requiring the maintenance and protection of trees on public and private property (Nicholas Institute for Environmental Policy, 2017).

If adopted, an urban forestry program will be implemented citywide and will be expected to provide benefits in the Campen Creek Catchment. The urban forestry program could increase the urban tree canopy on approximately ten acres of area draining to the Campen Creek Catchment.

Customized Stormwater Management Actions

These SMAs are based on activities conducted as part of the City's Permit required Stormwater Management Program (SWMP). These actions and activities are designed to reduce the discharge of pollutants from the City's storm sewer system and protect water quality. The 2019 SMAP Guidance recommends including targeted, enhanced, or customized implementation of SWMP activities in the

SMAP. The following programs were identified to focus SWMP activities on the specific needs of the Campen Creek Catchment.

SMA 8 Septic Elimination Program

The SMAP recommends a septic system elimination program. The City has identified 23 parcels with on-site sewage systems (often called septic systems) in the Campen Creek Catchment. Eliminating septic systems in the catchment could reduce the discharge of fecal coliform and E. coli bacteria to streams and ditches from approximately 49 acres of contributing area. Eliminating sources of bacteria is the only method Ecology approves for addressing bacteria in stormwater and surface water.

The program will focus on outreach to properties in the Campen Creek Catchment which are using on-site sewage systems. Outreach will identify the pollutants associated with use of septic systems, encourage property owners to inspect and maintain their systems per state law, and encourage property owners to consider connecting to public sewer. To enhance the outreach program, the City will investigate whether options exist for financially supporting connection of residential properties to public sewer. For example, City of Vancouver offers a Sewer Connection Incentive Program (SCIP) which supports sewer connections by guaranteeing the cost of the public sanitary sewer extension for the property owner and providing low-interest financing for property owners to connect (City of Vancouver, 2023). In order to expand the Septic Elimination Program from an outreach-based program to an incentive program, the City will research legal implications, identify a source of funding, and request City Council support for a policy.

SMA 10 Golf Course Voluntary Water Quality Program

The SMAP recommends a voluntary golf course water quality program. This recommendation is conditional on voluntary cooperation of the private golf course operators. The Orchard Hills Golf Course is located entirely in the Gibbons Creek Basin and part of the golf course is located in the Campen Creek Catchment. The City would attempt to partner with Orchard Hills Golf Course to work towards elements of the Salmon Safe Certification program that reduce nutrient runoff and reduce stream temperatures. Full certification as a Salmon-Safe golf course would involve meeting specific standards and related performance requirements in six habitat-related management categories:

- Instream habitat protection and restoration,
- Riparian/wetland/vegetation protection and restoration,
- Stormwater management,
- Water use management,
- Erosion prevention and sediment control, and
- Chemical and nutrient containment (Salmon-Safe Inc., 2019).

Although there is some overlap in the benefits from these categories, this program would focus on riparian/wetland/vegetation protection and restoration to increase shade and filter nutrients and implementing a chemical and nutrient containment plan.

Riparian, wetland, and vegetation protection and restoration focuses on assessing the condition of riparian and wetland vegetation and maintaining and restoring these areas to provide shade, stream bank stability and cover, and filtration of sediment. A nutrient containment plan would minimize the potential for nutrient and lime use to contaminate stormwater and streams through the use of alternative practices to maintain soil fertility, using fertilizers with discretion based on soil fertility and plant needs, using slow-reacting fertilizers, and ensuring proper application of fertilizer and lime in terms of amounts and timing (Salmon-Safe Inc., 2019).

This program would involve the golf course voluntarily adjusting their turf management practices and landscaping along Campen Creek. Meeting these standards would reduce the discharge of pesticide, fertilizer, and nutrient pollutants to and reduce temperatures in Campen Creek from approximately 93 aces of contributing area.

In developing this program, the City would consider options for incentivizing participation. Available options have not been determined.

SMA 11 Enhanced Pet Waste Reduction Program

The SMAP recommends an enhanced pet waste reduction program. The enhanced pet waste reduction program will enhance the existing SWMP public education and outreach activities also required by the Permit. As part of the SMWP, the City conducts a citywide pet waste behavior change program which provides pet waste bags at parks and trailheads. The enhanced pet waste reduction program will construct permanent signs that discuss the impacts of pet waste on water quality in Washougal's waterbodies. The program will be expected to benefit Campen Creek. Two parks are located along Campen Creek within the Campen Creek Catchment and are connected by a trail, Campen Creek Park and Hartwood Park. These parks and trail are prime candidates for pet waste reduction. Increasing proper disposal of pet waste will reduce the discharge of fecal coliform and E. coli bacteria from approximately 33 acres of contributing area. Eliminating sources of bacteria is the only method Ecology approves for addressing bacteria in stormwater and surface water. Signs, posters, and fliers to support this program are available through the Clark County Canines for Clean Water program. Poop Smart Clark (https://poopsmartclark.org/), run by the Clark Conservation District in partnership with Clark County and the Washington State University Extension is another potential partner for pet waste signage installations and maintenance.

Implementation Schedule

The 2019 SMAP Guidance directs the City to propose an implementation strategy and identify potential budget sources to fund the plan. The schedule should outline the time and resources required for detailed planning and successful implementation of the SMAP actions.

The implementation schedule is divided into short-term and long-term actions. Short-term actions take place within a one-to-six-year timeframe. Short-term actions are a mix of opportunistic efforts and strategic projects and activities. Short-term actions should take advantage of other efforts occurring or planned in the area. Long-term actions and projects are intended to be strategic, rather than opportunistic.

Implementation of CIPs will be funded by the City's stormwater utility capital projects fund and grants. The projects will be implemented and phased based on the available funding and constructability. Larger projects may be divided into phases to fit the available budget. One hypothetical schedule is presented in Table 7. Project order and phasing may be adjusted depending on funding opportunities and other City priorities. The schedule also simplifies project scheduling, some project costs may begin before and continue after the fiscal years shown.

Table 7 Hypothetical CIP Implementation Schedule

Project	Project Name	Project Total Cost	City Portion of Cost	Phase Sub-Total	FY1	FY2	FY3	FY4	FY5	FY6	FY7	FY8	FY9	FY10	FY11
SMA 1	**Washougal High School Stormwater Retrofit**	**$1,718,000**	**$978,000**												
	Design and Permitting														
	Construction Year 1				$703,035										
	Construction Year 2					$275,446									
SMA 2	**Q Street Infiltration Pond Retrofit**	**$776,000**	**$776,000**												
	Design and Permitting						$270,400								
	Construction Year 1							$505,100							
SMA 3	**X Street Water Quality Retrofit**	**$400,000**	**$400,000**												
	Design and Permitting								$144,300						
	Construction								$255,400						
SMA 5	**J Street and 42nd Street Water Quality Retrofit**	**$2,360,000**	**$2,360,000**												
	Phase 1			**$1,338,275**											
	Design and Permitting									$489,075					
	Construction Year 1										$424,600				
	Construction Year 2											$424,600			
	Phase 2			**$1,012,225**											
	Design and Permitting												$163,025		
	Construction Year 1													$424,600	
	Construction Year 2														$424,600
Total		**$5,254,000**	**$4,514,000**		**$703,035**	**$275,446**	**$270,400**	**$505,100**	**$399,700**	**$489,075**	**$424,600**	**$424,600**	**$163,025**	**$424,600**	**$424,600**

Short-Term Actions

Phase 1 (years one through six of implementation) will be an initiation and early action phase. The selected stormwater facility retrofit projects, customized stormwater management actions, and outreach and incentive aspects of land management and development strategies are considered short-term actions. Exploration, and implementation if feasible, of the regulatory aspects of land management and development strategies is also a short-term action.

The short-term actions include the following structural SMAs which were developed into concept sketches and cost opinions (Appendix E):

- SMA 1, Washougal High School Vicinity Stormwater Retrofit – This SMA was submitted as part of a grant application in partnership with the Lower Columbia Estuary Partnership and Washougal School District (Appendix E). This project could be implemented immediately if funded.
- SMA 2, Q Street Infiltration Pond Retrofit – This SMA makes use of an existing infiltration pond and add pre-treatment to provide water quality treatment and flow control to 20 acres of existing residential development. This project will require minor construction and can be implemented as a short-term action.
- SMA 3, X Street Water Quality Retrofit – This SMA will install a water quality vault upstream of an existing detention facility. This project will require minor construction and can be implemented as a short-term action.
- SMA 5, J Street and 42nd (Vintage Crest Estates) Water Quality Retrofit – This SMA will install bioretention planters throughout the Vintage Crest Estates Subdivision to provide water quality treatment. The project will require more extensive construction than SMA 2 or SMA 3; however, the project is straightforward in concept and can be implemented as a short-term action.

The short-term actions also include the following non-structural SMAs:

- SMA 8, Septic Elimination Program – This SMA includes both short-term and long-term actions. This SMA will conduct outreach and provide incentives to connect residential properties on septic systems to the City's sanitary sewer to reduce fecal coliform bacteria in streams. Outreach activities will start in the short-term timeframe. The City will also research policy and financial options in the short-term.
- SMA 9, Stream Shade Program – This SMA will incentivize homeowners to improve native trees and shrubs to reduce temperature of streams in the Campen Creek Catchment. Incentivizing homeowners to improve native trees and shrubs is a short-term action.
- SMA 11, Targeted Pet Waste Reduction Program – This SMA will enhance the existing pet waste reduction program to reduce fecal coliform bacteria in streams. Implementation of the pet waste reduction program is a short-term action.
- SMA 12, Urban Forestry Program – This SMA will implement an urban forestry program that includes community outreach; active tree management; and policies managing removal, pruning, and planting of trees to reduce temperature of runoff and reduce runoff volume. Development and implementation of the urban forestry program supports other City goals and is a short-term action.

Long-Term Actions

Phase 2 of SMAP implementation is proposed to occur in years seven through 20. SMAs initiated during the short-term phase will continue during the long-term phase based on lessons learned through adaptive management. Additional long-term actions include stormwater management actions with limited

immediate opportunity or a greater likelihood of being modified through adaptive management. Short-term actions that are not implemented during Phase 1 could be better suited for and completed in Phase 2.

Structural SMAs recommended but not selected as CIPs may be implemented in Phase 2:

- SMA 4, Columbia View Flow Control and Water Quality Retrofit will add detention pipe capacity to meet current flow control standards and retrofit or expand the existing swale to improve from the Columbia View neighborhood. The parcel to the north of the existing swale is owned by the City, and the parcel to the east is owned by the Columbia View neighborhood association. The project may be implemented in phases to achieve funding.

- SMA 6, M Street and 39th Street Channel Erosion Study will evaluate the cause of erosion at the corner of M Street and 39th Street and prepare an alternatives analysis of potential solutions. Potential solutions may include developing upstream solutions, realigning the channel to remove a 90-degree bend, and identifying retrofits of existing facilities that will prevent erosion. The location of this erosion was the focus of a recent City repair project. The efficacy of that project should be evaluated as part of this study to determine what additional effort, if any, is required to prevent erosion at the site.

Additional non-structural SMAs not implemented in Phase 1 could also be implemented in Phase 2. These include land management and development strategies and customized stormwater management actions or elements of these strategies and actions that require additional study or funding prior to adoption.

Phase 2 actions may also require collaboration with other jurisdictions, stewardship groups, and organizations such as adjacent cities, Clark County, the Lower Columbia River Fish Recovery Board, and WSDOT.

The following non-structural SMAs are identified for implementation in Phase 2:

- SMA 8, Septic Elimination Program – This SMA includes both short-term and long-term actions. This stage of SMA 8 will continue outreach efforts and implement options to financially support connection of residential properties to public sewer.

- SMA 10, Golf Course Voluntary Water Quality Program – This SMA will attempt to partner with Orchard Hills Golf Course to voluntarily adjust their turf management practices and landscaping along Campen Creek to reduce temperature of streams and improve water quality of runoff. Partnering with Orchard Hills Golf Course is a long-term action.

Budget Sources

The current Permit only requires the City to prepare a SMAP. Ecology has not yet established a level of effort for SMAP implementation. However, the 2019 SMAP Guidance states the City should identify potential fundings sources to support a realistic schedule to achieve progress on both short-term and long-term actions. What follows is a summary discussion of available resources to fund SMAP actions.

The two major sources of available funding are revenues from stormwater utility fees and grants from external sources.

The stormwater utility maintains the stormwater facilities around the City. The stormwater utility is funded through the stormwater fund, which is an enterprise fund. Enterprise funds are used to account for activities for which the City charges a fee to operate the service. An associated capital project fund used to account for stormwater capital projects is supported by the enterprise operation fund and supplemented by other revenues, such as grants, revenue bonds, and impact fees.

The fees for utility services are the primary source of revenue for this fund (budget). The stormwater fees are assessed against each parcel of property within the boundaries of the utility and are based on the amount of impervious surface contained within each parcel. The rate structure includes service charges and system development charges.

Service charges are used to pay operating expenses and capital expenses through system reinvestment funding. System development charges are assessed on new development rather than from the existing customer base. The system development charge revenue can legally be used in two ways: applied to capital project costs directly or applied toward annual debt service payments. The City uses system development charge revenue to directly fund capital expenses.

The operating account holds funds used to pay for staff salaries, wages, and benefits; services; supplies; and intergovernmental services to perform regular maintenance and operations of the stormwater utility. The City maintains an operating reserve sufficient to fund 30-45 days of operations in the operating account. Funds in excess of the operating reserve are transferred from the operating account to the capital account at year-end. The stormwater capital fund holds debt proceeds, system development charge revenues, system reinvestment funding from rates, and any transfers of cash reserves from the operating account. (City of Washougal, 2021).

Service charges are based on impervious area estimated as an equivalent residential unit (ERU). All single-family dwelling units and accessory uses are deemed to contain one ERU, and each dwelling unit of a duplex structure is deemed to contain one ERU. For all other developed properties, the number of equivalent residential units is determined by dividing the number of square feet of impervious surface on each property by 3,900 square feet per ERU and rounded to the nearest half. Each developed parcel is deemed to comprise a minimum of one ERU.

Effective Jan. 1, 2023, the stormwater rate will be $35.17 bimonthly ($17.59 per month) per ERU. The City provides a reduced rate for low-income senior citizens and credits for commercial properties with private on-site stormwater quality and quantity facilities.

In addition to service charges, the City imposes system development charges on the owners of properties seeing to connect to the City's stormwater system. The system development charge is $478.00 times the number of proposed ERUs. The system development charge is paid at the time of permit issuance for development and prior to actual development. The system development charge reflects a proportionate share of the utility's capital costs attributable to the newly developed property (City of Washougal, 2022).

The City is undertaking a utility rate study to be completed in 2023. The rate study will establish the amount required to fully fund the water, wastewater, and stormwater utility programs while also proportionally distributing those costs among various users in accordance with their impact on the total utility system. In order to track with system changes and improvements, a rate study should be completed every 4-5 years. The last rate study was completed in 2018.

The City anticipates the need to work in partnership with federal, regional, other local government agencies, and other organizations if the SMAP is implemented. Due to the cost and scale of capital projects and programs outlined in this SMAP, the availability and timing of grants and other outside funding will determine the actual timeframe for implementation.

The City should investigate and evaluate potential funding sources and collaborative options further, as a part of the implementation of Phase 1 of the SMAP. If certain SMAP strategies are implemented, the City's operations and maintenance program budget may need to be slightly increased.

Ecology has been a significant source of funding in the past for Washougal stormwater projects and should be considered for SMAP implementation. Washougal received Water Quality Stormwater Capacity grants in 2015, 2017, 2019 and 2021 totaling $175,000 to assist with management of the municipal stormwater program (Washington State Department of Ecology, 2022). The Water Quality Combined Funding Program funds projects that improve and protect water quality. Funds are made available through an annual single-application process to apply for funding from multiple sources. Funding available varies based on the state budget, and grant awards depend on the funding source and project type. (Washington State Department of Ecology, 2022). The City has recently been designated as a community that is required to contribute a reduced matching of only 5% of a project's budget.

The Lower Columbia Fish Recovery Board's Salmon Recovery Plan also provides funding sources for appropriate projects and programs (Lower Columbia Fish Recovery Board, 2022). Lower Columbia Fish Recovery Board may also support the City in seeking funding for other local, state, and federal sources. Ecology's Regional On-Site Sewage System Loan Program provides loans to replace or repair failing septic systems state-wide through a non-profit lender. The City may assist with applications to replace septic systems when homeowners are under orders to fix their system (Washington State Department of Ecology, 2021).

Adaptive Management

The 2019 SMAP Guidance requires the City to adaptively manage the SMAP. Adaptive management will allow City goals and methods to change in response to new information, new opportunities, or new or changed community or regulatory goals. The key process in adaptive management is assessing progress. The City's Public Works Department will be responsible for assessing progress towards meeting the City's SMAP goals and making or recommending changes.

The adaptive management process will include implementation tracking and an ongoing assessment of what portion of the planned projects and activities have taken place, and how much of the catchment area has been addressed. The City will ensure adaptive management of the SMAP by keeping the SMAP document and the live web map accessible on the City's website. As adaptations, findings, and status changes occur over the implementation period, the web map will be updated to reflect live progress and associated metrics.

The Ecology Stormwater Action Monitoring program conducts status and trends monitoring of Campen Creek annually as part of the Lower Columbia urban streams study (Washington State Department of Ecology, 2022). Data from this study will provide valuable feedback for this SMAP.

Adaptive management will allow the City to document progress toward meeting SMAP goals and enable the City to report progress to the funders, the public, and Ecology. If SMAP is implemented, the City expects to adapt its approach to SMAP over time as lessons are learned from implementation of various strategies.

Section 6. Conclusion

Campen Creek and Gibbons Creek are important water resources for the City of Washougal. The impairment of these waters harms the quality of life in Washougal. Poor water quality reduces opportunities for recreation and harms threatened species of fish that define the character of the City and region. This SMAP will guide the City's continuing work to restore these streams.

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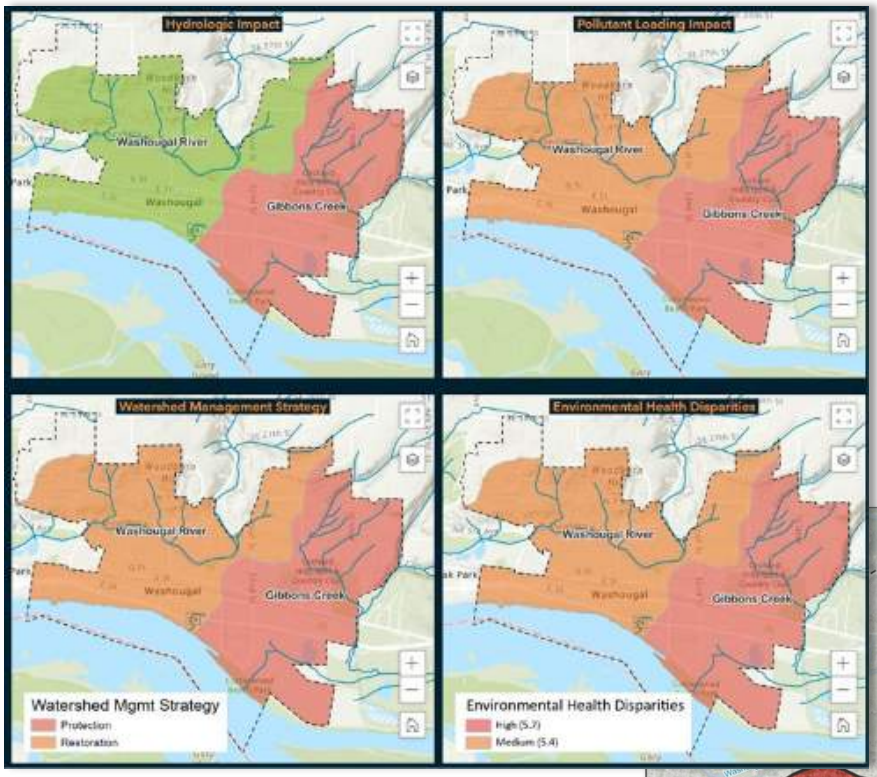

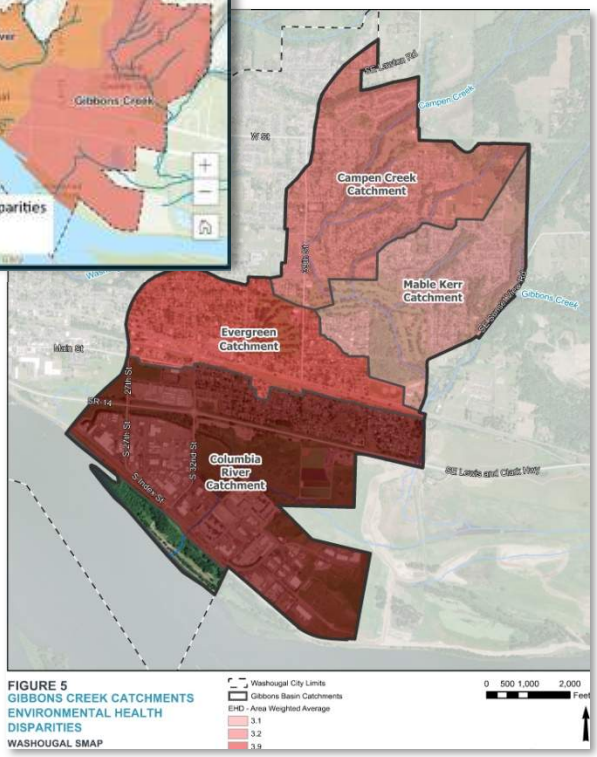

City of Washougal

Stormwater Management Action Plan: Appendices

Final

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March 2023

Project No. 20155

DEPARTMENT OF ECOLOGY
State of Washington

Appendix A

Water Quality Combined Financial Assistance Agreement

Agreement No. WQC-2022-WashPW-00041

WATER QUALITY COMBINED FINANCIAL ASSISTANCE AGREEMENT

BETWEEN

THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY

AND

CITY OF WASHOUGAL PUBLIC WORKS DEPARTMENT

This is a binding Agreement entered into by and between the state of Washington, Department of Ecology, hereinafter referred to as "ECOLOGY," and City of Washougal Public Works Department, hereinafter referred to as the "RECIPIENT," to carry out with the provided funds activities described herein.

GENERAL INFORMATION

Project Title:	Washougal Stormwater Management Action Plan (SMAP)
Total Cost:	$129,360.00
Total Eligible Cost:	$129,360.00
Ecology Share:	$97,020.00
Recipient Share:	$32,340.00
The Effective Date of this Agreement is:	07/01/2021
The Expiration Date of this Agreement is no later than:	06/30/2024
Project Type:	Stormwater Facility

Project Short Description:

This project will improve water quality in the City of Washougal by removing pollutants before they can be carried by stormwater into Lacamas Lake, Washougal River, or the Columbia River by engaging in a Stormwater Management Action Plan (SMAP) process. The process will include a Receiving Water Conditions Assessment, Receiving Water Prioritization, and developing a SMAP to effectively reduce pollutant loads and address hydrologic impacts from existing development.

Project Long Description:

The City of Washougal is a small city of approximately 16,000 people and is about seven square miles. Located on the banks of the Columbia River and spanning the lower reaches of the Washougal River, the City has a long history as a local hub of agriculture, industry, river navigation, natural resources extraction, and small-town living. The majority of the City drains to the two rivers and the ground via Underground Injection Controls wells.

The RECIPIENT will follow Ecology's Stormwater Management Action Planning (SMAP) Guidance for Phase I and Western Washington Phase II Municipal Stormwater Permits (Ecology, 2019; Publication 19-10-010), to envision where stormwater retrofits and targeted stormwater management actions would be the most effective in protecting or restoring water quality and hydrology for fish and people. The first steps in the SMAP planning process is to complete the Receiving Waters Conditions Assessment, prioritize the receiving waters, and identify one for additional planning efforts. The RECIPIENT will compile existing information related to Washougal's receiving waters including: the Washougal River, Columbia River, Gibbons Creek, Campen Creek, and Lacamas Creek.

For each receiving water they will delineate the watershed boundary and the portion of each receiving water's watershed inside City limits. The RECIPIENT will identify the designated uses and desired water quality conditions to support those uses, assess the extent to which the desired conditions are being met, and determine if the water body is impaired, or likely to become impaired under future development conditions.

The pollutants of concern are likely to be one or more of the following: bacteria (Gibbons Creek Watershed Bacteria TMDL), metals (common stormwater pollutant), or total suspended solids (common stormwater pollutant). The following pollutants may be addressed if the assessment concludes that stormwater management actions could improve these conditions and temperature (Category 5 listings on the Columbia River, Gibbons Creek, and Lacamas Creek). This information will assist the RECIPIENT in selecting a receiving water for more targeted SMAP planning efforts.

Next, the RECIPIENT will develop and implement a process to determine which receiving waters will benefit most from stormwater facility retrofits, tailored implementation of stormwater management program actions, and other land/development management actions. This Receiving Water Prioritization process will include the identification of high priority catchment area(s) for focus of the SMAP. The RECIPIENT will present the draft prioritization to stakeholders for consideration and comment and incorporate feedback into the final prioritization. The RECIPIENT will select a basin within the priority receiving water watershed.

The RECIPIENT will prepare a SMAP for at least one high priority catchment area identified during the Receiving Water Prioritization process. The SMAP will include, but is not limited to, stormwater facility retrofits, land management/development strategies, and implementation of stormwater management actions related to the City of Washougal municipal stormwater permit. The SMAP will also include a proposed implementation schedule, budget sources, and a process to adaptively manage the plan.

Overall Goal:
This project will help protect and restore water quality in Washington state by reducing stormwater impacts from existing infrastructure and development.

RECIPIENT INFORMATION

Organization Name: City of Washougal Public Works Department

Federal Tax ID: 91-6001525
UEI Number: K76UWJBQAN37

Mailing Address: 1701 C Street
Washougal, WA 98671

Physical Address: 1701 C Street
Washougal, Washington 98671

Organization Email: rcharles@cityofwashougal.us

Contacts

Project Manager	Sean Mulderig Stormwater program Coordinator 1701 C Street Washougal, Washington 98671 Email: sean.mulderig@cityofwashougal.us Phone: (360) 835-2662 X230
Billing Contact	Monie Holmes Assistant Finance Director 1701 C Street Washougal, Washington 98671 Email: monie.holmes@cityofwashougal.us Phone: (360) 835-8501
Authorized Signatory	Rob Charles 1701 C Street Washougal, Washington 98671 Email: rcharles@ci.washougal.wa.us Phone: (360) 835-2662

ECOLOGY INFORMATION

Mailing Address: Department of Ecology
Water Quality
PO BOX 47600
Olympia, WA 98504-7600

Physical Address: Water Quality
300 Desmond Drive SE
Lacey, WA 98503

Contacts

Project Manager	David Mora 12121 NE 99th Street Suite 2100 Vancouver, Washington 98677 Email: damo461@ecy.wa.gov Phone: (360) 690-4782
Financial Manager	Melissa Conger PO Box 47600 Olympia, Washington 98504-7600 Email: MECO461@ecy.wa.gov Phone: (360) 407-6225
Technical Advisor	Doug Howie Senior Stormwater Engineer PO Box 47600 Olympia, Washington 98504-7600 Email: DOHO461@ecy.wa.gov Phone: (360) 407-6444

AUTHORIZING SIGNATURES

RECIPIENT agrees to furnish the necessary personnel, equipment, materials, services, and otherwise do all things necessary for or incidental to the performance of work as set forth in this Agreement.

RECIPIENT acknowledges that they had the opportunity to review the entire Agreement, including all the terms and conditions of this Agreement, Scope of Work, attachments, and incorporated or referenced documents, as well as all applicable laws, statutes, rules, regulations, and guidelines mentioned in this Agreement. Furthermore, the RECIPIENT has read, understood, and accepts all requirements contained within this Agreement.

This Agreement contains the entire understanding between the parties, and there are no other understandings or representations other than as set forth, or incorporated by reference, herein.

No subsequent modifications or amendments to this agreement will be of any force or effect unless in writing, signed by authorized representatives of the RECIPIENT and ECOLOGY and made a part of this agreement. ECOLOGY and RECIPIENT may change their respective staff contacts without the concurrence of either party.

This Agreement shall be subject to the written approval of Ecology's authorized representative and shall not be binding until so approved.

The signatories to this Agreement represent that they have the authority to execute this Agreement and bind their respective organizations to this Agreement.

Washington State
Department of Ecology

By: DocuSigned by: On behalf of 2BCA6B80046746E... 5/27/2022

Vincent McGowan, P.E. Date

Water Quality

Program Manager

Template Approved to Form by
Attorney General's Office

City of Washougal Public Works Department

By: DocuSigned by: 9C171485ECA4477... 5/27/2022

Rob Charles Date

SCOPE OF WORK

Task Number: 1 **Task Cost:** $0.00

Task Title: Grant and Loan Administration

Task Description:

A. The RECIPIENT shall carry out all work necessary to meet ECOLOGY grant or loan administration requirements. Responsibilities include, but are not limited to: Maintenance of project records; submittal of requests for reimbursement and corresponding backup documentation; progress reports; the EAGL (Ecology Administration of Grants and Loans) recipient closeout report; and a two-page outcome summary report (including photos, if applicable). In the event that the RECIPIENT elects to use a contractor to complete project elements, the RECIPIENT shall retain responsibility for the oversight and management of this funding agreement.

B. The RECIPIENT shall keep documentation that demonstrates the project is in compliance with applicable procurement, contracting, and interlocal agreement requirements; permitting requirements, including application for, receipt of, and compliance with all required permits, licenses, easements, or property rights necessary for the project; and submittal of required performance items. This documentation shall be available upon request.

C. The RECIPIENT shall maintain effective communication with ECOLOGY and maintain up-to-date staff contact information in the EAGL system. The RECIPIENT shall carry out this project in accordance with any completion dates outlined in this agreement.

Task Goal Statement:

Properly managed and fully documented project that meets ECOLOGY's grant or loan administrative requirements.

Task Expected Outcome:

* Timely and complete submittal of requests for reimbursement, quarterly progress reports, Recipient Closeout Report, and two-page outcome summary report.
* Properly maintained project documentation.

Grant and Loan Administration

Deliverables

Number	Description	Due Date
1.1	Progress Reports that include descriptions of work accomplished, project challenges or changes in the project schedule. Submitted at least quarterly.	
1.2	Recipient Closeout Report (EAGL Form)	
1.3	Two-page Outcome Summary Report	

SCOPE OF WORK

Task Number: 2 **Task Cost:** $0.00

Task Title: Consultant Selection

Task Description:
The RECIPIENT will submit a consultant scope of work and select a consultant following the RECIPIENT's purchasing guidelines.

A. The RECIPIENT will respond to ECOLOGY comments on the consultant scope of work.

B. The RECIPIENT will attain a signed contract with their consultant.

Task Goal Statement:
The RECIPIENT will select and contract a consultant.

Task Expected Outcome:
Completion of Washougal Stormwater Management Action Plan (SMAP) grant deliverables.

Consultant Selection

Deliverables

Number	Description	Due Date
2.1	Signed SMAP consultant contract. Upload to EAGL and notify ECOLOGY when upload is complete.	

SCOPE OF WORK

Task Number: 3 **Task Cost:** $40,449.00

Task Title: Receiving Water Conditions Assessment

Task Description:
The RECIPIENT will use the approach outlined in the Stormwater Management Action Planning Guidance for Phase I and Western Washington Phase II Municipal Stormwater Permits (Ecology, 2019; Publication 19-10-010) to support the Receiving Water Conditions Assessment.

A. The RECIPIENT will identify receiving waters, delineate each receiving water's watershed boundary, and calculate the total basin size and portion of each receiving water basin within city limits. In addition to other resources, the RECIPIENT will use the latest GIS data of the municipal separate storm sewer system (MS4) to help perform this task.

B. The RECIPIENT will document and assess existing information related to their local receiving waters and contributing area conditions.

C. The RECIPIENT will determine the relative influence of the RECIPIENT's MS4 and land use patterns on each receiving water. At a minimum the assessment will consider: MS4 relative flow contribution to receiving water, land cover, pollution generating impervious surface, large-scale pollution generating pervious surfaces, traffic volume, presence and lack of treatment and flow control facilities, and land uses.

D. The RECIPIENT will assess the relative conditions of receiving waters and contributions of basins using information collected in previous steps to identify which receiving waters are most likely to benefit from stormwater management planning. The management goals described in Building Cities in the Rain (BCitR) will be considered as part of the evaluation process.

E. The RECIPIENT will submit a watershed inventory table that references a map of delineated basins. The table will include: the receiving water name, its total watershed area, the percent of the total watershed area that is in the Permittee's jurisdiction, and the findings of the stormwater management influence assessment for each receiving water. The table will indicate which receiving water basins are expected to have a relatively low Stormwater Management Influence for the SMAP. In addition to a text copy of the watershed inventory, the information should be presented in online GIS interface.

Task Goal Statement:
The RECIPIENT will respond to ECOLOGY and complete Receiving Water Conditions Assessment in a timely manner.

Task Expected Outcome:
Receiving Water Conditions Assessment will generate a candidate list of receiving waters to be further assessed in Task 4: Receiving Water Prioritization.

Receiving Water Conditions Assessment

Deliverables

Number	Description	Due Date
3.1	Present data layers that identify receiving waters and the associated drainage basins. Present data as an online GIS interface. Notify ECOLOGY Project Manager when the online GIS interface is published.	
3.2	Draft Receiving Water Conditions Assessment that includes a watershed inventory table, referenced basin map, proposed MS4 influence method, and analysis. The watershed inventory should be presented as an online GIS interface. Upload to EAGL and notify ECOLOGY Project Manager when upload is complete.	
3.3	Response to ECOLOGY Receiving Water Conditions Assessment. Upload to EAGL and notify ECOLOGY Project Manager when upload is complete.	
3.4	ECOLOGY acceptance of Receiving Water Conditions Assessment. Upload acceptance letter to EAGL and notify ECOLOGY Project Manager when upload is complete.	
3.5	Final Receiving Water Conditions Assessment including online GIS interface. Upload to EAGL and notify ECOLOGY Project Manager when upload is complete. Notify ECOLOGY Project Manager when the online GIS interface is updated.	

SCOPE OF WORK

Task Number: 4 **Task Cost:** $39,240.00

Task Title: Receiving Water Prioritization

Task Description:

A. The RECIPIENT will prioritize the candidate list of receiving waters from Task 3 to select a subbasin or catchment area tributary to the receiving water of focus where the SMAP will be applied.

The RECIPIENT will develop a system to score and prioritize the receiving waters and pick a catchment area to focus improvements. The RECIPIENT will build on the results of Task 3, which narrow down which receiving waters to prioritize through relative comparison. The BCitR and Stormwater Management Action Planning Guidance will be referenced to support development of the scoring methodology. The development of the scoring method will be documented.

B. The RECIPIENT will apply the scoring methodology in Task 4A to the candidate list of receiving waters developed in Task 3. The ranking process will identify a list of high priority receiving waters and catchment area(s) for focus of the SMAP.

C. The RECIPIENT will develop a public involvement process to inform the community and solicit feedback regarding the prioritization of catchment area(s). A list of key internal and external stakeholders will be developed. One opportunity will be provided for stakeholders to review and comment on prioritized catchment area(s). The RECIPIENT will consider feedback from the stakeholders in selecting a priority receiving water and catchment. Stakeholder feedback will be documented.

D. The RECIPIENT will document the Receiving Water Prioritization process and results in a memorandum and online GIS interface.

Task Goal Statement:

The RECIPIENT will complete the Receiving Water Prioritization and respond to ECOLOGY and public comments in a timely manner.

Task Expected Outcome:

The Receiving Water Prioritization will select high priority catchment area(s) where the SMAP will be developed as well as record comments from stakeholders to assist in the development of the SMAP.

Receiving Water Prioritization

Deliverables

Number	Description	Due Date
4.1	Draft prioritization scoring methodology. Upload to EAGL and notify ECOLOGY Project Manager when upload is complete.	
4.2	Response to ECOLOGY prioritization scoring methodology comments. Upload to EAGL and notify ECOLOGY Project Manager when upload is complete.	
4.3	Draft public outreach materials that provide the public and stakeholders an opportunity to comment on proposed prioritized catchment area(s). Upload to EAGL and notify ECOLOGY when upload is complete.	
4.4	Document stakeholder feedback, and document responsiveness to comments. Upload documentation of effort to EAGL and notify ECOLOGY when upload is complete.	
4.5	Submit text document of the final Receiving Water Prioritization process and results in a memorandum and online GIS interface. The online GIS interface at this stage must include: Critical Areas, High Risk Cultural Resource Areas from WISAARD, and Environmental Justice areas of concern.	

SCOPE OF WORK

Task Number: 5 **Task Cost:** $49,671.00

Task Title: Stormwater Management Action Plan

Task Description:

A. Within the prioritized subbasin or catchment area(s), the RECIPIENT will describe potential Stormwater Management Actions (SMAs) consisting of structural best management practices (BMPs) and non-structural SMAs. This may include non-structural BMPs, land/development management policies and actions, and targeted stormwater management program (SWMP) actions to support improved receiving water quality. Structural SMAs could be proposed as new treatment or flow control facilities, retrofit of existing treatment or flow control facilities, or opportunities to provide additional treatment or flow control service with planned public construction projects.

B. The RECIPIENT will continue the public involvement process developed in Task 4 to inform the community and solicit feedback regarding the SMAs. One opportunity will be provided for stakeholders to review and comment on the proposed SMAs. Stakeholder feedback will be documented and taken into consideration when developing the SMAP.

C. The RECIPIENT will prepare a draft SMAP, including a proposed implementation schedule, short and long term goals, conceptual budget, potential funding sources, and adaptive management.

D. The RECIPIENT will prepare a final SMAP that considers and incorporates ECOLOGY feedback as appropriate.

Task Goal Statement:

Prepare Stormwater Management Action Plan.

Task Expected Outcome:

Development of stormwater and land management strategies that act as water quality management tools intended to conserve, protect, or restore water quality in a selected Receiving Water.

Stormwater Management Action Plan

Deliverables

Number	Description	Due Date
5.1	Draft list of structural and non-structural SMAs. For treatment and flow control facilities, the online GIS interface will include feature layers for each facility's approximate catchment and approximate footprint. Facility attributes will include type of facility and types of pollutants removed. Notify ECOLOGY when public outreach has been initiated and the list of SMAs and online GIS interface are published.	
5.2	Document stakeholder feedback and responsiveness to comments. Upload documentation to EAGL and notify ECOLOGY when upload is complete.	
5.3	Draft SMAP, including supporting narrative, proposed schedule, conceptual budget, potential funding sources, and adaptive management. Upload to EAGL and notify ECOLOGY when upload is complete.	
5.4	Response to ECOLOGY SMAP comments. Upload to EAGL and notify ECOLOGY when upload is complete.	
5.5	Final written SMAP, including list of SMAs for targeted areas and online GIS interface. Upload to EAGL and notify ECOLOGY when upload is complete.	

SCOPE OF WORK

Task Number: 6 **Task Cost:** $0.00

Task Title: Cultural and Environmental Reviews, and Permitting

Task Description:
The RECIPIENT shall ensure the following items are completed and provide the associated deliverables to ECOLOGY. The RECIPIENT must approve all materials prior to submitting them to ECOLOGY for acceptance.

A. The RECIPIENT will provide both the ECOLOGY project manager and separegister@ecy.wa.gov an initial consultation on the draft State Environmental Policy Act (SEPA) documents.

B. The RECIPIENT will notify the ECOLOGY project manager, in addition to the required distribution and public notice, when SEPA documents have been issued for the official comment period, which is a minimum of 21 days.

C. The RECIPIENT is responsible for application of, receipt of, and compliance with all required local, state, tribal and federal permits, licenses, easements, or property rights necessary for the project.

D. The RECIPIENT will submit the documents listed below to ECOLOGY to initiate cultural resources review. Property acquisition and above and below ground activities proposed at any project site must be reviewed for potential affects to cultural resources.

1. The RECIPIENT will submit the Cultural Resources Review Form to ECOLOGY, using the ECOLOGY template. Any supporting materials must conform to the Department of Archeology and Historic Preservation's Washington State Standards for Cultural Resource Reporting. The Cultural Resources Review Form template may be found on the ECOLOGY website.

2. The RECIPIENT will submit an Inadvertent Discovery Plan (IDP) to ECOLOGY, using the ECOLOGY template. The RECIPIENT will ensure that all contractors and subcontractors have a copy of the completed IDP prior to and while working on-site. The IDP template may be found on the ECOLOGY website.

The RECIPIENT must receive written notice from ECOLOGY prior to proceeding with work. Examples of work may include (but are not limited to) geotechnical work, acquisition, site prep work, and BMP installations. Work done prior to written notice to proceed shall not be eligible for reimbursement.

Task Goal Statement:
The RECIPIENT will complete all cultural and environmental reviews and permitting tasks in a timely manner.

Task Expected Outcome:
The project will meet the requirements set forth by the cultural resource protection requirements, State Environmental Policy Act, and all other applicable federal, state, and local laws, and regulations.

Cultural and Environmental Reviews, and Permitting

Deliverables

Number	Description	Due Date
6.1	SEPA checklist, or other documentation for projects considered exempt from SEPA review. Upload to EAGL and notify ECOLOGY when upload is complete.	
6.2	List of permits acquired and environmental review documents. Upload to EAGL and notify ECOLOGY when upload is complete.	
6.3	Cultural Resources Review Form. Email the form and any supplemental cultural resources documentation directly to the ECOLOGY Project Manager. ECOLOGY will upload documentation to EAGL when cultural resources is complete.	
6.4	Inadvertent Discovery Plan. Upload to EAGL and notify ECOLOGY when upload is complete.	

BUDGET

Funding Distribution EG220698

NOTE: *The above funding distribution number is used to identify this specific agreement and budget on payment remittances and may be referenced on other communications from ECOLOGY. Your agreement may have multiple funding distribution numbers to identify each budget.*

Funding Title: SFAP
Funding Type: Grant
Funding Effective Date: 07/01/2021
Funding Expiration Date: 06/30/2024

Funding Source:

Title: SFAP - SFY22

Fund: FD
Type: State
Funding Source %: 100%
Description: Model Toxics Control Capital Account(MTCCA) Stormwater

Approved Indirect Costs Rate: Approved State Indirect Rate: 0%
Recipient Match %: 25%
InKind Interlocal Allowed: No
InKind Other Allowed: No
Is this Funding Distribution used to match a federal grant? No

SFAP	Task Total
Grant and Loan Administration	$ 0.00
Consultant Selection	$ 0.00
Receiving Water Conditions Assessment	$ 40,449.00
Receiving Water Prioritization	$ 39,240.00
Stormwater Management Action Plan	$ 49,671.00
Cultural and Environmental Reviews, and Permitting	$ 0.00
Total: $	**129,360.00**

Funding Distribution Summary

Recipient / Ecology Share

Funding Distribution Name	Recipient Match %	Recipient Share	Ecology Share	Total
SFAP	25.00 %	$ 32,340.00	$ 97,020.00	$ 129,360.00
Total		**$ 32,340.00**	**$ 97,020.00**	**$ 129,360.00**

AGREEMENT SPECIFIC TERMS AND CONDITIONS

N/A

SPECIAL TERMS AND CONDITIONS

SECTION 1: DEFINITIONS

Unless otherwise provided, the following terms will have the respective meanings for all purposes of this agreement:

“Administration Charge” means a charge established in accordance with Chapter 90.50A RCW and Chapter 173-98 WAC, to be used to pay Ecology’s cost to administer the State Revolving Fund by placing a percentage of the interest earned in an Administrative Charge Account.

“Administrative Requirements” means the effective edition of ECOLOGY's Administrative Requirements for Recipients of Ecology Grants and Loans at the signing of this agreement.

“Annual Debt Service” for any calendar year means for any applicable bonds or loans including the loan, all interest plus all principal due on such bonds or loans in such year.

“Average Annual Debt Service” means, at the time of calculation, the sum of the Annual Debt Service for the remaining years of the loan to the last scheduled maturity of the loan divided by the number of those years.

“Acquisition” means the purchase or receipt of a donation of fee or less than fee interests in real property. These interests include, but are not limited to, conservation easements, access/trail easements, covenants, water rights, leases, and mineral rights.

“Centennial Clean Water Program” means the state program funded from various state sources.

“Contract Documents” means the contract between the RECIPIENT and the construction contractor for construction of the project.

“Cost Effective Analysis” means a comparison of the relative cost-efficiencies of two or more potential ways of solving a water quality problem as described in Chapter 173-98-730 WAC.

“Defease” or “Defeasance” means the setting aside in escrow or other special fund or account of sufficient investments and money dedicated to pay all principal of and interest on all or a portion of an obligation as it comes due.

“Effective Date” means the earliest date on which eligible costs may be incurred.

“Effective Interest Rate” means the total interest rate established by Ecology that includes the Administrative Charge.

“Estimated Loan Amount” means the initial amount of funds loaned to the RECIPIENT.

“Estimated Loan Repayment Schedule” means the schedule of loan repayments over the term of the loan based on the Estimated Loan Amount.

“Equivalency” means projects designated by ECOLOGY to meet additional federal requirements.

“Expiration Date” means the latest date on which eligible costs may be incurred.

“Final Accrued Interest” means the interest accrued beginning with the first disbursement of funds to the RECIPIENT through

such time as the loan is officially closed out and a final loan repayment schedule is issued.
“Final Loan Amount” means all principal of and interest on the loan from the Project Start Date through the Project Completion Date.
“Final Loan Repayment Schedule” means the schedule of loan repayments over the term of the loan based on the Final Loan Amount.
“Forgivable Principal” means the portion of a loan that is not required to be paid back by the borrower.
“General Obligation Debt” means an obligation of the RECIPIENT secured by annual ad valorem taxes levied by the RECIPIENT and by the full faith, credit, and resources of the RECIPIENT.
“General Obligation Payable from Special Assessments Debt” means an obligation of the RECIPIENT secured by a valid general obligation of the Recipient payable from special assessments to be imposed within the constitutional and statutory tax limitations provided by law without a vote of the electors of the RECIPIENT on all of the taxable property within the boundaries of the RECIPIENT.
“Gross Revenue” means all of the earnings and revenues received by the RECIPIENT from the maintenance and operation of the Utility and all earnings from the investment of money on deposit in the Loan Fund, except (i) Utility Local Improvement Districts (ULID) Assessments, (ii) government grants, (iii) RECIPIENT taxes, (iv) principal proceeds of bonds and other obligations, or (v) earnings or proceeds (A) from any investments in a trust, Defeasance, or escrow fund created to Defease or refund Utility obligations or (B) in an obligation redemption fund or account other than the Loan Fund until commingled with other earnings and revenues of the Utility or (C) held in a special account for the purpose of paying a rebate to the United States Government under the Internal Revenue Code.
“Guidelines” means the ECOLOGY's Funding Guidelines that that correlate to the State Fiscal Year in which the project is funded.
“Initiation of Operation Date” means the actual date the Water Pollution Control Facility financed with proceeds of the loan begins to operate for its intended purpose.
“Loan” means the Washington State Water Pollution Control Revolving Fund Loan or Centennial Clean Water Fund (Centennial) Loan made pursuant to this loan agreement.
“Loan Amount” means either an Estimated Loan Amount or a Final Loan Amount, as applicable.
“Loan Fund” means the special fund created by the RECIPIENT for the repayment of the principal of and interest on the loan.
“Loan Security” means the mechanism by which the RECIPIENT pledges to repay the loan.
“Loan Term” means the repayment period of the loan.
“Maintenance and Operation Expense” means all reasonable expenses incurred by the RECIPIENT in causing the Utility to be operated and maintained in good repair, working order, and condition including payments to other parties, but will not include any depreciation or RECIPIENT levied taxes or payments to the RECIPIENT in lieu of taxes.
“Net Revenue” means the Gross Revenue less the Maintenance and Operation Expense.
“Original Engineer’s Estimate” means the engineer’s estimate of construction costs included with bid documents.
“Principal and Interest Account” means, for a loan that constitutes Revenue-Secured Debt, the account created in the loan fund to be first used to repay the principal of and interest on the loan.
“Project” means the project described in this agreement.
“Project Completion Date” means the date specified in the agreement on which the Scope of Work will be fully completed. This term is only used in loan agreements.
“Project Schedule” means that schedule for the project specified in the agreement.
“Revenue-Secured Debt” means an obligation of the RECIPIENT secured by a pledge of the revenue of a utility and one not a general obligation of the RECIPIENT.
“Reserve Account” means, for a loan that constitutes a Revenue Secured Debt and if specifically identified as a term and condition of the funding agreement, the account of that name created in the loan fund to secure the payment of the principal of and interest on the loan.

"Risk-Based Determination" means an approach to sub-recipient monitoring and oversight based on risk factors associated to a RECIPIENT or project.
"Scope of Work" means the tasks and activities constituting the project.
"Section 319" means the section of the Clean Water Act that provides funding to address nonpoint sources of water pollution.
"Senior Lien Obligations" means all revenue bonds and other obligations of the RECIPIENT outstanding on the date of execution of this loan agreement (or subsequently issued on a parity therewith, including refunding obligations) or issued after the date of execution of this loan agreement having a claim or lien on the Gross Revenue of the Utility prior and superior to the claim or lien of the loan, subject only to Maintenance and Operation Expense.
"State Water Pollution Control Revolving Fund (Revolving Fund)" means the water pollution control revolving fund established by Chapter 90.50A.020 RCW.
"Termination Date" means the effective date of ECOLOGY's termination of the agreement.
"Termination Payment Date" means the date on which the RECIPIENT is required to repay to ECOLOGY any outstanding balance of the loan and all accrued interest.
"Total Eligible Project Cost" means the sum of all costs associated with a water quality project that have been determined to be eligible for ECOLOGY grant or loan funding, including any required recipient match.
"Total Project Cost" means the sum of all costs associated with a water quality project, including costs that are not eligible for ECOLOGY grant or loan funding.
"ULID" means any utility local improvement district of the RECIPIENT created for the acquisition or construction of additions to and extensions and betterments of the Utility.
"ULID Assessments" means all assessments levied and collected in any ULID. Such assessments are pledged to be paid into the Loan Fund (less any prepaid assessments permitted by law to be paid into a construction fund or account). ULID Assessments will include principal installments and any interest or penalties which may be due.
"Utility" means the sewer system, stormwater system, or the combined water and sewer system of the RECIPIENT, the Net Revenue of which is pledged to pay and secure the loan.

SECTION 2: THE FOLLOWING CONDITIONS APPLY TO ALL RECIPIENTS OF WATER QUALITY COMBINED FINANCIAL ASSISTANCE FUNDING.
The Water Quality Financial Assistance Funding Guidelines are included in this agreement by reference and are available on ECOLOGY's Water Quality Program website.
A. Architectural and Engineering Services: The RECIPIENT certifies by signing this agreement that the requirements of Chapter 39.80 RCW, "Contracts for Architectural and Engineering Services," have been, or shall be, met in procuring qualified architectural/engineering services. The RECIPIENT shall identify and separate eligible and ineligible costs in the final architectural/engineering services contract and submit a copy of the contract to ECOLOGY.
B. Acquisition: The following provisions shall be in force only if the project described in this agreement is an acquisition project:
a. Evidence of Land Value and Title. The RECIPIENT shall submit documentation of the cost of the property rights and the type of ownership interest that has been acquired.
b. Legal Description of Real Property Rights Acquired. The legal description of the real property rights purchased with funding assistance provided through this agreement (and protected by a recorded conveyance of rights to the State of Washington) shall be incorporated into the agreement before final payment.
c. Conveyance of Rights to the State of Washington. Upon purchase of real property rights (both fee simple and lesser interests), the RECIPIENT shall execute the document necessary to convey certain rights and responsibilities to ECOLOGY, on behalf of the State of Washington. The documents required will depend on the project type, the real property rights being acquired, and whether or not those rights are being acquired in perpetuity (see options below). The RECIPIENT shall use language provided by ECOLOGY, to record the executed document in the County where the real property lies, and to provide a copy of the recorded document to ECOLOGY.

Documentation Options:

1. Deed of Right. The Deed of Right conveys to the people of the state of Washington the right to preserve, protect, and/or use the property for public purposes consistent with the fund source. RECIPIENTs shall use this document when acquiring real property rights that include the underlying land. This document may also be applicable for those easements where the RECIPIENT has acquired a perpetual easement for public purposes. The RECIPIENT must obtain ECOLOGY approval on the draft language prior to executing the deed of right.

2. Assignment of Rights. The Assignment of Rights document transfers certain rights such as access and enforcement to ECOLOGY. The RECIPIENT shall use this document when an easement or lease is being acquired for water quality and habitat conservation. The Assignment of Rights requires the signature of the underlying landowner and must be incorporated by reference in the easement document.

3. Easements and Leases. The RECIPIENT may incorporate required language from the Deed of Right or Assignment of Rights directly into the easement or lease document, thereby eliminating the requirement for a separate document. Language will depend on the situation; therefore, the RECIPIENT must obtain ECOLOGY approval on the draft language prior to executing the easement or lease.

d. Real Property Acquisition and Relocation Assistance.

1. Federal Acquisition Policies. See Section 4 of this agreement for requirements specific to Section 319 and SRF funded projects.

2. State Acquisition Policies. When state funds are part of this agreement, the RECIPIENT agrees to comply with the terms and conditions of the Uniform Relocation Assistance and Real Property Acquisition Policy of the State of Washington, Chapter 8.26 RCW, and Chapter 468-100 WAC.

3. Housing and Relocation. In the event that housing and relocation costs, as required by federal law set out in subsection (1) above and/or state law set out in subsection (2) above, are involved in the execution of this project, the RECIPIENT agrees to provide any housing and relocation assistance required.

e. Hazardous Substances.

1. Certification. The RECIPIENT shall inspect, investigate, and conduct an environmental audit of the proposed acquisition site for the presence of hazardous substances, as defined in RCW 70.105D.020(10), and certify:

i. No hazardous substances were found on the site, or

ii. Any hazardous substances found have been treated and/or disposed of in compliance with applicable state and federal laws, and the site is deemed “clean.”

2. Responsibility. Nothing in this provision alters the RECIPIENT's duties and liabilities regarding hazardous substances as set forth in RCW 70.105D.

3. Hold Harmless. The RECIPIENT will defend, protect and hold harmless ECOLOGY and any and all of its employees and/or agents, from and against any and all liability, cost (including but not limited to all costs of defense and attorneys' fees) and any and all loss of any nature from any and all claims or suits resulting from the presence of, or the release or threatened release of, hazardous substances on the property the RECIPIENT is acquiring.

f. Restriction On Conversion Of Real Property And/Or Facilities To Other Uses

The RECIPIENT shall not at any time convert any real property (including any interest therein) or facility acquired, developed, maintained, renovated, and/or restored pursuant to this agreement to uses other than those purposes for which funds were approved without prior approval of ECOLOGY. For acquisition projects that are term limited, such as one involving a lease or a term-limited restoration, renovation or development project or easement, this restriction on conversion shall apply only for the length of the term, unless otherwise provided in written documents or required by applicable state or federal law. In such case, the restriction applies to such projects for the length of the term specified by the lease, easement, deed, or landowner agreement.

C. Best Management Practices (BMP) Implementation: If the RECIPIENT installs BMPs that are not approved by

ECOLOGY prior to installation, the RECIPIENT assumes the risk that part or all of the reimbursement for that activity may be delayed or ineligible. For more details regarding BMP Implementation, please reference the Water Quality Financial Assistance Funding Guidelines available on ECOLOGY's Water Quality Program funding website.

D. Electronic Fund Transfers: Payment will be issued through Washington State's Office of Financial Management's Statewide Payee Desk. To receive payment you must register as a statewide vendor by submitting a statewide vendor registration form and an IRS W-9 form at website, https://ofm.wa.gov/it-systems/statewide-vendorpayee-services. If you have questions about the vendor registration process or electronic fund transfers, you can contact Statewide Payee Help Desk at (360) 407-8180 or email PayeeRegistration@ofm.wa.gov.

E. Equipment Purchase: Equipment purchases over $5,000 and not included in the scope of work or the Ecology approved construction plans and specifications, must be pre-approved by ECOLOGY's project manager before purchase. All equipment purchases over $5,000 and not included in a contract for work being completed on the funded project, must also be reported on the Equipment Purchase Report in EAGL.

F. Funding Recognition: The RECIPIENT must inform the public about ECOLOGY or any EPA (see Section 3.B for Section 319 funded or Section 5.E for SRF funded projects) funding participation in this project through the use of project signs, acknowledgement in published materials, reports, the news media, websites, or other public announcements. Projects addressing site-specific locations must utilize appropriately sized and weather-resistant signs. Sign logos are available from ECOLOGY's Financial Manager upon request.

G. Growth Management Planning: The RECIPIENT certifies by signing this agreement that it is in compliance with the requirements of Chapter 36.70A RCW, "Growth Management Planning by Selected Counties and Cities." If the status of compliance changes, either through RECIPIENT or legislative action, the RECIPIENT shall notify ECOLOGY in writing of this change within 30 days.

H. Interlocal: The RECIPIENT certifies by signing this agreement that all negotiated interlocal agreements necessary for the project are, or shall be, consistent with the terms of this agreement and Chapter 39.34 RCW, "Interlocal Cooperation Act." The RECIPIENT shall submit a copy of each interlocal agreement necessary for the project to ECOLOGY upon request.

I. Lobbying and Litigation: Costs incurred for the purposes of lobbying or litigation are not eligible for funding under this agreement.

J. Post Project Assessment Survey: The RECIPIENT agrees to participate in a brief survey regarding the key project results or water quality project outcomes and the status of long-term environmental results or goals from the project approximately three years after project completion. A representative from ECOLOGY's Water Quality Program may contact the RECIPIENT to request this data. ECOLOGY may also conduct site interviews and inspections, and may otherwise evaluate the project, as part of this assessment.

K. Project Status Evaluation: ECOLOGY may evaluate the status at any time. ECOLOGY's Project Manager and Financial Manager will meet with the RECIPIENT to review spending trends, completion of outcome measures, and overall project administration and performance. If the RECIPIENT fails to make satisfactory progress toward achieving project outcomes, ECOLOGY may change the scope of work, reduce grant funds, or increase oversight measures.

L. Technical Assistance: Technical assistance for agriculture activities provided under the terms of this agreement shall be consistent with the current U.S. Natural Resource Conservation Service ("NRCS") Field Office Technical Guide for Washington State and specific requirements outlined in the Water Quality Funding Guidelines. Technical assistance, proposed practices, or project designs that do not meet these standards may be eligible if approved in writing by ECOLOGY.

SECTION 3: THE FOLLOWING CONDITIONS APPLY TO SECTION 319 AND CENTENNIAL CLEAN WATER FUNDED PROJECTS BEING USED TO MATCH SECTION 319 FUNDS.

The RECIPIENT must submit the following documents to ECOLOGY before this agreement is signed by ECOLOGY:

1. Federal Funding Accountability and Transparency Act (FFATA) Form, available on the Water Quality Program website. (This form is used for Section 319 funds only)

2. “Section 319 Initial Data Reporting” form in EAGL.
A. Data Reporting: The RECIPIENT must complete the “Section 319 Initial Data Reporting” form in EAGL before this agreement can be signed by Ecology. This form is used to gather general information about the project for EPA.
B. Funding Recognition and Outreach: In addition to Section 2.F. of these Special Terms and Conditions, the RECIPIENT shall provide signage that informs the public that the project is funded by EPA. The signage shall contain the EPA logo and follow usage requirements available at http://www2.epa.gov/stylebook/using-epa-seal-and-logo. To obtain the appropriate EPA logo or seal graphic file, the RECIPIENT may send a request to their Ecology Financial Manager.
To increase public awareness of projects serving communities where English is not the predominant language, RECIPIENTS are encouraged to provide their outreach strategies communication in non-English languages. Translation costs for this purpose are allowable, provided the costs are reasonable. (Applies to both the Section 319 funded projects and the Centennial match projects)
The RECIPIENT shall use the following paragraph in all reports, documents, and signage developed under this agreement: (Applies to Section 319 funded projects only)
“This project has been funded wholly or in part by the United States Environmental Protection Agency under an assistance agreement to the Washington State Department of Ecology. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.”
C. Load Reduction Reporting: The RECIPIENT shall complete the “Section 319 Annual Load Reduction Reporting” form in EAGL by January 15 of each year and at project close-out. ECOLOGY may hold reimbursements until the RECIPIENT has completed the form. This form is used to gather information on best management practices (BMPs) installed and associated pollutant load reductions that were funded as a part of this project.
D. Time Extension: The RECIPIENT may request a one-time extension for up to 12 months. However, the time extension cannot exceed the time limitation established in EPA’s assistance agreement. In the event a time extension is requested and approved by ECOLOGY, the RECIPIENT must complete all eligible work performed under this agreement by the expiration date. (For Section 319 funded projects only)

SECTION 4: THE FOLLOWING CONDITIONS APPLY TO SECTION 319 AND STATE REVOLVING FUND (SRF) LOAN FUNDED PROJECTS ONLY.
A. Accounting Standards: The RECIPIENT shall maintain accurate records and accounts for the project (PROJECT Records) in accordance with Generally Accepted Accounting Principles (GAAP) as issued by the Governmental Accounting Standards Board (GASB), including standards related to the reporting of infrastructure assets or in accordance with the standards in Chapter 43.09.200 RCW “Local Government Accounting – Uniform System of Accounting.”
B. Acquisitions: Section 319 and SRF Equivalency project RECIPIENTs shall comply with the terms and conditions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 84 Stat. 1894 (1970)--Public Law 91-646, as amended by the Surface Transportation and Uniform Relocation Assistance Act, PL 100-17-1987, and applicable regulations and procedures of the federal agency implementing that Act.

C. Audit Requirements: In accordance with 2 CFR 200.501(a), the RECIPIENT agrees to obtain a single audit from an independent auditor, if their organization expends $750,000 or more in total Federal funds in their fiscal year. The RECIPIENT must submit the form SF-SAC and a Single Audit Report Package within 9 months of the end of the fiscal year or 30 days after receiving the report from an independent auditor. The SF-SAC and a Single Audit Report Package MUST be submitted using the Federal Audit Clearinghouse’s Internet Data Entry System available at: https://facweb.census.gov/..
D. Archaeological Resources and Historic Properties (Section 106): The RECIPIENT shall comply with the additional requirements under section 106 of the National Historic Preservation Act (NHPA, 36 CFR 800).
E. Data Universal Numbering System (DUNS) and Central Contractor Registration (CCR) Requirements: RECIPIENTs shall

have a DUNS number. Unless exempted from this requirement under 2 CFR 25.110, the RECIPIENT must ensure that their organization's information in the System for Award Management (SAM), https://www.sam.gov, is kept current through project closeout. This requires that the RECIPIENT reviews and updates the information at least annually after the initial registration, and more frequently if information changes.

F. Disadvantaged Business Enterprise (DBE): General Compliance, 40 CFR, Part 33. The RECIPIENT agrees to comply with the requirements of the Environmental Protection Agency's Program for Utilization of Small, Minority, and Women's Business Enterprises (MBE/WBE) 40CFR, Part 33 in procurement under this agreement.

Six Good Faith Efforts, 40 CFR, Part 33, Subpart C. The RECIPIENT agrees to make the following good faith efforts whenever procuring construction, equipment, services, and supplies under this agreement. Records documenting compliance with the following six good faith efforts shall be retained:

1) Ensure Disadvantaged Business Enterprises are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government RECIPIENTs, this shall include placing Disadvantaged Business Enterprises on solicitation lists and soliciting them whenever they are potential sources.

2) Make information on forthcoming opportunities available to Disadvantaged Business Enterprises and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by Disadvantaged Business Enterprises in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of thirty (30) calendar days before the bid or proposal closing date.

3) Consider, in the contracting process, whether firms competing for large contracts could subcontract with Disadvantaged Business Enterprises. For Indian Tribal, State, and Local Government RECIPIENTs, this shall include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by Disadvantaged Business Enterprises in the competitive process.

4) Encourage contracting with a consortium of Disadvantaged Business Enterprises when a contract is too large for one of these firms to handle individually.

5) Use services and assistance of the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

6) If the prime contractor awards subcontracts, require the prime contractor to take the five good faith efforts steps in paragraphs 1 through 5 above.

The RECIPIENT agrees to submit ECOLOGY's Contractor Participation Report Form D with each payment request.

Contract Administration Provisions, 40 CFR, Section 33.302. The RECIPIENT agrees to comply with the contract administration provisions of 40 CFR, Section 33.302.

Non-discrimination Provision. The RECIPIENT shall not discriminate on the basis of race, color, national origin or sex in the performance of this agreement. The RECIPIENT shall carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the RECIPIENT to carry out these requirements is a material breach of this agreement which may result in the termination of this contract or other legally available remedies.

This does not preclude the RECIPIENT from enacting broader nondiscrimination protections.

The RECIPIENT shall comply with all federal and state nondiscrimination laws, including but not limited to, Title VI and VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1975, and Chapter 49.60 RCW, Washington's Law Against Discrimination, and 42 U.S.C. 12101 et seq, the Americans with Disabilities Act (ADA).

In the event of the RECIPIENT's noncompliance or refusal to comply with any applicable nondiscrimination law, regulation, or policy, this agreement may be rescinded, canceled, or terminated in whole or in part and the RECIPIENT may be declared ineligible for further funding from ECOLOGY. The RECIPIENT shall, however, be given a reasonable time in which to cure this noncompliance.

The RECIPIENT shall include the following terms and conditions in contracts with all contractors, subcontractors, engineers,

vendors, and any other entity for work or services pertaining to this agreement.
"The Contractor will not discriminate on the basis of race, color, national origin or sex in the performance of this Contract. The Contractor will carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under Environmental Protection Agency financial agreements. Failure by the Contractor to carry out these requirements is a material breach of this Contract which may result in termination of this Contract or other legally available remedies."
Bidder List, 40 CFR, Section 33.501(b) and (c). The RECIPIENT agrees to create and maintain a bidders list. The bidders list shall include the following information for all firms that bid or quote on prime contracts, or bid or quote subcontracts, including both MBE/WBEs and non-MBE/WBEs.
1. Entity's name with point of contact
2. Entity's mailing address, telephone number, and e-mail address
3. The procurement on which the entity bid or quoted, and when
4. Entity's status as an MBE/WBE or non-MBE/WBE
G. Electronic and information Technology (EIT) Accessibility: RECIPIENTs shall ensure that loan funds provided under this agreement for costs in the development or purchase of EIT systems or products provide individuals with disabilities reasonable accommodations and an equal and effective opportunity to benefit from or participate in a program, including those offered through electronic and information technology as per Section 504 of the Rehabilitation Act, codified in 40 CFR Part 7. Systems or products funded under this agreement must be designed to meet the diverse needs of users without barriers or diminished function or quality. Systems shall include usability features or functions that accommodate the needs of persons with disabilities, including those who use assistive technology.
H. Hotel-Motel Fire Safety Act: The RECIPIENT shall ensure that all space for conferences, meetings, conventions or training seminars funded in whole or in part with federal funds complies with the protection and control guidelines of the Hotel and Motel Fire Safety Act (15 USC 2225a, PL 101-391, as amended). Recipients may search the Hotel-Motel National Master List at http://www.usfa.dhs.gov/applications/hotel/ to see if a property is in compliance, or to find other information about the Act. Pursuant to 15 USC 2225a.
I. Trafficking In Persons: The RECIPIENT and RECIPIENT employees that are private entities shall not engage in forms of trafficking in persons during the period of time this agreement is effective. This includes, but is not limited to, the procurement of a commercial sex act or forced labor. The RECIPIENT shall notify ECOLOGY immediately of any information received from any source alleging a violation under this provision.

SECTION 5: THE FOLLOWING CONDITIONS APPLY TO STATE REVOLVING FUND (SRF) LOAN FUNDED PROJECTS ONLY.
The RECIPIENT must submit the following documents/forms to ECOLOGY before this agreement is signed by ECOLOGY:
1. Financial Capability Assessment Documentation
2. Opinion of RECIPIENT's Legal Council
3. Authorizing Ordinance or Resolution
4. Federal Funding Accountability and Transparency Act (FFATA) Form (Required for SRF Equivalency projects only)
5. CWSRF Federal Reporting Information form available in EAGL
6. Fiscal Sustainability Plan (Asset Management) Certification Form in EAGL (Only required if the project includes construction of a wastewater or stormwater facility construction)
7. Cost and Effectiveness Analysis Certification Form in EAGL (Required for all projects receiving SRF Loan funding)
8. State Environmental Review Process (SERP) Documentation (Required for facility projects only)
A. Alteration and Eligibility of Project: During the term of this agreement, the RECIPIENT (1) shall not materially alter the design or structural character of the project without the prior written approval of ECOLOGY and (2) shall take no action which would adversely affect the eligibility of the project as defined by applicable funding program rules and state statutes, or which would cause a violation of any covenant, condition, or provision herein.

B. American Iron and Steel (Buy American): This loan provision applies to projects for the construction, alteration, maintenance, or repair of a "treatment works" as defined in the Federal Water Pollution Control Act (33 USC 1381 et seq.) The RECIPIENT shall ensure that all iron and steel products used in the project are produced in the United States. Iron and Steel products means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials. The RECIPIENT may request waiver from this requirement from the Administrator of the Environmental Protection Agency. The RECIPIENT must coordinate all waiver requests through ECOLOGY. This provision does not apply if the engineering plans and specifications for the project were approved by ECOLOGY prior to January 17, 2014. ECOLOGY reserves the right to request documentation of RECIPIENT'S compliance with this provision.
C. Authority of RECIPIENT: This agreement is authorized by the Constitution and laws of the state of Washington, including the RECIPIENT's authority, and by the RECIPIENT pursuant to the authorizing ordinance or resolution. The RECIPIENT shall submit a copy of the authorizing ordinance or resolution to the ECOLOGY Financial Manager before this agreement shall be signed by ECOLOGY.
D. Equivalency Projects: (For designated equivalency projects only)
1. The RECIPIENT must procure architectural and engineering services in accordance with the federal requirements in Chapter 11 of Title 40, U.S.C. (see www.gpo.gov/fdsys/pkg/USCODE-2011-title40/pdf/USCODE-2011-title40-subtitleI-chap11.pdf).
E. Fiscal Sustainability Plan Certification: The RECIPIENT shall submit a completed Fiscal Sustainability Plan Certification before this agreement is signed by ECOLOGY. The Fiscal Sustainability Plan Certification is available from the ECOLOGY Financial Manager or on the Water Quality Program website.
F. Funding Recognition and Outreach: In addition to Section 2.F of these Terms and Conditions, the RECIPIENT agrees to comply with the EPA SRF Signage Guidance in order to enhance public awareness of EPA assistance agreements nationwide. The signage guidance can be found at: https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Water-Quality-grants-and-loans/Facility-project-resources.
G. Insurance: The RECIPIENT shall at all times carry fire and extended insurance coverage, public liability, and property damage, and such other forms of insurance with responsible insurers and policies payable to the RECIPIENT on such of the buildings, equipment, works, plants, facilities, and properties of the Utility as are ordinarily carried by municipal or privately-owned utilities engaged in the operation of like systems, and against such claims for damages as are ordinarily carried by municipal or privately-owned utilities engaged in the operation of like systems, or it shall self-insure or participate in an insurance pool or pools with reserves adequate, in the reasonable judgment of the RECIPIENT, to protect it against loss.
H. Litigation Authority: No litigation is now pending, or to the RECIPIENT's knowledge, threatened, seeking to restrain, or enjoin:
(i) the execution of this agreement; or
(ii) the fixing or collection of the revenues, rates, and charges or the formation of the ULID and the levy and collection of ULID Assessments therein pledged to pay the principal of and interest on the loan (for revenue secured lien obligations); or
(iii) the levy and collection of the taxes pledged to pay the principal of and interest on the loan (for general obligation-secured loans and general obligation payable from special-assessment-secured loans); or
(iv) in any manner questioning the proceedings and authority under which the agreement, the loan, or the project are authorized. Neither the corporate existence, or boundaries of the RECIPIENT nor the title of its present officers to their respective offices is being contested. No authority or proceeding for the execution of this agreement has been repealed, revoked, or rescinded.
I. Loan Interest Rate and Terms: This loan agreement shall remain in effect until the date of final repayment of the loan, unless terminated earlier according to the provisions herein.
When the Project Completion Date has occurred, ECOLOGY and the RECIPIENT shall execute an amendment to this loan

agreement which details the final loan amount (Final Loan Amount), and ECOLOGY shall prepare a final loan repayment schedule. The Final Loan Amount shall be the combined total of actual disbursements made on the loan and all accrued interest to the computation date.

The Estimated Loan Amount and the Final Loan Amount (in either case, as applicable, a "Loan Amount") shall bear interest based on the interest rate identified in this agreement as the "Effective Interest Rate," per annum, calculated on the basis of a 365 day year. Interest on the Estimated Loan Amount shall accrue from and be compounded monthly based on the date that each payment is mailed to the RECIPIENT. The Final Loan Amount shall be repaid in equal installments, semiannually, over the term of this loan "Loan Term" as outlined in this agreement.

J. Loan Repayment:

Sources of Loan Repayment

1. Nature of RECIPIENT's Obligation. The obligation of the RECIPIENT to repay the loan from the sources identified below and to perform and observe all other agreements and obligations on its part, contained herein, shall be absolute and unconditional, and shall not be subject to diminution by setoff, counterclaim, or abatement of any kind. To secure the repayment of the loan from ECOLOGY, the RECIPIENT agrees to comply with all of the covenants, agreements, and attachments contained herein.

2. For General Obligation. This loan is a General Obligation Debt of the RECIPIENT.

3. For General Obligation Payable from Special Assessments. This loan is a General Obligation Debt of the RECIPIENT payable from special assessments to be imposed within the constitutional and statutory tax limitations provided by law without a vote of the electors of the RECIPIENT on all of the taxable property within the boundaries of the RECIPIENT.

4. For Revenue-Secured: Lien Position. This loan is a Revenue-Secured Debt of the RECIPIENT's Utility. This loan shall constitute a lien and charge upon the Net Revenue junior and subordinate to the lien and charge upon such Net Revenue of any Senior Lien Obligations.

In addition, if this loan is also secured by Utility Local Improvement Districts (ULID) Assessments, this loan shall constitute a lien upon ULID Assessments in the ULID prior and superior to any other charges whatsoever.

5. Other Sources of Repayment. The RECIPIENT may repay any portion of the loan from any funds legally available to it.

6. Defeasance of the Loan. So long as ECOLOGY shall hold this loan, the RECIPIENT shall not be entitled to, and shall not affect, an economic Defeasance of the loan. The RECIPIENT shall not advance refund the loan.

If the RECIPIENT defeases or advance refunds the loan, it shall be required to use the proceeds thereof immediately upon their receipt, together with other available RECIPIENT funds, to repay both of the following:

(i) The Loan Amount with interest

(ii) Any other obligations of the RECIPIENT to ECOLOGY under this agreement, unless in its sole discretion ECOLOGY finds that repayment from those additional sources would not be in the public interest.

Failure to repay the Loan Amount plus interest within the time specified in ECOLOGY's notice to make such repayment shall incur Late Charges and shall be treated as a Loan Default.

7. Refinancing or Early Repayment of the Project. So long as ECOLOGY shall hold this loan, the RECIPIENT shall give ECOLOGY thirty days written notice if the RECIPIENT intends to refinance or make early repayment of the loan.

Method and Conditions on Repayments

1. Semiannual Payments. Notwithstanding any other provision of this agreement, the first semiannual payment of principal and interest on this loan shall be due and payable no later than one year after the project completion date or initiation of operation date, whichever comes first.

Thereafter, equal payments shall be due every six months.

If the due date for any semiannual payment falls on a Saturday, Sunday, or designated holiday for Washington State agencies, the payment shall be due on the next business day for Washington State agencies.

Payments shall be mailed to:

Department of Ecology

Cashiering Unit
P.O. Box 47611
Olympia WA 98504-7611

In lieu of mailing payments, electronic fund transfers can be arranged by working with ECOLOGY's Financial Manager.

No change to the amount of the semiannual principal and interest payments shall be made without a mutually signed amendment to this agreement. The RECIPIENT shall continue to make semiannual payments based on this agreement until the amendment is effective, at which time the RECIPIENT's payments shall be made pursuant to the amended agreement.

2. Late Charges. If any amount of the Final Loan Amount or any other amount owed to ECOLOGY pursuant to this agreement remains unpaid after it becomes due and payable, ECOLOGY may assess a late charge. The late charge shall be one percent per month on the past due amount starting on the date the debt becomes past due and until it is paid in full.

3. Repayment Limitations. Repayment of the loan is subject to the following additional limitations, among others: those on defeasance, refinancing and advance refunding, termination, and default and recovery of payments.

4. Prepayment of Loan. So long as ECOLOGY shall hold this loan, the RECIPIENT may prepay the entire unpaid principal balance of and accrued interest on the loan or any portion of the remaining unpaid principal balance of the Loan Amount. Any prepayments on the loan shall be applied first to any accrued interest due and then to the outstanding principal balance of the Loan Amount. If the RECIPIENT elects to prepay the entire remaining unpaid balance and accrued interest, the RECIPIENT shall first contact ECOLOGY's Revenue/Receivable Manager of the Fiscal Office.

K. Loan Security

Due Regard: For loans secured with a Revenue Obligation: The RECIPIENT shall exercise due regard for Maintenance and Operation Expense and the debt service requirements of the Senior Lien Obligations and any other outstanding obligations pledging the Gross Revenue of the Utility, and it has not obligated itself to set aside and pay into the loan Fund a greater amount of the Gross Revenue of the Utility than, in its judgment, shall be available over and above such Maintenance and Operation Expense and those debt service requirements.

Where collecting adequate gross utility revenue requires connecting additional users, the RECIPIENT shall require the sewer system connections necessary to meet debt obligations and expected operation and maintenance expenses.

Levy and Collection of Taxes (if used to secure the repayment of the loan): For so long as the loan is outstanding, the RECIPIENT irrevocably pledges to include in its budget and levy taxes annually within the constitutional and statutory tax limitations provided by law without a vote of its electors on all of the taxable property within the boundaries of the RECIPIENT in an amount sufficient, together with other money legally available and to be used therefore, to pay when due the principal of and interest on the loan, and the full faith, credit and resources of the RECIPIENT are pledged irrevocably for the annual levy and collection of those taxes and the prompt payment of that principal and interest.

Not an Excess Indebtedness: For loans secured with a general obligation pledge or a general obligation pledge on special assessments: The RECIPIENT agrees that this agreement and the loan to be made do not create an indebtedness of the RECIPIENT in excess of any constitutional or statutory limitations.

Pledge of Net Revenue and ULID Assessments in the ULID (if used to secure the repayment of this loan): For so long as the loan is outstanding, the RECIPIENT irrevocably pledges the Net Revenue of the Utility, including applicable ULID Assessments in the ULID, to pay when due the principal of and interest on the loan.

Utility Local Improvement District (ULID) Assessment Collection (if used to secure the repayment of the loan): All ULID Assessments in the ULID shall be paid into the Loan Fund and used to pay the principal of and interest on the loan.

L. Maintenance and Operation of a Funded Utility: The RECIPIENT shall, at all times, maintain and keep the funded Utility in good repair, working order, and condition.

M. Opinion of RECIPIENT's Legal Counsel: The RECIPIENT must submit an "Opinion of Legal Counsel to the RECIPIENT" to ECOLOGY before this agreement will be signed. ECOLOGY will provide the form.

N. Prevailing Wage (Davis-Bacon Act): The RECIPIENT agrees, by signing this agreement, to comply with the Davis-Bacon Act prevailing wage requirements. This applies to the construction, alteration, and repair of treatment works carried out, in

whole or in part, with assistance made available by the State Revolving Fund as authorized by Section 513, title VI of the Federal Water Pollution Control Act (33 U.S.C. 1372). Laborers and mechanics employed by contractors and subcontractors shall be paid wages not less often than once a week and at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor.

The RECIPIENT shall obtain the wage determination for the area in which the project is located prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation). These wage determinations shall be incorporated into solicitations and any subsequent contracts. The RECIPIENT shall ensure that the required EPA contract language regarding Davis-Bacon Wages is in all contracts and sub contracts in excess of $2,000. The RECIPIENT shall maintain records sufficient to document compliance with the Davis-Bacon Act, and make such records available for review upon request.

The RECIPIENT also agrees, by signing this agreement, to comply with State Prevailing Wages on Public Works, Chapter 39.12 RCW, as applicable. Compliance may include the determination whether the project involves "public work" and inclusion of the applicable prevailing wage rates in the bid specifications and contracts. The RECIPIENT agrees to maintain records sufficient to evidence compliance with Chapter 39.12 RCW, and make such records available for review upon request.

O. Progress Reports: RECIPIENTS funded with State Revolving Fund Loan or Forgivable Principal shall include the following verification statement in the "General Comments" text box of each progress report.

"We verify that we are in compliance with all the requirements as outlined in our funding agreement(s) with the Department of Ecology. This includes but is not limited to:

- The Davis-Bacon Act, 29 CFR (If applicable)
- Washington State Prevailing Wage Rate, Chapter 39.12 RCW (Pertaining to all recipients)
- The Disadvantaged Business Enterprise (DBE), 40 CFR, Part 33"

P. Representations and Warranties: The RECIPIENT represents and warrants to ECOLOGY as follows:

Application: Material Information. All information and materials submitted by the RECIPIENT to ECOLOGY in connection with its loan application were, when made, and are, as of the date the RECIPIENT signs this agreement, true and correct. There is no material adverse information relating to the RECIPIENT, the project, the loan, or this agreement known to the RECIPIENT, which has not been disclosed in writing to ECOLOGY.

Existence; Authority. It is a duly formed and legally existing municipal corporation or political subdivision of the state of Washington or a federally recognized Indian Tribe. It has full corporate power and authority to execute, deliver, and perform all of its obligations under this agreement and to undertake the project identified herein.

Certification. Each payment request shall constitute a certification by the RECIPIENT to the effect that all representations and warranties made in this loan agreement remain true as of the date of the request and that no adverse developments, affecting the financial condition of the RECIPIENT or its ability to complete the project or to repay the principal of or interest on the loan, have occurred since the date of this loan agreement. Any changes in the RECIPIENT's financial condition shall be disclosed in writing to ECOLOGY by the RECIPIENT in its request for payment.

Q. Sale or Disposition of Funded Utility: The RECIPIENT shall not sell, transfer, or otherwise dispose of any of the works, plant, properties, facilities, or other part of the funded Utility or any real or personal property comprising a part of the funded Utility unless:

1. The facilities or property transferred are not material to the operation of the funded Utility, or have become unserviceable, inadequate, obsolete, or unfit to be used in the operation of the funded Utility or are no longer necessary, material, or useful to the operation of the funded Utility; or

2. The aggregate depreciated cost value of the facilities or property being transferred in any fiscal year comprises no more than three percent of the total assets of the funded Utility; or

3. The RECIPIENT receives from the transferee an amount equal to an amount which will be in the same proportion to the net amount of Senior Lien Obligations and this LOAN then outstanding (defined as the total amount outstanding less the

amount of cash and investments in the bond and loan funds securing such debt) as the Gross Revenue of the funded Utility from the portion of the funded Utility sold or disposed of for the preceding year bears to the total Gross Revenue for that period.

4. Expressed written agreement by the ECOLOGY-.

The proceeds of any transfer under this paragraph must be used (1) to redeem promptly, or irrevocably set aside for the redemption of, Senior Lien Obligations and to redeem promptly the loan, and (2) to provide for part of the cost of additions to and betterments and extensions of the Utility.

R. Sewer-Use Ordinance or Resolution for Funded Wastewater Facility Projects: If not already in existence, the RECIPIENT shall adopt and shall enforce a sewer-use ordinance or resolution. Such ordinance or resolution shall be submitted to ECOLOGY upon request.

The sewer use ordinance must include provisions to:

1) Prohibit the introduction of toxic or hazardous wastes into the RECIPIENT's sewer system.

2) Prohibit inflow of stormwater into separated sewer systems.

3) Require that new sewers and connections be properly designed and constructed.

S. Termination and Default:

Termination and Default Events

1. For Insufficient ECOLOGY or RECIPIENT Funds. ECOLOGY may terminate this loan agreement for insufficient ECOLOGY or RECIPIENT funds.

2. For Failure to Commence Work. ECOLOGY may terminate this loan agreement for failure of the RECIPIENT to commence project work.

3. Past Due Payments. The RECIPIENT shall be in default of its obligations under this loan agreement when any loan repayment becomes 60 days past due.

4. Other Cause. The obligation of ECOLOGY to the RECIPIENT is contingent upon satisfactory performance in full by the RECIPIENT of all of its obligations under this loan agreement. The RECIPIENT shall be in default of its obligations under this loan agreement if, in the opinion of ECOLOGY, the RECIPIENT has unjustifiably failed to perform any obligation required of it by this loan agreement.

Procedures for Termination. If this loan agreement is terminated prior to project completion, ECOLOGY shall provide to the RECIPIENT a written notice of termination at least five working days prior to the effective date of termination (the "Termination Date"). The written notice of termination by the ECOLOGY shall specify the Termination Date and, when applicable, the date by which the RECIPIENT must repay any outstanding balance of the loan and all accrued interest (the "Termination Payment Date").

Termination and Default Remedies

No Further Payments. On and after the Termination Date, or in the event of a default event, ECOLOGY may, at its sole discretion, withdraw the loan and make no further payments under this agreement.

Repayment Demand. In response to an ECOLOGY initiated termination event, or in response to a loan default event, ECOLOGY may at its sole discretion demand that the RECIPIENT repay the outstanding balance of the Loan Amount and all accrued interest.

Interest after Repayment Demand. From the time that ECOLOGY demands repayment of funds, amounts owed by the RECIPIENT to ECOLOGY shall accrue additional interest at the rate of one percent per month, or fraction thereof.

Accelerate Repayments. In the event of a default, ECOLOGY may, in its sole discretion, declare the principal of and interest on the loan immediately due and payable, subject to the prior lien and charge of any outstanding Senior Lien Obligation upon the Net Revenue. That is, the loan is not subject to acceleration so long as any Senior Lien Obligations are outstanding. Repayments not made immediately upon such acceleration will incur Late Charges.

Late Charges. All amounts due to ECOLOGY and not paid by the RECIPIENT by the Termination Payment Date or after acceleration following a default event, as applicable, shall incur late charges.

Intercept State Funds. In the event of a default event and in accordance with Chapter 90.50A.060 RCW, "Defaults," any state funds otherwise due to the RECIPIENT may, at ECOLOGY's sole discretion, be withheld and applied to the repayment of the loan.

Property to ECOLOGY. In the event of a default event and at the option of ECOLOGY, any personal property (equipment) acquired under this agreement may, in ECOLOGY's sole discretion, become ECOLOGY's property. In that circumstance, ECOLOGY shall reduce the RECIPIENT's liability to repay money by an amount reflecting the fair value of such property.

Documents and Materials. If this agreement is terminated, all finished or unfinished documents, data studies, surveys, drawings, maps, models, photographs, and reports or other materials prepared by the RECIPIENT shall, at the option of ECOLOGY, become ECOLOGY property. The RECIPIENT shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials.

Collection and Enforcement Actions. In the event of a default event, the state of Washington reserves the right to take any actions it deems necessary to collect the amounts due, or to become due, or to enforce the performance and observance of any obligation by the RECIPIENT, under this agreement.

Fees and Expenses. In any action to enforce the provisions of this agreement, reasonable fees and expenses of attorneys and other reasonable expenses (including, without limitation, the reasonably allocated costs of legal staff) shall be awarded to the prevailing party as that term is defined in Chapter 4.84.330 RCW.

Damages. Notwithstanding ECOLOGY's exercise of any or all of the termination or default remedies provided in this agreement, the RECIPIENT shall not be relieved of any liability to ECOLOGY for damages sustained by ECOLOGY and/or the state of Washington because of any breach of this agreement by the RECIPIENT. ECOLOGY may withhold payments for the purpose of setoff until such time as the exact amount of damages due ECOLOGY from the RECIPIENT is determined.

T. User-Charge System for Funded Utilities: The RECIPIENT certifies that it has the legal authority to establish and implement a user-charge system and shall adopt a system of user-charges to assure that each user of the funded utility shall pay its proportionate share of the cost of operation and maintenance, including replacement during the design life of the project. The user-charge system will include provisions for a connection charge.

In addition, the RECIPIENT shall regularly evaluate the user-charge system, at least annually, to ensure the system provides adequate revenues necessary to operate and maintain the funded utility, to establish reserves to pay for replacement, and to repay the loan.

GENERAL FEDERAL CONDITIONS

If a portion or all of the funds for this agreement are provided through federal funding sources or this agreement is used to match a federal grant award, the following terms and conditions apply to you.

A. CERTIFICATION REGARDING SUSPENSION, DEBARMENT, INELIGIBILITY OR VOLUNTARY EXCLUSION:

1. The RECIPIENT/CONTRACTOR, by signing this agreement, certifies that it is not suspended, debarred, proposed for debarment, declared ineligible or otherwise excluded from contracting with the federal government, or from receiving contracts paid for with federal funds. If the RECIPIENT/CONTRACTOR is unable to certify to the statements contained in the certification, they must provide an explanation as to why they cannot.
2. The RECIPIENT/CONTRACTOR shall provide immediate written notice to ECOLOGY if at any time the RECIPIENT/CONTRACTOR learns that its certification was erroneous when submitted or had become erroneous by reason of changed circumstances.
3. The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used in this clause, have the meaning set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact

ECOLOGY for assistance in obtaining a copy of those regulations.

4. The RECIPIENT/CONTRACTOR agrees it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under the applicable Code of Federal Regulations, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction.
5. The RECIPIENT/CONTRACTOR further agrees by signing this agreement, that it will include this clause titled "CERTIFICATION REGARDING SUSPENSION, DEBARMENT, INELIGIBILITY OR VOLUNTARY EXCLUSION" without modification in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
6. Pursuant to 2CFR180.330, the RECIPIENT/CONTRACTOR is responsible for ensuring that any lower tier covered transaction complies with certification of suspension and debarment requirements.
7. RECIPIENT/CONTRACTOR acknowledges that failing to disclose the information required in the Code of Federal Regulations may result in the delay or negation of this funding agreement, or pursuance of legal remedies, including suspension and debarment.
8. RECIPIENT/CONTRACTOR agrees to keep proof in its agreement file, that it, and all lower tier recipients or contractors, are not suspended or debarred, and will make this proof available to ECOLOGY before requests for reimbursements will be approved for payment. RECIPIENT/CONTRACTOR must run a search in <http://www.sam.gov> and print a copy of completed searches to document proof of compliance.

B. FEDERAL FUNDING ACCOUNTABILITY AND TRANSPARENCY ACT (FFATA) REPORTING REQUIREMENTS:

CONTRACTOR/RECIPIENT must complete the FFATA Data Collection Form (ECY 070-395) and return it with the signed agreement to ECOLOGY.

Any CONTRACTOR/RECIPIENT that meets each of the criteria below must report compensation for its five top executives using the FFATA Data Collection Form.

- Receives more than $30,000 in federal funds under this award.
- Receives more than 80 percent of its annual gross revenues from federal funds.
- Receives more than $25,000,000 in annual federal funds.

Ecology will not pay any invoices until it has received a completed and signed FFATA Data Collection Form. Ecology is required to report the FFATA information for federally funded agreements, including the required Unique Entity Identifier in www.sam.gov <http://www.sam.gov/> within 30 days of agreement signature. The FFATA information will be available to the public at www.usaspending.gov <http://www.usaspending.gov/>.

For more details on FFATA requirements, see www.fsrs.gov <http://www.fsrs.gov/>.

C. FEDERAL FUNDING PROHIBITION ON CERTAIN TELECOMMUNICATIONS OR VIDEO SURVEILLANCE SERVICES OR EQUIPMENT:

As required by 2 CFR 200.216, federal grant or loan recipients and subrecipients are prohibited from obligating or expending loan or grant funds to:

1. Procure or obtain;
2. Extend or renew a contract to procure or obtain; or

3. Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment, video surveillance services or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232 <https://www.govinfo.gov/content/pkg/PLAW-115publ232/pdf/PLAW-115publ232.pdf>, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

Recipients, subrecipients, and borrowers also may not use federal funds to purchase certain prohibited equipment, systems, or services, including equipment, systems, or services produced or provided by entities identified in section 889, are recorded in the System for Award Management (SAM) <https://sam.gov/SAM/> exclusion list.

GENERAL TERMS AND CONDITIONS

Pertaining to Grant and Loan Agreements With the state of Washington, Department of Ecology

GENERAL TERMS AND CONDITIONS
For DEPARTMENT OF ECOLOGY GRANTS and LOANS
06/24/2021 Version

1. ADMINISTRATIVE REQUIREMENTS

a) RECIPIENT shall follow the "Administrative Requirements for Recipients of Ecology Grants and Loans – EAGL Edition." (https://fortress.wa.gov/ecy/publications/SummaryPages/1701004.html)

b) RECIPIENT shall complete all activities funded by this Agreement and be fully responsible for the proper management of all funds and resources made available under this Agreement.

c) RECIPIENT agrees to take complete responsibility for all actions taken under this Agreement, including ensuring all subgrantees and contractors comply with the terms and conditions of this Agreement. ECOLOGY reserves the right to request proof of compliance by subgrantees and contractors.

d) RECIPIENT's activities under this Agreement shall be subject to the review and approval by ECOLOGY for the extent and character of all work and services.

2. AMENDMENTS AND MODIFICATIONS

This Agreement may be altered, amended, or waived only by a written amendment executed by both parties. No subsequent modification(s) or amendment(s) of this Agreement will be of any force or effect unless in writing and signed by authorized representatives of both parties. ECOLOGY and the RECIPIENT may change their respective staff contacts and administrative information without the concurrence of either party.

3. ACCESSIBILITY REQUIREMENTS FOR COVERED TECHNOLOGY

The RECIPIENT must comply with the Washington State Office of the Chief Information Officer, OCIO Policy no. 188, Accessibility (https://ocio.wa.gov/policy/accessibility) as it relates to "covered technology." This requirement applies to all products supplied under the Agreement, providing equal access to information technology by individuals with disabilities, including and not limited to web sites/pages, web-based applications, software systems, video and audio content, and electronic documents intended for publishing on Ecology's public web site.

4. ARCHAEOLOGICAL AND CULTURAL RESOURCES

RECIPIENT shall take all reasonable action to avoid, minimize, or mitigate adverse effects to archaeological and historic archaeological sites, historic buildings/structures, traditional cultural places, sacred sites, or other cultural resources, hereby referred to as Cultural Resources.

The RECIPIENT must agree to hold harmless ECOLOGY in relation to any claim related to Cultural Resources discovered, disturbed, or damaged due to the RECIPIENT's project funded under this Agreement.

RECIPIENT shall:

a) Contact the ECOLOGY Program issuing the grant or loan to discuss any Cultural Resources requirements for their project:

• Cultural Resource Consultation and Review should be initiated early in the project planning process and must be completed prior to expenditure of Agreement funds as required by applicable State and Federal requirements.

* For state funded construction, demolition, or land acquisitions, comply with Governor Executive Order 21-02, Archaeological and Cultural Resources.

• For projects with any federal involvement, comply with the National Historic Preservation Act of 1966 (Section 106).

b) If required by the ECOLOGY Program, submit an Inadvertent Discovery Plan (IDP) to ECOLOGY prior to implementing any project that involves field activities. ECOLOGY will provide the IDP form.

RECIPIENT shall:

• Keep the IDP at the project site.
• Make the IDP readily available to anyone working at the project site.
• Discuss the IDP with staff, volunteers, and contractors working at the project site.
• Implement the IDP when Cultural Resources or human remains are found at the project site.

c) If any Cultural Resources are found while conducting work under this Agreement, follow the protocol outlined in the project IDP.

• Immediately stop work and notify the ECOLOGY Program, who will notify the Department of Archaeology and Historic Preservation at (360) 586-3065, any affected Tribe, and the local government.

d) If any human remains are found while conducting work under this Agreement, follow the protocol outlined in the project IDP.

• Immediately stop work and notify the local Law Enforcement Agency or Medical Examiner/Coroner's Office, the Department of Archaeology and Historic Preservation at (360) 790-1633, and then the ECOLOGY Program.

e) Comply with RCW 27.53, RCW 27.44, and RCW 68.50.645, and all other applicable local, state, and federal laws protecting Cultural Resources and human remains.

5. ASSIGNMENT

No right or claim of the RECIPIENT arising under this Agreement shall be transferred or assigned by the RECIPIENT.

6. COMMUNICATION

RECIPIENT shall make every effort to maintain effective communications with the RECIPIENT's designees, ECOLOGY, all affected local, state, or federal jurisdictions, and any interested individuals or groups.

7. COMPENSATION

a) Any work performed prior to effective date of this Agreement will be at the sole expense and risk of the RECIPIENT. ECOLOGY must sign the Agreement before any payment requests can be submitted.

b) Payments will be made on a reimbursable basis for approved and completed work as specified in this Agreement.

c) RECIPIENT is responsible to determine if costs are eligible. Any questions regarding eligibility should be clarified with ECOLOGY prior to incurring costs. Costs that are conditionally eligible require approval by ECOLOGY prior to expenditure.

d) RECIPIENT shall not invoice more than once per month unless agreed on by ECOLOGY.

e) ECOLOGY will not process payment requests without the proper reimbursement forms, Progress Report and supporting documentation. ECOLOGY will provide instructions for submitting payment requests.

f) ECOLOGY will pay the RECIPIENT thirty (30) days after receipt of a properly completed request for payment.

g) RECIPIENT will receive payment through Washington State's Office of Financial Management's Statewide Payee Desk. To receive payment you must register as a statewide vendor by submitting a statewide vendor registration form and an IRS W-9 form at website, https://ofm.wa.gov/it-systems/statewide-vendorpayee-services. If you have questions about the vendor registration process, you can contact Statewide Payee Help Desk at (360) 407-8180 or email PayeeRegistration@ofm.wa.gov.

h) ECOLOGY may, at its sole discretion, withhold payments claimed by the RECIPIENT if the RECIPIENT fails to satisfactorily comply with any term or condition of this Agreement.

i) Monies withheld by ECOLOGY may be paid to the RECIPIENT when the work described herein, or a portion thereof, has been completed if, at ECOLOGY's sole discretion, such payment is reasonable and approved according to this Agreement, as appropriate, or upon completion of an audit as specified herein.

j) RECIPIENT must submit within thirty (30) days after the expiration date of this Agreement, all financial, performance, and other reports required by this Agreement. Failure to comply may result in delayed reimbursement.

8. COMPLIANCE WITH ALL LAWS

RECIPIENT agrees to comply fully with all applicable federal, state and local laws, orders, regulations, and permits related to this Agreement, including but not limited to:

a) RECIPIENT agrees to comply with all applicable laws, regulations, and policies of the United States and the State of Washington which affect wages and job safety.

b) RECIPIENT agrees to be bound by all applicable federal and state laws, regulations, and policies against discrimination.

c) RECIPIENT certifies full compliance with all applicable state industrial insurance requirements.

d) RECIPIENT agrees to secure and provide assurance to ECOLOGY that all the necessary approvals and permits required by authorities having jurisdiction over the project are obtained. RECIPIENT must include time in their project timeline for the permit and approval processes.

ECOLOGY shall have the right to immediately terminate for cause this Agreement as provided herein if the RECIPIENT fails to comply with above requirements.

If any provision of this Agreement violates any statute or rule of law of the state of Washington, it is considered modified to conform to that statute or rule of law.

9. CONFLICT OF INTEREST

RECIPIENT and ECOLOGY agree that any officer, member, agent, or employee, who exercises any function or responsibility in the review, approval, or carrying out of this Agreement, shall not have any personal or financial interest, direct or indirect, nor affect the interest of any corporation, partnership, or association in which he/she is a part, in this Agreement or the proceeds thereof.

10. CONTRACTING FOR GOODS AND SERVICES

RECIPIENT may contract to buy goods or services related to its performance under this Agreement. RECIPIENT shall award all contracts for construction, purchase of goods, equipment, services, and professional architectural and engineering services through a competitive process, if required by State law. RECIPIENT is required to follow procurement procedures that ensure legal, fair, and open competition.

RECIPIENT must have a standard procurement process or follow current state procurement procedures. RECIPIENT may be required to provide written certification that they have followed their standard procurement procedures and applicable state law in awarding contracts under this Agreement.

ECOLOGY reserves the right to inspect and request copies of all procurement documentation, and review procurement practices related to this Agreement. Any costs incurred as a result of procurement practices not in compliance with state procurement law or the RECIPIENT's normal procedures may be disallowed at ECOLOGY's sole discretion.

11. DISPUTES

When there is a dispute with regard to the extent and character of the work, or any other matter related to this Agreement the determination of ECOLOGY will govern, although the RECIPIENT shall have the right to appeal decisions as provided for below:

a) RECIPIENT notifies the funding program of an appeal request.

b) Appeal request must be in writing and state the disputed issue(s).

c) RECIPIENT has the opportunity to be heard and offer evidence in support of its appeal.

d) ECOLOGY reviews the RECIPIENT's appeal.

e) ECOLOGY sends a written answer within ten (10) business days, unless more time is needed, after concluding the review.

The decision of ECOLOGY from an appeal will be final and conclusive, unless within thirty (30) days from the date of such decision, the RECIPIENT furnishes to the Director of ECOLOGY a written appeal. The decision of the Director or duly authorized representative will be final and conclusive.
The parties agree that this dispute process will precede any action in a judicial or quasi-judicial tribunal.
Appeals of the Director's decision will be brought in the Superior Court of Thurston County. Review of the Director's decision will not be taken to Environmental and Land Use Hearings Office.
Pending final decision of a dispute, the RECIPIENT agrees to proceed diligently with the performance of this Agreement and in accordance with the decision rendered.
Nothing in this Agreement will be construed to limit the parties' choice of another mutually acceptable method, in addition to the dispute resolution procedure outlined above.

12. ENVIRONMENTAL DATA STANDARDS

a) RECIPIENT shall prepare a Quality Assurance Project Plan (QAPP) for a project that collects or uses environmental measurement data. RECIPIENTS unsure about whether a QAPP is required for their project shall contact the ECOLOGY Program issuing the grant or loan. If a QAPP is required, the RECIPIENT shall:

- Use ECOLOGY's QAPP Template/Checklist provided by the ECOLOGY, unless ECOLOGY Quality Assurance (QA) officer or the Program QA coordinator instructs otherwise.
- Follow ECOLOGY's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, July 2004 (Ecology Publication No. 04-03-030).
- Submit the QAPP to ECOLOGY for review and approval before the start of the work.

b) RECIPIENT shall submit environmental data that was collected on a project to ECOLOGY using the Environmental Information Management system (EIM), unless the ECOLOGY Program instructs otherwise. The RECIPIENT must confirm with ECOLOGY that complete and correct data was successfully loaded into EIM, find instructions at: http://www.ecy.wa.gov/eim.
c) RECIPIENT shall follow ECOLOGY's data standards when Geographic Information System (GIS) data is collected and processed. Guidelines for Creating and Accessing GIS Data are available at: https://ecology.wa.gov/Research-Data/Data-resources/Geographic-Information-Systems-GIS/Standards. RECIPIENT, when requested by ECOLOGY, shall provide copies to ECOLOGY of all final GIS data layers, imagery, related tables, raw data collection files, map products, and all metadata and project documentation.

13. GOVERNING LAW

This Agreement will be governed by the laws of the State of Washington, and the venue of any action brought hereunder will be in the Superior Court of Thurston County.

14. INDEMNIFICATION

ECOLOGY will in no way be held responsible for payment of salaries, consultant's fees, and other costs related to the project described herein, except as provided in the Scope of Work.
To the extent that the Constitution and laws of the State of Washington permit, each party will indemnify and hold the other harmless from and against any liability for any or all injuries to persons or property arising from the negligent act or omission of that party or that party's agents or employees arising out of this Agreement.

15. INDEPENDENT STATUS

The employees, volunteers, or agents of each party who are engaged in the performance of this Agreement will continue to be employees, volunteers, or agents of that party and will not for any purpose be employees, volunteers, or agents of the other party.

16. KICKBACKS

RECIPIENT is prohibited from inducing by any means any person employed or otherwise involved in this Agreement to give up any part of the compensation to which he/she is otherwise entitled to or receive any fee, commission, or gift in return for award of a subcontract hereunder.

17. MINORITY AND WOMEN'S BUSINESS ENTERPRISES (MWBE)

RECIPIENT is encouraged to solicit and recruit, to the extent possible, certified minority-owned (MBE) and women-owned (WBE) businesses in purchases and contracts initiated under this Agreement.

Contract awards or rejections cannot be made based on MWBE participation; however, the RECIPIENT is encouraged to take the following actions, when possible, in any procurement under this Agreement:

a) Include qualified minority and women's businesses on solicitation lists whenever they are potential sources of goods or services.

b) Divide the total requirements, when economically feasible, into smaller tasks or quantities, to permit maximum participation by qualified minority and women's businesses.

c) Establish delivery schedules, where work requirements permit, which will encourage participation of qualified minority and women's businesses.

d) Use the services and assistance of the Washington State Office of Minority and Women's Business Enterprises (OMWBE) (866-208-1064) and the Office of Minority Business Enterprises of the U.S. Department of Commerce, as appropriate.

18. ORDER OF PRECEDENCE

In the event of inconsistency in this Agreement, unless otherwise provided herein, the inconsistency shall be resolved by giving precedence in the following order: (a) applicable federal and state statutes and regulations; (b) The Agreement; (c) Scope of Work; (d) Special Terms and Conditions; (e) Any provisions or terms incorporated herein by reference, including the "Administrative Requirements for Recipients of Ecology Grants and Loans"; (f) Ecology Funding Program Guidelines; and (g) General Terms and Conditions.

19. PRESENTATION AND PROMOTIONAL MATERIALS

ECOLOGY reserves the right to approve RECIPIENT's communication documents and materials related to the fulfillment of this Agreement:

a) If requested, RECIPIENT shall provide a draft copy to ECOLOGY for review and approval ten (10) business days prior to production and distribution.

b) RECIPIENT shall include time for ECOLOGY's review and approval process in their project timeline.

c) If requested, RECIPIENT shall provide ECOLOGY two (2) final copies and an electronic copy of any tangible products developed.

Copies include any printed materials, and all tangible products developed such as brochures, manuals, pamphlets, videos, audio tapes, CDs, curriculum, posters, media announcements, or gadgets with a message, such as a refrigerator magnet, and any online communications, such as web pages, blogs, and twitter campaigns. If it is not practical to provide a copy, then the RECIPIENT shall provide a description (photographs, drawings, printouts, etc.) that best represents the item.

Any communications intended for public distribution that uses ECOLOGY's logo shall comply with ECOLOGY's graphic requirements and any additional requirements specified in this Agreement. Before the use of ECOLOGY's logo contact ECOLOGY for guidelines.

RECIPIENT shall acknowledge in the communications that funding was provided by ECOLOGY.

20. PROGRESS REPORTING

a) RECIPIENT must satisfactorily demonstrate the timely use of funds by submitting payment requests and progress reports to ECOLOGY. ECOLOGY reserves the right to amend or terminate this Agreement if the RECIPIENT does not document timely use of funds.
b) RECIPIENT must submit a progress report with each payment request. Payment requests will not be processed without a progress report. ECOLOGY will define the elements and frequency of progress reports.
c) RECIPIENT shall use ECOLOGY's provided progress report format.
d) Quarterly progress reports will cover the periods from January 1 through March 31, April 1 through June 30, July 1 through September 30, and October 1 through December 31. Reports shall be submitted within thirty (30) days after the end of the quarter being reported.
e) RECIPIENT must submit within thirty (30) days of the expiration date of the project, unless an extension has been approved by ECOLOGY, all financial, performance, and other reports required by the Agreement and funding program guidelines. RECIPIENT shall use the ECOLOGY provided closeout report format.

21. PROPERTY RIGHTS

a) Copyrights and Patents. When the RECIPIENT creates any copyrightable materials or invents any patentable property under this Agreement, the RECIPIENT may copyright or patent the same but ECOLOGY retains a royalty free, nonexclusive, and irrevocable license to reproduce, publish, recover, or otherwise use the material(s) or property, and to authorize others to use the same for federal, state, or local government purposes.
b) Publications. When the RECIPIENT or persons employed by the RECIPIENT use or publish ECOLOGY information; present papers, lectures, or seminars involving information supplied by ECOLOGY; or use logos, reports, maps, or other data in printed reports, signs, brochures, pamphlets, etc., appropriate credit shall be given to ECOLOGY.
c) Presentation and Promotional Materials. ECOLOGY shall have the right to use or reproduce any printed or graphic materials produced in fulfillment of this Agreement, in any manner ECOLOGY deems appropriate. ECOLOGY shall acknowledge the RECIPIENT as the sole copyright owner in every use or reproduction of the materials.
d) Tangible Property Rights. ECOLOGY's current edition of "Administrative Requirements for Recipients of Ecology Grants and Loans," shall control the use and disposition of all real and personal property purchased wholly or in part with funds furnished by ECOLOGY in the absence of state and federal statutes, regulations, or policies to the contrary, or upon specific instructions with respect thereto in this Agreement.
e) Personal Property Furnished by ECOLOGY. When ECOLOGY provides personal property directly to the RECIPIENT for use in performance of the project, it shall be returned to ECOLOGY prior to final payment by ECOLOGY. If said property is lost, stolen, or damaged while in the RECIPIENT's possession, then ECOLOGY shall be reimbursed in cash or by setoff by the RECIPIENT for the fair market value of such property.
f) Acquisition Projects. The following provisions shall apply if the project covered by this Agreement includes funds for the acquisition of land or facilities:
1. RECIPIENT shall establish that the cost is fair value and reasonable prior to disbursement of funds provided for in this Agreement.
2. RECIPIENT shall provide satisfactory evidence of title or ability to acquire title for each parcel prior to disbursement of funds provided by this Agreement. Such evidence may include title insurance policies, Torrens certificates, or abstracts, and attorney's opinions establishing that the land is free from any impediment, lien, or claim which would impair the uses intended by this Agreement.
g) Conversions. Regardless of the Agreement expiration date, the RECIPIENT shall not at any time convert any equipment, property, or facility acquired or developed under this Agreement to uses other than those for which assistance was originally approved without prior written approval of ECOLOGY. Such approval may be conditioned upon payment to ECOLOGY of that portion of the proceeds of the sale, lease, or other conversion or encumbrance which monies granted pursuant to this Agreement bear to the total acquisition, purchase, or construction costs of such property.

22. RECORDS, AUDITS, AND INSPECTIONS

RECIPIENT shall maintain complete program and financial records relating to this Agreement, including any engineering documentation and field inspection reports of all construction work accomplished.

All records shall:

a) Be kept in a manner which provides an audit trail for all expenditures.

b) Be kept in a common file to facilitate audits and inspections.

c) Clearly indicate total receipts and expenditures related to this Agreement.

d) Be open for audit or inspection by ECOLOGY, or by any duly authorized audit representative of the State of Washington, for a period of at least three (3) years after the final grant payment or loan repayment, or any dispute resolution hereunder.

RECIPIENT shall provide clarification and make necessary adjustments if any audits or inspections identify discrepancies in the records.

ECOLOGY reserves the right to audit, or have a designated third party audit, applicable records to ensure that the state has been properly invoiced. Any remedies and penalties allowed by law to recover monies determined owed will be enforced. Repetitive instances of incorrect invoicing or inadequate records may be considered cause for termination.

All work performed under this Agreement and any property and equipment purchased shall be made available to ECOLOGY and to any authorized state, federal or local representative for inspection at any time during the course of this Agreement and for at least three (3) years following grant or loan termination or dispute resolution hereunder.

RECIPIENT shall provide right of access to ECOLOGY, or any other authorized representative, at all reasonable times, in order to monitor and evaluate performance, compliance, and any other conditions under this Agreement.

23. RECOVERY OF FUNDS

The right of the RECIPIENT to retain monies received as reimbursement payments is contingent upon satisfactory performance of this Agreement and completion of the work described in the Scope of Work.

All payments to the RECIPIENT are subject to approval and audit by ECOLOGY, and any unauthorized expenditure(s) or unallowable cost charged to this Agreement shall be refunded to ECOLOGY by the RECIPIENT.

RECIPIENT shall refund to ECOLOGY the full amount of any erroneous payment or overpayment under this Agreement.

RECIPIENT shall refund by check payable to ECOLOGY the amount of any such reduction of payments or repayments within thirty (30) days of a written notice. Interest will accrue at the rate of twelve percent (12%) per year from the time ECOLOGY demands repayment of funds.

Any property acquired under this Agreement, at the option of ECOLOGY, may become ECOLOGY's property and the RECIPIENT's liability to repay monies will be reduced by an amount reflecting the fair value of such property.

24. SEVERABILITY

If any provision of this Agreement or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision, and to this end the provisions of this Agreement are declared to be severable.

25. STATE ENVIRONMENTAL POLICY ACT (SEPA)

RECIPIENT must demonstrate to ECOLOGY's satisfaction that compliance with the requirements of the State Environmental Policy Act (Chapter 43.21C RCW and Chapter 197-11 WAC) have been or will be met. Any reimbursements are subject to this provision.

26. SUSPENSION

When in the best interest of ECOLOGY, ECOLOGY may at any time, and without cause, suspend this Agreement or any portion thereof for a temporary period by written notice from ECOLOGY to the RECIPIENT. RECIPIENT shall resume performance on the next business day following the suspension period unless another day is specified by ECOLOGY.

27. SUSTAINABLE PRACTICES

In order to sustain Washington's natural resources and ecosystems, the RECIPIENT is fully encouraged to implement sustainable practices and to purchase environmentally preferable products under this Agreement.

a) Sustainable practices may include such activities as: use of clean energy, use of double-sided printing, hosting low impact meetings, and setting up recycling and composting programs.

b) Purchasing may include such items as: sustainably produced products and services, EPEAT registered computers and imaging equipment, independently certified green cleaning products, remanufactured toner cartridges, products with reduced packaging, office products that are refillable, rechargeable, and recyclable, 100% post-consumer recycled paper, and toxic free products.

For more suggestions visit ECOLOGY's web page, Green Purchasing, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Sustainable-purchasing.

28. TERMINATION

a) For Cause

ECOLOGY may terminate for cause this Agreement with a seven (7) calendar days prior written notification to the RECIPIENT, at the sole discretion of ECOLOGY, for failing to perform an Agreement requirement or for a material breach of any term or condition. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

Failure to Commence Work. ECOLOGY reserves the right to terminate this Agreement if RECIPIENT fails to commence work on the project funded within four (4) months after the effective date of this Agreement, or by any date mutually agreed upon in writing for commencement of work, or the time period defined within the Scope of Work.

Non-Performance. The obligation of ECOLOGY to the RECIPIENT is contingent upon satisfactory performance by the RECIPIENT of all of its obligations under this Agreement. In the event the RECIPIENT unjustifiably fails, in the opinion of ECOLOGY, to perform any obligation required of it by this Agreement, ECOLOGY may refuse to pay any further funds, terminate in whole or in part this Agreement, and exercise any other rights under this Agreement.

Despite the above, the RECIPIENT shall not be relieved of any liability to ECOLOGY for damages sustained by ECOLOGY and the State of Washington because of any breach of this Agreement by the RECIPIENT. ECOLOGY may withhold payments for the purpose of setoff until such time as the exact amount of damages due ECOLOGY from the RECIPIENT is determined.

b) For Convenience

ECOLOGY may terminate for convenience this Agreement, in whole or in part, for any reason when it is the best interest of ECOLOGY, with a thirty (30) calendar days prior written notification to the RECIPIENT, except as noted below. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

Non-Allocation of Funds. ECOLOGY's ability to make payments is contingent on availability of funding. In the event funding from state, federal or other sources is withdrawn, reduced, or limited in any way after the effective date and prior to the completion or expiration date of this Agreement, ECOLOGY, at its sole discretion, may elect to terminate the Agreement, in whole or part, or renegotiate the Agreement, subject to new funding limitations or conditions. ECOLOGY may also elect to suspend performance of the Agreement until ECOLOGY determines the funding insufficiency is resolved. ECOLOGY may exercise any of these options with no notification or restrictions, although ECOLOGY will make a reasonable attempt to provide notice.

In the event of termination or suspension, ECOLOGY will reimburse eligible costs incurred by the RECIPIENT through the effective date of termination or suspension. Reimbursed costs must be agreed to by ECOLOGY and the RECIPIENT. In no

event shall ECOLOGY's reimbursement exceed ECOLOGY's total responsibility under the Agreement and any amendments. If payments have been discontinued by ECOLOGY due to unavailable funds, the RECIPIENT shall not be obligated to repay monies which had been paid to the RECIPIENT prior to such termination.
RECIPIENT's obligation to continue or complete the work described in this Agreement shall be contingent upon availability of funds by the RECIPIENT's governing body.

c) By Mutual Agreement
ECOLOGY and the RECIPIENT may terminate this Agreement, in whole or in part, at any time, by mutual written agreement.

d) In Event of Termination
All finished or unfinished documents, data studies, surveys, drawings, maps, models, photographs, reports or other materials prepared by the RECIPIENT under this Agreement, at the option of ECOLOGY, will become property of ECOLOGY and the RECIPIENT shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and other materials.
Nothing contained herein shall preclude ECOLOGY from demanding repayment of all funds paid to the RECIPIENT in accordance with Recovery of Funds, identified herein.

29. THIRD PARTY BENEFICIARY
RECIPIENT shall ensure that in all subcontracts entered into by the RECIPIENT pursuant to this Agreement, the state of Washington is named as an express third party beneficiary of such subcontracts with full rights as such.

30. WAIVER
Waiver of a default or breach of any provision of this Agreement is not a waiver of any subsequent default or breach, and will not be construed as a modification of the terms of this Agreement unless stated as such in writing by the authorized representative of ECOLOGY.

End of General Terms and Conditions

Appendix B

Receiving Water Conditions Assessment – SMAP, Memorandum

Memorandum

To:	Sean Mulderig, City of Washougal
From:	Trista Kobluskie, Cara Donovan, Frank Sottosanto, PE, Otak, Inc.
Copies:	Rob Charles
Date:	March 30, 2022
Subject:	Receiving Water Conditions Assessment - SMAP
Project No.:	20155

1. Introduction and Organization

The Receiving Water Conditions Assessment has been prepared pursuant to the City of Washougal's Phase II National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit and a water quality grant from the Washington Department of Ecology. The assessment generally follows the receiving water conditions assessment steps described in the *Stormwater Management Action Planning Guidance* published by the Washington Department of Ecology in 2019 (2019 SMAP Guidance). The purpose of the Receiving Water Conditions Assessment is to identify basins and receiving waters that could benefit from stormwater management action planning (SMAP). The outcome of this phase is a narrowed list of candidate basins that includes the information needed to support a prioritization process. The ultimate outcome of the process is a SMAP for a priority catchment within the City of Washougal where the City's investments in stormwater retrofits, targeted stormwater management activities, or targeted policies could benefit a receiving water.

The results of this assessment are summarized in this memorandum. Geographic input data and analyses used in or created for this assessment are presented in a web map. The URL is provided in Attachment A to this memorandum, which may be updated if the web map URL changes.

This memorandum is organized as follows:

This project has been funded in part by a grant from Washington State Department of Ecology.

Figures

Tables

Attachment A – Web Map

2. Methodologies

This section describes the methodologies used to assess the receiving waters and assess relative conditions. Assessments have been made using available information from reports, studies, and geographic information systems (GIS) of City of Washougal, Clark County, state agencies, and federal agencies.

2.1. Receiving Water Conditions Assessment Methodology

This section describes the methods used to assess conditions in each receiving water.

Setting and Flow Characteristics

The receiving waters in the City of Washougal are identified using Clark County's watershed delineations. Washougal River and Gibbons Creek watershed boundaries have both been modified for this analysis using the City's storm sewer geographic information system (GIS) and topography. Washougal River Watershed has been extended into Skamania County to its natural topographic boundary. Gibbons Creek Watershed has been modified along the Columbia River to account for new levees and along the Skamania County border based on topography, omitting the Lawton Creek drainage which is included in the County's delineation. In this document, "watershed" refers to an entire basin both within the City of

Washougal and outside of it, while “basin” refers to only the portion of the watershed within Washougal’s City limits.

Clark County's Stormwater Needs Assessment Reports were reviewed for important information about each receiving water. Receiving waters are the result of the physical characteristics of the basin as well as human intervention that has altered the natural characteristics. The characteristics considered for the receiving water assessment are listed and described below.

Information regarding flow characteristics of the receiving waters has been collected largely from the City, Clark County, the US Geological Survey (USGS), and Federal Emergency Management Agency (FEMA) flood insurance studies.

The distribution of soil types influences the flow of surface water and groundwater within a watershed. The assessment uses soil data from the Natural Resources Conservation Service (NRCS). The hydrologic-soil group designations include hydrologic soils groups A, B, C, and D. Generally, group A allows infiltration, soil group B allows for a moderate rate of infiltration, and groups C and D allow limited infiltration and produce more runoff.

Topography plays a large role in defining drainage basins and influences the flow of water within a basin. The assessment uses 5-foot contours from Clark and Skamania Counties. The assessment very generally describes watershed topography.

Changes in land cover from historic forests and prairies to impervious surfaces and lawns impacts streams by directing more runoff to them and changing the timing and duration of their peak flows. Land cover has been collected from the 2019 National Land Cover Dataset (NLCD). To estimate current impervious surfaces within City limits, a National Agriculture Imagery Program (NAIP) raster dataset has been clipped to the City limits and reclassified. Impervious surface coverage is classified by three types (dark roofs, light roofs, and roadways) and combined for analysis.

Stormwater facilities designed to control flow (flow control facilities) in Washougal mitigate some impacts of such land cover changes. Stormwater facilities within City limits are classified as flow control facilities or water quality facilities based on the City’s GIS data. The following facilities are classified as flow control facilities:

- Detention vaults
- Infiltration trenches
- Permeable pavement
- Infiltration planters
- Bio-infiltration planters
- Ponds
- Infiltration rain gardens

Flow control facilities, water quality facilities, outfalls, drywells, stormwater pipes, and ditches are counted and located within each basin to determine whether infrastructure distribution is consistent with land cover and land use.

The City protects wetlands, wetland buffers, critical aquifer recharge areas, geologically hazardous areas, frequently flooded areas, and fish and wildlife habitat conservation areas through its critical areas ordinance (Chapter 16.04). Wetlands and wetland buffers are important to hydrology and water quality

because they reduce the velocity of stormwater and provide a natural filter for sediment and metals. The presence, quality, and location of critical areas in the watershed can be key indicators in understanding the health of the watershed. Presence of critical areas may also affect where development can occur. Critical areas are mapped and listed for each basin.

Stormwater improvement projects can be most easily placed in the public right-of-way and in publicly-owned land. Major public lands in the City limits were collected from the City, Clark County, Washington State, and the federal government.

Water Quality and Aquatic Habitat

Washington State's Department of Ecology's Water Quality Atlas and Washington's Administrative Code have been reviewed for each receiving water's water quality standards. These criteria, outlined in Section 4, are used to assess the health of the surface water for recreation, drinking water, aquatic life, and other uses.

Washington State's Department of Ecology's 2016 Water Quality Assessment has been reviewed for each receiving water. Category 4 and 5 impairments are listed for each watershed. Any total maximum daily loads (TMDL)s or water quality improvement (WQI) projects are listed.

Fish use in each receiving water and contributing waterbodies has been collected from the Northwest Indian Fisheries Commission's Statewide Integrated Fish Distribution webmap.

The location and severity of fish barriers from the Washington Department of Fish and Wildlife's (WDFW) Washington State Fish Passage webmap are described for each stream and tributary.

The Puget Sound Stream Benthos webmap, Ecology's Environmental Information Management System, USGS's Water Quality Data for the Nation, and USGS's Regional Stream Quality Assessment have been reviewed for stream health of the receiving waters. Water quality data is summarized for each watershed in Section 4.

Land use has a significant impact on water quality. The City's zoning was used as a proxy for land use in the City limits. Zoning is classified as polluting or non-polluting for the purpose of this assessment. The areas zoned medium density residential, high density residential, town center, commercial, industrial, and schools/public facilities are classified as land uses that contribute stormwater pollutants such as total suspended solids (TSS), turbidity, and metals. Low-density residential and open spaces/parks are considered non-pollution generating land uses.

Large-scale pervious surfaces can be significant contributors of pollution. Pervious surfaces with areas greater than a city block that receive intensive management have been digitized in GIS by reviewing aerial imagery. Areas with this designation have been confirmed with City staff's knowledge of land management on the identified tracts.

Water quality treatment facilities mitigate the impacts of urban land uses on receiving waters. Stormwater facilities in City limits are classified as flow control facilities or water quality facilities based on the City's GIS data. The following facilities are classified as water quality facilities:

- Bio-infiltration swales
- Filter vaults
- Contech StormFilters

- Bioretention rain gardens

Heavily traveled roadways produce more pollutants in runoff than other land uses. Heavily traveled roadways and highways in the City with an average daily traffic (ADT) greater than 7,500 have been collected from the Southwest Washington Regional Transportation Council.

Environmental Justice and Cultural Review

The Washington Environmental Health Disparities Map (WEHDM) project compares communities for health disparities related to the environment. The map may assist local decision-makers to prioritize public investments where disparities exist. The map shows a "cumulative environmental health impact score for each census tract reflecting pollutant exposures and factors that affect people's vulnerability to environmental pollution" (WEHDM, 2019). Environmental exposures include, but are not limited to, ozone and toxic releases, while factors that affect vulnerability include, but are not limited to, socioeconomic factors and populations with health sensitivities. Impact ranks are calculated relative to other communities in the state and range between 1 and 10, with 10 being communities with the highest impact.

The WEHDM index scores of each census tract and the area of each census tract that falls within a basin have been collected. A weighted average based on the area of each census tract in the basin is calculated with this information. The area weighted averages are included in Section 4 for each basin.

Based on Ecology's SMAP guidance and the City's grant agreement with Ecology, the Environmental Protection Agency's (EPA) Environmental Justice (EJ) Screening was reviewed. The intent of the review was to find inequity and overburdened communities and include those as a factor in prioritizing a receiving water. In the best-case scenario, there would be factors in the EJScreen tool which would present inequity that could be addressed by stormwater solutions. However, the demographic indicators (demographic index, people of color, and low-income data) in Washougal did not significantly distinguish census block groups from one another. Therefore, the Washington Environmental Health Disparities (WEHDM) project has been used for this assessment instead, as described above.

Future analyses in the prioritized basin will include review of cultural resources data available from the Washington State Department of Archaeology and Historic Preservation.

2.2. Relative Conditions Assessment Methodology

The relative conditions assessment includes an assessment of stormwater management influence (SMI) as well as an assessment of historic conditions and current degradation to inform the selection of a basin management strategy. Each assessment process is described further below.

Stormwater Management Influence

The influence of the City's municipal separate storm sewer system (MS4) and land uses on the existing conditions of the receiving waters is assessed based on Step 3 of the 2019 SMAP Guidance, with some guidance derived from *Building Cities in the Rain: Watershed Prioritization for Stormwater Retrofits*, published by the Washington Department of Commerce in 2016. The purpose of stormwater management influence (SMI) is to discover the relative influence that the City's storm system has in maintaining or improving stream or river health. The SMI evaluation in turn informs the selection of a high priority catchment where the SMAP will be applied.

SMI for each basin is qualitatively evaluated based on information in Table 1 and Section 4, Receiving Waters Conditions Assessment Analysis and MS4 Influence. Nine factors are considered. A description of each factor and how it influences the City's SMI score for each receiving water is described below.

SMI - Hydrology Factors

The first factor is whether the receiving water is flow control exempt. A flow control exempt waterbody has a high volume of flow; therefore, the City's MS4 may have little influence on its hydrology. Flow control exempt waters receive a low score and non-flow control exempt receiving waters receive a high score.

The second factor is the percent of the watershed within City limits (Table 1). The City has a higher influence on a stream or river if a significant portion of the watershed is within City limits. This factor is a relative assessment between watersheds. A higher score is assigned to basins where the City controls a larger fraction of the basin.

The third factor is the City's location in the basin (Table 1). The City's location in the basin is an important consideration because if the receiving water is already degraded before it reaches City limits, the City's MS4 may not have a significant impact on its condition.

The fourth factor is impervious surfaces within City limits. Impervious surfaces alter the hydrology of a watershed and can increase the number of pollutants entering a receiving water. The fraction of impervious coverage of each basin within City limits is calculated in Section 4. This factor is a relative assessment between watersheds. A basin with a higher percentage of imperviousness within City limits receives a higher score.

The fifth factor is a relative assessment between impervious land cover mitigated by flow control facilities and drywells. The factor is measured by the density of flow control facilities and drywells per acre of developed surfaces. The number of flow control facilities and drywells in each basin is tabulated in Section 4. The density of these facilities is calculated based on the developed surfaces in the basin using the National Land Cover Dataset (NLCD). Higher scores are given to basins with a lower density of flow control facilities because these may have a larger impact on hydrology in the existing condition.

SMI - Water Quality Factors

The sixth factor is a relative assessment of pollutant-generating land uses within City limits. The fraction of pollutant-generating land uses for each basin is calculated in Section 4. Zoning is used as a proxy for land use, and each zone is categorized as pollutant-generating or non-pollutant-generating. For this assessment, pollutant-generating zoning includes high-density residential, medium-density residential, commercial, industrial, and school/public facilities. A higher score is assigned to a basin with a larger area of pollutant-generating land use because of its influence on water quality under existing conditions.

The seventh factor is the presence of high traffic roadways in the basin. High traffic roads and highways are known to produce more pollutants in runoff. Higher scores are given to basins with high relative area of road with average daily traffic (ADT) greater than 7,500. Area of high ADT roadways for each basin is documented in Section 4.

The eighth factor is large pollutant-generating pervious surfaces within City limits. Large pollutant-generating pervious surfaces are defined as golf courses, ball fields, maintained turf in parks and cemeteries, and manicured private yards exceeding one city block. Locations are identified using visual review of aerial imagery. The fraction of large pollutant-generating pervious surfaces within Ccity limits is calculated in Section 4. Only those identified surfaces that do not overlap pollution-generating land uses

(factor 6) are counted to ensure pollutant-generating areas are not double-counted. A higher score is assigned to a basin with a larger relative area of large pollution-generating pervious surfaces compared to other basins.

The ninth factor is a relative assessment of the density of water quality facilities per acre of pollutant-generating surfaces. Section 4 describes the area of polluting land uses, the area of large pollution-generating pervious surfaces, and the number of water quality treatment facilities in each basin within City limits. Higher scores are given to basins with a lower density of water quality facilities per area of pollutant-generating surfaces because of the impact on water quality in the existing condition.

Basin Management Strategy

The 2019 SMAP Guidance suggests the use of the *Building Cities in the Rain* "Management Matrix for Restoration and Protection" for prioritizing basins suitable for stormwater retrofit investment. A simplified version is shown in *Puget Sound Characterization: Volume 1: the Water Resource Assessments* and is reproduced in Figure 1, below. The matrix allows watersheds to be compared by level of importance and level of degradation and then sorted into one of four management strategies: protection, restoration, conservation, and development.

<table>
<tr><td rowspan="5">IMPORTANCE</td><td>High</td><td colspan="2" rowspan="2">Protection</td><td colspan="2" rowspan="2">Restoration</td></tr>
<tr><td>Med-High</td></tr>
<tr><td>Medium</td><td colspan="2" rowspan="2">Conservation</td><td colspan="2" rowspan="2">Development</td></tr>
<tr><td>Low</td></tr>
<tr><td></td><td>Low</td><td>Medium</td><td>Med-High</td><td>High</td></tr>
<tr><td colspan="5">DEGRADATION</td></tr>
</table>

Figure 1 Watershed Management Matrix, reproduced from Figure 5c (Stanley, S. et. al., 2016)

For the purposes of this plan, importance and degradation are determined qualitatively as described below.

Historic fish use and degree of recovery needed to meet regional fish recovery goals has been used to determine the level of importance of the stream or river (the Y axis of Figure 1). Historic fish use information in the basin is collected from the Lower Columbia Fish Recovery Board (LCFRB) and includes streams in the basin, fish species that were historically present in each, and their quantities. Higher importance of the historic resource is given to waters with a high number of species and high numbers of individuals present in the historic condition. The need for recovery for each fish species is also collected from the LCFRB. The relative need for recovery is based on regional recovery objectives: productive populations, abundant populations, support of multiple life history strategies, and utilization of significant portions of the subbasin. Higher importance is given to waters that require a higher functioning ecosystem to reach the recovery goal.

In order to determine degradation (the X axis of Figure 1), the following factors are considered: urbanization, fish passage barriers, and documented water quality impairments. Urbanization leads to higher imperviousness, which impacts both water flow and water quality in a receiving water. For this assessment, urbanization is calculated as the percentage of developed surfaces in each basin using the National Land Cover Dataset (NLCD) 2019 (see Land Cover Comparison graph for each basin in Section 4). Fish passage barrier data is collected from the Washington Department of Fish and Wildlife's (WDFW) Fish Passage Website. For this analysis, the number of 0-33% passable barriers in the City of Washougal

and downstream until next receiving water are tabulated. These are the most restrictive fish passage barriers and, therefore, prevent or significantly impede anadromous fish from accessing upstream reaches. Finally, water quality impairment information is collected from Ecology's Water Quality Atlas and the Washington State Water Quality Assessment 303(d)/305(b) List database. The presence, severity, and quantity of water quality impairments in the basin are considered and rated qualitatively. Water quality impairments are listed for each basin in Section 4.

Once the levels of importance and degradation for each basin are collected, the basin management strategy is assigned by plotting the results on the Figure 1 matrix. The assigned management strategy is then confirmed by reviewing Clark County's recommended stream health strategies (Clark County, 2010).

The Puget Sound Partnership includes the following list of solutions associated with each of the four management strategies:

- Typical BMPs, habitat improvements, and policies that apply to **all management strategies** include maintaining stream/wetland physical integrity, restoring floodplains and wetlands, restoring riparian zones, and protecting aquifer recharge areas.
- Typical BMPs that apply to the **conservation and the development management strategies** include all of the above plus emphasizing dispersion and on-site infiltration.
- Typical BMPs and policies that apply to the **protection management category** include all of the above plus increasing buffer widths, reducing groundwater withdrawals, reducing interception of shallow groundwater in ditches, and revegetating uplands.
- Typical BMPs that apply to the **restoration management category** include all of the above plus retrofitting structures and roads for greater infiltration, and reconstructing stream reaches or artificial wetlands. (Puget Sound Partnership, 2016).

3. Watershed Inventory

Table 1 lists each receiving water, the watershed area draining to the receiving water, and the fraction of that basin within City limits.

Table 1 Receiving Water Inventory – Watershed Area and Fraction within Washougal

Basin Name	Receiving Waters within Basin	Watershed Area (Acres) [SqMi]	Area inside Washougal (Acres)	Fraction of Watershed within Washougal	Percent of the City Occupied by the Basin
Gibbons	Gibbons Creek; Campen Creek; Steigerwald Lake	7,100 [11]	1,721	24.2%	45%
Washougal	Washougal River	78,880 [123]	1,918	2.4%	50%
Lacamas	Lacamas Creek	42,784 [67]	203	0.5%	5%

4. Receiving Water Conditions Assessment and Relative Conditions Analyses

The purpose of the Receiving Water Assessment is to identify receiving waters that could benefit from stormwater management planning. The outcome of this assessment is a list of candidate basins that includes the information needed to support a prioritization process.

4.1. Gibbons Creek Receiving

The Gibbons Creek Watershed is a largely rural basin in Clark County and water resource inventory area (WRIA) 28. Gibbons Creek drains a total of 11.1 square miles, flowing in a southwesterly direction through southeast Clark County and the City of Washougal before joining the Columbia River east of Washougal.

The main stem of Gibbons Creek flows for approximately eight miles. Roughly 24% of the Gibbons Creek Watershed is located within the City, and it occupies roughly 45% of the City. The stream's entire basin is referred to hereafter as the "Gibbons Creek Watershed." The portion of the stream's drainage basin located within the City limits is referred to hereafter as the "Gibbons Creek Basin."

Flow for the Gibbons Creek Watershed originates northeast of the City limits, near the Clark and Skamania County border. Gibbons Creek has several tributaries, the largest of which is Campen Creek. Gibbons Creek flows through the Steigerwald Lake National Wildlife Refuge before its confluence with the Columbia River. Since the refuge was established, the Columbia River has been cut off by a 5.5 mile levee (Lower Columbia Estuary Partnership, 2022a).

This memorandum presents the highlights of the Receiving Water Assessment for Gibbons Creek. The majority of the assessment is presented in a web map as a series of data layers.

Setting and Flow Characteristics

The total area of the Gibbons Creek Watershed is approximately 7,100 acres (11.1 square miles). The area within the City limits is 1,720 acres (2.7 square miles), or 24% of the watershed. The main streams within the Gibbons Creek Watershed consist of Gibbons Creek (31,730 ft/ 6.0 miles) and its tributary Campen Creek (12,170 ft/ 2.3 miles). The watershed boundary as described by Clark County and in this assessment also includes lands south of Washington State Highway 14 (SR-14) which discharge directly to the Columbia River or to wetlands that are not connected to Gibbons Creek itself. Gibbons Creek flows into the Columbia River east of the City of Washougal. No flow monitoring data was found for Gibbons Creek. However, based on information from the USGS StreamStats application, the 100-year flow is estimated to be 1,040 cubic feet per second (cfs), downstream of the culvert under SR-14.

The stream course downstream of SR-14 was significantly impacted in the 1960s when the Army Corps of Engineers constructed a 5.5-mile long flood control levee along the Columbia River from the Lawton Creek drainage (east of Gibbons) to what is now known as Steamboat Landing Park. In 1992, Gibbons Creek was rerouted west to Port of Camas-Washougal property where a pump system discharged the flows past the levee. This change left a 1.5 mile remnant channel connected to Steigerwald Lake and its wetlands (Ecology, 1996). In recent years, the Steigerwald Floodplain Restoration Project (constructed in 2019-2022) removed portions of the levee along the Columbia River, removed the fish ladder, and constructed two new cross-levees preventing Gibbons Creek from flowing to the Port pump system.

Gibbons Creek was returned to a more natural discharge pathway through the floodplain and then to the Columbia River (Lower Columbia Estuary Partnership, 2022).*

Neither Gibbons nor Campen Creeks are listed as a flow control exempt receiving water based on Appendix I-A of the 2019 Stormwater Management Manual for Western Washington; therefore, the Gibbons Creek Watershed is not flow control exempt.

Washington State Highway 14 (SR-14) and the BNSF Railroad traverse the watershed in an east-west direction, paralleling the Columbia River. The City operates a wastewater treatment plant. The watershed contains a large federal facility, the Steigerwald National Wildlife Refuge (NWR), the William Clark Regional Park (Cottonwood Beach Park), and several city parks.

Slopes are generally very steep in the northern portion of the watershed, with incised valleys that form the tributaries. Slopes remain steep until Gibbons Creek reaches Washington State Highway 14, where slopes decrease significantly (WSDOE, 2013). Elevations range from 1116 ft. at the northern border of the watershed and the lowest elevation is 8 ft at the Columbia River. The highest elevation within the City is 596 ft near the northern border.

The upper areas of Gibbons Creek Watershed outside the City limits, consists of agricultural and rural areas. The southwestern portion of the Gibbons Creek Watershed within the City limits consists of residential, commercial, and industrial areas, including the City's wastewater treatment plant. The southeastern portion of the watershed consists of agricultural and rural areas, as well as lakes and significant wetlands in the Steigerwald National Wildlife Refuge (NWR).

Soils in the watershed include hydrologic soil groups B, C, and D. The northern portion of the watershed (including the northern portion of the City limits) mainly consists of clay soils with a hydrologic soil group C, which is considered poorly to moderately drained soils. Soils near the Evergreen Way and Washington State Highway 14 consist of loam and silt loams, with hydrologic soil group B, which is considered moderately to well drained soils. South of Washington State Highway 14, where the wetlands are located, soils mainly consist of silt loams with a hydrologic soil groups B, C, and C/D, which are considered moderately to well drained soils.

Critical areas within the Gibbons Creek Watershed consist of critical aquifer recharge areas (CARAs), wetland areas, geological hazardous areas (steep slopes), and frequently flooded areas. The CARA are only located within the northern portions of the City limits. Wetlands are located just south of SR-14, concentrated in Steigerwald NWR. Geological hazardous areas with slopes greater than 15% are generally located near Gibbons or Campen Creeks, as well as their tributaries. Frequently flooded areas mainly occur south of SR-14.

The watershed remains nearly 30% forested, while grass covers another 30%, developed surfaces cover about 18%, and remaining land cover is a mix of wetlands, shrub/scrub, and cultivated/open space areas. Areas south of SR-14 and outside City limits have pasture hay, emergent herbaceous wetlands, and cultivated crops. These areas have low imperviousness values. Within the City limits (Gibbons Basin), forest cover is less than 5% while developed surfaces cover more than 60%, and remaining land cover is a mix of wetlands, shrub/scrub, grass, and cultivated/open space areas. Areas within the City limits have open space development, low intensity development (rural areas), and medium/high intensity

* Changes to the Gibbons Creek flow path are so recent that no maps yet show its path.

development (residential, commercial, and industrial). Many neighborhoods in the Campen Creek tributary basin were annexed to the City from unincorporated Clark County and have wider paved rights-of-way than required under City codes. These areas have high imperviousness values.

A comparison of land cover with the watershed and within the City limits can be found in Figure 2 below.

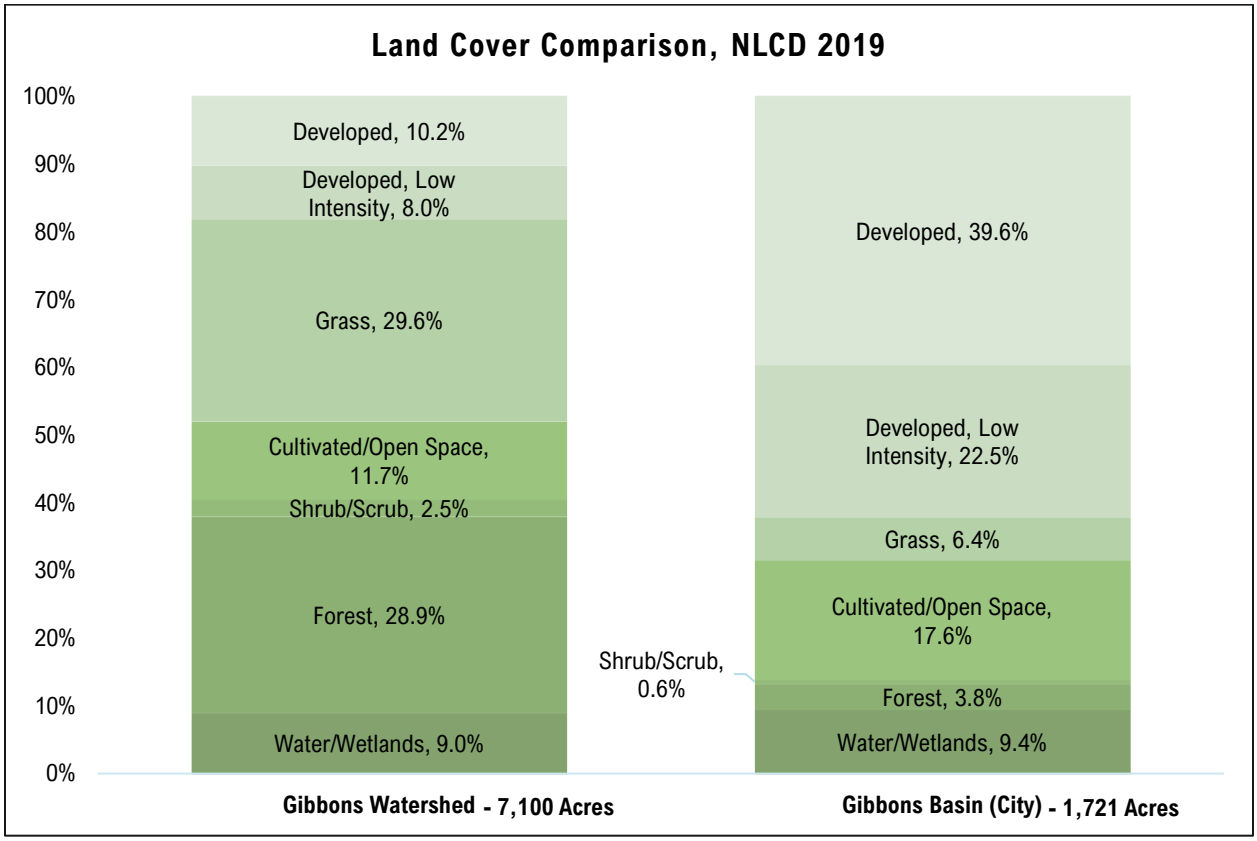

Figure 2 Land Cover Comparison, Gibbons Creek Watershed to Gibbons Creek Basin

Using a different data source (NAIP 2019) and processing technique, impervious surface in the Gibbons Creek Basin is estimated to be 761 acres, or 44% of the basin.

Within City limits, the stormwater infrastructure consists of conveyance pipes, detention ponds water quality facilities, and drywells. In the Campen Creek tributary basin, there are numerous flow control and water quality facilities serving residential subdivisions. Drywells are concentrated in the mid-basin north of Evergreen Way. The storm system outfalls to the tributaries of Gibbons or Campen Creek. Conveyances from industrial areas in the southern portion of the City often discharge directly to wetlands. Table 2 presents stormwater infrastructure counts in Gibbons Creek basin.

Table 2 Gibbons Creek Basin City-Owned and Privately Owned Stormwater Infrastructure

Stormwater Infrastructure	Measure
Outfalls (ea.)	51
Drywells (ea.)	71

Stormwater Infrastructure	Measure
Pipe[1] (ft.)	95,000 (18 miles)
Ditches (ft.)	5,145 (0.97 miles)
Flow control facilities (ea.)	26 of these 56 were installed after 2009 using the latest standards
Water quality facilities (ea.)	29 of these 63 were installed after 2009 using the latest standards

[1] includes all pipe diameters and excludes culverts

Water Quality and Aquatic Habitat

The State of Washington Department of Ecology (Ecology) has set water quality standards for surface waters. These criteria are used to assess the health of the surface water for recreation, drinking water, aquatic life, and other uses. The most stringent designated uses and associated water quality standards are outlined in Table 3 below.

Table 3 Gibbons Creek Designated Uses and Water Quality Standards

Designated Use	Parameter	Water Quality Standard (WAC 173-201A)
Aquatic Life		
Salmonid Spawning, Rearing, and Migration	Temperature	Highest 7-DADMax[1]: 17.5°C (63.5°F)
	DO	Lowest 1-Day Minimum: 8.0 mg/L
	pH	6.5 - 8.5 pH units, with a human-caused variation within the range of less than 0.5 units
	Turbidity	< 5 NTU over background[2] when the background is 50 NTU or less; or a 10% increase in the turbidity when the background turbidity is more than 50 NTU
Recreation		
Primary Contact	Bacteria	Fecal coliform organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within an averaging period exceeding 200 CFU or MPN per 100 mL
		E. coli organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL

[1] 7-DADMax is the arithmetic average of seven consecutive measures of daily maximum temperatures
[2] Background levels are not established for Gibbons Creek

Numerous reaches of Gibbons Creek do not meet water quality standards and are listed by Ecology in its 2016 water quality assessment.† Gibbons Creek upstream of SE Wooding Road in unincorporated Clark County, has a Category 5 listing for temperature and a Category 4A listing for bacteria. Two tributaries in unincorporated Clark County also have water quality listings, one of which is a Category 4A listing for

† While not included in this analysis, there are other water quality listings in the watershed available through the Washington Department of Ecology.

bacteria. The middle reach of Gibbons Creek, upstream of Campen Creek, has four listings, including a Category 5 listing for temperature. Downstream of Campen Creek, Gibbons Creek has three listings, including a Category 5 listing for temperature and a Category 4A listing for bacteria (Ecology, 2016).

The Gibbons Creek Remnant Channel receives wastewater from industrial facilities and stormwater runoff from other facilities (Ecology, 1996), and it has a Category 4A listing for bacteria among other listings (Ecology, 2016; Ecology, 2022).

Campen Creek also has several water quality listings including a Category 5 listing for temperature, a Category 4A listing for bacteria that is associated with the Gibbons Creek Watershed Bacteria TMDL. An unknown tributary to Campen Creek has a Category 4A listing for bacteria (Ecology, 2016; Ecology, 2022).

The Category 4A listings for bacteria are addressed in the Gibbons Creek Watershed Bacteria TMDL (Ecology, 2016; Ecology, 2022).

USGS's Regional Stream Quality Assessment evaluated Gibbons Creek at Evergreen Highway in 2015. Total nitrogen and total phosphorus levels were concerning, although the rest of the samples indicated Gibbons Creek's health is fair.

Using various measurements of macroinvertebrate health in Gibbons Creek, stream health appears to be good. In 2019, Clark County assessed a B-IBI score of 83.7 (excellent) just downstream of the Campen Creek confluence. In 2015, USGS's Regional Stream Quality Assessment evaluated Gibbons Creek at Evergreen Highway in 2015, and found a macroinvertebrate MMI score of 76.15 (good).

According to the Statewide Integrated Fish Distribution (SWIFD) web map, fish species present in Gibbons Creek or Campen Creek include Fall Chum, Coho Salmon, Rainbow Trout, and Winter Steelhead (Northwest Indian Fisheries Commission, 2022). There is only one fish passage barrier upstream of the City of Washougal at the headwaters of a tributary to Gibbons Creek which is not passable (WDFW, 2022).

Water quality in Gibbons Creek Basin is impacted by pollution-generating land uses, large-scale pollution-generating pervious surfaces, and highways with high traffic volumes.

Zoning in the City of Washougal is used as a proxy for land use. Within City limits, Gibbons Creek Basin is dominated by single family housing in the upper portion of the basin, industrial zoning near the Columbia River, and schools/public facilities zoning that is scattered throughout. Other zoning in the basin includes medium density residential, town center, commercial, rural estate, water, parks, open space, and greenway. For the purposes of this assessment, the following zoning categories have been defined as "pollution-generating": high-density residential, medium-density residential, commercial, industrial, and school/public facilities. Pollution-generating land uses make up 46% of the basin (Figure 3).

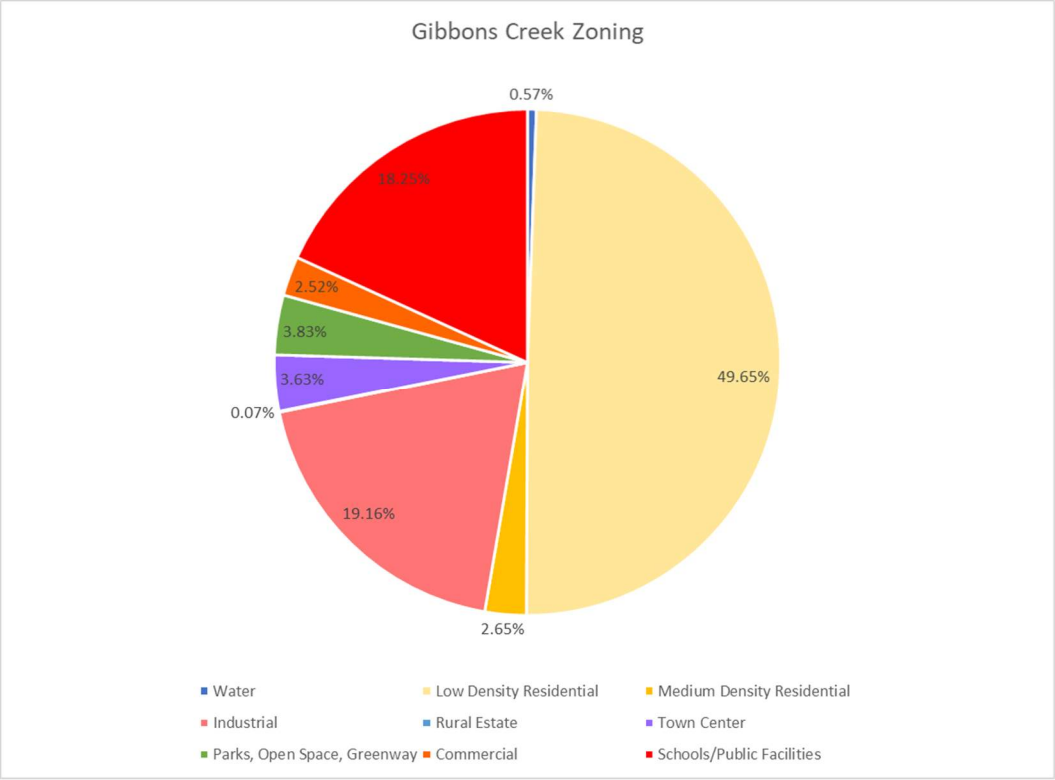

Figure 3 Gibbons Creek Basin Zoning

Several large-scale pollution-generating pervious surfaces are present in the basin, including golf courses, ball fields, parks, and large lawns on private property. Most of these are located within zoning considered pollution-generating and, for the purposes of this assessment, were not counted again. Ten acres of pollution-generating pervious surfaces (0.61% of the basin) are present outside of the pollution-generating zoning.

The roadway in Gibbons Creek Basin with high average daily traffic (ADT) is a portion of SR-14 in the western portion the basin accounting for 4,900 feet of pollution-generating surface‡.

Some pollutant-generating land uses are managed under NPDES Industrial Stormwater General Permits issued to industrial site operators by Department of Ecology. The permit holders are responsible for monitoring, measuring, and reducing stormwater pollution leaving their site. The active Industrial Stormwater General Permits in Gibbons Creek basin are:

- Advanced Drainage Systems Inc (WAR000137); 627 S 37TH ST
- ALLEN BROWN WOODWASTE INC (WAR001811); 3495 TRUMAN RD
- Burlington Environmental LLC Washougal (WAR003079); 625 S 32ND ST
- CALVERT CO INC WASHOUGAL (WAR011365); 3559 S TRUMAN RD
- Corrosion Companies Inc (WAR011162); 3725 S GRANT ST STE 3
- FIBER WEB WASHOUGAL INC (WAR000503); 3720 GRANT ST
- INTECH ENTERPRISES GRANT ST WASHOUGAL (WAR011345); 3825 GRANT ST

‡ High ADT roadway surfaces that overlap with the pollution-generating land uses were subtracted from the area in order to avoid double-counting.

- IP Maintenance Yard (CNE301470); 2197 Index street
- Kemira Chemicals Inc Washougal Plant (WAR001125); 1150 S 35TH ST
- ORBIT INDUSTRIES (WAR001814); 778 S 27TH ST
- Northwest Adhesives (CNE304754); 4325 S Lincoln Street
- Norwesco Inc (WAR304442); 3860 GRANT ST
- PILLER PLASTICS INC GRANT ST (WAR011660); 3925 S GRANT ST
- WASHOUGAL TRANSFER STATION (WAR012022); 4020 S GRANT ST
- FERGUSON INDUSTRIAL PLASTICS (WAR004479); 740 S 28TH ST
- TrueGuard LLC (WA0040029); 725 S 32nd St

Future Development and Improvement Plans

The City expects redevelopment within its Town Center East Village District consisting of higher density housing, auto-oriented retail, and open space. Upcoming redevelopment in the Gibbons Creek Basin will be required to meet current stormwater standards which will mitigate for impervious surfaces by providing flow control and water quality facilities. The City is planning major upgrades to the sewage treatment facility south of SR-14 and a few other capital improvements, including:

- J Street Water Main Installation from 32nd to 34th Street
- 39th Street/Evergreen Way Realignment near the City of Washougal Permit Center
- 32nd Street Underpass Preliminary Design - one component of a significant multi-component economic development and safety project providing improved access to the Port of Camas-Washougal and the growing Washougal Town Center, a much needed grade separated railroad crossing at 32nd Street, new connector streets in the Town Center and road improvements within the Port's industrial park. The underpass will ensure the free-flow of traffic off of SR14 by eliminating the delays at the rail crossing. This project includes a roundabout at 32nd and Main Street, a signal at 32nd Street and Evergreen Way to reduce costs and excavation, a free right turn (that does not stop) from northbound 32nd Street east on Evergreen Way, and a sidewalk and multi-use path to maximize funding support. The 32nd Street underpass also provides for a third BNSF track (which is a required request by the BNSF)
- Hartwood Bridge to install a new bridge over Campen Creek and replace existing abutments

Stormwater Retrofits and Restoration Projects in the Basin

- The collaborative Steigerwald Reconnection Project recently reconnected 965 acres of Columbia River floodplain, reducing flood risk from Gibbons Creek, improving habitat for fish and wildlife, and creating new trails for recreation at the refuge.
- The Lower Columbia Estuary Partnership collaborated with the City to select a stormwater retrofit and restoration site in the Gibbons Creek Basin, focusing particularly on the Campen Creek tributary drainage. The site, currently a ditch in the right-of-way along Washougal High School's parking lot, plans to provide treatment and flow control for the entire South parking lot.
- 32nd Street will be widened; however, cost barriers may prevent additional stormwater management projects from being included

Environmental Justice

To show the relative environmental health disparity of the Gibbons Creek basin, an area-weighted average of the combined index scores of 19 factors from 4 census tracts was calculated. Overall, the environmental health disparities indices in the basin are between 3 and 9, which is low to high. The area-weighted average of the combined index scores for Gibbons Creek basin is 5.7. This indicates that the community in the Gibbons Creek basin ranks moderately high according to the risk from environmental factors that influence health outcomes.

Relative Conditions Assessment

The relative conditions assessment includes an assessment of stormwater management influence (SMI) as well as an assessment of historic conditions and current degradation to inform the selection of a basin management strategy.

Stormwater Management Influence

The influence of the City's land uses and stormwater system (Stormwater Management Influence (SMI)) on Gibbons Creek is estimated qualitatively using the following factors and findings (Table 4). The analysis relies on selected elements that have been described above in the Receiving Water Assessment. The assessment includes influence on both hydrology and water quality and is relative to other basins in the City. Factors are listed in descending order of those that most describe the City's influence on receiving water conditions. The percentage of the watershed within the City limits is included in both the hydrology and water quality assessments.

Table 4 SMI Assessments for Gibbons Creek

SMI Parameter	Assessment Theory	Gibbons Creek Basin Characteristics	Assessment
Hydrology			
Flow Control Exempt	A flow control exempt waterbody has a high volume of flow; therefore, the City can have little influence on its hydrology. Flow control exempt receiving waters receive a low score and non-flow control exempt receiving waters receive a high score.	Gibbons Creek is not flow control exempt	High
Percent of Watershed in City Limits	This factor is a relative assessment between watersheds that indicates the amount of the basin that falls within the City limits. A higher percentage within the City results in a higher score.	24% of the watershed is in the City	High
Location of City within Watershed	The location of the City in the watershed dictates the influence the City can have on hydrology. A City at the headwaters has high influence and receives a high score while a City near the mouth has a low influence and receives a low score.	The City is located at the lower reaches of Gibbons Creek while nearly the entire Campen Creek tributary, including most of its headwaters, is within the City	Medium
Impervious Surfaces	This factor is a relative assessment between watersheds, where the basin with the higher percentage of imperviousness will receive the higher score.	761 of 1,721 acres, or 44%	High

SMI Parameter	Assessment Theory	Gibbons Creek Basin Characteristics	Assessment
Density of Flow Control Facilities and Drywells Per Acre of Developed Surfaces	This indicates what level of the developed surfaces in the basin is being managed by flow control facilities. A low density of flow control facilities will receive a high score and a high density of flow control facilities will receive a low score relative to other basins.	56 flow control facilities plus 71 drywells (127) and 682 acres developed surfaces, or 0.186 facilities/acre	Low
Influence on Hydrology			**High**
Water Quality			
Percent of Watershed in City Limits	This factor is a relative assessment between watersheds that indicates the amount of the basin that falls within the City limits. A higher percentage within the City results in a higher score.	24% of the watershed is in the City	High
Pollution-Generating Land Use	This factor is a relative assessment between watersheds of pollution-generating land use in the basin within City limits. A high percent of pollution-generating land use in the basin will receive a high score and a low percentage of pollution-generating land use in the basin will receive a low score.	790 of 1,721 acres, or 46%	High
Roadways with High Traffic Volumes	This factor is a relative assessment of high traffic volumes in the basin within City limits. A high score is assigned to a basin with a higher length of roadways with a high AADT of 7,500 or greater and a low score is assigned to a basin with a low number of roadways with a high AADT of 7,500 or greater relative to other basins. Only segments that do not overlap pollution-generating land uses are counted.	4,908 linear feet (Estimated width of SR-14 is 22 feet per lane for an area of 107,976 square feet)	Medium
Large Pollution-Generating Pervious Surfaces	This factor is a relative assessment of large pollution-generating pervious surfaces. A high score is assigned to a basin with a large area of large pollution-generating pervious surfaces and a low score is assigned to a basin with a small area of large pollution-generating pervious surfaces relative to other basins. Only those that do not overlap pollution-generating land uses are counted.	36 of 1,721 acres, or 2.1%	High

SMI Parameter	Assessment Theory	Gibbons Creek Basin Characteristics	Assessment
Density of Water Quality Facilities Per Acre of Pollution-Generating Land Use and Large Pervious Surfaces	This indicates what level of the pollution-generating land use and large pervious surfaces in the basin is being managed by water quality facilities. A high score is assigned to a basin with a lower density of water quality facilities per area of pollution-generating land uses, and a low score is assigned to a basin with a higher density of water quality facilities per area of pollution-generating land uses relative to other basins.	63 water quality facilities and 826 acres of pollution-generating land use plus large pollution-generating pervious surfaces, or 0.076 facilities/acre	Medium
Influence on Water Quality			**High**

Basin Management Strategy

The basin management strategy for Gibbons Creek has been established using several factors described in Table 5.

Table 5 Factors Used to Select a Basin Management Strategy for Gibbons Creek Basin

		Gibbons Creek
Importance	**Historic Fish Use**	High
	Explanation	The Lower Gorge Tributaries are part of the Columbia Lower Subbasin as defined by the NPPC (Figure O1). The primary streams are Gibbons Creek, Lawton Creek, Duncan Creek, Hardy Creek, and Hamilton Creek. These streams historically supported abundant winter steelhead, chum, coho, and fall chinook. (LCFRB, Vol. II - Ch. O, Lower Columbia Gorge Tribs, p. 4)
	Need For Recovery	High
	Explanation	Lower Gorge Tributaries winter steelhead and coho will need to be restored to a high level of viability, chum to a very high level of viability, and fall Chinook to a medium level of viability to meet regional recovery objectives. This means that the populations are productive, abundant, exhibit multiple life history strategies, and utilize significant portions of the subbasin. (LCFRB, Vol. II - Ch. O, Lower Columbia Gorge Tribs, p. 4-5)
Degradation	**Urbanization**	High
	Explanation	Developed surfaces make up 39.6% of the land cover in the Gibbons Creek Basin.
	Fish Passage Barriers	Low
	Explanation	There are no 0-33% passable barriers in the City and downstream until next receiving water.
	Water Quality Impairments	High
	Explanation	There are 6 Category 4A and 3 Category 5 water quality impairments in the receiving water and tributaries within City limits or downstream of Washougal.

Given the high importance and high degradation of the Gibbons Creek Basin, the selected basin management strategy is restoration.

The restoration management goal requires the highest level of investment for returning an important and degraded watershed to a more functional system. The Puget Sound Partnership includes the following list of solutions associated with each of the four management strategies:

- Typical BMPs and habitat improvements and policies that apply to **all management strategies** include maintaining stream/wetland physical integrity, restoring floodplains and wetlands, restoring riparian zones, and protecting aquifer recharge areas.
- Typical BMPs that apply to the **conservation and the development management strategies** include all of the above plus emphasizing dispersion and on-site infiltration.
- Typical BMPs and policies that apply to the **protection management category** include all of the above plus increasing buffer widths, reducing groundwater withdrawals, reducing interception of shallow groundwater in ditches, and revegetating uplands.
- Typical BMPs that apply to the **restoration management category** include all of the above plus retrofitting structures and roads for greater infiltration, and reconstructing stream reaches or artificial wetlands. (Puget Sound Partnership, 2016).

Clark County assessed Gibbons Creek in its 2010 Clark Count Stream Health Report and recommended the following actions for improving the health of receiving waters in the Gibbons Basin: stream health strategies include conserving agricultural lands and promoting healthy practices; working with property owners to eliminate pollution sources; increasing infiltration and retention of stormwater runoff in developed areas; and restoring riparian vegetation in lower watershed (particularly along Steigerwald channel) (Clark County, 2010)

Conclusion

Nearly 25% of the Gibbons Creek Watershed is within City limits, and the City has a relatively high influence over both hydrology and water quality compared to other receiving waters in its jurisdiction. The Gibbons Creek Watershed is important for fish recovery and is degraded, as evidenced by several water quality impairments and a TMDL for bacteria. Several other agencies have recently or are planning to focus efforts to improving conditions in Gibbons Creek, Steigerwald Lake, and Campen Creek.

Therefore, the Gibbons Creek Basin is a likely candidate for Stormwater Management Action Planning.

4.2. Washougal River

The Washougal River Watershed is a largely rural basin in Skamania and Clark Counties and WRIA 28. Washougal River drains a total of 123 square miles, flowing in a southwesterly direction through southwest Skamania County, southeast Clark County, and the City of Washougal before joining the Columbia River in Camas, Washington.

The main stem of Washougal River flows for approximately 47 miles from Lookout Mountain in the Gifford Pinchot National Forest. Roughly 2.4% of the Washougal River Watershed is located within the City of Washougal, and it occupies roughly 50% of the City's area. The river's entire basin is referred to hereafter as the "Washougal River Watershed." The portion of the river's drainage basin located within the City limits is referred to hereafter as the "Washougal River Basin."

Flow for the Washougal River Watershed originates northeast of the City limits, in southwestern Skamania County. Washougal River has several tributaries, the largest of which are the West Fork Washougal River, Little Washougal River, and Lacamas Creek.

This memorandum presents the highlights of the Receiving Water Assessment for Washougal River. The majority of the assessment is presented in a web map as a series of data layers.

Setting and Flow Characteristics

The total area of the Washougal River Watershed is approximately 78,880 acres (123.2 square miles). The area of the Washougal River Watershed that is within the City limits is 1,918 acres (3.0 square miles), or 2.4% of the watershed. The main tributaries are the Little Washougal River (50,500 ft/9.56 miles), which enters from the north just 0.6 miles northeast of City limits at SE Blair Road, Cougar Creek, which enters from the north at N. Bon Road in Clark County, the West Fork Washougal River (59,400 ft/ 11.25 miles), which enters from the north between Skye and Northfork Roads in Skamania County, and Lacamas Creek (88,705 ft/16.8 miles), which enters from the north in Camas. Within City limits, five small unnamed tributaries flow south from the bluffs south of SE 30th Street to the Washougal River. Each of these tributaries drains a basin of less than one square mile and is highly modified, flowing through a combination of piped and open channel segments. The Washougal River flows into the Columbia River in Camas, just west of Washougal.

A stream gage is located on the main stem approximately 3.7 miles upstream of the confluence with the Little Washougal River. Based on the results from Clark County Flood Insurance Study, the 100-year flow is estimated to be 30,138 cfs at the stream gage and 56,672 cfs at the mouth of the Washougal River (FEMA, 2018).

The Washougal River is not listed as a flow control exempt receiving water based on Appendix I-A of the *2019 Stormwater Management Manual for Western Washington*; therefore, the Washougal River Watershed is not flow control exempt. However, its estimated 100-year flow at the mouth is higher than the estimated flow at the mouth of the East Fork Lewis River (26,900 cfs (FEMA, 2018) in Clark and Cowlitz counties, which has a similar watershed area and is listed as a flow control exempt water body.

Washington State Highway 14 (SR-14) and the BNSF Railroad traverse the watershed in an east-west direction, paralleling the Columbia River. The Washougal River Road follows the mainstem through the City, into Clark County, past Washougal River State Park, and into Skamania County until it reaches state Department of Natural Resources (DNR) lands in the upper watershed. The Port of Camas-Washougal is a significant landholder in the City and neighboring City of Camas.

Slopes are generally very steep in the upper watershed, with steep forested valleys that form hundreds of tributaries. Elevations range from 3790 ft. at the northern border of the watershed to 10 ft. at the Columbia River. Within City limits, slopes are steep north of the river and flatten south of the river. The highest elevation within the City is 620 ft just south of SE 30th Street.

Soils in the watershed include hydrologic soil groups B and C. Soils in the northeastern watershed in unincorporated Skamania and Clark counties includes clay loam and gravelly loam soils with a hydrologic soil group B. Soils just north of the City limits include clay loams with hydrologic soil group C. Within City limits, soils north of the river are clay loams, with hydrologic soil group C, and soils south of the river are clay loams and gravelly loams with a hydrologic soil group B. All major soil groups noted here are considered well drained.

Critical areas within the Washougal River Watershed include critical aquifer recharge areas (CARAs), wetlands, geological hazard areas (steep slopes), and frequently flooded areas. The CARAs are located within City limits, in close proximity to the Washougal River and areas south of the Washougal River.

Wetlands are located in close proximity to the Washougal River and along the Columbia River. Geological hazard areas with slopes greater than 15% are generally located near the Washougal River, as well as its tributaries. The geological hazard areas are more frequent upstream of the Washougal River. Frequently flooded areas mainly occur south of SR-14 and in areas in close proximity to the Washougal River. Critical areas in Skamania County were not assessed.

According to the National Land Cover Dataset (NLCD) 2019, the watershed remains nearly 70% forested, while grass covers another 10%, developed surfaces cover about 4%, and remaining land cover is a mix of wetlands, shrub/scrub, and cultivated/open space areas. Areas north of the City limits have pasture/hay, forests, shrub/scrub and grasslands. These areas have low imperviousness values. Within the City limits (Washougal River Basin), forest cover is less than 10% while developed surfaces cover more than 60%, and remaining land cover is a mix of wetlands, shrub/scrub, grass, and cultivated/open space areas. Areas within the City limits have open space development, low intensity development (rural areas), and medium/high intensity development (residential, commercial, and industrial). These areas have high imperviousness values. (NLCD, 2019)

A comparison of land cover with the watershed and within the City limits can be found in Figure 4 below.

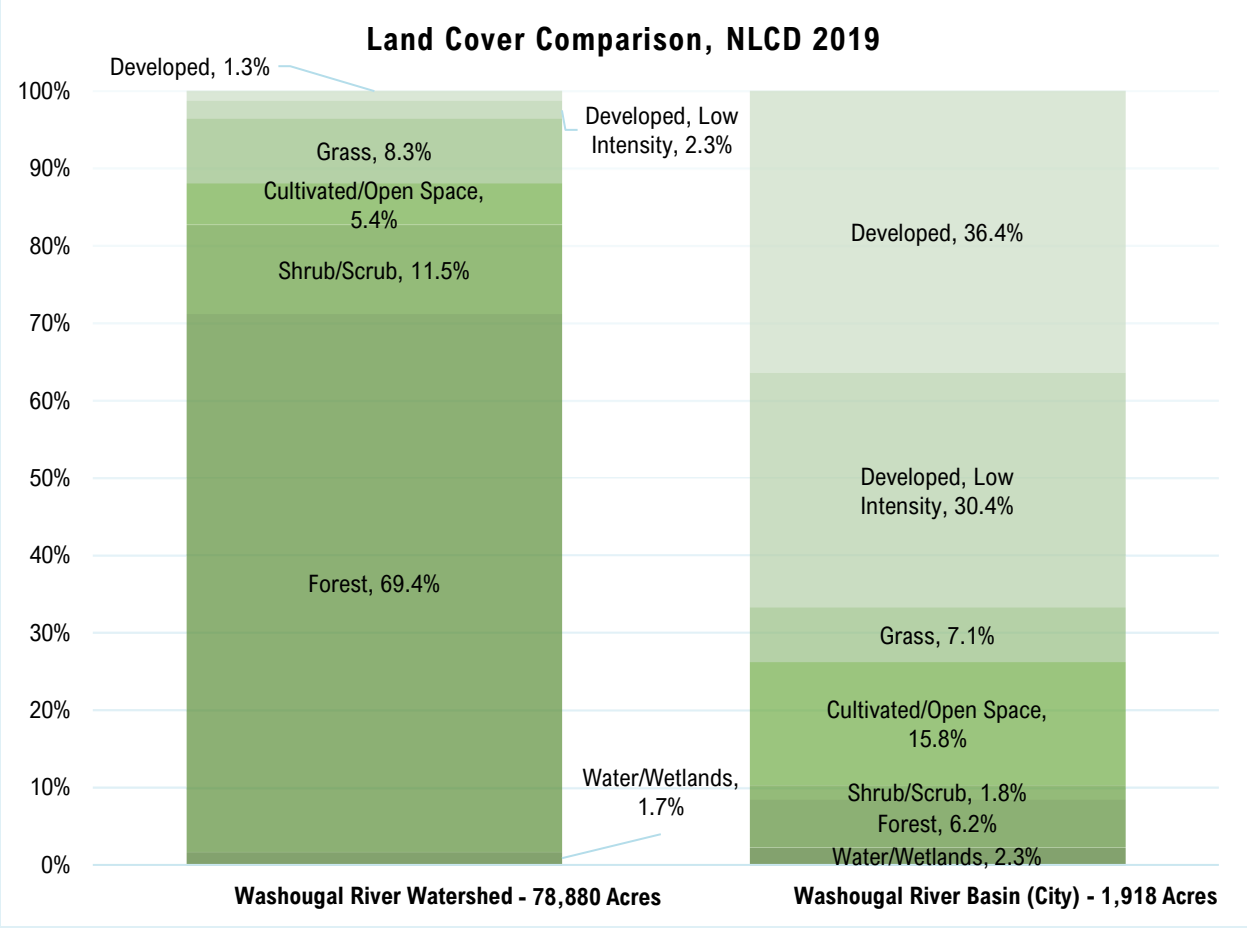

Figure 4 Land Cover Comparison, Washougal River Watershed to Washougal River Basin

Using a different data source (NAIP 2019) and processing technique, impervious surface in the Washougal River Basin is estimated to be 852 acres, or 44% of the basin.

Within City limits, the stormwater infrastructure consists of conveyance pipes, detention ponds, water quality facilities, and drywells. Drywells are concentrated in the southern portion of the City limits, south of the Washougal River. The storm system outfalls to the Washougal River. Table 6 presents stormwater infrastructure counts in the Washougal River Basin.

Table 6 Washougal River Basin City-Owned and Privately Owned Stormwater Infrastructure

Stormwater Infrastructure	Measure
Outfalls (ea.)	38
Drywells (ea.)	142
Pipe[1] (ft.)	110,770 (21 miles)
Ditches (ft.)	12,481 (2.36 miles)
Flow control facilities (ea.)	33 of these 202 were installed after 2009 using the latest standards
Water quality facilities (ea.)	43 of these 76 were installed after 2009 using the latest standards

[1] includes all pipe diameters and excludes culverts

Water Quality and Aquatic Habitat

The State of Washington Department of Ecology (Ecology) has set water quality standards for surface waters. These criteria are used to assess the health of the surface water for recreation, drinking water, aquatic life, and other uses. The most stringent designated uses and associated water quality standards are outlined in Table 7 below.

Table 7 Washougal River Designated Uses and Water Quality Standards

Receiving Water	Designated Use	Parameter	Water Quality Standard (WAC 173-201A)
Washougal River: Downstream from latitude 45.5883, longitude -122.3711 at NE 3rd Ave	**Aquatic Life**		
	Salmonid Spawning, Rearing, and Migration	Temperature	Highest 7-DADMax[1]: 17.5°C (63.5°F)
		DO	Lowest 1-Day Minimum: 8.0 mg/L
		pH	6.5 - 8.5 pH units, with a human-caused variation within the range of less than 0.5 units
		Turbidity	< 5 NTU over background[2] when the background is 50 NTU or less; or a 10% increase in the turbidity when the background turbidity is more than 50 NTU
	Recreation		
	Primary Contact	Bacteria	Fecal coliform organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within an averaging period exceeding 200 CFU or MPN per 100 mL

Receiving Water	Designated Use	Parameter	Water Quality Standard (WAC 173-201A)
			E. coli organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL
Washougal River: Upstream from latitude 45.5883, longitude -122.3711 at NE 3rd Ave, including tributaries	**Aquatic Life**		
	Salmonid Spawning, Rearing, and Migration	Temperature	Highest 7-DADMax1: 16°C (60.8°F)
		Supplemental Spawning	Salmon and trout (13°C (55.4 °F)) from 2/15 to 6/15
		DO	Lowest 1-Day Minimum: 9.5 mg/L
		pH	6.5 - 8.5 pH units, with a human-caused variation within the range of less than 0.2 units
		Turbidity	< 5 NTU over background[2] when the background is 50 NTU or less; or a 10% increase in the turbidity when the background turbidity is more than 50 NTU
	Recreation		
	Primary Contact	Bacteria	Fecal coliform organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within an averaging period exceeding 200 CFU or MPN per 100 mL
			E. coli organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL

[1] 7-DADMax is the arithmetic average of seven consecutive measures of daily maximum temperatures
[2] Background levels are not established for Washougal River

Numerous reaches of Washougal River do not meet water quality standards and are listed by Ecology in its 2016 water quality assessment.§ Outside of City limits and upstream of the Little Washougal River confluence, Washougal River has a Category 5 listing for temperature. Slightly upstream of the Clark-Skamania County border, there are two listings for Washougal River, one of which is a Category 5 listing for bacteria. Stebbins Creek is a tributary to the Washougal River near the headwaters. An unnamed tributary to Stebbins Creek has a Category 5 listing for temperature (Ecology, 2016).

§ While not included in this analysis, there are other water quality listings in the watershed available through the Washington Department of Ecology.

Using measurements of macroinvertebrate health in the upper Washougal River Watershed, stream health appears to be good. In 2020, the Washington State Department of Ecology assessed a B-IBI score of 79.8 (good) approximately six miles from the headwaters of Washougal River in Skamania County. In 2019, Clark County assessed stream health at the mouth of Cougar Creek, a tributary to Washougal River north of Washougal City limits. The B-IBI score was assessed to be 67.3 (good).

According to the Statewide Integrated Fish Distribution (SWIFD) web map, fish species present in Washougal River include fall chum, fall Chinook salmon, coho salmon, rainbow trout, summer steelhead, winter steelhead, coastal cutthroat trout, eastern brook trout, largemouth bass, mountain whitefish, and Native char/Dolly Varden/bull trout (Northwest Indian Fisheries Commission, 2022). According to WDFW, there are 12 fish passage barriers on the Washougal River, both man-made and natural. The barriers on the main stem of the Washougal River are upstream of Washougal. There are 80 additional fish passage barriers on various tributaries in the watershed that range from 0% passable to 99% passable (WDFW, 2022).

Water quality in the Washougal River Basin is impacted by pollution-generating land uses, large-scale pollution-generating pervious surfaces, and highways with high traffic volumes.

Zoning in the City of Washougal is used as a proxy for land use. Within City limits, Washougal River Basin is dominated by single family housing in the upper portion of the basin, industrial zoning near the Columbia River, commercial and town center zoning near the center of the basin, and schools/public facilities zoning that is scattered throughout. Other zoning in the basin includes urban high density residential, water, parks, and open space. For the purposes of this assessment, the following zoning categories have been defined as “pollution-generating”: high-density residential, medium-density residential, commercial, industrial, and school/public facilities. Pollution-generating land uses make up 30% of the basin (Figure 5).

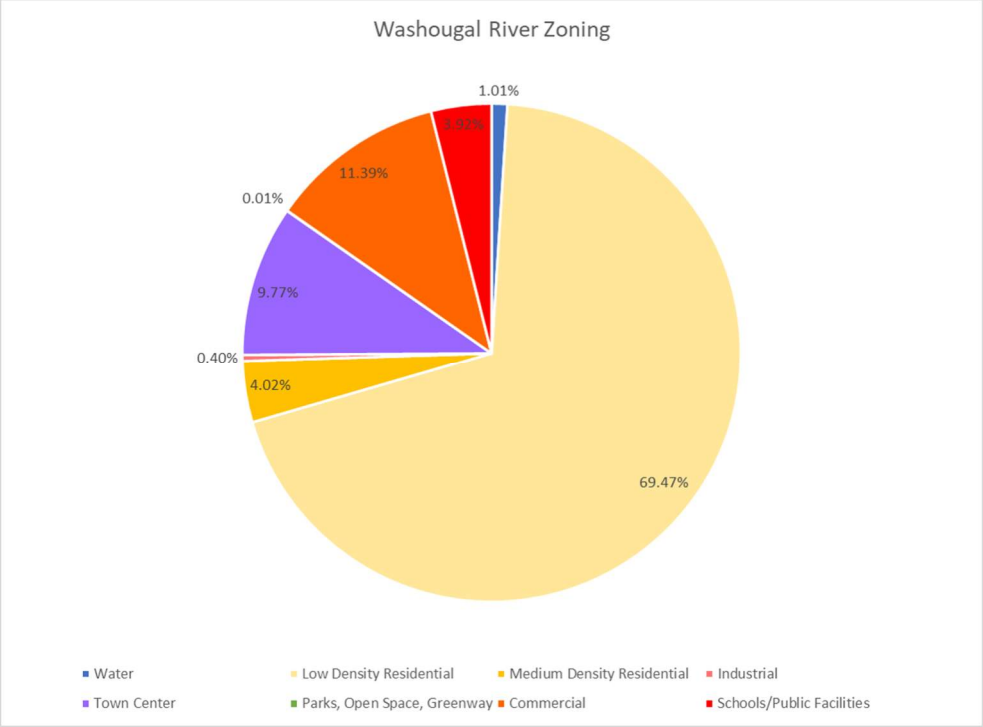

Figure 5 Washougal River Basin Zoning

Several large-scale pollution-generating pervious surfaces are present in the basin, including ball fields, parks, and large lawns on private property. Most of these are located within zoning considered pollution-generating and, for the purposes of this assessment, were not counted again. 27 acres of pollution-generating pervious surfaces (1.41% of the basin) are present outside of the pollution-generating zoning.

The roadway in Washougal River Basin with high average daily traffic (ADT) is SR-14 in the western portion of the basin. Each direction of travel is a total 9,527.5 feet in length and an estimate average width of 22 feet was applied to each direction of travel for SR-14. Therefore, the high ADT roadways in the basin account for 419,210 square feet of pollution-generating surface.

Some pollutant-generating land uses are managed under NPDES Industrial Stormwater General Permits issued by Department of Ecology. These permit holders are responsible for monitoring, measuring, and reducing stormwater pollution leaving their site. The active Industrial Stormwater General Permit in Washougal River basin is:

- PENDLETON WOOL MILL (WAR005577); 2 Pendleton Way

Future Development and Improvement Plans

The City expects redevelopment within its Town Center East Village District consisting of higher density housing, auto-oriented retail, and open space. The Port of Camas-Washougal is investing in significant development on the Columbia River waterfront including commercial, retail, mixed use, residential, and community spaces. Upcoming redevelopment in the Washington River Basin will be required to meet current stormwater standards which will mitigate for impervious surfaces by providing flow control and water quality facilities. The City is planning a few capital improvements including:

- Wastewater Pump Station #1 Relocation
- Wastewater Pump Station #2, #4, #5, and #8 Upgrades
- East County Family Resource Center Maintenance and Repair Project
- Schmid Family Park on the river may be developed in the near future, however, cost barriers may prevent the project from moving forward

Stormwater Retrofits and Restoration Projects in the Basin

- No upcoming or recent retrofits or restoration projects were identified in the City limits.
- There are several stormwater projects in the Washougal River Basin on the City's stormwater repairs and replacements list. If this basin is prioritized, these projects and other localized drainage concerns would be incorporated into future water quality and water flow capital improvement projects (CIPs) in the SMAP where possible.

Environmental Justice

To show the relative environmental health disparity of the Washougal River basin, an area-weighted average of the combined index scores of 19 factors from 6 census tracts was calculated. Overall, the environmental health disparities indices in the basin are between 3 and 9, which is low to high. The area-weighted average of the combined index scores for Gibbons Creek basin is 5.4. This indicates that the community in the Washougal River basin ranks moderate according to the risk from environmental factors that influence health outcomes.

Relative Conditions Assessment

The relative conditions assessment includes an assessment of stormwater management influence (SMI) as well as an assessment of historic conditions and current degradation to inform the selection of a basin management strategy.

Stormwater Management Influence

The influence of the City's land uses and stormwater system (Stormwater Management Influence (SMI)) on Washougal River is estimated qualitatively using the following factors and findings. The analysis relies on selected elements that have been described above in the Receiving Water Assessment. The assessment includes influence on both hydrology and water quality and is relative to other basins in the City (Table 8). Factors are listed in descending order of those that most describe the City's influence on receiving water conditions. The percentage of the watershed within the City limits is included in both the hydrology and water quality assessments.

Table 8 SMI Assessment for Washougal River

SMI Parameter	Assessment Theory	Washougal River Basin Characteristics	Assessment
Hydrology			
Flow Control Exempt	A flow control exempt waterbody has a high volume of flow; therefore, the City can have little influence on its hydrology. Flow control exempt receiving waters receive a low score and non-flow control exempt receiving waters receive a higher score.	Washougal River is not flow control exempt; however, its estimated 100-year discharge is greater than flow control exempt rivers with a similar watershed area	Medium
Percent of Watershed in City Limits	This factor is a relative assessment between watersheds that indicates the amount of the basin that falls within the City limits. A higher percentage within the City results in a higher score.	2.4% of the watershed is in the City	Low
Location of City within Watershed	The location of the City in the watershed dictates the influence the City can have on hydrology. A City at the headwaters has high influence and receives a high score while a City near the mouth has a low influence and receives a low score.	The City is located at the lower reaches of Washougal River	Low
Impervious Surfaces	This factor is a relative assessment between watersheds, where the basin with the higher percentage of imperviousness within City limits will receive the higher score.	852 of 1,918 acres, or 44%	High
Density of Flow Control Facilities and Drywells Per Acre of Developed Surfaces	This factor is a relative assessment that indicates what level of the developed surfaces in the basin within City limits is being managed by flow control facilities. A low density of flow control facilities will receive a high score and a high density of flow control facilities will receive a low score relative to other basins.	202 flow control facilities plus 142 drywells (344) and 698 acres developed surfaces, or 0.493 facilities/acre	Medium
Influence on Hydrology			**Low**

SMI Parameter	Assessment Theory	Washougal River Basin Characteristics	Assessment
Water Quality			
Percent of Watershed in City Limits	This factor is a relative assessment between watersheds that indicates the amount of the basin that falls within the City limits. A higher percentage within the City results in a higher score.	2.4% of the watershed is in the City	Low
Pollution-Generating Land Use	This factor is a relative assessment between watersheds of pollution-generating land use in the basin within City limits. A high percent of pollution-generating land use in the basin will receive a high score and a low percentage of pollution-generating land use in the basin will receive a low score.	567 of 1,918 acres, or 30%	Medium
Roadways with High Traffic Volumes	This factor is a relative assessment of high traffic volumes in the basin within City limits. A high score is assigned to a basin with a higher length of roadways with a high AADT of 7,500 or greater and a low score is assigned to a basin with a low number of roadways with a high AADT of 7,500 or greater relative to other basins. Only segments that do not overlap pollution-generating land uses are counted.	419,210 square feet	High
Large Pollution-Generating Pervious Surfaces	This factor is a relative assessment of large pollution-generating pervious surfaces. A high score is assigned to a basin with a large area of large pollution-generating pervious surfaces and a low score is assigned to a basin with a small area of large pollution-generating pervious surfaces relative to other basins. Only those that do not overlap pollution-generating land uses are counted.	45 of 1,918 acres, or 2.3%	High
Density of Water Quality Facilities Per Acre of Pollution-Generating Land Use and Large Pervious Surfaces	This factor is a relative assessment that indicates what level of the pollution-generating land use and large pervious surfaces in the basin within City limits is being managed by water quality facilities. A high score is assigned to a basin with a low density of water quality facilities per area of pollution-generating land uses, and a low score is assigned to a basin with a higher density of water quality facilities per area of pollution-generating land uses relative to other basins.	76 water quality facilities and 567 acres of pollution-generating land use plus large pollution-generating pervious surfaces, or 0.134 facilities/acre	Low
Influence on Water Quality			**Medium**

Basin Management Strategy

The basin management strategy for Washougal River has been selected using several factors described in Table 9.

Table 9 Factors Used to Select a Basin Management Strategy for Washougal River Basin

Washougal River		
Importance	Historic Fish Use	High
	Explanation	The Washougal River is one of twelve major Northwest Power and Conservation Council (NPCC) subbasins in the Washington portion of the Lower Columbia Region. The subbasin historically supported thousands of fall Chinook, chum, coho, and summer and winter steelhead. (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 4)
	Need For Recovery	High
	Explanation	Today, numbers of naturally spawning salmon and steelhead have plummeted to levels far below historical numbers. Chinook, coho, chum, and steelhead have been listed as threatened under the Endangered Species Act. Washougal River fall Chinook, and chum, will need to be restored to a high level of viability and coho and steelhead will need to be restored to a medium viability level to meet regional recovery objectives. (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 4)
Degradation	Urbanization	Medium
	Explanation	Developed surfaces make up 36.4% of the land cover in the Washougal River Basin.
	Fish Passage Barriers	Low
	Explanation	There are no 0-33% passable barriers in the City or downstream until next receiving water.
	Water Quality Impairments	Low
	Explanation	There are no Category 4A or 5 water quality impairments in the receiving water and tributaries within City limits or downstream of Washougal.

Given the high importance and moderate degradation of the Washougal River Basin, the selected basin management strategy is protection.

The protection management goal requires some of the highest levels of investment for maintaining a functional system. The Puget Sound Partnership includes the following list of solutions associated with each of the four management strategies:

- Typical BMPs, habitat improvements, and policies that apply to **all management strategies** include maintaining stream/wetland physical integrity, restoring floodplains and wetlands, restoring riparian zones, and protecting aquifer recharge areas.
- Typical BMPs that apply to the **conservation and the development management strategies** include all of the above plus emphasizing dispersion and on-site infiltration.
- Typical BMPs and policies that apply to the **protection management category** include all of the above plus increasing buffer widths, reducing groundwater withdrawals, reducing interception of shallow groundwater in ditches, and revegetating uplands.

- Typical BMPs that apply to the **restoration management category** include all of the above plus retrofitting structures and roads for greater infiltration, and reconstructing stream reaches or artificial wetlands. (Puget Sound Partnership, 2016).

Clark County assessed the Washougal River in its 2010 Clark County Stream Health Report and recommended the following actions for improving the health of receiving waters in the Washougal River Basin: stream health strategies include conserving agricultural lands and promoting healthy practices; implementing development regulations to minimize impacts, particularly from clearing and grading; protecting and restoring stream channels and riparian forest in tributary streams; and minimizing the impact of surface and groundwater withdrawals in tributary streams (Clark County, 2010).

Conclusion

Only 2.4% of the Washougal River Watershed is within City limits, and the City is located in the lower watershed. About 2/3 of the watershed is located in Skamania County, with significant tracts dedicated to agriculture and forestry. Tributaries within City limits each drain less than one square mile and may not be perennial. In addition, much of the City's downtown drains to drywells, thereby avoiding surface outfalls to the river. City of Washougal has a low influence on hydrology and a low or moderate influence on water quality compared to other receiving waters in its jurisdiction. The Washougal River Watershed is important for fish recovery and is moderately degraded, as evidenced by a few water quality impairments. No significant ongoing or future retrofit or restoration efforts were located for the Washougal River Watershed.

The Washougal River Basin may be a candidate for Stormwater Management Action Planning because it makes up 50% of the City's land area. However, the large size of the watershed may limit the City's ability to significantly influence receiving water conditions through stormwater management actions alone.

4.3. Lacamas Creek

The Lacamas Creek Watershed is a largely rural basin in Clark County and WRIA 28. Lacamas Creek drains a total of 67 square miles, flowing in a southeasterly direction from south of the City of Battle Ground through central Clark County and the City of Camas before joining the Washougal River approximately 1.3 miles upstream of the mouth.

The main stem of Lacamas Creek flows for approximately 24 miles. Roughly 0.5% of the Lacamas Creek Watershed is located within the City of Washougal, and it occupies roughly 5% of the City's area. The creek's entire basin is referred to hereafter as the "Lacamas Creek Watershed." The portion of the creek's drainage basin located within the City limits is referred to hereafter as the "Lacamas Creek Basin."

Flow for the Lacamas Creek Watershed originates northwest of the City limits, in central Clark County. Lacamas Creek has several tributaries, the largest of which are Fifth Plain Creek, East Fork Lacamas Creek, and Matney Creek. It flows through the regionally significant Lacamas Lake as well as Round Lake before reaching City of Washougal.

This memorandum presents the highlights of the Receiving Water Assessment for Lacamas Creek. The majority of the assessment is presented in a web map as a series of data layers.

Setting and Flow Characteristics

The total area of the Lacamas Creek Watershed is approximately 42,784 acres (66.9 square miles). The area of the Lacamas Creek Watershed that is within the City limits is 203 acres (0.32 square miles), or

0.5% of the watershed. Approximately, 5,300 acres (8 square miles) is within City of Camas, 1,700 acres (2.7 square miles) is within City of Vancouver, and the remaining area is in unincorporated Clark County.

Lacamas Creek is the main stream in the watershed (126,720 ft/24.0 miles), with numerous significant tributaries. The primary tributaries are Fifth Plain Creek (36,200 ft/ 6.86 miles), which enters Lacamas Creek from the north 7 miles northwest of City limits near the intersection of SR-500 and NE 182nd Avenue, Shanghai Creek (28,740 ft/5.44 miles), which is a tributary to Fifth Plain Creek, Matney Creek (23,670 ft/4.48 miles), North Fork Lacamas Creek (13,835 ft/ 2.62 miles), and East Fork Lacamas Creek (16,620 ft/ 3.14 miles).

Clark County designates the following nine sub-watersheds within the Lacamas Creek Watershed:

- Lacamas Lake
- Dwyer Creek
- Lower Lacamas Creek
- Upper Lacamas Creek
- Matney Creek
- Lower Fifth Plain Creek
- Shanghai Creek
- China Ditch
- Upper Fifth Plain Creek

City of Washougal is located in the Lacamas Lake sub-watershed. Neither Lacamas Creek nor any of its major tributaries flow within City limits. Lacamas Creek flows through the regionally significant Lacamas Lake, Round Lake, and Lacamas Park before passing near the City of Washougal and flowing into the Washougal River in the City of Camas. The levels of both Lacamas Lake and Round Lake are controlled by two dams on Round Lake, which are owned by the City of Camas.

Flows in the Lacamas Creek Watershed are relatively stable and are not flashy (Clark County, 2011). No stream gages were identified along Lacamas Creek. Based on information from the USGS StreamStats application, the 100-year flow is estimated to be 7,330 cfs at the mouth of Lacamas Creek.

Lacamas Creek is not listed as a flow control exempt receiving water based on Appendix I-A of the *2019 Stormwater Management Manual for Western Washington*; however, Lacamas Lake is listed as a flow control exempt receiving water. All areas draining directly to Lacamas Lake are flow control exempt.

The watershed is large with several important roads and highways. SR-500 traverse the watershed in a southeast-northwest direction north and west of City of Washougal. Within or near City limits, public roads include SE Crown Road and SE 23rd Street.

Slopes are generally steep in the upper northeast watershed, with grades ranging from 15%-25% near Lacamas Creek and tributaries while the northwestern watershed near Hockinson is nearly flat, with grades ranging from 0%-5%. Slopes become less steep south of NE 53rd Avenue. The areas near the mouth of Lacamas Creek including Lacamas Park and Lacamas Creek Park are geologically hazardous areas with slopes greater than 25% and have historic and active landslides according to Clark County data. Slopes within the City limits include slopes that are greater than 25%. Elevations range from 2,200 ft. at the northern border of the watershed to 12 ft. at the mouth of Lacamas Creek. The highest elevation within the City is 620 ft just south of SE 23rd Street.

Soils in the watershed include hydrologic soil groups B and C. Soils in the majority of the watershed includes clay loam with hydrologic soil group C. There are some large areas in the western edges of the watershed (near Mill Plain), and areas north of Lacamas Lake that include gravelly loam with hydrological soil group B. Within City limits, there is near an even mixture of clay loams, with hydrologic soil group C, and gravelly loams with a hydrologic soil group B. All major soil groups noted here are considered moderately well drained.

Critical areas within the Lacamas Creek Watershed include, wetlands, geological hazard areas (steep slopes), and frequently flooded areas. Wetlands are located in close proximity to the Lacamas Lake, Lacamas Creek and tributaries to Lacamas Creek. Geological hazard areas with slopes greater than 15% are generally located in the northern portions of the watershed north of NE 53rd Avenue, and in areas near the mouth of Lacamas Creek, that include Lacamas Park and Lacamas Creek Park are areas with slopes greater than 25% and have historic and active landslides. Geological hazard areas also include portions in the City limits include slopes that are great than 15%.

According to the National Land Cover Dataset (NLCD) 2019, the Lacamas Creek watershed remains nearly 33% forested, while grass covers another 25%, developed surfaces cover about 20%, and remaining land cover is a mix of wetlands, shrub/scrub, and cultivated/open space areas.

Areas within unincorporated Clark County are largely pasture/hay, forests, shrub/scrub and grasslands. These areas have low imperviousness values. Medium intensity development is present in and near City of Vancouver at the western border of the watershed. Areas within the City of Camas mainly consist of low and medium intensity developments, pasture/hay, some forested and wetland areas. Within the Washougal City limits (Lacamas Creek Basin), grass cover is 63%, while developed surfaces are 25%, and remaining land cover is cultivated/open space areas, forests, and shrub/scrub (NLCD, 2019). A comparison of land cover with the watershed and within the City limits can be found in Figure 6 below.

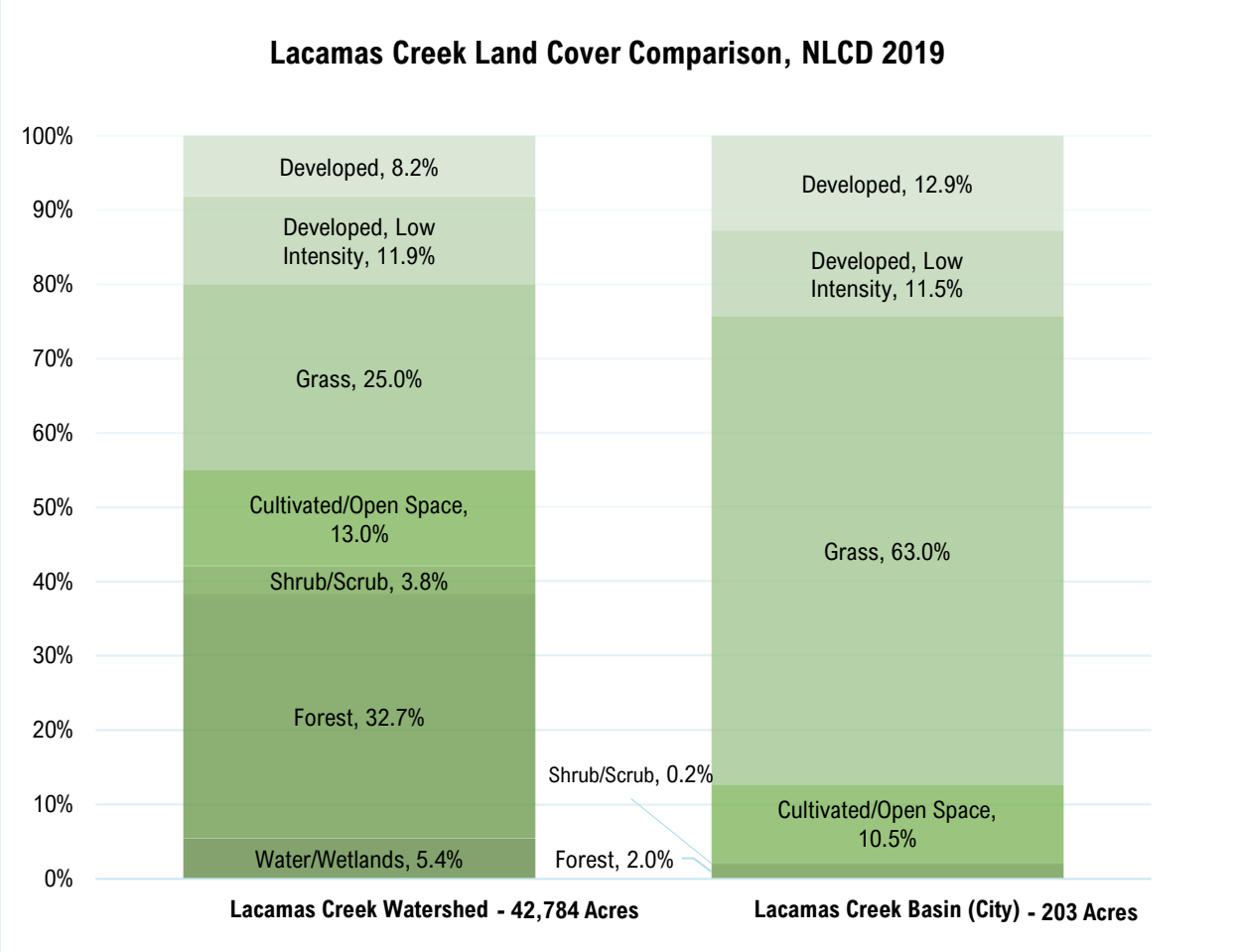

Figure 6 Land Cover Comparison, Lacamas Creek Watershed to Lacamas Creek Basin

Using a different data source (NAIP 2019) and processing technique, impervious surface in the Lacamas Creek Basin is estimated to be 54 acres, or 27% of the basin.

Within City limits, the stormwater infrastructure consists of conveyance pipes, detention ponds, and water quality facilities. The storm system outfalls to vegetated natural areas without defined channels. Table 10 presents stormwater infrastructure counts in the Lacamas River Basin.

Table 10 Lacamas River Basin City-Owned and Privately Owned Stormwater Infrastructure

Stormwater Infrastructure	Measure
Outfalls (ea.)	6
Drywells (ea.)	0
Pipe[1] (ft.)	10,433 (2.00 miles)
Ditches (ft.)	688 (0.13 miles)
Flow control facilities (ea.)	14, All installed after 2009 using the latest standards
Water quality facilities (ea.)	7, All were installed after 2009 using the latest standards

[1] includes all pipe diameters and excludes culverts

Water Quality and Aquatic Habitat

The State of Washington Department of Ecology (Ecology) has set water quality standards for surface waters. These criteria are used to assess the health of the surface water for recreation, drinking water, aquatic life, and other uses. The most stringent designated uses and associated water quality standards are outlined in Table 11 below.

Table 11 Lacamas Creek Designated Uses and Water Quality Standards

Designated Use	Parameter	Water Quality Standard (WAC 173-201A)
Aquatic Life		
Salmonid Spawning, Rearing, and Migration	Temperature	Highest 7-DADMax[1]: 17.5°C (63.5°F)
	DO	Lowest 1-Day Minimum: 8.0 mg/L
	pH	6.5 - 8.5 pH units, with a human-caused variation within the range of less than 0.5 units
	Turbidity	< 5 NTU over background[2] when the background is 50 NTU or less; or a 10% increase in the turbidity when the background turbidity is more than 50 NTU
Recreation		
Primary Contact	Bacteria	Fecal coliform organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within an averaging period exceeding 200 CFU or MPN per 100 mL
		E. coli organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL

[1] 7-DADMax is the arithmetic average of seven consecutive measures of daily maximum temperatures
[2] Background levels are not established for Lacamas Creek

Numerous reaches of Lacamas Creek do not meet water quality standards and are listed by Ecology in its 2016 water quality assessment (Ecology, 2016). Lacamas Lake, Round Lake, and tributaries to Lacamas Creek also have water quality listings. Category 5 listings for these waterbodies are presented in Table 12.** Ecology is currently developing a multi-parameter water quality improvement project for Lacamas Creek.

** While not included in this analysis, there are other water quality listings in the watershed available through the Washington Department of Ecology.

Table 12 Lacamas Creek Watershed Water Quality Listings

Waterbody (Location)	Category 5 Parameter
Lacamas Creek (Downstream of Matney Creek, at the crossing of SR-500)	Temperature Dissolved oxygen
Lacamas Creek (Upstream of Matney Creek)	Temperature Dissolved oxygen
Lacamas Creek (Immediately upstream of Lacamas Lake)	Temperature Dissolved oxygen Bacteria
Lacamas Creek (Downstream of Round Lake)	Temperature Dissolved oxygen pH
Lacamas Lake	Total phosphorus
Round Lake	Dissolved oxygen pH
Lacamas Creek Tributaries	
Dwyer Creek	Dissolved oxygen
Matney Creek	pH Dissolved oxygen Temperature Bacteria
Shanghai Creek	pH Dissolved oxygen Temperature
Fifth Plain Creek	Dissolved oxygen Temperature Bacteria Bioassessment
China Ditch	Dissolved oxygen Temperature
China Lateral	Dissolved oxygen Temperature

Using various measurements of macroinvertebrate health in Lacamas Creek Watershed, stream health appears to be fair. In 2017, Clark County assessed a B-IBI score of 36.1 (poor) at a sampling site slightly upstream of Lacamas Lake and a B-IBI score of 70.4 (good) at a sampling site slightly downstream of Camp Bonneville. Clark County also assessed several tributaries to Lacamas Creek. Matney Creek has a B-IBI score of 72 (good) based on data gathered at a sampling site slightly upstream of Lacamas Creek in 2019. Shanghai Creek has a B-IBI score of 78.8 (good) based on data gathered by Clark County in 2017. China Ditch Creek has a B-IBI score of 47.7 (fair) based on data gathered by Clark County in 2017. Finally, stream health of Fifth Plain Creek appears to be fair. There were two sampling locations, one site slightly upstream of Lacamas Creek and another site slightly upstream of Shanghai Creek which have B-IBI scores of 58.7 (fair) and 45.4 (fair), respectively.

The health of Lacamas Lake is affected by nutrients, and Clark County Public Health closes recreation sites on the lake each year due to toxic algae blooms.

According to the Statewide Integrated Fish Distribution (SWIFD) web map, fish species present in Lacamas Creek include fall Chinook salmon, coho salmon, rainbow trout, winter steelhead, coastal cutthroat trout, largemouth bass, and mountain whitefish (Northwest Indian Fisheries Commission, 2022). According to WDFW, there are 7 fish passage barriers on Lacamas Creek, both man-made and natural ranging from 0% passable to 99% passable. The barriers are not in the City of Washougal. There are 13 additional fish passage barriers on various tributaries and in Lacamas Lake that range from 0% passable to 99% passable (WDFW, 2022).

The Lacamas Creek Basin has few pollution-generating land uses and neither large-scale pollution-generating pervious surfaces nor highways with high traffic volumes.

Zoning in the City of Washougal is used as a proxy for land use. Within City limits, Lacamas Creek Basin is dominated by single family housing in the majority of the basin and schools/public facilities zoning in the southern portion of the basin. For the purposes of this assessment, the following zoning categories have been defined as “pollution-generating”: high-density residential, medium-density residential, commercial, industrial, and school/public facilities. Pollution-generating land uses make up 1% (2 acres) of the basin (Figure 7).

Some pollutant-generating land uses are managed under NPDES Industrial Stormwater General Permits issued by Department of Ecology. The permit holders are responsible for monitoring, measuring, and reducing stormwater pollution leaving their site. There are no active Industrial Stormwater General Permits in the Lacamas Creek Basin.

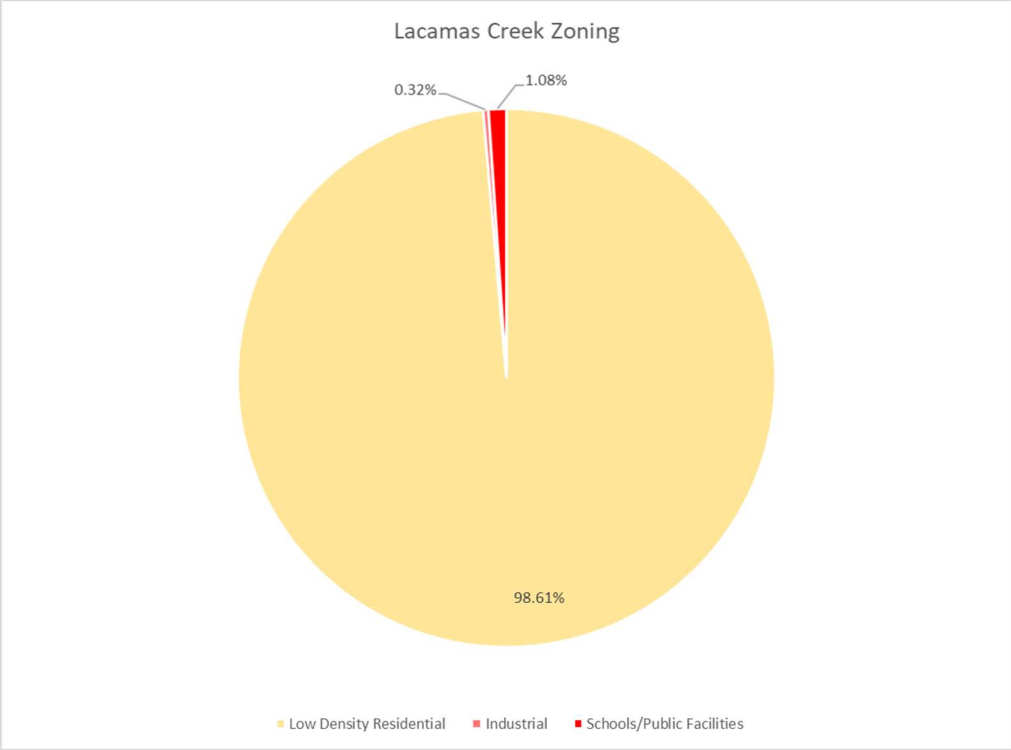

Figure 7 Lacamas Creek Basin Zoning

Future Development and Improvement Plans

Within the Lacamas Creek Basin, approximately 140 acres of the City's Northwest Urban Grown Area (UGA) has been annexed since 2017. The area is currently undergoing residential development of these former agricultural and rural lands, and the City expects available land to be developed within the next five to ten years. The City's critical areas ordinances may preserve small portions of this area as wetland (in the northeast corner downstream of Price Reservoir (in unincorporated Clark County)). The area also contains a severe erosion hazard area and potential unstable slopes as mapped by Clark County. Within the basin, approximately 90 acres of urban growth area (UGA) remain.

Significant development is expected to take place in the Lacamas Creek Watershed in City of Camas. The most notable development is a recent City of Camas annexation of largely undeveloped land on the north side of Lacamas Lake (City of Camas, 2022c). Currently, land use in this area consists of agriculture and single-family residences. The City of Camas subarea plan will be completed in 2022. The subarea plan will outline a plan for 140 acres of publicly held land along the shoreline, acquired by the City of Camas and Clark County's Legacy Land Program, and 670 acres of privately-owned land which is currently zoned largely for business parks and multifamily residential use.

Generally, Clark County is a fast growing county, and the unincorporated areas within Lacamas Creek Watershed are subject to development under Clark County's Comprehensive Plan. In upper Lacamas Creek Watershed Clark County accepted ownership of a private military post called Camp Bonneville in 2011. A master plan is anticipated in 2022 which will identify land uses. "Currently the county is implementing a forest management plan that uses selective thinning to create a healthy forest ecosystem that supports a diversity of plants and animals" (Clark County Public Works, 2021). The County and project partners intend to explore opportunities to preserve high-value riparian and upland areas along the extensive network of small streams in the project area.

In Clark County's Natural Areas Acquisition Plan, a 115-acre acquisition is planned in 2022 (Clark County Public Works, 2021). The acquisition will include the high point of Green Mountain and the area connecting Green Mountain to the Lacamas Prairie Natural Area. Another acquisition is planned for 2025 which will add 50 acres to the Lacamas Prairie Natural Area for wet meadow restoration.

The City of Camas is developing a Lacamas Lake Management Plan which will include Lacamas Lake, Round Lake, and Fallen Leaf Lake which is expected to be completed in 2023. The plan will identify goals and identify how to improve water quality and protect desired conditions of the lakes. The City of Camas will work towards objectives by "characterizing the lakes' water quality, identifying and quantifying the nutrient sources that are affecting the lakes, and evaluating potential management measures" (City of Camas, 2022b).

Stormwater Retrofits and Restoration Projects in the Basin

- The City of Camas is supporting a dam improvement project which will provide mechanical upgrade improvements to two Lacamas Lake dams. The project will also remove unnecessary equipment and conduct a hydraulic analysis (City of Camas, 2022a).

Environmental Justice

To show the relative environmental health disparity of the Lacamas Creek Basin, an area-weighted average of the combined index scores of 19 factors from 2 census tracts was calculated. Overall, the environmental health disparities indices in the basin are between 3 and 4, which is low to moderate. The

area-weighted average of the combined index scores is 3.2. This indicates that the community in the Lacamas Creek basin ranks low according to the risk from environmental factors that influence health outcomes.

Relative Conditions Assessment

The relative conditions assessment includes an assessment of stormwater management influence (SMI) as well as an assessment of historic conditions and current degradation to inform the selection of a basin management strategy.

Stormwater Management Influence

The influence of the City's land uses and stormwater system (Stormwater Management Influence (SMI)) on Lacamas Creek is estimated qualitatively using the following factors and findings. The analysis relies on selected elements that have been described above in the Receiving Water Assessment. The assessment includes influence on both hydrology and water quality and is relative to other basins in the City (Table 13). Factors are listed in descending order of those that most describe the City's influence on receiving water conditions. The percentage of the watershed within the City limits is included in both the hydrology and water quality assessments.

Table 13 SMI Assessment for Lacamas Creek

SMI Parameter	Assessment Theory	Lacamas Creek Basin Characteristics	Assessment
Hydrology			
Flow Control Exempt	A flow control exempt waterbody has a high volume of flow; therefore, the City can have little influence on its hydrology. Flow control exempt receiving waters receive a low score and non-flow control exempt receiving waters receive a higher score.	Lacamas Creek is not flow control exempt; however, Lacamas Lake is flow control exempt upstream of the City.	High
Percent of Watershed in City Limits	This factor is a relative assessment between watersheds that indicates the amount of the basin that falls within the City limits. A higher percentage within the City results in a higher score.	0.5% of the watershed is in the City	Low
Location of City within Watershed	The location of the City in the watershed dictates the influence the City can have on hydrology. A City at the headwaters has high influence and receives a high score while a City near the mouth has a low influence and receives a low score.	The City is located at the lower reaches of the Lacamas Creek Watershed and no waterbodies are located in the City.	Low
Impervious Surfaces	This factor is a relative assessment between watersheds, where the basin with the higher percentage of imperviousness within City limits will receive the higher score.	54 of 203 acres, or 27%	Low
Density of Flow Control Facilities and Drywells Per Acre of Developed Surfaces	This factor is a relative assessment that indicates what level of the developed surfaces in the basin within City limits is being managed by flow control facilities. A low density of flow control facilities will receive a high score and a high density of flow control facilities will receive a low score relative to other basins.	14 flow control facilities plus 0 drywells (14) and 26 acres developed surfaces, or 0.538 facilities/acre	Low

SMI Parameter	Assessment Theory	Lacamas Creek Basin Characteristics	Assessment
Influence on Hydrology			**Low**
Water Quality			
Percent of Watershed in City Limits	This factor is a relative assessment between watersheds that indicates the amount of the basin that falls within the City limits. A higher percentage within the City results in a higher score.	0.5% of the watershed is in the City	Low
Pollution-Generating Land Use	This factor is a relative assessment between watersheds of pollution-generating land use in the basin within City limits. A high percent of pollution-generating land use in the basin will receive a high score and a low percentage of pollution-generating land use in the basin will receive a low score.	2 of 203 acres, or 1%	Low
Roadways with High Traffic Volumes	This factor is a relative assessment of high traffic volumes in the basin within City limits. A high score is assigned to a basin with a higher length of roadways with a high AADT of 7,500 or greater and a low score is assigned to a basin with a low number of roadways with a high AADT of 7,500 or greater relative to other basins. Only segments that do not overlap pollution-generating land uses are counted.	N/A	Low
Large Pollution-Generating Pervious Surfaces	This factor is a relative assessment of large pollution-generating pervious surfaces. A high score is assigned to a basin with a large area of large pollution-generating pervious surfaces and a low score is assigned to a basin with a small area of large pollution-generating pervious surfaces relative to other basins. Only those that do not overlap pollution-generating land uses are counted.	N/A	Low
Density of Water Quality Facilities Per Acre of Pollution-Generating Land Use and Large Pervious Surfaces	This factor is a relative assessment that indicates what level of the pollution-generating land use and large pervious surfaces in the basin within City limits is being managed by water quality facilities. A high score is assigned to a basin with a low density of water quality facilities per area of pollution-generating land uses, and a low score is assigned to a basin with a higher density of water quality facilities per area of pollution-generating land uses relative to other basins.	7 water quality facilities and 203 acres of pollution-generating land use, or 0.034 facilities/acre	High
Influence on Water Quality			**Low**

Basin Management Strategy

The basin management strategy has been selected using several factors described in Table 14.

Table 14 Factors Used to Select a Basin Management Strategy for Lacamas Creek Basin

Lacamas Creek		
Importance	Historic Fish Use	Medium
	Explanation	The Washougal River is one of twelve major NPCC subbasins in the Washington portion of the Lower Columbia Region. The subbasin historically supported thousands of fall Chinook, chum, coho, and summer and winter steelhead. (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 4) Focal salmonid species in Washougal River watersheds include fall Chinook, summer and winter steelhead, chum and coho. (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 13) For this analysis, it is assumed anadromous fish species historically present were only able to access the lower reaches of Lacamas Creek due to natural barrier called Lower Falls which WDFW states currently ends anadromous access to upper portions of Lacamas Creek (WDFW, 2022)
	Need For Recovery	Medium
	Explanation	Today, numbers of naturally spawning salmon and steelhead have plummeted to levels far below historical numbers. Chinook, coho, chum, and steelhead have been listed as threatened under the Endangered Species Act. (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 4) Recovery goals call for restoring fall Chinook, and chum populations to a high or better viability level. This level will provide for a 95% or better probability of population survival over 100 years. Coho and steelhead will be restored to a moderate or better level of viability or a 75 to 95% probability of persistence over 100 years. (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 77) A spawning ground survey in 2000 found one chum salmon in Lacamas Creek (LCFRB, Vol. II - Ch. N, North Washougal Subbasins, p. 18). Although LCFRB describes the need for recovery to a high level of viability, it is assumed that only the lower reaches of Lacamas Creek will be available for anadromous fish use. Therefore, a “medium” value has been selected for Need for Recovery.
Degradation	Urbanization	Low
	Explanation	Developed surfaces make up 12.9% of the land cover in the Lacamas Creek Basin.
	Fish Passage Barriers	Low
	Explanation	There are no 0-33% passable barriers in the City or downstream of the City.
	Water Quality Impairments	Medium
	Explanation	There are no Category 4A water quality impairments and 3 Category 5 water quality impairments in the receiving water and tributaries within City limits or downstream of Washougal.

Given the moderate importance and moderate degradation of the Lacamas Creek Basin, the selected basin management strategy is conservation.

The conservation management goal requires some investment in maintaining the integrity of existing natural resources in a watershed. The Puget Sound Partnership includes the following list of solutions associated with each of the four management strategies:

- Typical BMPs, habitat improvements, and policies that apply to **all management strategies** include maintaining stream/wetland physical integrity, restoring floodplains and wetlands, restoring riparian zones, and protecting aquifer recharge areas.
- Typical BMPs that apply to the **conservation and the development management strategies** include all of the above plus emphasizing dispersion and on-site infiltration.
- Typical BMPs and policies that apply to the **protection management category** include all of the above plus increasing buffer widths, reducing groundwater withdrawals, reducing interception of shallow groundwater in ditches, and revegetating uplands.
- Typical BMPs that apply to the **restoration management category** include all of the above plus retrofitting structures and roads for greater infiltration, and reconstructing stream reaches or artificial wetlands. (Puget Sound Partnership, 2016).

Clark County assessed the Lacamas Watershed in its 2010 Clark County Stream Health Report and recommended the following actions for improving the health of receiving waters in the Lacamas Creek Watershed: stream health strategies include protecting remaining forested areas in upper watershed and Camp Bonneville; restoring stream channels and riparian forests; increasing infiltration and retention of stormwater runoff from older developments; implementing development regulations to minimize impacts, particularly enhanced nutrient control regulations to protect Lacamas Lake; and conserving agricultural lands and promoting healthy practices (Clark County, 2010).

Conclusion

Only 0.5% of the Lacamas Creek Watershed is within City limits, and the City is located in the lower watershed. The watershed also includes the cities of Vancouver and Camas, although the majority is located in unincorporated Clark County (87.6%). Neither Lacamas Creek nor any major tributaries to it are within Washougal City limits. City of Washougal has a low influence on hydrology and a low influence on water quality of Lacamas Creek compared to other receiving waters in its jurisdiction. The Lacamas Creek Basin is moderately important for fish recovery and is moderately degraded. No significant ongoing or future retrofit or restoration efforts are planned within the Lacamas Creek Basin, although the City of Washougal abuts Lacamas Park, which is a part of a matrix of parks and open spaces near Lacamas Lake preserved by a combination of Clark County and City of Camas.

Therefore, the Lacamas Creek Basin is not a likely candidate for Stormwater Management Action Planning.

5. Receiving Water Conditions Conclusion

Gibbons Creek Basin and Washougal River Basin higher relative SMI scores than Lacamas Creek Basin. In addition, Ecology's SMAP Guidance encourages cities to prioritize basins with a restoration or protection basin management strategy (Ecology, 2019). Gibbons Creek Basin and Washougal River Basin have been given restoration and protection management strategies, respectively. As a result,

Gibbons Creek Basin and Washougal River Basin have been selected to move into the receiving water prioritization step of SMAP. Table 15 summarizes the findings of the relative conditions assessment.

Table 15 Relative Conditions Assessment Summary

Basin Name	Receiving Waters within Basin	Watershed Area (Acres) [SqMi]	Area inside City (Acres)	Fraction of Watershed within City	Percent of the City that is Occupied by the Basin	SMI Score	Basin Management Strategy
Gibbons	Gibbons Creek; Campen Creek; Steigerwald Lake	7,100 [11]	1,721	24.2%	45%	High	Restoration
Washougal	Washougal River	78,880 [123]	1,918	2.4%	50%	Medium	Protection
Lacamas	Lacamas Creek;	42,784 [67]	203	0.5%	5%	Low	Conservation

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Abbreviation	Definition
7-DADMax	The arithmetic average of seven consecutive measures of daily maximum temperatures
AADT	Annual average daily traffic
ADT	Average daily traffic
B-IBI	Benthic index of biotic integrity, a measure of stream health using an assessment of the health of aquatic macroinvertebrate communities
C, °C	Celsius, degrees Celsius, a unit measuring temperature
CARA	Critical aquifer recharge areas
cfs	Cubic feet per second
CFU	Colony forming unit
CIP	Capital improvement projects
DO	Dissolved oxygen
Ecology	Washington Department of Ecology
EJ	Environmental Justice
EPA	Environmental Protection Agency
F, °F	Fahrenheit, degrees Fahrenheit, a unit measuring temperature
FEMA	Federal Emergency Management Agency (FEMA)
GIS	Geographic information system
LCFRB	Lower Columbia Fish Recovery Board
mg/L	Milligrams per liter
mL	Milliliter
MMI	Multimeric index, a measure of stream health using an assessment of the health of aquatic macroinvertebrate communities
MPN	Most probable number
NAIP	National Agriculture Imagery Program
NLCD	National Land Cover Dataset
NPCC	Northwest Power and Conservation Council
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
MS4	Municipal separate storm sewer system
NWIFC	Northwest Indian Fisheries Commission

Abbreviation	Definition
NTU	Nephelometric turbidity units
pH	Power of hydrogen (a unit measuring acidity)
SMAP	Stormwater management action plan, also Stormwater management action planning
SMI	Stormwater management influence
SR	State route
SWIFD	Statewide Integrated Fish Distribution
TMDL	Total maximum daily load
TSS	Total suspended solids
UGA	Urban growth area
USGS	US Geological Survey
WAC	Washington administrative code
WDFW	Washington Department of Fish and Wildlife
WEHDM	Washington Environmental Health Disparities
WRIA	Water resource inventory area
WQI	Water quality improvement

Attachment A

Web Map

March 2022 - The web map associated with this memorandum is located at this link:
https://washstorm.maps.arcgis.com/apps/webappviewer/index.html?id=f460f23d1bba4edc95634347535c7b21

Appendix C

Receiving Water Prioritization – SMAP, Memorandum

Memorandum

To: Sean Mulderig, City of Washougal

From: Trista Kobluskie, Cara Donovan, Frank Sottosanto, PE, Otak, Inc.

Copies:

Date: August 26, 2022

Subject: Receiving Water Prioritization – SMAP

Project No.: 20155

1. Introduction

The Receiving Water Prioritization has been prepared pursuant to the City of Washougal's Phase II National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit and a water quality grant from the Washington Department of Ecology. The prioritization generally follows the steps described in the Stormwater Management Action Planning Guidance published by the Washington Department of Ecology in 2019 (2019 SMAP Guidance). The purpose of the Receiving Water Prioritization is to determine which receiving water will receive the most benefit from implementation of stormwater facility retrofits, targeted stormwater management activities, and/or targeted policies. The outcome of this phase is a selected basin and catchment for which a stormwater management action plan (SMAP) will be developed. The results of the prioritization are summarized in this memorandum.

1.1. Summary of Receiving Water Conditions Assessment

The receiving water and relative conditions assessments were previously completed and are available for review on the City of Washougal's website. Gibbons Creek, Washougal River, and Lacamas Creek Basin were assessed. Gibbons Creek Basin and Washougal River Basin scored higher in the stormwater management influence (SMI) and relative conditions assessments than Lacamas Creek. As a result, Gibbons Creek Basin and Washougal River Basin were selected to be considered for the receiving water prioritization step.

2. Prioritization

Prioritization began with prioritizing a receiving water in the City of Washougal. The community was engaged in the receiving water prioritization decision. Following selection of a receiving water, a catchment within that basin was prioritized.

2.1. Receiving Water Prioritization

The receiving water basin prioritization criteria included numerous factors divided into three categories: receiving water condition information, stormwater management influence (SMI), and community factors. These factors and other receiving water conditions were described extensively in the *Receiving Water Conditions Assessment – SMAP* technical memorandum dated March 30, 2022, by Otak, which is

available for review on the City's website. Appendix A outlines the reasoning, score rationale, data sources, and notes for each of the considerations outlined in Table 1 below.

Table 1 Receiving Water Basin Prioritization Criteria

Consideration	Basin Scoring*	
	Gibbons Creek Basin	Washougal River Basin
Receiving Water Conditions		
Fish passage barriers	High (0 barriers)	High (0 barriers)
Ability to Influence (SMI)		
Hydrologic Impact	High (high score)	Low (low score)
Pollutant Loading Impact	High (high score)	Medium (medium score)
Watershed Management Strategy	High (Restoration)	Medium (Protection)
Community Factors		
Stakeholder/Community Feedback**	High (9 community points)	Low (4 community points)
Overburdened Communities	Medium (5.7)	Medium (5.4)

** Higher scores indicate the receiving water may benefit more from implementation of a SMAP.*
*** Stakeholder and community feedback is described is Section 2.2.*

Consideration of the above factors and scores for Gibbons Creek Basin and Washougal River Basin resulted in the section of the Gibbons Creek as the priority receiving water.

2.2. Community Engagement

The SMAP guidance calls for actively seeking input from natural resource agencies and tribes and for involving interested parties and the public early in the prioritization process. The City invited the general public and interested parties to participate in prioritizing a basin for two weeks in June and July 2022. A storymap website explained the SMAP process, presented the receiving waters assessment findings (Figure 1), and offered a survey.

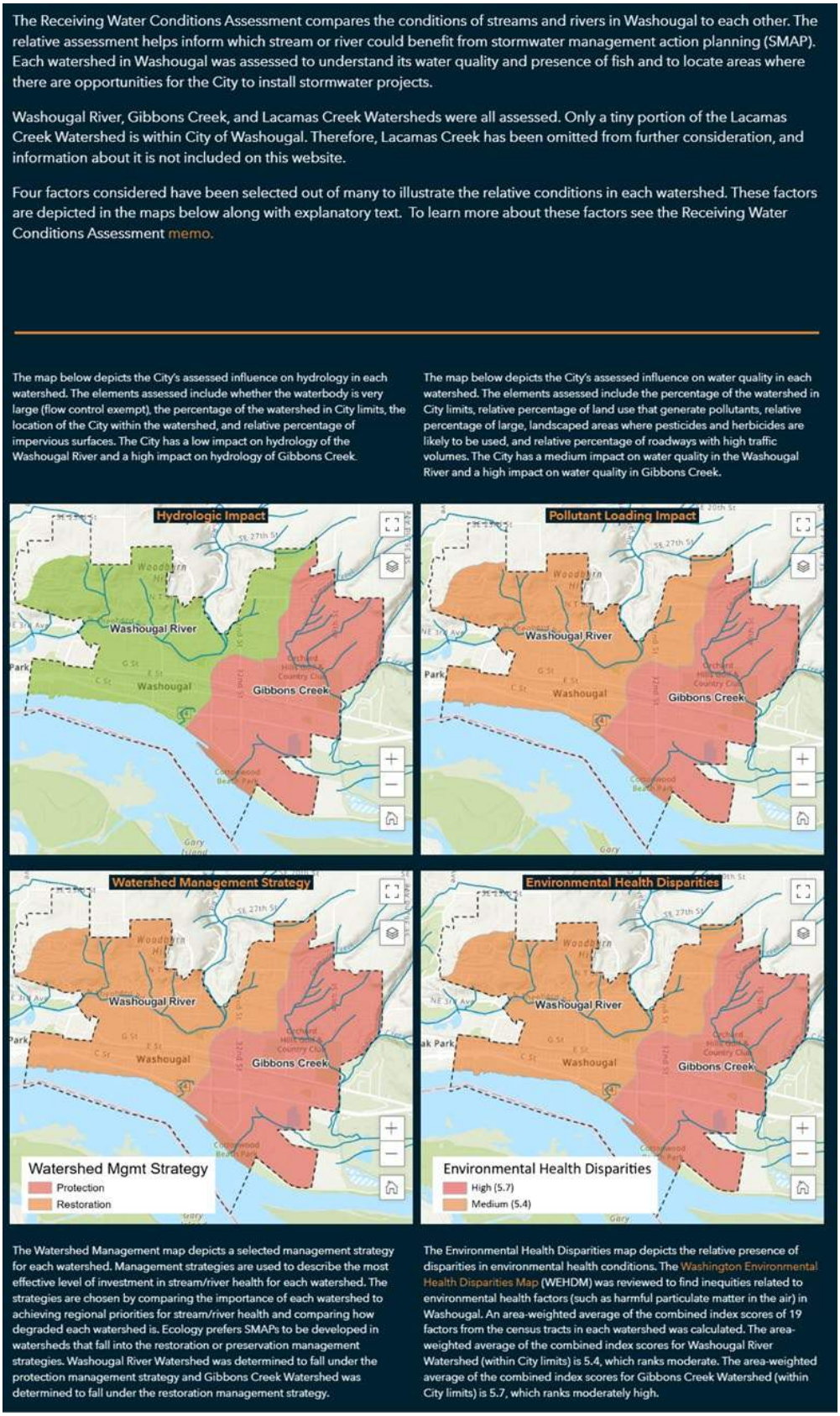

Figure 1: Receiving Water Assessment Findings in the Community Engagement Storymap

The survey included two questions. The first asked respondents to select a priority basin (Gibbons Creek or Washougal River). The second asked respondents to plot a point within the City of Washougal where SMAP should address water quality, stream/river conditions, or uncontrolled stormwater runoff. Once a point was selected the respondent could choose to answer the following questions:

- Why is this location important to you?
- Why is this location an area of concern?
- How would you like the City to address this issue?
- Do you have any additional comments?

To advertise the storymap and survey, the City contacted the community in various ways. The City identified and emailed interested parties. Interested parties included adjacent jurisdictions, the Port of Camas-Washougal, the Cowlitz Indian Tribe, and environmental groups such as the Lower Columbia Estuary Partnership. The storymap was announced on the City's website, the City's Facebook page, and on a flyer posted at public, high-traffic public places in Washougal.

Sixteen responses were collected. Eleven participants selected Gibbons Creek Basin and five selected the Washougal River Basin for prioritization (Table 2).

Table 2 Community Survey Responses

Community Survey Responses			
Comment ID	**Basin**	**Catchment**	**Comment***
1	Gibbons	Campen Creek	There are septic systems in this area. There are no curbs which allows direct runoff into Campen Creek.
2	Gibbons	Campen Creek	Golf courses provide almost no shade, little spawning habitat, and contribute significantly to chemical pollution. All the work at the Steigerwald Wildlife Refuge appears to be paying off. Let's keep enhancing what's already been started.
3	Gibbons	Mable Kerr	Mable Kerr Park is highly degraded and there is little stormwater treatment.
4	Gibbons	Columbia	There is continued industrial development in this area.
5	Gibbons	Columbia	There needs to be improved stream quality, improved riparian buffers, and removal of fish passage barriers to proactively improve stream health in the industrial areas.
6**	Gibbons	Campen Creek	Urbanization continues in Western Gibbons Creek.
7	Gibbons	Columbia River	Runoff from the private gravel mine and gravel washing facility [outside City limits] impacts the water quality flowing in Steigerwald Wildlife Refuge. Potential for holding ponds to fail, releasing contaminated water into Gibbons Creek.

Community Survey Responses			
Comment ID	**Basin**	**Catchment**	**Comment***
8	Washougal River	N/A***	[No comment]
9	Washougal River	N/A	All of the streets except K street have no sidewalks or storm drains for runoff.
10	Gibbons	Campen Creek	[No comment]
11	Gibbons	Mable Kerr	I have seen lots of litter, pollutants, and invasive plant species coming into the Steigerwald Wildlife Refuge during floods. I suspect they are coming from upstream development on Campen Creek
12	Washougal	N/A	There is runoff from a lot of cars and trucks driving on the roadway and parked on the side streets Where the Washougal River runs into Camas.
13	Gibbons	Campen Creek	The high school is the largest area of contiguous impervious surface in the Campen Creek watershed.

** Comments are responses to the question "Why is this location an area of concern?" and have been edited for clarity and privacy.*
*** Point is shown in the wrong basin on the map, as placed by the respondent. Based on the comment, we assume Gibbons Creek is the point of interest.*
**** Catchments were not delineated for Washougal River Basin.*

Fourteen responses to the second question can be seen in Figure 2, which shows that nine of the 13 points of interest or concern are in the Gibbons Creek Basin. Respondents chose their selected locations for a variety of reasons including degraded conditions, a lack of infrastructure, synergy with recent improvements to Steigerwald Lake National Wildlife Refuge, and concerns about pollutants from large private landowners, among other reasons.

2.3. Catchment Selection

The purpose of the catchment selection exercise was to determine which area of the Gibbons Creek Basin would receive the most benefit from a stormwater management action plan by the City.

2.3.1. Catchment Delineation

The consulting team delineated catchments in Gibbons Creek based on the SMAP Guidance, which states catchments should be between 400-600 acres or a scale that is appropriate for the jurisdiction. City of Washougal is a smaller southwest Washington city, and the appropriate catchment size tended to be smaller. Catchments range from 282 to 661 acres and are based on drainage areas to stream channels, adjusted for stormwater infrastructure, and to some extent, uniformity in land uses and storm system type. Catchments are presented on Figure 3.

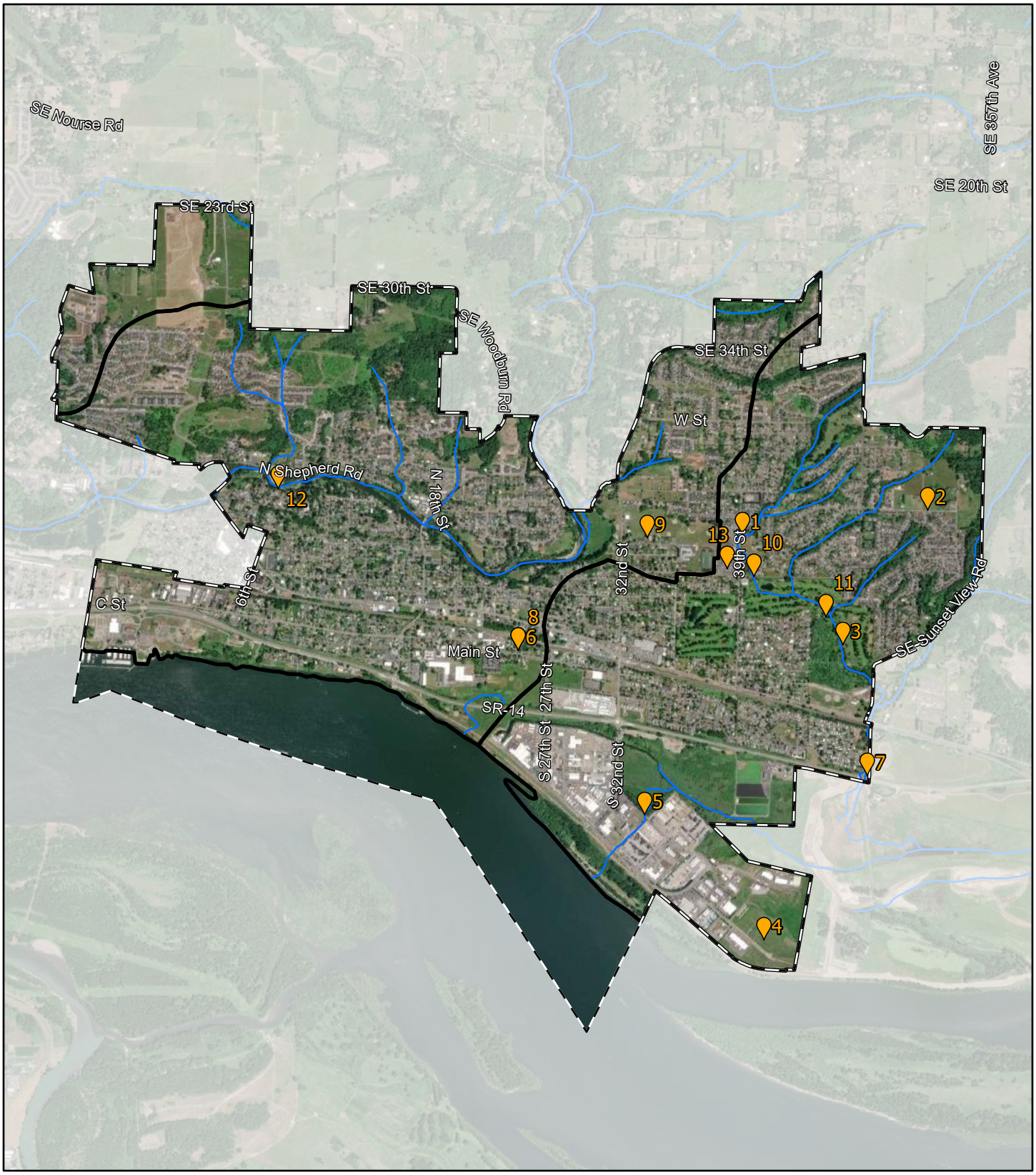

FIGURE 2
SURVEY RESPONSE LOCATIONS
WASHOUGAL SMAP

Basin Prioritization Survey Points

Washougal City Limits

Washougal Basins

Streams

0 1,000 2,000 4,000 Feet

Date: 8/24/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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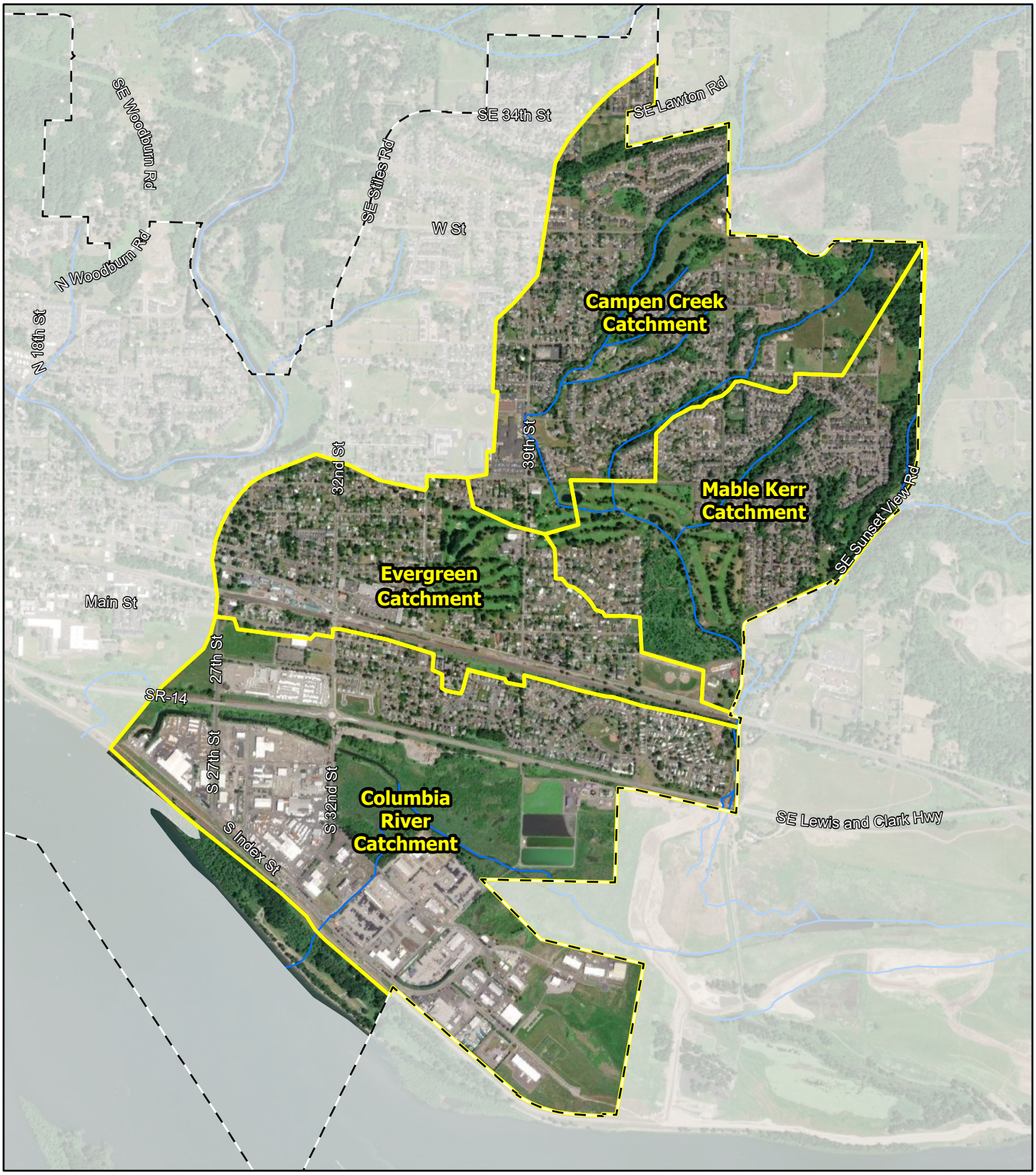

FIGURE 3

GIBBONS CREEK BASIN CATCHMENTS

WASHOUGAL SMAP

Washougal City Limits
Streams
Gibbons Creek Basin Catchments

0 500 1,000 2,000
Feet

Date: 8/24/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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2.3.2. Catchment Selection

The catchment prioritization criteria included numerous factors divided into four categories: receiving water condition information, stormwater management influence (SMI), community factors, and collaboration factors. Many of these factors and other receiving water conditions were described extensively in the *Receiving Water Conditions Assessment – SMAP* technical memorandum dated March 30, 2022, by Otak, which is available for review on the City of Washougal's website. Attachment A outlines the reasoning, score rationale, data sources, and notes for each of the scoring factors. Factors considered in catchment prioritization are also depicted on the Washougal SMAP Catchment Prioritization Web Map (Attachment B). Figure 4 and Figure 5, below Table 3, depict the Washington Department of Archaeology and Historic Preservation's archaeology predictive model (available through their WISAARD portal) and environmental health disparities within each Gibbon Creek catchment, respectively.

The City and consultant team conducted a site visit in Gibbons Creek Basin on July 27, 2022. The intent was to identify retrofit opportunities and stormwater management needs in Gibbons Creek Basin to inform catchment selection. Prior to the site visit the team evaluated many of the same factors as had been considered in prioritizing a receiving water, such as presence of pollution-generating surfaces, presence of City-owned properties, and presence of public stormwater facilities. The site visit included a drive through the Evergreen Catchment and stops within five areas in the Campen Creek and Mable Kerr catchments (Figure 6). During the visit, the team evaluated availability and ease of building in the right of way, condition of selected public stormwater facilities, and benefit of retrofitting selected public stormwater facilities. The site visit indicated the greatest number of opportunities for water quality projects are in the Campen Creek catchment.

Consideration of the prioritization factors and relative scores for the Gibbons Creek Basins catchments resulted in the section of the Campen Creek Catchment as the priority catchment as outlined in Table 3 below. Narrative of selected findings is presented in sections 2.3.2.1 through 2.3.2.4.

Table 3 Catchment Scores and Prioritization

Catchment Scoring				
Consideration	**Campen Creek**	**Mable Kerr**	**Evergreen**	**Columbia River**
Receiving Water Conditions				
Ratio of existing water quality facilities to pollution-generating land uses and large pollution-generating pervious surfaces*	Low (0.27)	High (0.09)	High (0.09)	High (0.05)
Ratio of existing flow control facilities to impervious surfaces*	Medium (0.13)	Medium (0.13)	High (0.05)	High (0.04)
Ability to Influence (SMI)				
Availability of publicly owned land (acres)	High (88.28)	Medium (31.15)	Low (8.37)	High (71.61)
Availability of right-of-way (miles / acre of catchment)	Neutral (0.02)	Neutral (0.02)	Neutral (0.02)	Neutral (0.02)
Community Factors				

Catchment Scoring				
Consideration	**Campen Creek**	**Mable Kerr**	**Evergreen**	**Columbia River**
Stakeholder Feedback (Figure 2)	High (4 community points)	Medium (2 community points)	Low (0 community points)	Medium (3 community points)
Washington Information System for Architectural and Archaeological Records Data (WISAARD) Predictive Model (Figure 4)	Medium (Very high risk in approximately ½ of the catchment)	Medium (Very high risk in approximately ¾ of the catchment)	High (Very high risk throughout catchment)	High (Very high risk throughout catchment)
Overburdened Communities** (Figure 5)	Low (3.18)	Low (3.08)	Low (3.90)	High (9.00)
Collaboration Factors				
Regional and local rehabilitation and restoration efforts	Medium See narrative below	Medium See narrative below	None identified	None Identified
City's Capital Improvement Projects	Hartwood Bridge Replacement	N/A	32nd Street Underpass; 39th Street/ Evergreen Way Realignment; J Street Water Main Installation	32nd Street Underpass; Biosolids Handling Facility
Final Selection				
Site Visit / Observations / Engineering Judgement	High See narrative below	Medium See narrative below	Medium See narrative below	Low See narrative below
Selection Status	Catchment Selected for SMAP	Not Selected for SMAP – Second Choice	Not Selected for SMAP – Third Choice	Not Selected for SMAP – Fourth Choice

**Some private stormwater facilities may not be documented in the City's GIS, particularly in the Columbia River Catchment*
***Intended to be used as a tiebreaker, if needed*

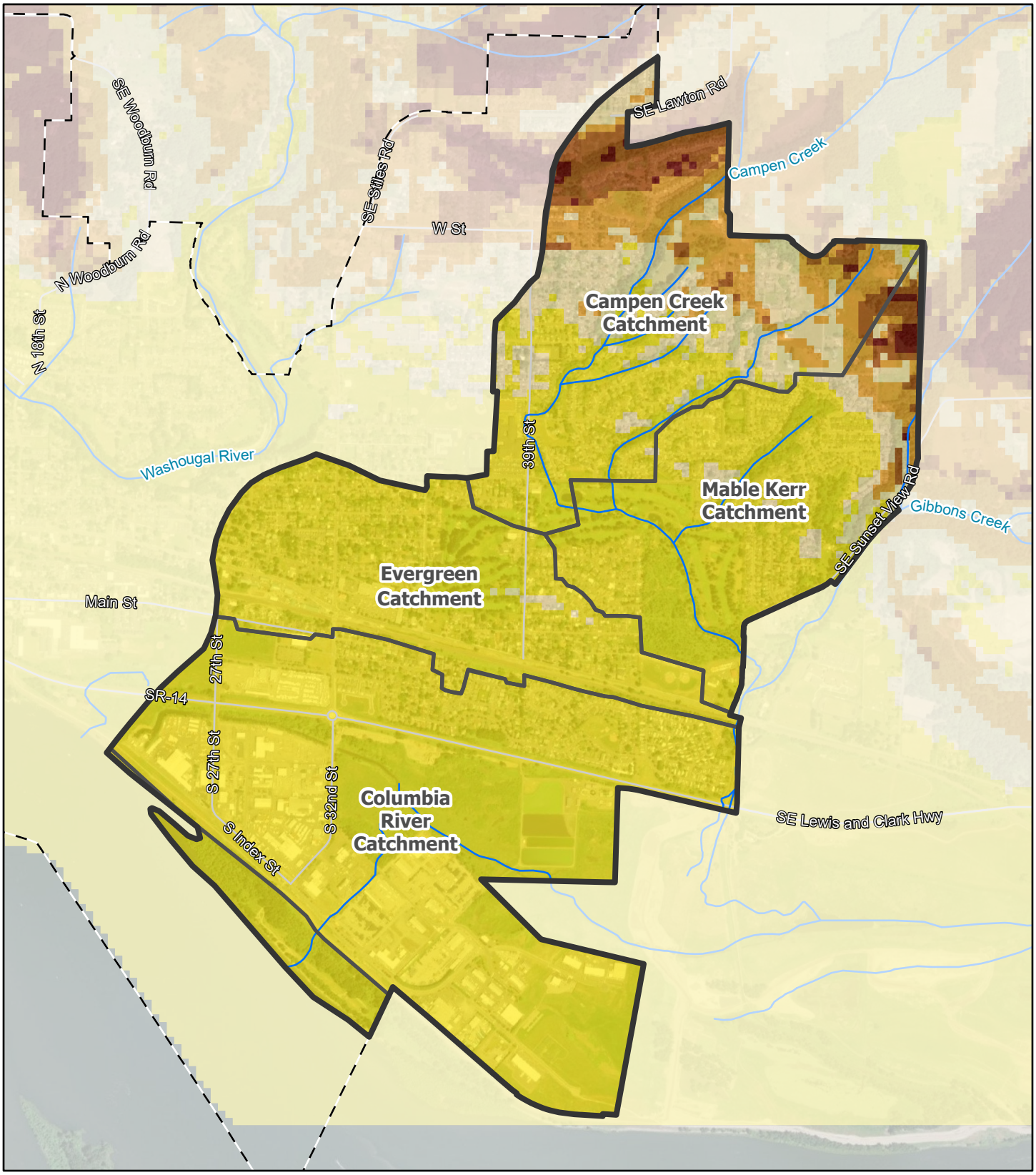

FIGURE 4

WISAARD PREDICTIVE MODEL RESULTS

WASHOUGAL SMAP

Washougal City Limits
Gibbons Basin
Gibbons Basin Catchments

Environmental Factors with Archaeological Resources Results

- 1 - Survey Contingent Upon Project Parameters: Low Risk (Color: Brick Red)
- 2 - Survey Contingent Upon Project Parameters: Moderately Low Risk (Color: Burnt Orange)
- 3 - Survey Recommended: Moderate Risk (Color: Orange)
- 4 - Survey Highly Advised: High Risk (Color: Pale Yellow)
- 5 - Survey Highly Advised: Very High Risk (Color: Brightest Yellow/Canary Yellow)

0 500 1,000 2,000
Feet

Date: 8/24/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Otak

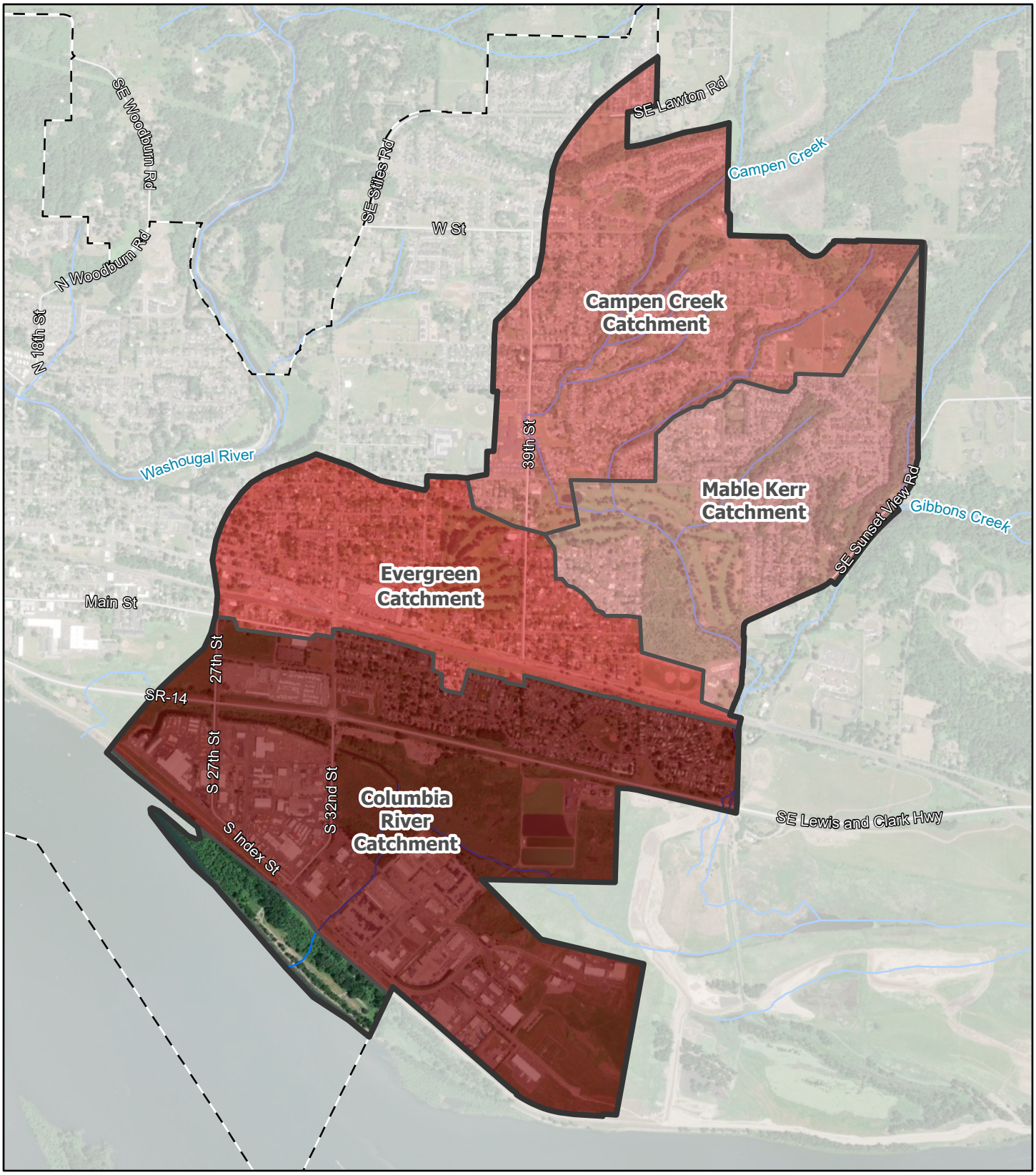

FIGURE 5
GIBBONS CREEK CATCHMENTS ENVIRONMENTAL HEALTH DISPARITIES
WASHOUGAL SMAP

Washougal City Limits
Gibbons Basin Catchments
EHD - Area Weighted Average
3.1
3.2
3.9
8.9
Streams

0 500 1,000 2,000
Feet

Date: 8/24/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Site Visit
Poorly functioning older water quality and flow control facilities on big city property. Property is a former wetland and current blackberry briar.

Site Visit
Neighborhood draining to older flow control and water quality facility on public property. Facilities in poor condition.

Culvert has high flow.

Treat right-of-way, improve flow control

Site Visit
Neighborhood with little treatment and an older flow control facility. Prime area for right-of-way retrofit because old county roads are wide and have no treatment or flow control.

Sink holes have formed here. Address drainage.

Treat right-of-way, improve flow control

Site Visit
Possible high risk
City-owned drywell with no treatment

Site Visit
Neighborhood draining to older public flow control facility. Facility has a lot of flow, and infiltrates amazingly well. This is not a problem facility.

Treat large pollution generating pervious surfaces and right-of-way, improve flow control

Riverview Park
Summer Slope Open Space
Hartwood Park
Eldridge Park
Campen Creek Park-Rolling Meadows Addition
Campen Creek Catchment
Schmid Family Park
Washougal River
Hathaway Park
Campen Creek
Mable Kerr Park
Evergreen Catchment
George Schmid Park
Hamlik Park
Columbia River Catchment
Captain William Clark Park
Gibbons Creek

1 2 3 4 5 7 10 13

FIGURE 6
AREAS OF OPPORTUNITY & NEED
GIS ANALYSIS FOR FIELD STUDY
GIBBONS CREEK BASIN
WASHOUGAL SMAP

- Gibbons Basin
- Pollution Generating Overlay
- Taxlots
- City Owned Properties
- Roads - Washougal Jurisdiction
- Streams
- High ADT Roads (> 6,000 / day)
- Basin Prioritization Survey Points
- Gibbons Creek Catchments

Stormwater Facilities
- New Water Quality
- Newer Flow Control
- Older Flow Control
- Older Water Quality

Drywells
Risk Level, Maintained By
- High, COW
- Not High, COW
- Not High, PVT

Outlets
Subtype
- Discharge Point
- Outfall

0 250 500 1,000 Feet

Date: 8/24/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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2.3.2.1. Campen Catchment Narrative and Site Visit Findings

The Campen Creek catchment is 407 acres and consists primarily of residential development. The City is located in the downstream half of the catchment, which extends north into unincorporated Clark County. The Campen Creek mainstem and the uppermost tributary pass through it. Hartwood Park, Eldridge Park, the Summer Slope subdivision open space, and portions of the Orchard Hills Golf Club are significant open spaces in the catchment. The Washougal High School is located at the western edge along 39th St. (Note: part of the high school property is located in the Washougal River Basin.) The northeastern corner of the catchment is currently agricultural and forested, and this area is expected to develop with residences.

Many residential subdivisions were developed under Clark County regulations in the 1990s and 2000s, which means most of them have older flow control and older water quality facilities, and many of them have wider county road widths. Some of these neighborhoods have steeper roadways, providing a challenge for stormwater facility retrofits in the rights-of-way. A small number of subdivisions are infill, and these have stormwater facilities built to the standards implemented in 2009. One large detention-only facility on Q Street west of 39th provides an opportunity to retrofit it for water quality for significant acres, including a higher traffic roadway, 39th St. One public underground injection control well has been identified as a possible risk to groundwater in this catchment. There is an opportunity to provide vegetated water quality treatment in this location.

City staff have noted that Campen Creek and its tributaries through this catchment are flashy. The City has documented a chronic erosion problem in the stream channel where Campen Creek crosses south under M Street, just east of 39th. The chronic erosion problem has not been studied in detail but could be caused both by historic realignment of the channel to a 90-degree bend and by increased flows and velocities resulting from upstream development. Above this erosion location, several flow control facilities were built to older standards and may provide opportunity to retrofit existing ponds to help address the erosion problem.

The City and Lower Columbia Estuary Partnership are constructing a water quality retrofit at the Washougal High School. The City is also pursuing a temporary repair of the erosion issue at 39th Street.

As Campen Creek is a tributary to Gibbons Creek, improving water quality in the catchment would also benefit Gibbons Creek itself. Campen Creek was selected for SMAP because of the ease of coordination for placing facilities in the ROW is underserved residential areas, the number of existing older publicly-owned flow control facilities that are eligible for retrofit, the presence of a known erosion problem in the tributary at 39th Street, and the focus on this catchment demonstrated through public feedback and the efforts the Lower Columbia Estuary Partnership.

2.3.2.2. Mable Kerr Catchment Narrative and Site Visit Findings

The Mable Kerr Catchment is 318 acres and consists primarily of residential development. The lowest downstream tributary to Campen Creek passes through this catchment and is the primary stream channel in it. Gibbons Creek mainstem flows for a short stretch at the eastern edge of the catchment along SE Sunset View Road. There are significant open spaces including: Mable Kerr Park, a Washougal School District open space between the George Schmidt Park ballfields and Mable Kerr Park, the majority of the Orchard Hills Golf Club, and the Sunset Ridge open space along the tributary stream channel. Most open spaces are located in the lower reach of the catchment. The northeastern corner is currently agricultural and forested, and this area is expected to develop with residences.

Residential subdivisions tend to have been developed under Clark County regulations in the 1990s and 2000s, which means most of them have older flow control and older water quality facilities, and many of them have wider county road widths. Some of these neighborhoods have steeper roadways, providing a challenge for stormwater facility retrofits in the rights-of-way. A small number of subdivisions are infill, and these have stormwater facilities built to the standards implemented in 2009. Several older water quality and flow control facilities near the creek channel serve entire subdivisions and could provide opportunities for retrofit to more current standards. A large infiltration facility near Sunset View Road performs well and serves a large drainage basin.

The large private golf course is primarily located in this catchment. The City does not control this property but could consider reaching out to property owners to develop a voluntary land management strategy that protects water quality in the stream. Because the golf course is within three catchments, a program like this could benefit multiple catchments.

The Lower Columbia Estuary Partnership is planning to restore vegetation and the stream channel on both sides of the stream through Mable Kerr Park, including parts of the golf course. The degraded habitat and stream conditions along Campen Creek through the golf course and Mable Kerr Park are a focus of the community, as evidenced by public feedback and the Lower Columbia Estuary Partnership's project. As Campen Creek is a tributary to Gibbons Creek, improving water quality in the catchment would also benefit Gibbons Creek itself.

2.3.2.3. Evergreen Catchment

The Evergreen Catchment is 282 acres and consists of dense residential and commercial development. Open spaces include part of the Orchard Hills Golf Club and George Schmidt Park. The BNSF Railroad and Evergreen Way traverse east-west through the catchment.

The area is served largely by public and private underground injection control wells (UICs) that manage stormwater, some of which have been identified as a possible risk to groundwater. Older water quality facilities are clustered around the commercial center at Evergreen Way and 32nd Street, which includes a grocery store, pharmacy, restaurants, and other businesses. Although most of the area is served by UICs, surface flow likely travels along Evergreen Way and the railroad and may make its way to the Gibbons Creek mainstem just northwest of Steigerwald National Wildlife Reserve (outside of City limits). Current surface flow contributions to Gibbons are not well documented due to the recent rerouting of Gibbons Creek and installation of a cross levee.

The large private golf course is partly located in this catchment. The City does not control this property but could consider reaching out to property owners to develop a voluntary land management strategy that protects water quality in the stream. Because the golf course is within three catchments, a program like this could benefit multiple catchments.

Improving water quality in this catchment is likely to have a greater impact on groundwater but could also benefit Gibbons Creek.

2.3.2.4. Columbia River Catchment

The Columbia River Catchment is 661 acres and consists of residential development, large tracts of industrial land including Port of Camas-Washougal, and the City's sewage treatment plant. Open spaces include a large open space which has the remnant Gibbons Creek channel located south of State Route

14 (SR-14), which traverses east-west through the area, Hamllik Park, and Captain William Clark Park along the Columbia River.

The catchment drains east towards the lower mainstem of Gibbons Creek and south to the Columbia River and includes both piped storm sewer, surface water flow, and UICs. Conveyances throughout the catchment often discharge directly to wetlands. Older water quality facilities are located in the northwest and southeast corners, near a commercial center and industrial area respectively. There is a small commercial development at SR-14 and 32nd Street which has two newer water quality facilities and a flow control facility. The rest of the residential portion of the catchment north of SR-14 and Hamllik Park are served by two older flow control facilities near SR-14. Runoff from this area is directed to wetlands along SR-14 which may naturally provide some treatment. There are opportunities to retrofit infrastructure serving this area to more current standards.

The Washington Department of Ecology currently has issued 16 NPDES Industrial Stormwater General Permits to industrial site operators in this catchment. Industrial NPDES permittees must monitor the quality of runoff at their outfalls and take corrective action if pollutants exceed benchmarks. Therefore, the team assesses that stormwater quality may be managed sufficiently on sites at Port of Camas-Washougal and other industrial properties. In addition, there are fewer public roads where the City may place new stormwater facilities in the industrial-zoned area along the Columbia River. The team considered and discarded the possibility of water quality retrofits at the City's Treatment Plant due to space limitations on the facility.

Improving water quality in this catchment could impact groundwater, Gibbons Creek, and the Columbia River.

The team notes that the Columbia River catchment has the highest environmental health disparities score (Table 3), which was intended to be used as a tiebreaker in prioritizing a catchment. The Columbia River catchment was not a contender for SMAP selection due to limited number of surface water discharges to Gibbons Creek, the predominance of industrial lands with existing NPDES permits, presence of significant wetlands that may naturally provide treatment, and right-of-way considerations. Therefore, the team did not employ the tiebreaker.

3. Conclusion

The receiving water basin prioritization criteria indicate that in each of the three categories Gibbons Creek Basin would receive the most benefit from a stormwater management action plan by the City. Additionally, 69% of survey respondents prioritized Gibbons Creek Basin. Therefore, Gibbons Creek was selected as the priority receiving water.

The receiving water catchment prioritization indicates that selecting the Campen Creek Catchment can benefit water quality in both Campen Creek and downstream Gibbons Creek. Existing efforts in the Campen Creek Catchment will be enhanced by additional City investment, and an existing erosion problem with threatens 39th Street as well as potentially impacting water quality in Campen Creek could be addressed with the SMAP.

Attachment A

Prioritization Criteria

Washougal Basin and Catchment Prioritization Criteria

5/18/2022

Prioritization					
Consideration	**Scale Applied**	**Reasoning**	**Influence / Score**	**Data Source**	**Notes**
Receving Water Conditions					
Ratio of existing stormwater facilities to pollution-generating land uses and large pollution-generating pervious surfaces	Catchment	Where there is a higher ratio, more treatment is already provided and may mean that there is less need for retrofit.	Smaller ratio = higher score	RWA at basin scale - recalculate at catchment scale	
Fish passage barriers	Basin	BCiTR. Applied at the basin scale because we are looking at the lowest downstream barrier on the waterbody. This factor helps distinguish receiving waters but does not help distinguish catchments.	Downstream barriers (with no removal plan) = lower score	RWA; Local knowledge of barrier removals	
Ability to Influence (SMI)					
Hydrologic Impact	Basin	Heavily impacted basins should have stormwater mitigation. Applied at the basin scale for comparison of basins. Individual factors within this analysis may be considered for catchment prioritization.	High impact = high score, medium = medium, low = low	RWA	Considers impervious surfaces, flow control exemption, portion/location of the basin in the City, density of flow control facilities and drywells per acre of developed surfaces, available area for treatment, and opportunities for retrofit. Assessment follows the SMI categories and weighting agreed upon by City and Consultant Team
Pollutant loading impact	Basin	High pollutant loading should be mitigated. Applied at the basin scale for comparison of basins. Individual factors within this analysis may be considered for catchment prioritization.	High impact = high score, medium = medium	RWA	Considers pollutant-generating land uses, large pollutant generating pervious surfaces, high ADT roads, portion/location of the basin in the City, density of water quality facilities per acre of pollutant-generating land uses, available area for treatment, and opportunities for retrofit Assessment follows the SMI categories and weighting agreed upon by City and Consultant Team
Watershed management strategy	Basin	BCiTR. Applied at the basin scale for comparison of basins. The factors considered in this decision are not applicable at the catchment scale.	Restoration = high score, Protection = medium score, Conservation = low score	RWA	Considers historic fish use, need for fish recovery, urbanization, fish passage barriers, and water quality impairments
Availability of Rights-of-Way and publicly-owned properties	Catchment	City has more influence where it owns the most land or rights-of-way	Catchments with more available City land and ROW will be preferred over catchments with less.	RWA, field visit	
Community Factors					
Stakeholder feedback	Basin and catchment	SMAP Guidance	High support = high score for basin Within a catchment = high number of areas of concern= high score	Stakeholder feedback from Survey 1 & Survey 2	Survey 1 requests stakeholder selection of a priority receiving water (basin). Survey 2 asks stakeholders to place points at specific areas of concern, allowing us to evaluate stakeholder's emphasis of different catchments.
WISAARD Predictive Model	Catchment	Considers where cultural resources are less likely to be disturbed by construction.	Lower risk of cultural resources = higher score	Washington State Department of Archaeology and Historic Preservation	Five risk levels are shown in the predictive model
Overburdened Communities	Basin and catchment	Included in SMAP guidance and BCiTR	Higher inequity = higher score	Washingoton State Environmental Health Disparities and ENSCREEN Demographic Index (shown on RWA map)	Use as a tiebreaker between similar catchments. The inequities measured by these indices may not be alleviated through stormwater management actions
Collaboration Factors					
Regional and local rehabilitation and restoration efforts	Catchment	Included in SMAP guidance and BCiTR	Numerous regional and local rehabilitation and restoration efforts = high score	RWA, WRIA plans, salmon recovery plans, MTCA/Superfund cleanups, critical habitat designations, local efforts	
City's CIPs	Catchment	Included in SMAP guidance and BCiTR	City's future CIP projects that can be combined with retrofits = high score	City's GIS	

Process
First, a receiving water (basin) will be prioritized using factors applied at the basin scale. Second, within the priority basin, a catchment will be prioritized using factors applied at the catchment scale. Results are qualitative.

Attachment B

Web Map

August 2022 - The web map associated with this memorandum is located at this link:
https://washstorm.maps.arcgis.com/apps/webappviewer/index.html?id=cc66036796d24913bcb51d4aff76b9b2

Appendix D

Solutions Outreach Supporting Material

Otak

Washougal Stormwater Management Solutions for Campen Creek Catchment

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

☐ **SMA 1) I Street Drywell Retrofit**

Project Description: Add a new drywell and reconfigure the existing drywell on I Street as a sedimentation manhole. Add bioretention planters upstream on I Street to provide water quality treatment.
Relative Initial Cost: Low
Relative Ongoing Cost: High
Relative Benefit: Low (8.5 acres)
Types of Pollutants Controlled/Removed: Flow control, TSS, dissolved metals, and 6PPD-q

☐ **SMA 2) Q Street Infiltration Pond Retrofit**

Project Description: Redirect stormwater in a 20-acre basin to drain to the existing infiltration

pond which is currently underutilized. Add pre-treatment.

Relative Initial Cost: Low

Relative Ongoing Cost: Low

Relative Benefit: High (20-27 acres)

Types of Pollutants Controlled/Removed: Flow control

Photo sourced from Google Maps

☐ **SMA 3) X Street Water Quality Retrofit**

Project Description: Install a water quality vault upstream of the existing detention pipe.

Relative Initial Cost: Low

Relative Ongoing Cost: Low

Relative Benefit: High (27 acres)

Types of Pollutants Controlled/Removed: TSS

Photo provided by Contech Engineered Solutions

☐ **SMA 4) Columbia View Flow Control and Water Quality Retrofit**

Project Description: Add detention pipe capacity to meet current flow control standards and add bioretention planters for additional treatment throughout the Columbia View neighborhood upstream of flow control facility.

Relative Initial Cost: High

Relative Ongoing Cost: High

Relative Benefit: High (20.5 acres)

Types of Pollutants Controlled/Removed: Flow control, TSS, dissolved metals, and 6PPD-q


☐ **SMA 5) J Street and 42nd (Vintage Crest Estates) Water Quality Retrofit**

Project Description: This project will install bioretention planters for runoff treatment throughout the Vintage Crest neighborhood.
Relative Initial Cost: Moderate
Relative Ongoing Cost: High
Relative Benefit: High (31.5 acres)
Types of Pollutants Controlled/Removed: TSS, dissolved metals, and 6PPD-q


☐ **SMA 6) M Street and 39th Street Channel Erosion Study**

Project Description: This study will evaluate the cause of erosion at the corner of M Street and 39th Street. The project will develop upstream solutions or identify retrofits of existing facilities that would prevent erosion.
Relative Initial Cost: High
Relative Ongoing Cost: None
Relative Benefit: Moderate

Types of Pollutants Controlled/Removed: Sediment and direct stream habitat improvement

☐ **SMA 7) J Street High School Frontage Retrofit**

Project Description: This project will capitalize on an existing project at the Washougal high school property. The project will resurface portions of J Street, improve ditches and install bioswales along J Street, and connect a catch basin to reduce ponding. Potential pervious concrete sidewalk on one side of J Street.
Relative Initial Cost: Moderate
Relative Ongoing Cost: High
Relative Benefit: Low (1 acre)
Types of Pollutants Controlled/Removed: Flow control and TSS

Photo sourced from Google Maps

☐ **I do not prefer any of these options.**

Next

Washougal Stormwater Management Solutions for Campen Creek Catchment

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

☐ **SMA 8) Septic Elimination Program**

Project Description: This program will partially or fully fund properties currently operating on septic systems to connect to the City's sewer system in the catchment. There are 23 parcels with septic systems in the catchment.
Relative Initial Cost: Low
Relative Ongoing Cost: None
Relative Benefit: Moderate (49.3 acres)
Types of Pollutants Controlled/Removed: Fecal coliform and E. coli

☐ **SMA 9) Stream Shade Program**

Project Description: Modeled on the Watershed Alliance program the City will incentivize homeowners to improve native trees and shrubs along Campen Creek, tributaries, and ditches.
Relative Initial Cost: Low
Relative Ongoing Cost: Low
Relative Benefit: Low (10 acres)
Types of Pollutants Controlled/Removed: Flow control and temperature

☐ **SMA 10) Golf Course Voluntary Water Quality Program**

Project Description: The City would attempt to partner with Orchard Hills Golf Course. The golf course would voluntarily adjust their turf management practices and landscaping along Campen Creek to work towards the nutrient and temperature elements of the Salmon Safe Certification program (Riparian/Wetland/Vegetation Protection and Restoration; Pest Management and Nutrient Containment). Orchard Hills Golf Course could work towards being a Salmon Safe certified golf course in the future.
Relative Initial Cost: Low
Relative Ongoing Cost: Low
Relative Benefit: High (93 acres)
Types of Pollutants Controlled/Removed: Pesticides, fertilizers, temperature, and nutrients

☐ **SMA 11) Targeted Pet Waste Reduction Program**

Project Description: The program will enhance the existing pet waste program which provides pet waste bags at parks and trailheads by constructing permanent signs that discuss the impacts of pet waste on water quality in Washougal's waterbodies.
Relative Initial Cost: None
Relative Ongoing Cost: Low
Relative Benefit: Moderate (33 acres)
Types of Pollutants Controlled/Removed: Fecal coliform and E. coli

☐ **SMA 12) Urban Forestry Program**

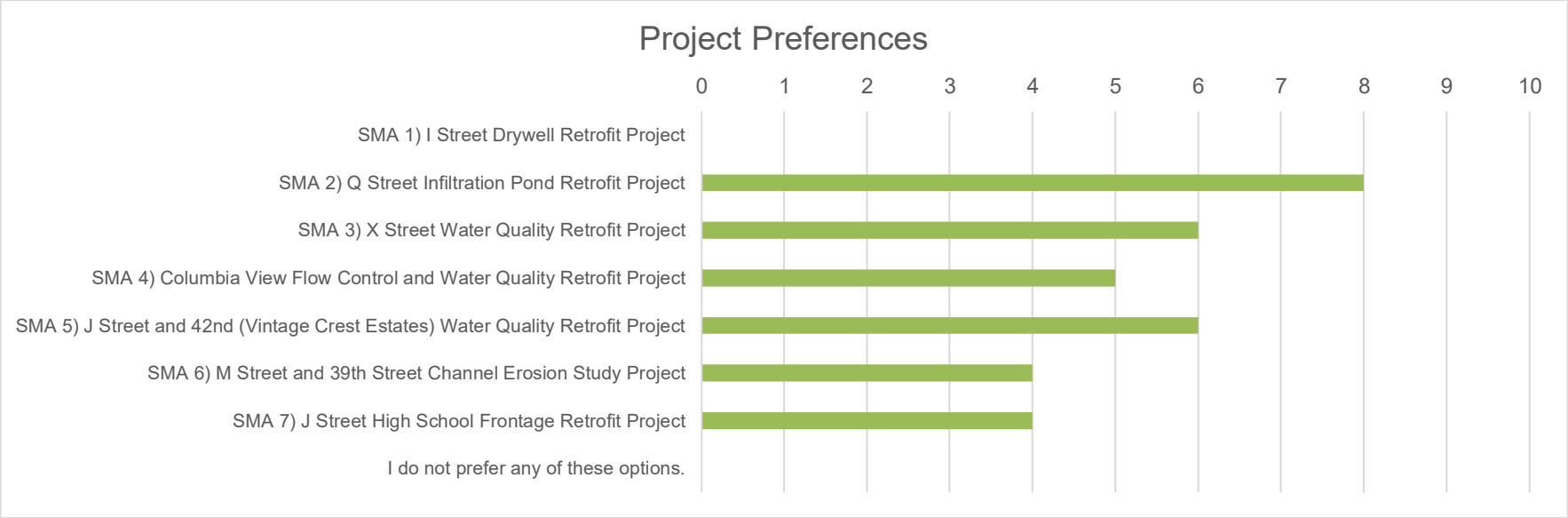
Project Description: The program aims to preserve, manage, and increase the urban tree canopy in Washougal. The program will include community outreach, active tree management, and policies managing removal, pruning, and planting of trees. If adopted, an urban forestry program would likely be city-wide but would be expected to provide benefits in Campen Creek Catchment.
Relative Initial Cost: Low
Relative Ongoing Cost: Low
Relative Benefit: High (10 acres)
Types of Pollutants Controlled/Removed: Flow control and temperature

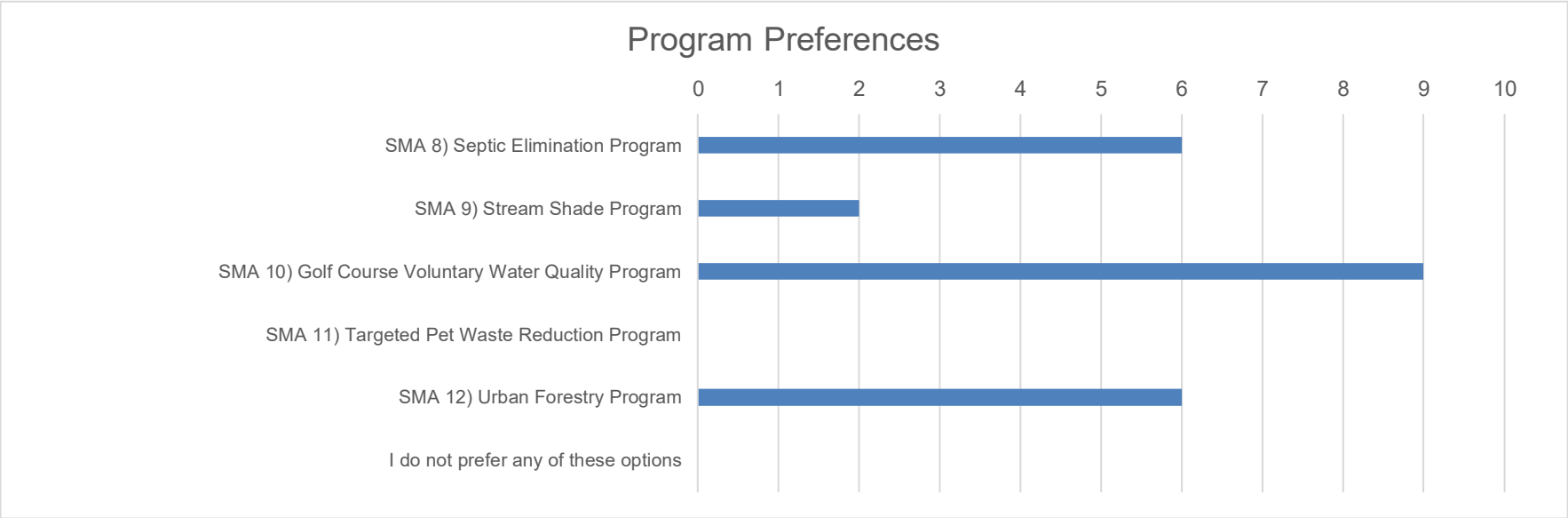
☐ **I do not prefer any of these options.**

Thank you for taking time to respond to this survey. Please press the "Done" button below for your answers to be recorded.

Prev Done

City of Washougal
SMAP Solutions Public Survey Results
November 2022





#1

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Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 6) M Street and 39th Street Channel Erosion StudyProject Description: This study will evaluate the cause of erosion at the corner of M Street and 39th Street. The project will develop upstream solutions or identify retrofits of existing facilities that would prevent erosion.Relative Initial Cost: HighRelative Ongoing Cost: NoneRelative Benefit: ModerateTypes of Pollutants Controlled/Removed: Sediment and direct stream habitat improvement

Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 8) Septic Elimination ProgramProject Description: This program will partially or fully fund properties currently operating on septic systems to connect to the City's sewer system in the catchment. There are 23 parcels with septic systems in the catchment.Relative Initial Cost: LowRelative Ongoing Cost: NoneRelative Benefit: Moderate (49.3 acres)Types of Pollutants Controlled/Removed: Fecal coliform and E. coli

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SMA 10) Golf Course Voluntary Water Quality Program Project Description: The City would attempt to partner with Orchard Hills Golf Course. The golf course would voluntarily adjust their turf management practices and landscaping along Campen Creek to work towards the nutrient and temperature elements of the Salmon Safe Certification program (Riparian/Wetland/Vegetation Protection and Restoration; Pest Management and Nutrient Containment). Orchard Hills Golf Course could work towards being a Salmon Safe certified golf course in the future. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (93 acres)Types of Pollutants Controlled/Removed: Pesticides, fertilizers, temperature, and nutrients

#2

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Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 5) J Street and 42nd (Vintage Crest Estates) Water Quality RetrofitProject Description: This project will install bioretention planters for runoff treatment throughout the Vintage Crest neighborhood.Relative Initial Cost: ModerateRelative Ongoing Cost: HighRelative Benefit: High (31.5 acres)Types of Pollutants Controlled/Removed: TSS, dissolved metals, and 6PPD-q

,

SMA 3) X Street Water Quality RetrofitProject Description: Install a water quality vault upstream of the existing detention pipe.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (27 acres)Types of Pollutants Controlled/Removed: TSS

,

SMA 4) Columbia View Flow Control and Water Quality RetrofitProject Description: Add detention pipe capacity to meet current flow control standards and add bioretention planters for additional treatment throughout the Columbia View neighborhood upstream of flow control facility. Relative Initial Cost: HighRelative Ongoing Cost: HighRelative Benefit: High (20.5 acres)Types of Pollutants Controlled/Removed: Flow control, TSS, dissolved metals, and 6PPD-q

Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 12) Urban Forestry ProgramProject Description: The program aims to preserve, manage, and increase the urban tree canopy in Washougal. The program will include community outreach, active tree management, and policies managing removal, pruning, and planting of trees. If adopted, an urban forestry program would likely be city-wide but would be expected to provide benefits in Campen Creek Catchment. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (10 acres)Types of Pollutants Controlled/Removed: Flow control and temperature

,

SMA 10) Golf Course Voluntary Water Quality Program Project Description: The City would attempt to partner with Orchard Hills Golf Course. The golf course would voluntarily adjust their turf management practices and landscaping along Campen Creek to work towards the nutrient and temperature elements of the Salmon Safe Certification program (Riparian/Wetland/Vegetation Protection and Restoration; Pest Management and Nutrient Containment). Orchard Hills Golf Course could work towards being a Salmon Safe certified golf course in the future. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (93 acres)Types of Pollutants Controlled/Removed: Pesticides, fertilizers, temperature, and nutrients

#3

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Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 2) Q Street Infiltration Pond RetrofitProject Description: Redirect stormwater in a 20-acre basin to drain to the existing infiltration pond which is currently underutilized. Add pre-treatment.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (20-27 acres)Types of Pollutants Controlled/Removed: Flow control

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SMA 4) Columbia View Flow Control and Water Quality RetrofitProject Description: Add detention pipe capacity to meet current flow control standards and add bioretention planters for additional treatment throughout the Columbia View neighborhood upstream of flow control facility. Relative Initial Cost: HighRelative Ongoing Cost: HighRelative Benefit: High (20.5 acres)Types of Pollutants Controlled/Removed: Flow control, TSS, dissolved metals, and 6PPD-q

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SMA 7) J Street High School Frontage Retrofit Project Description: This project will capitalize on an existing project at the Washougal high school property. The project will resurface portions of J Street, improve ditches and install bioswales along J Street, and connect a catch basin to reduce ponding. Potential pervious concrete sidewalk on one side of J Street.Relative Initial Cost: ModerateRelative Ongoing Cost: HighRelative Benefit: Low (1 acre)Types of Pollutants Controlled/Removed: Flow control and TSS

Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 12) Urban Forestry ProgramProject Description: The program aims to preserve, manage, and increase the urban tree canopy in Washougal. The program will include community outreach, active tree management, and policies managing removal, pruning, and planting of trees. If adopted, an urban forestry program would likely be city-wide but would be expected to provide benefits in Campen Creek Catchment. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (10 acres)Types of Pollutants Controlled/Removed: Flow control and temperature

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SMA 10) Golf Course Voluntary Water Quality Program Project Description: The City would attempt to partner with Orchard Hills Golf Course. The golf course would voluntarily adjust their turf management practices and landscaping along Campen Creek to work towards the nutrient and temperature elements of the Salmon Safe Certification program (Riparian/Wetland/Vegetation Protection and Restoration; Pest Management and Nutrient Containment). Orchard Hills Golf Course could work towards being a Salmon Safe certified golf course in the future. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (93 acres)Types of Pollutants Controlled/Removed: Pesticides, fertilizers, temperature, and nutrients

#4

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, November 04, 2022 11:57:17 AM
Last Modified: Friday, November 04, 2022 12:02:04 PM
Time Spent: 00:04:46
IP Address: 73.25.73.106

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 2) Q Street Infiltration Pond RetrofitProject Description: Redirect stormwater in a 20-acre basin to drain to the existing infiltration pond which is currently underutilized. Add pre-treatment.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (20-27 acres)Types of Pollutants Controlled/Removed: Flow control

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SMA 3) X Street Water Quality RetrofitProject Description: Install a water quality vault upstream of the existing detention pipe.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (27 acres)Types of Pollutants Controlled/Removed: TSS

Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 8) Septic Elimination ProgramProject Description: This program will partially or fully fund properties currently operating on septic systems to connect to the City's sewer system in the catchment. There are 23 parcels with septic systems in the catchment.Relative Initial Cost: LowRelative Ongoing Cost: NoneRelative Benefit: Moderate (49.3 acres)Types of Pollutants Controlled/Removed: Fecal coliform and E. coli

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SMA 12) Urban Forestry ProgramProject Description: The program aims to preserve, manage, and increase the urban tree canopy in Washougal. The program will include community outreach, active tree management, and policies managing removal, pruning, and planting of trees. If adopted, an urban forestry program would likely be city-wide but would be expected to provide benefits in Campen Creek Catchment. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (10 acres)Types of Pollutants Controlled/Removed: Flow control and temperature

#5

COMPLETE

Collector:	Web Link 1 (Web Link)
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Last Modified:	Friday, November 04, 2022 1:49:25 PM
Time Spent:	00:37:23
IP Address:	64.4.181.31

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 2) Q Street Infiltration Pond RetrofitProject Description: Redirect stormwater in a 20-acre basin to drain to the existing infiltration pond which is currently underutilized. Add pre-treatment.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (20-27 acres)Types of Pollutants Controlled/Removed: Flow control

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SMA 3) X Street Water Quality RetrofitProject Description: Install a water quality vault upstream of the existing detention pipe.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (27 acres)Types of Pollutants Controlled/Removed: TSS

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Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 12) Urban Forestry ProgramProject Description: The program aims to preserve, manage, and increase the urban tree canopy in Washougal. The program will include community outreach, active tree management, and policies managing removal, pruning, and planting of trees. If adopted, an urban forestry program would likely be city-wide but would be expected to provide benefits in Campen Creek Catchment. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (10 acres)Types of Pollutants Controlled/Removed: Flow control and temperature

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SMA 9) Stream Shade Program Project Description: Modeled on the Watershed Alliance program the City will incentivize homeowners to improve native trees and shrubs along Campen Creek, tributaries, and ditches. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: Low (10 acres)Types of Pollutants Controlled/Removed: Flow control and temperature

#6

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, November 04, 2022 7:59:36 PM
Last Modified:	Friday, November 04, 2022 8:08:17 PM
Time Spent:	00:08:40
IP Address:	71.236.206.128

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 2) Q Street Infiltration Pond RetrofitProject Description: Redirect stormwater in a 20-acre basin to drain to the existing infiltration pond which is currently underutilized. Add pre-treatment.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (20-27 acres)Types of Pollutants Controlled/Removed: Flow control

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Page 2

Q2

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#7

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Sunday, November 06, 2022 2:27:37 PM
Last Modified:	Sunday, November 06, 2022 2:30:21 PM
Time Spent:	00:02:44
IP Address:	166.198.34.20

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 2) Q Street Infiltration Pond RetrofitProject Description: Redirect stormwater in a 20-acre basin to drain to the existing infiltration pond which is currently underutilized. Add pre-treatment.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (20-27 acres)Types of Pollutants Controlled/Removed: Flow control

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Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 8) Septic Elimination ProgramProject Description: This program will partially or fully fund properties currently operating on septic systems to connect to the City's sewer system in the catchment. There are 23 parcels with septic systems in the catchment.Relative Initial Cost: LowRelative Ongoing Cost: NoneRelative Benefit: Moderate (49.3 acres)Types of Pollutants Controlled/Removed: Fecal coliform and E. coli

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SMA 10) Golf Course Voluntary Water Quality Program Project Description: The City would attempt to partner with Orchard Hills Golf Course. The golf course would voluntarily adjust their turf management practices and landscaping along Campen Creek to work towards the nutrient and temperature elements of the Salmon Safe Certification program (Riparian/Wetland/Vegetation Protection and Restoration; Pest Management and Nutrient Containment). Orchard Hills Golf Course could work towards being a Salmon Safe certified golf course in the future. Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (93 acres)Types of Pollutants Controlled/Removed: Pesticides, fertilizers, temperature, and nutrients

#8

COMPLETE

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Started:	Friday, November 04, 2022 9:45:49 PM
Last Modified:	Sunday, November 06, 2022 4:09:52 PM
Time Spent:	Over a day
IP Address:	67.171.249.112

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

SMA 5) J Street and 42nd (Vintage Crest Estates) Water Quality RetrofitProject Description: This project will install bioretention planters for runoff treatment throughout the Vintage Crest neighborhood.Relative Initial Cost: ModerateRelative Ongoing Cost: HighRelative Benefit: High (31.5 acres)Types of Pollutants Controlled/Removed: TSS, dissolved metals, and 6PPD-q

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SMA 6) M Street and 39th Street Channel Erosion StudyProject Description: This study will evaluate the cause of erosion at the corner of M Street and 39th Street. The project will develop upstream solutions or identify retrofits of existing facilities that would prevent erosion.Relative Initial Cost: HighRelative Ongoing Cost: NoneRelative Benefit: ModerateTypes of Pollutants Controlled/Removed: Sediment and direct stream habitat improvement

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Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

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#9

COMPLETE

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Time Spent:	00:13:06
IP Address:	71.236.207.172

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

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SMA 3) X Street Water Quality RetrofitProject Description: Install a water quality vault upstream of the existing detention pipe.Relative Initial Cost: LowRelative Ongoing Cost: LowRelative Benefit: High (27 acres)Types of Pollutants Controlled/Removed: TSS

Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

SMA 8) Septic Elimination ProgramProject Description: This program will partially or fully fund properties currently operating on septic systems to connect to the City's sewer system in the catchment. There are 23 parcels with septic systems in the catchment.Relative Initial Cost: LowRelative Ongoing Cost: NoneRelative Benefit: Moderate (49.3 acres)Types of Pollutants Controlled/Removed: Fecal coliform and E. coli

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#10

COMPLETE

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Last Modified:	Wednesday, November 16, 2022 7:16:25 AM
Time Spent:	00:02:48
IP Address:	24.22.109.242

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

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SMA 6) M Street and 39th Street Channel Erosion StudyProject Description: This study will evaluate the cause of erosion at the corner of M Street and 39th Street. The project will develop upstream solutions or identify retrofits of existing facilities that would prevent erosion.Relative Initial Cost: HighRelative Ongoing Cost: NoneRelative Benefit: ModerateTypes of Pollutants Controlled/Removed: Sediment and direct stream habitat improvement

Page 2

Q2

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#11

COMPLETE

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Started: Thursday, November 17, 2022 11:19:30 AM
Last Modified: Thursday, November 17, 2022 11:25:28 AM
Time Spent: 00:05:58
IP Address: 50.193.214.237

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

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Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

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#12

COMPLETE

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Last Modified:	Thursday, November 17, 2022 1:15:53 PM
Time Spent:	00:46:13
IP Address:	198.99.101.244

Page 1

Q1

Question 1. Select up to three preferred stormwater retrofit solutions from the seven options listed below. To help you decide, we have shown each solution on the map to the right and have listed some key details for each option.

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Page 2

Q2

Question 2. Select up to two preferred programs to improve water quality from the five options listed below.

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Appendix E

Capital Improvement Project Factsheet

Memorandum

To:	Sean Mulderig (City of Washougal)
From:	Trista Kobluskie; Cody Kent; Frank Sottosanto, PE
Date:	February 15, 2023
Subject:	City of Washougal SMAP Project Cost Opinion Methodology
Project No.:	20155

The Washougal Stormwater Management Action Plan (SMAP) includes four recommended Capital Improvement Projects (CIPs). These CIPs are retrofit projects that would address water quality or flow control deficiencies in existing infrastructure. Otak developed planning-level project scopes and cost opinions for these projects. This appendix describes the procedure used to assess the cost of these CIPs.

1. Project Scopes

Cost opinions are based on conceptual project scopes and engineering and are presented in 2023 dollars. Conceptual project scopes and designs are developed with limited detail about permit requirements, existing system attributes (e.g., invert elevations), utility conflicts, and external impacts. Conceptual engineering includes preliminary engineering calculations or uses information from recent similar work. Concepts and costs should be considered preliminary.

2. Construction

Construction consists of construction elements and required ancillary construction pay items.

2.1. Construction Elements

Construction elements are the necessary significant pay items to construct the project. Items are usually presented as a package that includes labor and a variety of materials. For example, the unit cost for a right-of-way bioretention planter is a package based on a typical design and includes labor and materials such as Portland cement, pipe, bioretention soils, plants, and other needed materials. Otak civil engineers researched unit prices from recently completed local and regional construction projects to assess project costs. Each project includes an engineer's assumption for preliminary unit quantities.

2.2. Required Ancillary Items

Required ancillary construction items include mobilization, temporary water management, erosion & sedimentation control, traffic control, and a planning level construction contingency. Each of these is calculated based on a percentage of project costs as described in the table below.

Type of Cost	Includes	How Applied	How Calculated
Mobilization	▪ Contractor's mobilization	All projects	10% of construction elements subtotal
Erosion & Sedimentation Control	▪ Contractor's erosion control costs	All projects	5% of construction elements subtotal
Traffic Control	▪ Contractor's traffic control costs	If needed based on desktop analysis of site conditions	Percentage of construction elements subtotal based on engineering judgement
Planning Level Construction Contingency	▪ Expected costs that are not specified at the planning level	All projects	Percentage of total construction cost ▪ 40% for less than $500,000 construction ▪ 30% for over $500,000 construction

3. Permitting and Land Acquisition

Basic Permitting cost was applied to all sites. Based on desktop analysis, no sites trigger federal or state environmental permits or environmental mitigation, which would entail additional cost. Basic permitting is estimated to be $15,000 for all projects.

Land acquisition is not anticipated for any of the projects.

4. Studies and Engineering

Type of Cost	Includes	How Applied	How Calculated
State Sales Tax*	▪ State sales and use tax rate ▪ Local City/County sales and use tax rate ▪ Rates effective 1/1/2023	All Projects	8.5% of total construction

Type of Cost	Includes	How Applied	How Calculated
Engineering	▪ Engineering design ▪ Preparation of SWPPP and erosion & sediment control plans ▪ Geotechnical studies (if needed) ▪ Archaeological survey (if needed) ▪ Other special studies when described in fact sheet	All projects	Varied percentage of total construction cost ▪ 25% for construction under $500,000 ▪ 20% for construction over $500,000 ▪ 15% for construction over $1 million
Project Administration	▪ City's staffing cost to manage the project and related grants, if any	All projects	Varied percentage of total construction cost ▪ 5% for construction under $1 million ▪ 2% for construction over $1 million
Construction Management	▪ Either the City's staffing or a contractor to oversee construction	All projects	10% of total construction
Survey	▪ Survey	All projects	2% of total construction

* Depending on classification of the project, it may not require a separate sales tax. City will make this determination when putting a project out to bid.

5. Escalation and Future Estimation

Cost opinions were developed in 2023 dollars. Cost opinions in the SMAP do not include escalation. Otak recommends escalating a cost opinion using an established index when the City adds a project to its capital improvement program. After the project design phase is complete, the construction costs should be replaced by the engineers' estimate.

PROJECT FACTSHEET—SMA-1

Project Title: Washougal High School Vicinity Stormwater Retrofit

Location: Washougal High School property; I and J Streets between 34th Street and 39th Street

Campen Creek Stormwater Improvement Project

October 12, 2022

Project Lead:

Lower Columbia Estuary Partnership

Project Partners:

City of Washougal

WASHOUGAL SCHOOL DISTRICT

Designer:

JUNCUS STUDIO

GENERAL INFORMATION

ROADWAY FUNCTIONAL CLASSIFICATION:

J ST	Urban Collector
36TH ST	Local Roads
I ST	Local Roads

DRAINAGE BASINS:

1	EAST BIORETENTION SWALE RENOVATION	30,600 SF (3.00 AC)
2	PARKING LOT BIORETENTION PLANTER RETROFITS	88,030 SF (2.02 AC)
3	J ST ROADSIDE BIORETENTION SWALE RENOVATION	64,900 SF (1.49 AC)
4	36TH ST ROADSIDE BIORETENTION PLANTER RETROFIT	12,850 SF (0.29 AC)
5	I ST ROADSIDE BIORETENTION PLANTER RETROFIT	70,500 SF (1.62 AC)
Total		**366,800 SF (8.42 AC)**

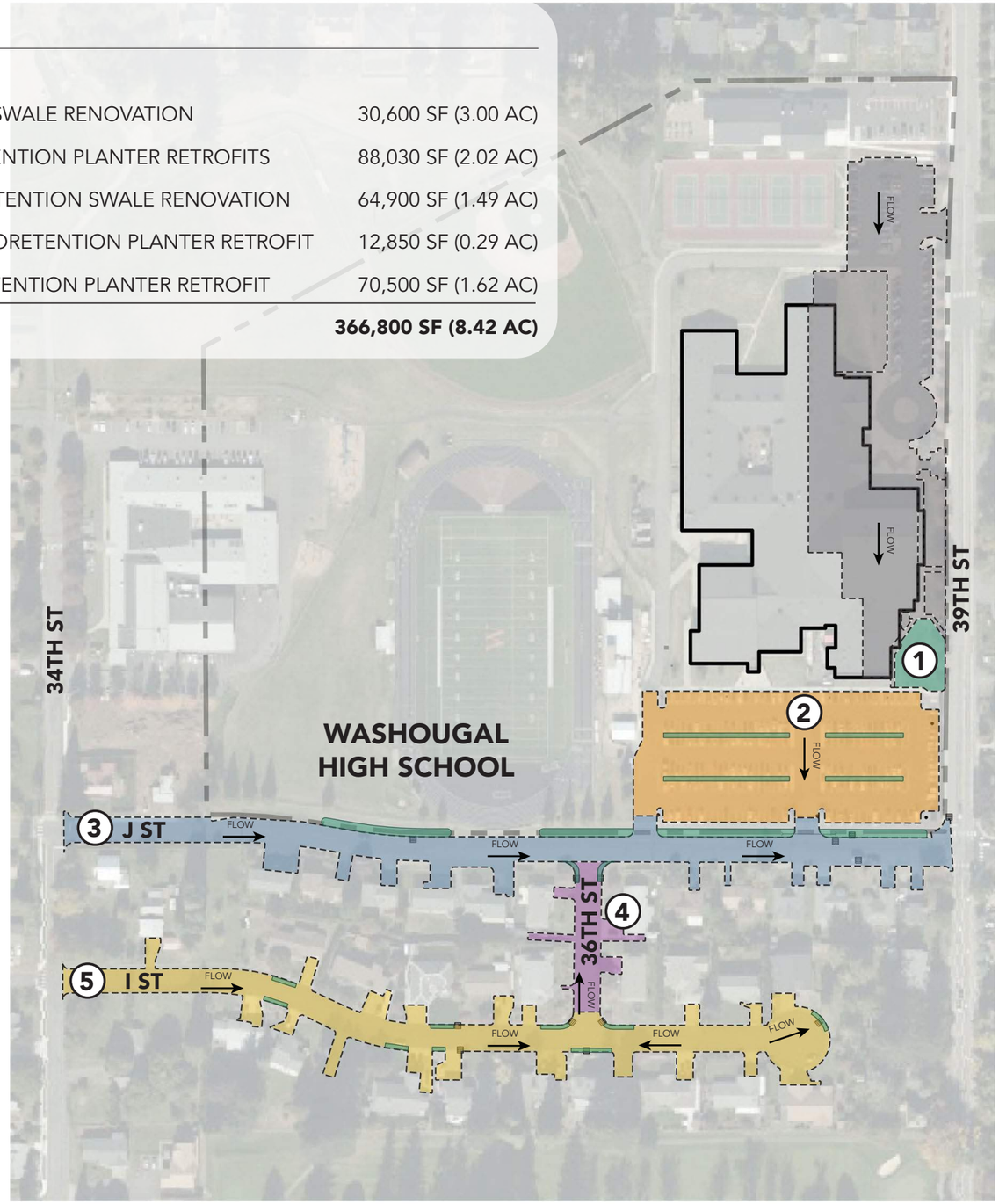
1 EAST BIORETENTION SWALE RENOVATION

2 PARKING LOT BIORETENTION PLANTER RETROFITS

4 ROADSIDE BIORETENTION PLANTER RETROFITS

3 ROADSIDE BIORETENTION SWALE RENOVATION

5 ROADSIDE BIORETENTION PLANTER RETROFITS



SCHOOL RETROFITS

CITY RETROFITS

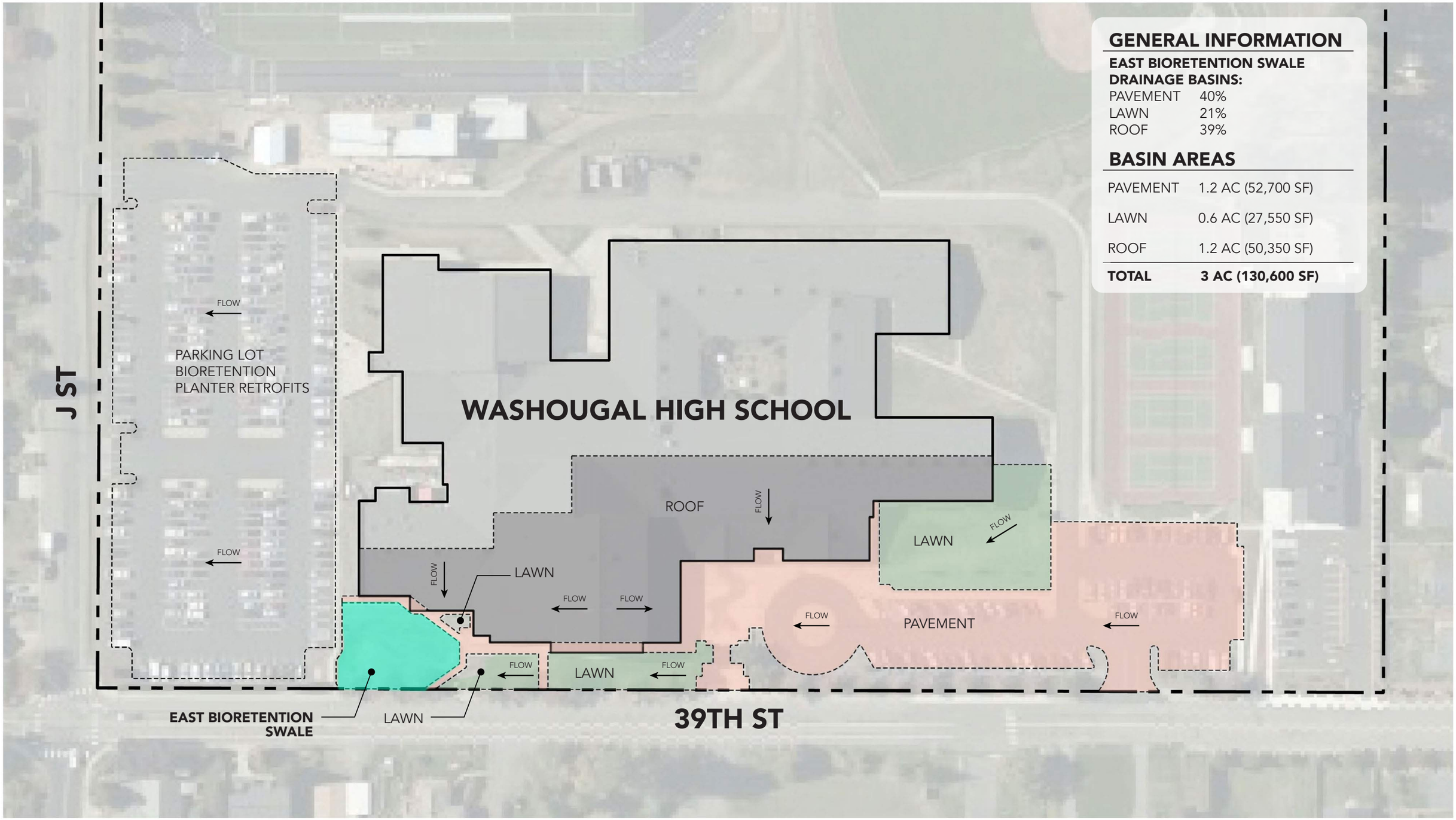
Neighborhood Drainage Basins

Campen Creek Stormwater Improvement Project

October 12, 2022

0 100′ 200′ 400′

JUNCUS STUDIO



GENERAL INFORMATION

EAST BIORETENTION SWALE DRAINAGE BASINS:

PAVEMENT	40%
LAWN	21%
ROOF	39%

BASIN AREAS

PAVEMENT	1.2 AC (52,700 SF)
LAWN	0.6 AC (27,550 SF)
ROOF	1.2 AC (50,350 SF)
TOTAL	**3 AC (130,600 SF)**

1 East Bioretention Swale Drainage Basins

Campen Creek Stormwater Improvement Project

October 12, 2022

0 40′ 80′ 160′

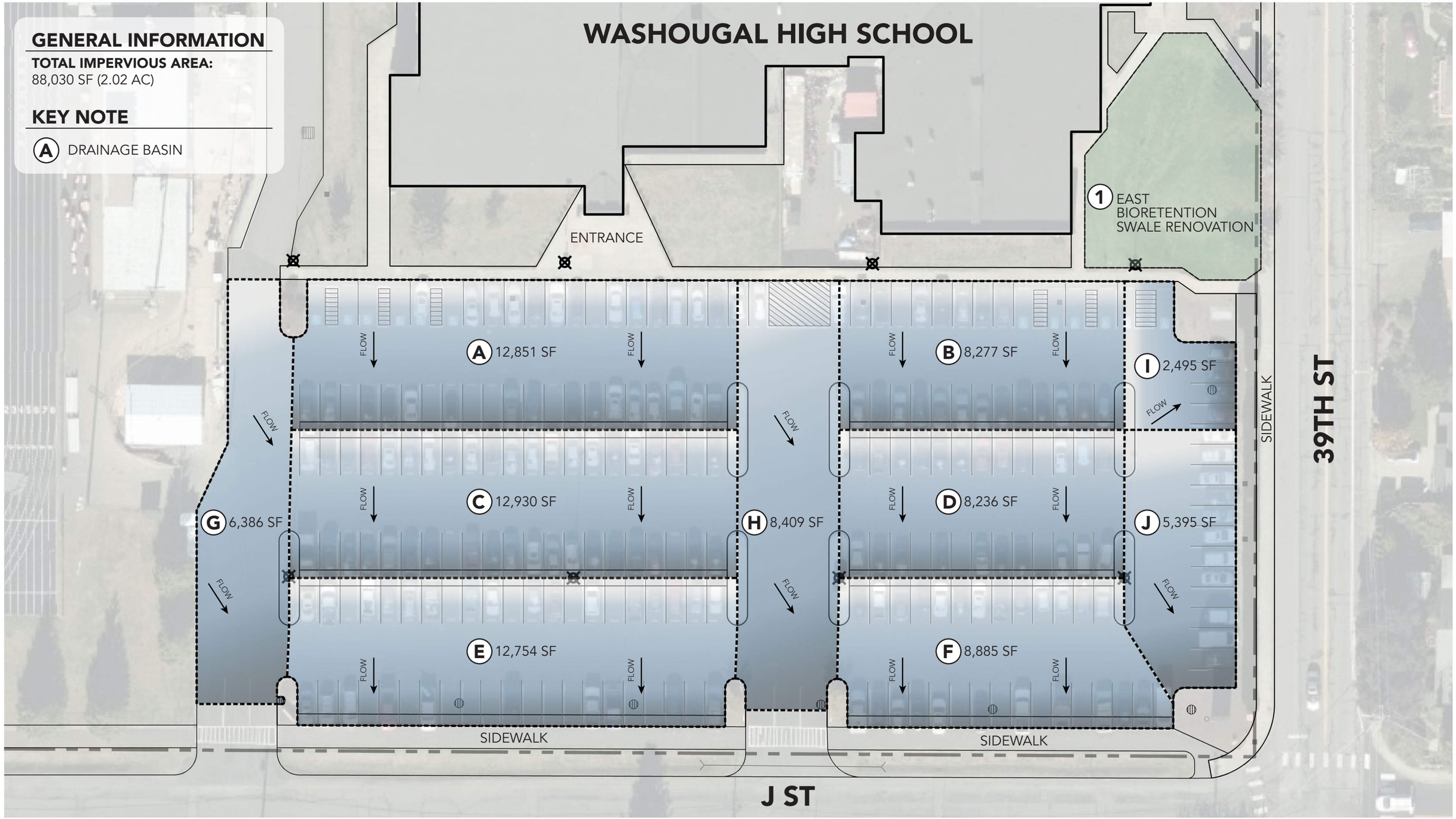
JUNCUS STUDIO

GENERAL INFORMATION

TOTAL IMPERVIOUS AREA:
88,030 SF (2.02 AC)

KEY NOTE

(A) DRAINAGE BASIN



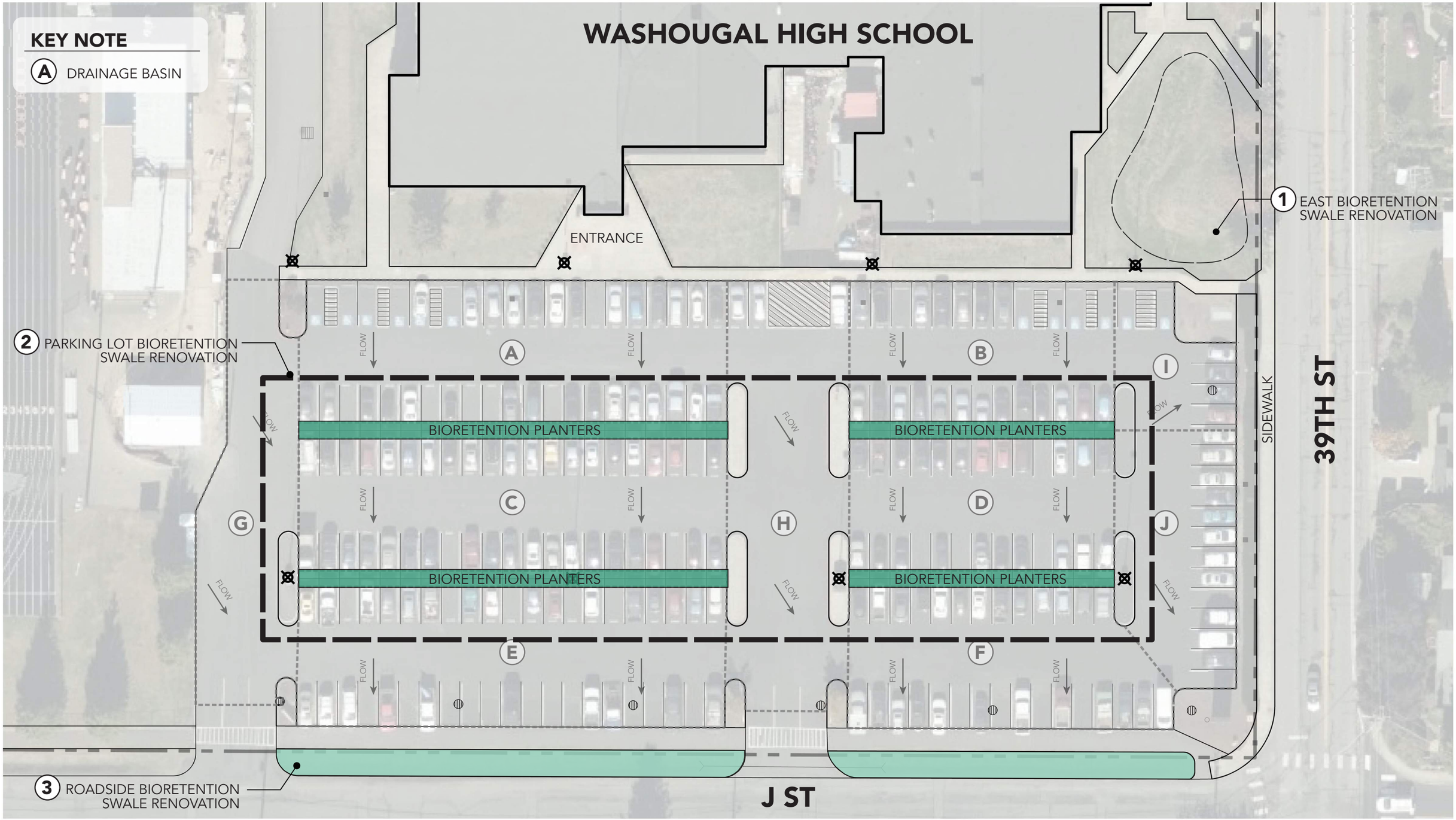
2 Parking Lot Drainage Basins

Campen Creek Stormwater Improvement Project

October 12, 2022

0 20′ 40′ 80′

JUNCUS STUDIO



2 Parking Lot Bioretention Planter Retrofits

Campen Creek Stormwater Improvement Project

October 12, 2022

0 20′ 40′ 80′

JUNCUS STUDIO

OPTION WITH WHEEL STOPS

Total Area of SW Facilities	: 3,060 SF
Total Impervious Runoff Area Managed	: 37,000 SF (0.9 AC)

OPTION WITH CURB & GUTTER

Total Area of SW Facilities	: 4,300 SF
Total Impervious Runoff Area Managed	: 36,000 SF (0.8 AC)

2 Parking Lot Bioretention Planter Retrofit

Campen Creek Stormwater Improvement Project

October 12, 2022

JUNCUS STUDIO

GENERAL INFORMATION

DRAINAGE BASINS:

3	J ST ROADSIDE BIORETENTION SWALE RENOVATION	64,900 SF (1.49 AC)
4	36TH ST ROADSIDE BIORETENTION PLANTER RETROFITS	12,850 SF (0.29 AC)
5	I ST ROADSIDE BIORETENTION PLANTER RETROFITS	70,500 SF (1.62 AC)
	Total	**148,250 SF (3.40 AC)**

MAJOR SOIL TYPES:

1. LOAM
   - Well drained
   - Moderate infiltration rate
2. SILT LOAM
   - Moderately well drained
   - slow infiltration rate

1 EAST BIORETENTION SWALE RENOVATION

2 PARKING LOT

WASHOUGAL HIGH SCHOOL

ROADSIDE BIORETENTION SWALE RENOVATION

3 J ST

FLOW

FLOW

FLOW

34TH ST

36TH ST

39TH ST

4

ROADSIDE BIORETENTION PLANTER

ROADSIDE BIORETENTION PLANTER

5 I ST

FLOW

FLOW

FLOW

FLOW

FLOW

INLET

3 4 5 Roadside Bioretention Options

Campen Creek Stormwater Improvement Project

October 12, 2022

0 50′ 100′ 200′

JUNCUS STUDIO

3 **J ST ROADSIDE BIORETENTION SWALE RENOVATION OPTION**

Total Area of SW Facilities : 8,320 SF
Total Impervious Runoff Area Managed : 64,900 SF (1.49 AC)

4 **5** **36TH ST & I ST ROADSIDE BIORETENTION PLANTER RETROFITS**

Total Area of SW Facilities : 2,050 SF
Total Impervious Runoff Area Managed : 83,350 SF (1.91 AC)

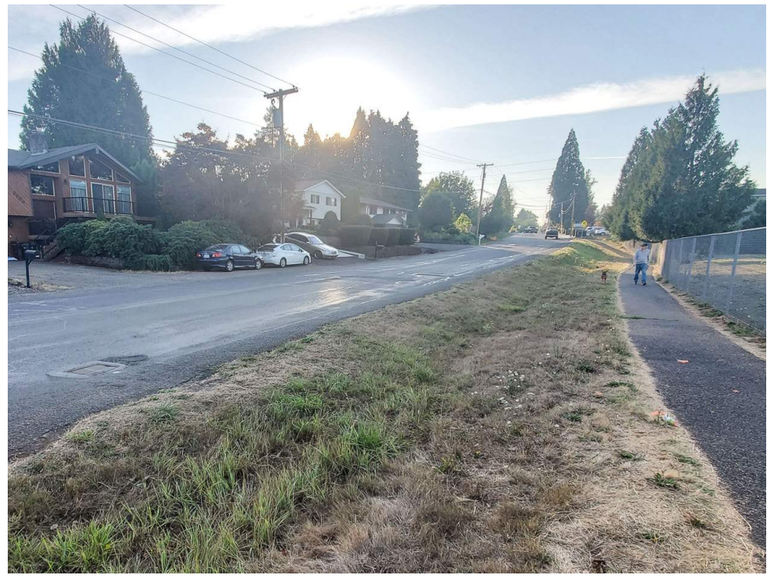
1 WHS INTERIOR PARKING (LOOKING EAST)

2 WHS INTERIOR PARKING (LOOKING WEST)

3 WHS EAST BIORETENTION SWALE

4 J ST SOUTH OF WHS PARKING LOT

5 J ST NEAR WHS PARKING LOT ENTRANCE



6 J ST SOUTH OF WHS ATHLETIC FIELD

Existing Conditions - WHS Parking Lot & J St

Campen Creek Stormwater Improvement Project

October 12, 2022

JUNCUS STUDIO

7 **36TH ST & J ST INTERSECTION (LOOKING SOUTH)**

8 **36TH ST & I ST INTERSECTION (LOOKING SOUTH)**

9 **36TH ST & I ST INTERSECTION (LOOKING NORTH)**

10 **I ST (LOOKING WEST)**

11 **I ST (LOOKING EAST)**

12 **I ST CUL-DE-SAC**

Existing Conditions - 36th St & I St

GENERAL INFORMATION

TOTAL IMPERVIOUS AREA:
88,028 SF (2.02 AC)

SOIL TYPES:
1. SILT LOAM
   - Moderately well drained
   - Slow infiltration rate
2. LOAM
   - Well drained
   - Moderate infiltration rate

KEY NOTE

1 PHOTO LOCATION

WASHOUGAL HIGH SCHOOL

ENTRANCE

EAST BIORETENTION SWALE

LIGHT POLE

PROPERTY BOUNDARY

AREA INLET

SIDEWALK

39TH ST

LOAM

SILT LOAM

SIDEWALK

ROADSIDE BIORETENTION SWALE

CULVERT

ROADSIDE BIORETENTION SWALE

J ST

23'

26'

25'

36'

25'

383'

189'

36'

117'

25'

153'

189'

144'

FLOW

Existing Conditions - WHS Parking Lot

Campen Creek Stormwater Improvement Project

October 12, 2022

0 20' 40' 80'

JUNCUS STUDIO

City of Washougal Campen Creek Stormwater Improvement Project
Application: WQC-2024-WashPW-00175
Overall Project Budget - October 2022

Direct Construction Costs				
Category of Work				**Subtotals**
1 - Washougal High School East Bioretention Swale Renovation				$93,088
2 - Washougal High School Parking Bioretention Planter Retrofits				$362,540
3 - J Street Bioretention Swale Renovation				$433,000
4 - 36th Street Roadside Bioretention Planter Retrofit				$50,340
5 - I Street Roadside Bioretention Planter Retrofit				$126,560
SubTotal Direct Consruction Cost				**$1,065,528**
Compounded Mark Up Categories and Description		**%**	**Amount**	**Subtotals**
Estimating Level of Confidence Buffer		30.00%	$319,658	$1,385,186
General Conditions		10.00%	$138,519	$1,523,705
Overhead		3.00%	$45,711	$1,569,416
Profit		7.00%	$109,859	$1,679,275
Insurance		1.50%	$25,189	$1,704,464
Bond		1.50%	$25,566.97	$1,730,031
Pre-Scope Contingency Direct Construction Costs				**$1,730,031**
Construction Contingency		10.00%	$173,003	$1,903,035
Total Compounded Mark-Up		78.60%	$837,507	
Total Direct Construction Contract Cost				**$1,903,035**
Design/Engineering Consultant Contract Estimator				
Percentage of "Not to Exceed" Construction Budget		16.00%		
Total Design/Engineering Consultant Contract Cost				**$304,486**
Design/Engineering Services Breakdown				
Landscape Architect		38.00%		$115,705
Civil Engineer		30.00%		$91,346
Structural Engineer		5.00%		$15,224
Geotechnical Engineer		5.00%		$15,224
Cultural Resources		2.00%		$6,090
Permitting		5.00%		$15,224
Surveyor		15.00%		$45,673
Design/Engineering Services Subtotal		**100.00%**		**$304,486**
Design Contingency		10.00%		$30,449
Estuary Partnership Project Management		25.00%		$76,121
Total Project Cost (Design/Engineering/Project Management/Etc.)				**$411,055**
Estuary Partnership Cash Match Provided		**15.00%**		**$61,658**
Total Ecology Grant Request				**$349,397**

City of Washougal Campen Creek Stormwater Improvement Project
Application: WQC-2024-WashPW-00175
Direct Construction Cost Calculator

	Qty	Unit	Price / Unit	Total Price	Notes/Assumptions
1 - WHS East Bioretention Swale Renovation					
Mobilization (7%)	1	LS	$6,000.00	$6,000.00	
Construction Staking (1.5%)	1	LS	$1,275.00	$1,275.00	
Erosion Control(2%)	1	LS	$2,500.00	$2,500.00	
Excavation including haul	185	CY	$125.00	$23,125.00	Assume 5000 sf. - 1 ft excavation
Concrete Check Dams	3	EA	$1,500.00	$4,500.00	
Stormwater Planter Soil Import	185	CY	$90.00	$16,650.00	Assume 5000 sf. - 1 ft excavation
Tree Planting	5	EA	$750.00	$3,750.00	
Shrub Planting (No. 1 Cont)	920	EA	$15.00	$13,800.00	1800 sf bioswale permiter w/ shrubs 18" o.c.
Beehive Inlet	1	EA	$2,350.00	$2,350.00	Costs pulled from Clackamas WES Design Std.
Seeding	3,200	SF	$0.75	$2,400.00	
Bark Mulch	85	CY	$82.00	$6,988.31	4" depth
Misc. Drainage Pipe + Fittings	50	LF	$195.00	$9,750.00	Costs pulled from Clackamas WES Design Std.
			Subtotal =	**$93,088.31**	
2 - WHS Parking Bioretention Planter Retrofits					
Mobilization (7%)	1	LS	$14,500.00	$14,500.00	
Construction Staking (1.5%)	1	LS	$3,500.00	$3,500.00	
Traffic Control Plan (3%)	1	LS	$6,500.00	$6,500.00	
Erosion Control (2%)	1	LS	$4,500.00	$4,500.00	
Sawcut Asphalt	1280	LF	$1.50	$1,920.00	
Excavation including haul	320	CY	$125.00	$40,000.00	2 ft soil depth
Asphalt Demolition and Disposal	4290	SF	$2.00	$8,580.00	
Asphalt Patch	3850	SF	$8.00	$30,800.00	3 ft patch around perimeter
Concrete Curb + Gutter	1290	LF	$86.00	$110,940.00	
Stormwater Planter Soil Import	320	CY	$90.00	$28,800.00	2 ft soil depth
Tree Planting	25	EA	$750.00	$18,750.00	
Shrub Planting (No. 1 Cont)	2190	EA	$15.00	$32,850.00	
Bark Mulch	60	CY	$125.00	$7,500.00	4" depth
Educational Signage	2	EA	$2,500.00	$5,000.00	
Beehive Inlets	4	EA	$2,350.00	$9,400.00	Costs pulled from Clackamas WES Design Std.
Misc. Drainage Pipe + Fittings	200	LF	$195.00	$39,000.00	Costs pulled from Clackamas WES Design Std.
			Subtotal =	**$362,540.00**	
3 - J Street Bioretention Swale Renovation					
Mobilization (7%)	1	LS	$21,500.00	$21,500.00	
Construction Staking (1.5%)	1	LS	$5,000.00	$5,000.00	
Traffic Control Plan (3%)	1	LS	$10,000.00	$10,000.00	
Erosion Control(2%)	1	LS	$6,800.00	$6,800.00	
Sawcut Asphalt	750	LF	$1.50	$1,125.00	
Excavation including haul	310	CY	$125.00	$38,750.00	1 ft soil depth
Asphalt Planing	7,580	SF	$1.00	$7,580.00	
Asphalt Demolition & Disposal	7,580	SF	$2.00	$15,160.00	
Crushed Gravel Base	7,580	SF	$3.00	$22,740.00	
Asphalt Paving & Overlay	15,160	SF	$4.00	$60,640.00	
Beehive Inlet	2	EA	$2,700.00	$5,400.00	Costs pulled from Clackamas WES Design Std.
Misc. Drainage Pipe + Fittings	125	LF	$195.00	$24,375.00	Costs pulled from Clackamas WES Design Std.
Concrete Curb + Gutter	910	LF	$86.00	$78,260.00	
Concrete Check Dams	14	EA	$1,000.00	$14,000.00	
Stormwater Planter Soil Import	310	CY	$90.00	$27,900.00	1ft soil depth
Tree Planting	28	EA	$750.00	$21,000.00	
Shrub Planting	4,250	EA	$15.00	$63,750.00	8,300 sf of planting area
Bark Mulch	110	CY	$82.00	$9,020.00	4" depth
			Subtotal =	**$433,000.00**	
4 - 36th St. Roadside Bioretention Planter Retrofit					
Mobilization (7%)	1	LS	$2,500.00	$2,500.00	
Construction Staking (5%)	1	LS	$1,500.00	$1,500.00	
Traffic Control Plan (3%)	1	LS	$1,500.00	$1,500.00	
Erosion Control(2%)	1	LS	$1,000.00	$1,000.00	
Sawcut Asphalt	130	LF	$1.50	$195.00	
Excavation including haul	33	CY	$125.00	$4,125.00	2 ft soil depth
Asphalt Demolition and Disposal	440	SF	$2.00	$880.00	
Asphalt Patch	600	SF	$8.00	$4,800.00	
Concrete Curb	125	LF	$45.00	$5,625.00	
Concrete Curb + Gutter	100	LF	$86.00	$8,600.00	
Concrete Check Dams	2	EA	$600.00	$1,200.00	
Stormwater Planter Soil Import	33	CY	$90.00	$2,970.00	2 ft soil depth
Tree Planting	2	EA	$750.00	$1,500.00	
Shrub Planting	225	EA	$15.00	$3,375.00	
Bark Mulch	10	CY	$82.00	$820.00	4" depth
Misc. Drainage Pipe + Fittings	50	LF	$195.00	$9,750.00	Costs pulled from Clackamas WES Design Std.
			Subtotal =	**$50,340.00**	
5 - I St. Roadside Bioretention Planter Retrofit					
Mobilization (7%)	1	LS	$10,000.00	$10,000.00	
Construction Staking (1.5%)	1	LS	$2,500.00	$2,500.00	
Traffic Control Plan (3%)	1	LS	$4,500.00	$4,500.00	
Erosion Control(2%)	1	LS	$3,250.00	$3,250.00	
Sawcut Asphalt	360	LF	$1.50	$540.00	
Excavation including haul	120	CY	$125.00	$15,000.00	
Asphalt Demolition and Disposal	1,610	SF	$2.00	$3,220.00	
Asphalt Patch	1,110	SF	$8.00	$8,880.00	
Concrete Curb	360	LF	$45.00	$16,200.00	
Concrete Curb + Gutter	280	LF	$86.00	$24,080.00	
Stormwater Planter Soil Import	120	CY	$90.00	$10,800.00	
Tree Planting	5	EA	$750.00	$3,750.00	
Shrub Planting	830	EA	$15.00	$12,450.00	
Bark Mulch	20	CY	$82.00	$1,640.00	
Misc. Drainage Pipe + Fittings	50	LF	$195.00	$9,750.00	
			Subtotal =	**$126,560.00**	
			SUB -TOTAL DIRECT CONSTRUCTION COST =	**$1,065,528**	

PROJECT FACTSHEET—SMA-2

Project Title: Q Street Infiltration Pond Retrofit

Location: Stormwater facility north of Q Street between 37th and 39th Street

Issue Description and Additional Benefits:

Issue	Description
Flow Control	The runoff from most of the Campen Creek Villa subdivision drains to Campen Creek without being detained and could contribute to high flows in the stream. Either by accident or by design, an older existing large infiltration pond in the vicinity is underutilized for the drainage area.
Water Quality	The area was developed before modern water quality standards were in place. Runoff from residential roofs and streets likely contains high concentrations of fine sediment, dissolved metals, and 6PPD-quinone. Runoff drains into Campen Creek without treatment.

Project Description:

A large infiltration pond exists on the north side of Q Street between 37th and 39th Streets in the Campen Creek Villa subdivision. Based on the available as-built drawings and a desktop analysis, the infiltration pond currently only collects and infiltrates stormwater from adjacent properties (approximately 0.7 acres). There no inlet pipe to the infiltration pond and one overflow outlet from the infiltration pond to the stormwater system on Q Street. Runoff from the remaining residential properties and streets in the Campen Creek Villa subdivision is conveyed directly to Campen Creek without flow control or treatment.

Following an initial survey and engineering investigation to confirm the existing drainage area, this project will redirect runoff from a drainage area of approximately 22 acres (assumed to be 70% impervious and 30% pervious) from Q Street to W Street and between approximately 37th Street and 41st Street to the existing infiltration facility. This will involve installing a new manhole at the intersection of Q Street and 39th Street. New stormwater pipe will be installed to redirect runoff to the infiltration pond from the new manhole to the west and the existing manhole on Q Street and 37th Street to the east to redirect runoff to the infiltration pond. The project will also install two proprietary pre-treatment facilities in Q Street to remove total suspended solids (TSS) and protect the infiltration capacity of the pond's soils. The existing infiltration pond outlet will be raised to the infiltration pond's overflow elevation. This will discharge excess runoff from the infiltration pond directly to the public stormwater sewer in Q Street. The project will regrade and replant the facility and, if necessary, replace compacted topsoil to ensure the facility is functioning as intended.

The existing infiltration facility will provide flow control for runoff from the drainage area. By combining pre-treatment and infiltration into native soil, the proposed facilities will also meet phosphorus, enhanced, and basic treatment performance goals. The facility will be able to provide flow control and treatment for approximately 20 acres of the total 22-acre drainage area being redirected into the infiltration pond during the 100-year storm event. Excess runoff will overflow through the infiltration pond's existing overflow outlet to the stormwater system on Q Street and discharge to Campen Creek.

Pretreatment will be provided by Contech Vortechs® 2000 structures, which have a General Use Level Designation (GULD) approval from Department of Ecology. Other GULD approved pretreatment technologies may be considered during final design.

Solution Sizing Basis:

Existing Infiltration Pond

- The existing infiltration pond is sufficiently sized to provide treatment and flow control for approximately 14 acres of impervious area and 6 acres of pervious area.
- Assumes 5.7 in-hr infiltration rate at the bottom of the pond.
- After rehabilitation and retrofit, the infiltration pond would meet the LID Performance Standard for flow control and infiltrate at least 91% of the annual runoff volume for 20 acres of the contributing drainage area.
- Facility Volume = 2.8 ac-ft

Contech Vortechs® 2000

- Two Vortechs® 2000 structures are proposed to provide pre-treatment for 14 acres of impervious area and 6 acres of pervious area.
- Water Quality Flow Rate = 1.8 cfs (0.9 cfs per each structure)
- Treatment capacity = 2.0 cfs (1.0 cfs per each structure)
- The proposed pre-treatment facilities are sized to treat at least 91% of the annual runoff volume for 20 acres of the contributing drainage area.

Pollutants Addressed: The project will provide flow control and will remove trash, debris, sediment, dissolved metals, phosphorus, hydrocarbons, and 6PPD-quinone[1] from stormwater runoff.

Future Consideration: The City will need to investigate the facility and drainage pipes on surrounding streets to ensure there are no other existing inlets to the pond. Survey in needed to ensure there is sufficient hydraulic drop for conveyance to the infiltration facility. A geotechnical study is required to confirm infiltration rate in the pond and groundwater elevations. If infiltration is found to be poor, additional excavation could be used to replace and amend compacted topsoil or the design could be changed to a detention pond with additional upstream treatment.

Estimated Project Cost: $776,000

[1] 6PPD-quinone is an emerging pollutant of concern in Washington. As of 2022, bioretention is the only runoff treatment facility type known to remove 6PPD-quinone from stormwater runoff. Because stormwater is fully infiltrated in this facility, we assume P66D-quinone is removed from the storm system by the facility.

Photographs:

Q Street Infiltration Pond. Google, Image Captured June 2021, Accessed 2022.

PLANNING LEVEL PROJECT COST OPINION

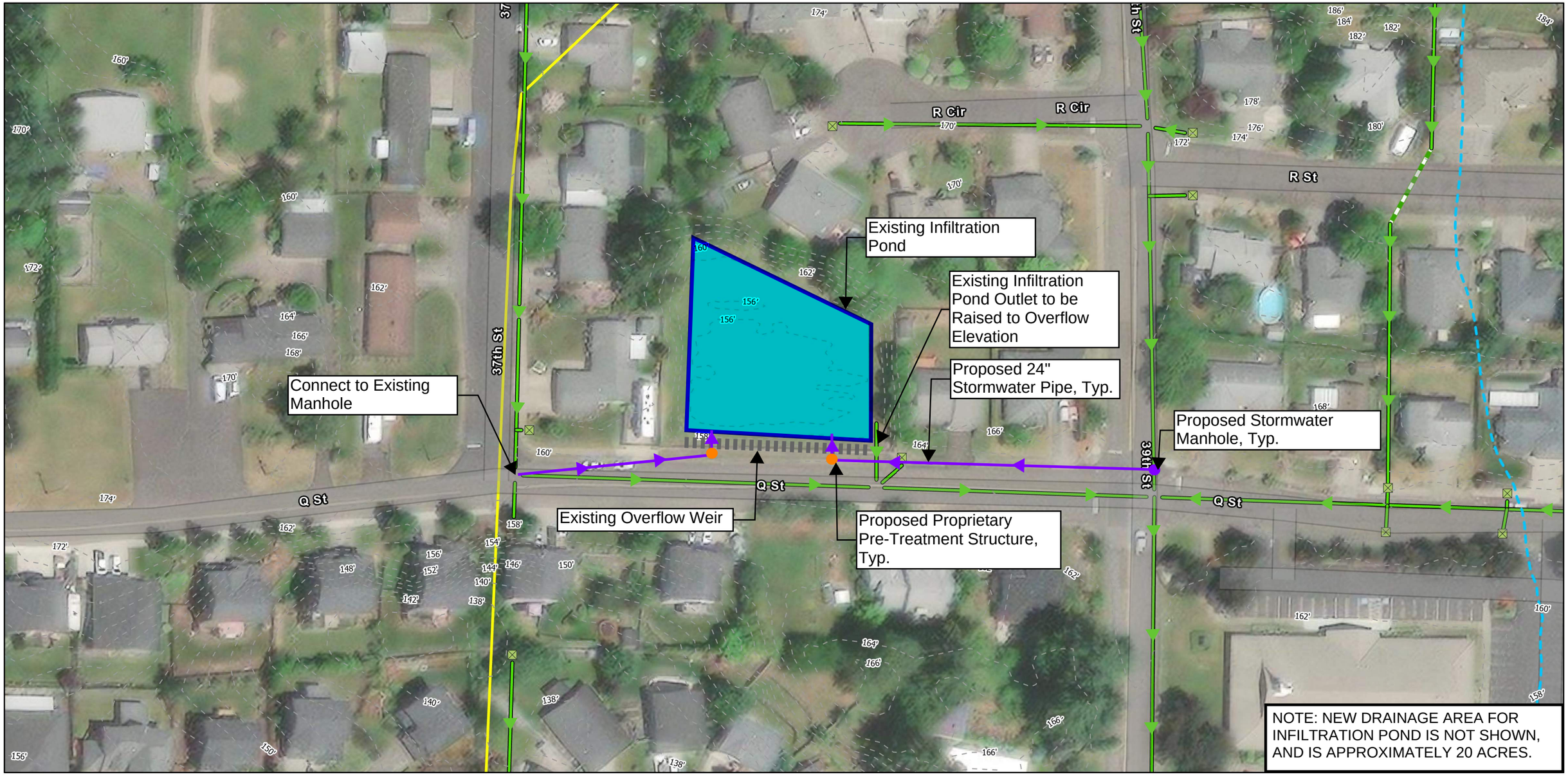
LOCATION: Q Street Infiltration Pond Retrofit
PROJ. ID: SMA-2
DESC. Flow Control and Water Quality Retrofit Improvements near Q Street and 39th Street

BY: FJS
DATE: 2/14/2023

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Construction Elements					
1	STORM SEWER PIPE, 24 IN. DIAM	450	LF	$ 240	$ 108,000
2	MANHOLE 48 IN. DIAM. TYPE 1	1	EA	$ 8,240	$ 8,300
3	PROPRIETARY PRE-TREATMENT STRUCTURE	2	EA	$ 50,800	$ 101,600
4	EXCAVATION (EXPORT OFFSITE)	475	CY	$ 60	$ 28,500
5	TOP SOIL	475	CY	$ 80	$ 38,000
6	DETENTION POND PLANTING	3,000	SY	$ 2.00	$ 6,000
7	RAISE EXISTING OUTLET PIPE IN POND	1	LS	$ 4,000	$ 4,000
				Subtotal Construction Elements	$ 294,400
Required Ancillary Items					
8	MOBILIZATION	10%	Of Construction Elements		$ 29,500
9	EROSION & SEDIMENTATION CONTROL	5%	Of Construction Elements		$ 14,800
10	TRAFFIC CONTROL	5%	Of Construction Elements		$ 14,800
11	PLANNING LEVEL CONSTRUCTION CONTINGENCY	30%	Of Total Construction		$ 151,600
				Subtotal Ancillary	$ 210,700
				Total Construction	**$ 505,100**
Permitting and Land Acquisition					
12	BASIC PERMITTING	1	LS	$ 15,000	$ 15,000
				Total Permitting and Land Acquisition	**$ 15,000**
Studies & Engineering					
13	STATE SALES TAX	8.5%	Of Total Construction		$ 43,000
14	ENGINEERING	25%	Of Total Construction		$ 126,300
15	PROJECT ADMINISTRATION	5%	Of Total Construction		$ 25,300
16	CONSTRUCTION MANAGEMENT	10%	Of Total Construction		$ 50,600
17	SURVEY	2%	Of Total Construction		$ 10,200
				Total Studies & Engineering	**$ 255,400**
				Total Cost	**$ 775,500**
2023 Dollars	**Total Estimated Project Cost (Rounded)**				**$ 776,000**

Notes:

1. The above cost opinion is in 2023 dollars and does not include future escalation, financing, or O&M costs.
2. The order-of-magnitude cost opinion has been prepared for guidance in project evaluation from the information available at the time of preparation and for the assumptions stated. The final costs of the project will depend on actual labor and material.



SMA 2
Q STREET INFILTRATION POND RETROFIT PLAN VIEW

WASHOUGAL SMAP

Data Sources:
Date: 2/13/2023
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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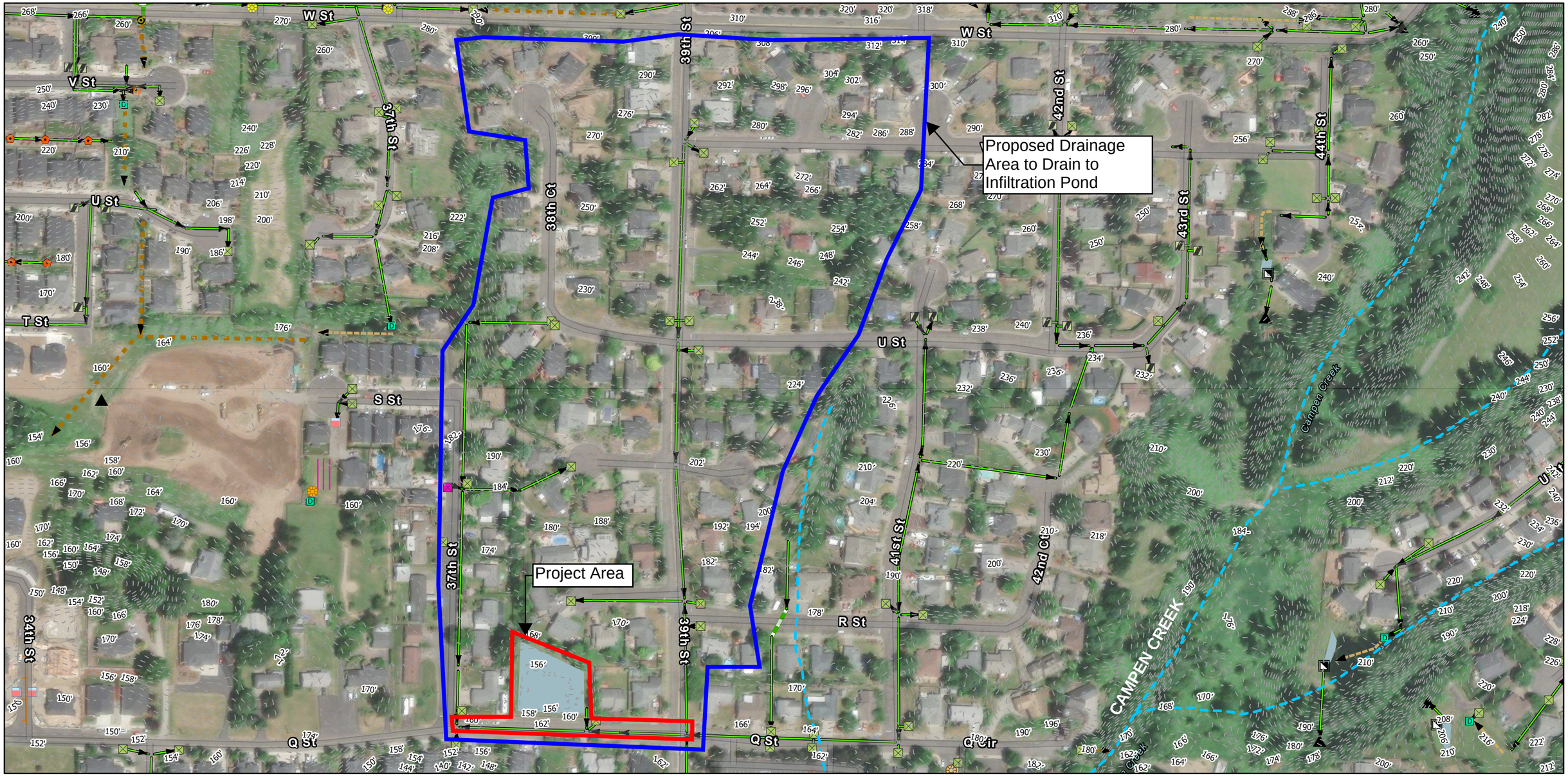
Legend

- Washougal City Limits
- Gibbons Creek Basin Catchments
- Streams
- Contours
- Storm Line
- Culverts
- Ponds
- Catchbasin
- Existing Infiltration Pond
- Proposed Proprietary Pre-Treatment Structure
- Proposed Stormwater Manhole
- Proposed Stormwater Pipe
- Existing Overflow Weir

0 37.5 75 150 Feet

N

Otak



SMA 2
Q STREET INFILTRATION POND RETROFIT DRAINAGE BASIN
WASHOUGAL SMAP

Data Sources:
Date: 12/30/2022
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Legend

- Washougal City Limits
- Contours
- Discharge Point
- Outfall
- <all other values>
- Cleanout
- Catchbasin
- Combination Inlet
- Curb Inlet
- Field inlet
- Flow Control Manholes
- Filter Manholes
- Sedimentation Manholes
- Flow Control Inlets
- Filter Vaults
- Filter Catchbasins
- Drywells
- Swales
- Storm line
- Infiltration Trenches
- Ditches
- Detention Vaults
- Culverts
- Ponds
- Streams
- Drainage Area (20 Acres)
- Project Area

0 125 250 500 Feet

N

Otak

PROJECT FACTSHEET—SMA-3

Project Title: X Street Water Quality Retrofit

Location: The Summer Slopes open space north of X Street between 41st Street and 45th Street

Issue Description and Additional Benefits:

Issue	Description
Flow Control	The Summer Slopes neighborhood drains to two detention facilities. One located in the power transmission line tract west of 42nd Street, and one located in the Summer Slopes open space. The detention facilities may not be functioning as designed. Runoff drains to Campen Creek and could contribute to high flows in the stream.
Water Quality	The area was developed without water quality treatment. Runoff from residential roofs and residential streets likely contains fine sediment. Runoff drains into Campen Creek without treatment.

Project Description:

Under existing conditions, runoff from the residential properties and streets from the Summer Slopes subdivision is conveyed to two detention facilities. One is located in the power transmission line tract west of 42nd Street, and one is located in the Summer Slopes open space north of X Street between 41st and 45th Streets. The runoff is discharged to Campen Creek without treatment. Additionally, the detention facility in the Summer Slopes open space may be in groundwater and therefore not providing effective detention.

This project will install two proprietary runoff treatment vaults and evaluate the function of the existing detention facilities for potential repair or redesign. The proprietary treatment vaults will remove total suspended solids (TSS) from runoff for the entire drainage basin.

Basic and phosphorus runoff treatment will be provided by two Contech Peak Diversion StormFilter® Vaults with PhosphoSorb® media, which have a General Use Level Designation (GULD) approval from Department of Ecology. PhosphoSorb® was chosen because fewer media cartridges are required to treat the same runoff volume compared to the Contech ZPG® media cartridges which provide only basic treatment. As a result, construction costs are lower, and maintenance costs are lower at the current media price differential. Other GULD approved treatment technologies may be considered during final design.

In addition to installing treatment, the function of the existing detention system will be evaluated. The function and connection of the detention facility west of 42nd Street will need to be confirmed. The function of the detention facility in the Summer Slopes open space will also need be determined. The site is a former wetland, and water flow was observed during a site visit in summer. The cause of this dry weather flow will need to be investigated, and the design of the treatment or detention facility may need to be adjusted.

Solution Sizing Basis:

Contech 6' x 12' Peak Diversion StormFilter® Vault #1

- Treats 4.1 acre of impervious area and 11 acres of pervious area
- Water Quality Flow Rate = 0.45 cfs
- Number of Cartridges = Eleven (11) 27" Cartridges (PhosphoSorb® media)

Contech 8' x 11' Peak Diversion StormFilter® Vault #2

- Treats 3.1 acre of impervious area and 8.9 acres of pervious area
- Water Quality Flow Rate = 0.59 cfs
- Number of Cartridges = Fifteen (15) 27" Cartridges (PhosphoSorb® media)

Pollutants Addressed: The project will remove total suspended solids (TSS) and phosphorus from stormwater runoff.

Future Consideration: The City will need to evaluate the function of the existing detention facility. A malfunctioning detention facility could affect the design of the planned treatment facilities, require repair, or require replacement to meet the project goals. The estimated project cost includes an engineering study to determine detention facility function but does not include repair or replacement of the facility.

Estimated Project Cost: $400,000

Photographs:

Looking North at proposed location of proprietary treatment vault location #2 from X Street.

Looking East at field inlet near proposed location of proposed proprietary treatment vault location #2 from X street.

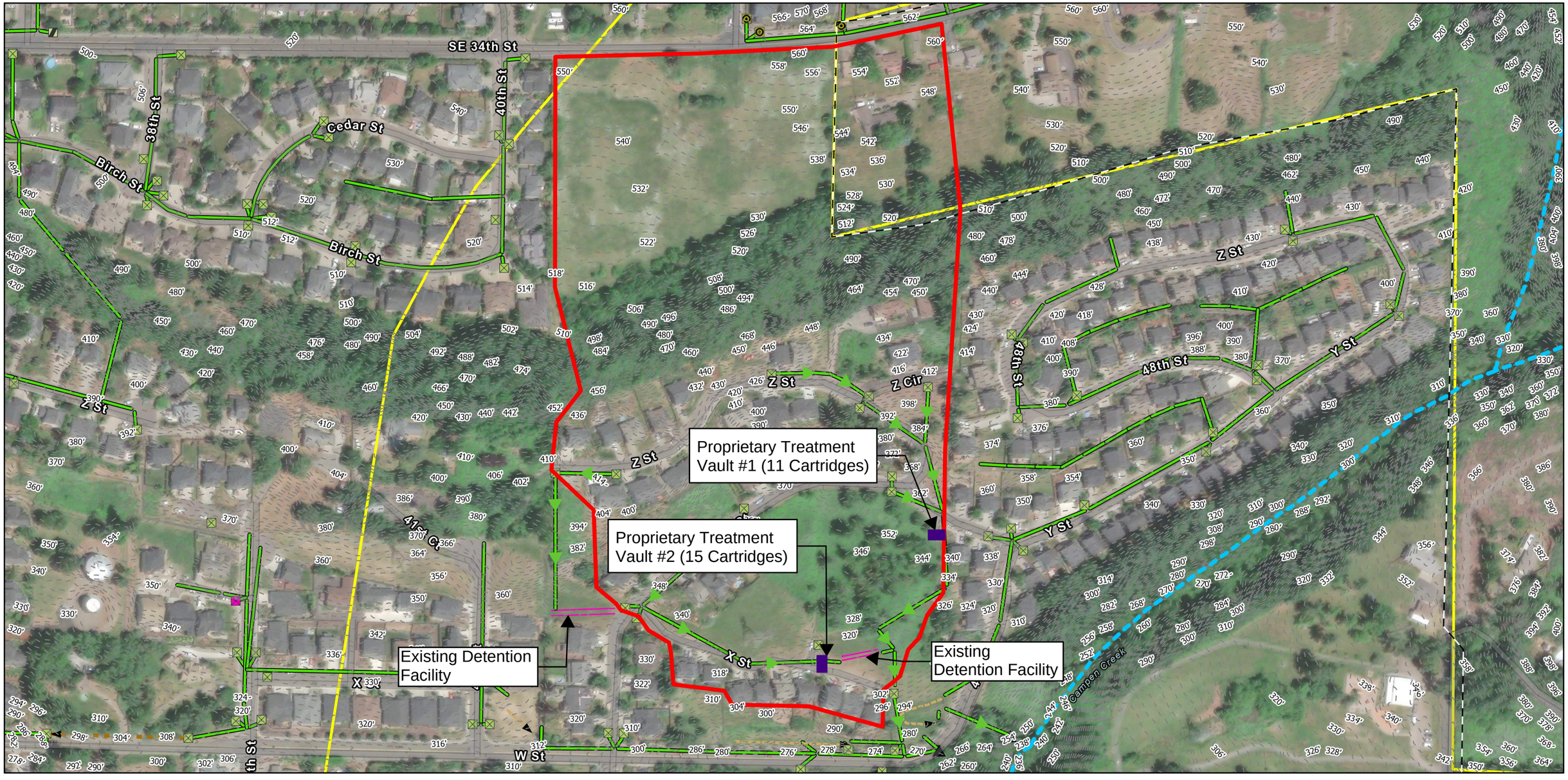
PLANNING LEVEL PROJECT COST OPINION

LOCATION: **X Street Water Quality Retrofit** **BY:** **FJS**
PROJ. ID: **SMA-3** **DATE:** **1/6/2023**
DESC. **Water Quality Retrofit Improvements on X Street**

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Construction Elements					
1	PROPRIETARY TREATMENT VAULT (15 CARTRIDGES)	1	LS	$ 72,000	$ 72,000
2	PROPRIETARY TREATMENT VAULT (11 CARTRIDGES)	1	LS	$ 60,000	$ 60,000
				Subtotal Construction Elements	$ 132,000
Required Ancillary Items					
3	MOBILIZATION	10%	Of Construction Elements		$ 13,200
4	EROSION & SEDIMENTATION CONTROL	5%	Of Construction Elements		$ 6,600
5	TRAFFIC CONTROL	1%	Of Construction Elements		$ 1,400
6	PLANNING LEVEL CONSTRUCTION CONTINGENCY	40%	Of Total Construction		$ 102,200
				Subtotal Ancillary	$ 123,400
				Total Construction	**$ 255,400**
Permitting and Land Acquisition					
7	BASIC PERMITTING	1	LS	$ 15,000	$ 15,000
				Total Permitting and Land Acquisition	$ 15,000
Studies & Engineering					
8	STATE SALES TAX	8.5%	Of Total Construction		$ 21,800
9	ENGINEERING	25%	Of Total Construction		$ 63,900
10	PROJECT ADMINISTRATION	5%	Of Total Construction		$ 12,800
11	CONSTRUCTION MANAGEMENT	10%	Of Total Construction		$ 25,600
12	SURVEY	2%	Of Total Construction		$ 5,200
				Total Studies & Engineering	**$ 129,300**
				Total Cost	**$ 399,700**
2023 Dollars	**Total Estimated Project Cost (Rounded)**				**$ 400,000**

Notes:

1. The above cost opinion is in 2023 dollars and does not include future escalation, financing, or O&M costs.
2. The order-of-magnitude cost opinion has been prepared for guidance in project evaluation from the information available at the time of preparation and for the assumptions stated. The final costs of the project will depend on actual labor and material.



SMA 3

X STREET WATER QUALITY RETROFIT

WASHOUGAL SMAP

Data Sources:
Date: 2/9/2023
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Legend

- Washougal City Limits
- Gibbons Creek Basin Catchments
- Drainage Area
- Streams
- Contours
- Storm Line
- Detention Vaults
- Outfall
- Catchbasin
- Combination Inlet
- Curb Inlet
- Filter Catchbasins
- Swales
- Ditches
- Proprietary Treatment Vault

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PROJECT FACTSHEET—SMA-5

Project Title: J Street and 42nd Street (Vintage Crest Estates Subdivision) Water Quality Retrofit

Location: Vintage Crest Estates Subdivision: 42nd Street north of J Street, M Drive, M Loop and Rolling Meadows Drive

Issue Description and Additional Benefits:

Issue	Description
Flow Control	The neighborhood drains to an existing detention facility near J Street and 42nd Street. The detention pond was built to an older standard and may be undersized for the contributing drainage area at the current standard. City staff have not observed performance difficulties, so sizing analysis was not performed for this document.
Water Quality	The neighborhood drains to an existing biofiltration swale near J Street and 42nd Street. The water quality swale as constructed is undersized for the contributing drainage area. Runoff from residential roofs and residential streets likely contains fine sediment.

Project Description:

Under existing conditions, runoff from the residential properties and streets from the Vintage Crest Estates Subdivision is conveyed through a biofiltration swale to a detention pond located at J Street and 42nd Street. The biofiltration swale appears to have been constructed with a much smaller width than its design, and it is significantly undersized to treat the entire contributing drainage of 23.5 acres to current standards. City staff have observed excessive inundation and have installed an orifice plate in the upstream manhole to direct some flows away from the swale and directly to the detention pond. An engineering analysis using rough dimensions calculated from field photographs found that the swale can treat approximately two acres in its current condition.

This project will install bioretention planters in the neighborhood streets to treat a portion of the drainage area that is not currently treated. This project will install approximately 11,000 square feet of bioretention planter (footprint) for runoff treatment in 42nd Street north of J Street, M Drive, and M Loop. The bioretention planters will supplement the runoff treatment provided by the existing biofiltration swale and remove sediment, dissolved metals, and 6PPD-quinone. Assuming a conservative infiltration rate of 0.5 inches per hour, the bioretention planters will be able to treat approximately 8.8 acres of the drainage basin and will provide a minor flow control benefit.

The bioretention planters are able to provide both basic and enhanced treatment. The bioretention planter locations are preliminary. Bioretention planters will be designed to provide runoff treatment in accordance with BMP T7.30: Bioretention from the *2019 Stormwater Management Manual for Western Washington*.

Drainage Basin Treatment Summary:

The following is a summary of how the contributing drainage area will be treated.

- Total drainage basin = 23.5 acres
- Acres assumed to be treated by current swale = 2.0 acres
- Acres to be treated by bioretention planters = 8.8 acres
- Acres not treated by proposed project = 12.7 acres

Solution Sizing Basis:

Bioretention Planters

- Treats 6.2 acres of impervious area and 2.6 acres of pervious area
- Total Bioretention Planter footprint = 11,000 sf
- Infiltration rate 0.5in/hr

Pollutants Addressed: The project will provide limited flow control and will remove sediment, dissolved metals, and 6PPD-quinone[1] from stormwater runoff.

Future Consideration:

This project presents one option to provide treatment and flow control for the runoff from the Vintage Crest Estates Subdivision. This project is based on an initial evaluation of the existing drainage and soil conditions in the neighborhood. The first step will be a thorough evaluation of existing conditions including, survey and geotechnical evaluation, and an engineering alternatives analysis. Several variables are unknown and conservative assumptions were made in the outline of this project.

Two key unknowns are the infiltration rate of soils where bioretention planters may be constructed and the drainage area contributing flow to the biofiltration swale and detention pond located at J Street and 42nd Street. As proposed, the bioretention planters are not intended to treat the entire neighborhood due to limited space in the right-of-way. Bioretention planters can be sized to treat a specific quantity of runoff when the soil infiltration rate is known. Streets in the Vintage Crest Estates Subdivision are steep, and the bioretention sizing analysis assumed a conservative, low infiltration rate. The flow treatment and flow control benefits will be maximized to the extent feasible based on site conditions and siting limitations. The analysis also assumed a drainage area that includes the entire lots of all of the properties in the portion of the neighborhood that drains to the swale and detention pond. Based on plat documents, some houses in the northern portion of the neighborhood may drain to on-site swales at the back of each lot. The City has no evidence of construction and no access for inspection of the on-site swales, and the bioretention sizing analysis assumed they do not exist.

Additionally, there may be more effective or efficient alternatives not considered in this brief analysis. Those alternatives will need to be evaluated. Other nearby plots may be available to install treatment facilities, or final design could supplement bioretention planters with proprietary underground runoff treatment structures to treat more acreage. The existing swale should be evaluated for size and function.

[1] 6PPD-quinone is an emerging pollutant of concern in Washington. As of 2022, bioretention is the only runoff treatment facility type known to remove 6PPD-quinone from stormwater runoff.

Planters will be located in the parking lanes of residential streets; specific locations have not been selected and will need to be identified during final design with input from residents.

Total Estimated Project Cost: $2,360,000

This project may be implemented in two or more phases. The existing conditions study and alternatives analysis for the whole site could be conducted in the first phase, along with construction over one or two years. Additional phases of capital construction may follow as funding is available.

Estimated Phase 1 Cost: $1,339,000

Estimated Phase 2 Cost: $1,012,000

Photographs:

Biofiltration swale, looking East,
site visit July 27, 2022.

M Drive, looking Northeast. Google, Image Captured August 2012, Accessed 2022.

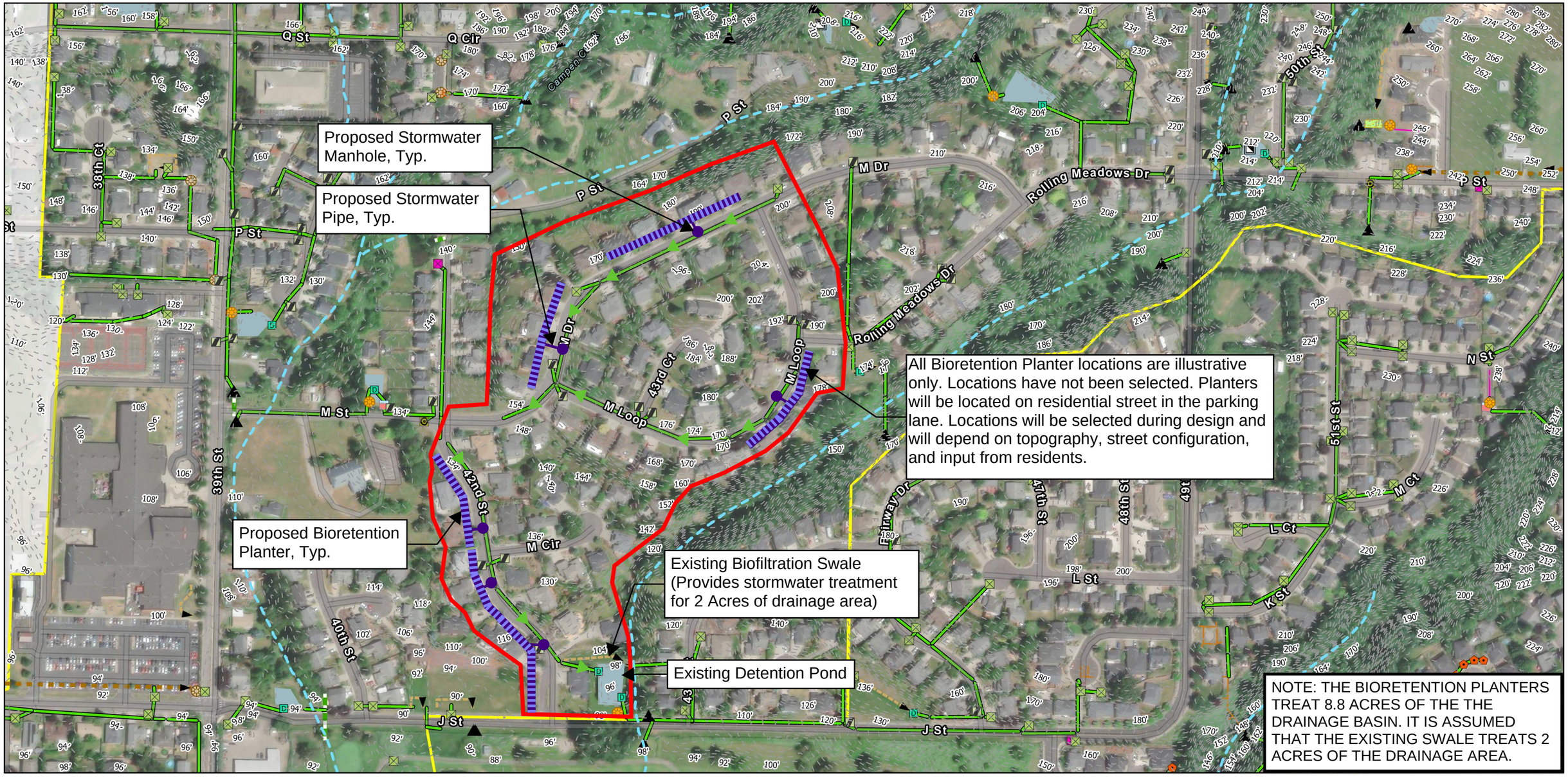
PLANNING LEVEL PROJECT COST OPINION

LOCATION: J Street and 42nd Street Water Quality Retrofit — **BY:** FJS
PROJ. ID: SMA-5 — **DATE:** 2/14/2023
DESC. Water Quality Retrofit Improvements near Q Street and 39th Street

ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Construction Elements					
1	STORM SEWER PIPE, 12 IN. DIAM	120	LF	$ 190	$ 22,800
2	MANHOLE 48 IN. DIAM. TYPE 1	6	EA	$ 8,240	$ 49,500
3	BIORETENTION PLANTER	11,000	SF	$ 85	$ 935,000
				Subtotal Construction Elements	$ 1,007,300
Required Ancillary Items					
4	MOBILIZATION	10%	Of Construction Elements		$ 100,800
5	EROSION & SEDIMENTATION CONTROL	5%	Of Construction Elements		$ 50,400
6	TRAFFIC CONTROL	3%	Of Construction Elements		$ 30,300
7	PLANNING LEVEL CONSTRUCTION CONTINGENCY	30%	Of Total Construction		$ 509,600
				Subtotal Ancillary	$ 691,100
				Total Construction	**$ 1,698,400**
Permitting and Land Acquisition					
8	BASIC PERMITTING	1	LS	$ 15,000	$ 15,000
				Total Permitting and Land Acquisition	**$ 15,000**
Studies & Engineering					
9	STATE SALES TAX	8.5%	Of Total Construction		$ 144,400
10	ENGINEERING	15%	Of Total Construction		$ 254,800
11	PROJECT ADMINISTRATION	2%	Of Total Construction		$ 34,000
12	CONSTRUCTION MANAGEMENT	10%	Of Total Construction		$ 169,900
13	SURVEY	2%	Of Total Construction		$ 34,000
				Total Studies & Engineering	**$ 637,100**
				Total Cost	**$ 2,350,500**
2023 Dollars	**Total Estimated Project Cost (Rounded)**				**$ 2,360,000**

Notes:

1. The above cost opinion is in 2023 dollars and does not include future escalation, financing, or O&M costs.
2. The order-of-magnitude cost opinion has been prepared for guidance in project evaluation from the information available at the time of preparation and for the assumptions stated. The final costs of the project will depend on actual labor and material.



SMA 5

J STREET AND 42ND (VINTAGE CREST ESTATES) WATER QUALITY RETROFIT

WASHOUGAL SMAP

Data Sources:
Date: 2/13/2023
Disclaimer: This data is not to survey accuracy and is meant for planning purposes only.

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Legend

- Washougal City Limits
- Gibbons Creek Basin Catchments
- Streams
- Contours
- Storm Line
- Detention Vaults
- Flow Control Manholes
- Filter Manholes
- Flow Control Inlets
- Filter Vaults
- Filter Catchbasins
- Drywells
- Swales
- Infiltration Trenches
- Ditches
- Culverts
- Rain Gardens
- Ponds
- Drainage Area (23.5 acres)
- Proposed Stormwater Manhole
- Proposed Stormwater Pipe
- Proposed Bioretention Planter (11,000 SF Total)

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Appendix F

Web Map

Appendix F

SMAP Web Map

March 2023 - The web map associated with this plan is located at this link:
https://washstorm.maps.arcgis.com/apps/webappviewer/index.html?id=903ddd1ad8c7421c85734e21d2108a59