PRIORITIES FOR STORMWATER CAPITAL FACILITIES

For CFP Period 2018-2023

I. BASIS FOR SELECTING PROJECTS FOR THE CFP

A. Need: The capital facility projects identified serve previously developed areas within the Stormwater Utility. Many of these areas have inadequate or failing pre-existing stormwater systems, which cause localized flooding, and in some cases affect or could affect water quality and freshwater and marine habitat.

New stormwater facilities constructed in association with parcel development are subject to the requirements set forth by the current edition of the Thurston County Drainage Design and Erosion Control Manual (DDECM). These new facilities are funded entirely by the developer, and address potential flooding and water quality impacts, which are a direct result of the planned development.

B. Criteria or Basis for Setting Priorities:

Adopted Comprehensive Drainage Basin Plans and 1998 Re-prioritization Study:

Comprehensive planning for stormwater drainage basins for the north county stormwater utility began in 1989. To date, Thurston County has adopted seven (7) basin plans. These plans identify structural and non-structural alternative solutions to flooding, water quality and habitat problems identified in each basin. The needed structural solutions become part of the Water Resources Division of the Resource Stewardship Department's Capital Facility Plan for 6 and 20 year projects. In late 1997, the Board of County Commissioners directed a comprehensive review of the Stormwater Utility's Capital Facility Plan. An outside engineering firm, staff, and the Storm and Surface Water Advisory Board (SSWAB) reviewed all projects.

Emerging Issues & Post-1998 Basin Plans:

The Storm and Surface Water Utility continues to address emerging issues. Foreseen issues the SSWU will need to address in the future include: 1) conditions and stipulations of the NPDES Phase 2 Permit (issued under the federal Clean Water Act); 2) thresholds and limitations due to Total Maximum Daily Limits (TMDL) and other water quality studies; 3) protection of state and federal (ESA) listings of endangered species and their related habitat; 4) goals and objectives to improve conditions for recreational and commercial shellfish harvesting within the Nisqually and Henderson Inlet basins; etc. These foreseen issues will require the SSWU to annually assess the 6YR CFP and 20YR CFP.

During 2002, the Storm and Surface Water Advisory Board (SSWAB) evaluated and developed ranking criteria, which address the above mentioned foreseen issues. This ranking process was revised in 2010. The SSWAB comprehensively reviewed and ranked each identified capital facility project using the 2010 ranking criterion. In 2013, the SSWU worked with SSWAB to update the 2010 capital facility ranking criterion to better reflect current priorities under the NPDES permit and planning efforts completed by the Puget Sound Partnership and other Agencies. The proposed ranking system requires greater preliminary design and evaluation of each

project and was implemented in 2015 for existing and new projects. Re-prioritization of projects using the new system was incorporated into the 2016-2021 Capital Facilities Plan Update.

The SSWU will also need to address unforeseen issues, such as aged and degraded infrastructure, changes in local, state and federal regulations and permitting processes, budget reductions in state and federal grant and loan programs, etc. Subsequently, the SSWU will assess each emerging need to determine whether a capital facility is imminent.

As such, the SSWAB annually assesses the SSWU CFP priorities as well as evaluates the need for future projects. SSWAB recognizes projects currently under engineering design, environmental permitting, and construction efforts have a priority over other projects. Shifting priorities are therefore avoided to maintain a programmatic approach to successfully and efficiently implement the SSWU 6YR CFP. Changes in priorities only occur when the flooding, water quality or habitat conditions degrade creating a more severe situation, which requires immediate action.

C. Ranking Criteria (as revised in 2013):

1. *Location*
    a. UGA and NPDES Permit boundaries
    b. Fish bearing waters, BIBI monitoring points
    c. Proximity to water body, stream size
    d. Well head protection areas
    e. High ADT roadway or high use sites
    f. Number of projects previously completed in the area

2. *Project Feasibility*
    a. Ease of permitting
    b. Potential utility or site constraints
    c. Parcel ownership and number of parcels involved
    d. Community acceptance of the project
    e. Access for construction and maintenance
    f. Project impact on site use and operations (mainly commercial and industrial considerations)
    g. Sufficiency of space
    h. Existing grading and drainage and infrastructure configuration
    i. Level of existing treatment and flow control

3. *Compliance with federal and state water quality regulations*
    a. Identified in long range plan document
    b. Facility maintenance identified in resource plan
    c. Project required under regulatory action

4. *Protection of People and Property*
    a. Project reduces threat to human safety, health or welfare.
    b. Frequency of reoccurrences
    c. Existing drainage problem
    d. Detrimental impact to public facilities
    e. Problem Frequency
    f. Provides maximum benefit to ratepayers
    g. Protects water Quality
    h. Enhances environmental protection to sensitive resources

5. *Water Quality and Quantity*
    a. Total area treated or project size for restoration projects
    b. % impervious in the tributary area
    c. Closed conveyance vs. open conveyance
    d. Land use
    e. Amount and degree of treatment provided
    f. Pollutant removal effectiveness
    g. Degree and amount of flow control provided
    h. Overall efficiency of project

6. Environment, Habitat & Ecology
    a. Environmental enhancement and benefits
    b. Habitat enhancement for fish
    c. Habitat enhancement for other species
    d. Priority habitats in the vicinity
    e. Forest, native vegetation, or soils restoration
    f. Recreational, open space, and connectivity considerations

7. *Public Stewardship*
    a. Cost per treated area and cost to stormwater utility
    b. Special opportunity for high priority project may be lost
    c. Significant reduction in maintenance and operations costs
    d. Support economic development by solving regional stormwater problem
    e. Urgent problem
    f. Supports inter-jurisdictional solutions
    g. Increases public education and citizen involvement

8. Discretionary Rating
    a. Best professional judgement of evaluator to take into consideration other project factors not captured above

II. PROJECT LIST IN ORDER OF PRIORITY

Project Priorities: SSWU capital facility projects typically address three general priorities: 1) Flood alleviation; 2) Water quality protection; and 3) Habitat preservation and restoration. Many of these projects address multiple priorities providing greater community benefit.

Capital Projects:

Capital Project	Priority/Why Needed	Status
Woodland Creek Estates – Retrofit	**Priority #1** Water quality treatment retrofit to address bacterial pollutants to Woodland Creek.	Feasibility analysis and concept design completed in 2013. Preliminary design and 90% design in 2014 under Ecology Capacity Grant. Permitting is complete. Project split into two phases. Final design in 2016 and construction of Phase I in 2016 and Phase II in 2017.
Rochester Stormwater Pond $305,000	**Priority #2** Construct infiltration pond, replace catch basins and pipe, and install culvert under Albany Road SW to address localized flooding	Property acquisition in 2017, design in 2017, and construction in 2018.
Woodard Retrofit Study – Site 3	**Priority #3** Runoff treatment for roadway and adjacent property runoff. Roadside bioretention and enhanced roadside ditch. Treats 6.0 acres. 96% of runoff treated.	Pre-Design completed. Design in 2016 and construction in 2017.
Woodard Retrofit Study – Site 5	**Priority #4** Runoff treatment for roadway and adjacent property runoff. Enhanced roadside ditches and filter vault. Treats 12.3 acres. 91% of runoff treated.	Pre-Design completed. Design in 2016 and construction in 2017.

Capital Project	Priority/Why Needed	Status
92nd Court SE Retrofit	**Priority #5** Stormwater from the adjacent subdivision flows untreated into the Deschutes. Project will install a biofiltration swale to treat stormwater before discharge to the river.	Design and construction in 2018
Rochester Vicinity Drainage Study	**Priority #6** Flooding occurs regularly on Boston Harbor Rd caused by runoff from an area roughly bounded by 72nd Ave to 77th Way. This project will study the existing drainage structures and provide possible solutions for future CFP projects.	Study in 2018
Boston Harbor Vicinity Drainage Study	**Priority #7** The area south of Highway 12 from Gresham Street to Leon Street to 187th Ave has experienced flooding which have resulted in some claims against the County. This project will study the existing drainage structures and provide possible solutions for future CFP projects.	Study in 2018

Capital Project	Priority/Why Needed	Status
Boston Harbor Road NE Outfall Replacement	**Priority #8** The outfall located at 7325 Boston Harbor Rd is failing and needs to be repaired or replaced. Other drainage problems in the area cause flooding of the driveway and erosion which washes sediment directly into the Puget Sound. This project will add a culvert under Boston Harbor Rd and replace the outfall.	Design in 2018 and construction in 2019
Madrona Beach Road NW Vic. Retrofits	**Priority #9** There are five locations along Madrona Beach Road where stormwater infrastructure is failing or inadequate and causing flooding and erosion of the road and driveways. This project will fix the infrastructure.	Design in 2019 and construction in 2020
Woodard Retrofit Study – Site 1	**Priority #10** Runoff treatment for roadway and adjacent property runoff. Roadside bioretention and filter vault. Treats 9.1 acres. 91% of runoff treated.	Pre-Design completed. Design in 2017 and construction in 2018.
Meadows Subdivision Pond 4C Retrofit	**Priority #11** The pond in this subdivision was built in the mid-1980's and does not meet current standards. The project will excavate the pond and retrofit the outlet to meet current stormwater quality and flow control standards.	Design in 2019 and construction in 2020

Capital Project	Priority/Why Needed	Status
Woodard Retrofit Study – Site 2	**Priority #12** Runoff treatment for roadway and adjacent property runoff. Enhanced roadside ditch and filter vault. Treats 12.4 acres. 91% of runoff treated.	Pre-Design completed. Design in 2018 and construction in 2019.
Woodard Retrofit Study – Site 4	**Priority #13** Runoff treatment for roadway and adjacent property runoff. Roadside bioretention swales. Treats 159 acres. 40-47% of runoff treated.	Pre-Design completed. Design in 2018 and construction in 2019.
Littlerock Area Stormwater Retrofit	**Priority #14** The area around Littlerock Elementary School, 127th Ave, and 128th Ave discharge untreated stormwater runoff directly to tributaries of the Black River and Beaver Creek. This project will add biofiltration swales to treat the water before discharging to the river and creek.	Design in 2019 and construction in 2020
Fairground LID Demonstration Project	**Priority #15** Low Impact Development (LID) is now required by the Thurston County Drainage Manual. This project will retrofit portions of the fairgrounds with various LID best management practices to treat and infiltrate the stormwater and provide a high visibility area for citizens and contractors to see how LID BMPs can be used in their projects.	Design in 2019 and construction in 2020

Capital Project	Priority/Why Needed	Status
Manzanita Rd.	**Priority #16** Reduce marine shoreline erosion at outfall	Feasibility analysis and concept design in 2014. Final design begins 2018 with construction 2019.
Cedar Shores Subdivision Pond Retrofit	**Priority #17** Upgrade existing stormwater pond to provide water quality treatment and reduce gulley erosion.	Feasibility analysis and concept design in 2014. Final design in 2018 and construction in 2019.
Donnelly Drive	**Priority #18** Reduce urban street flooding, reduce peak flows to Chambers Ditch and treat stormwater before discharge to ground water and Chambers Ditch	Feasibility analysis and concept design in 2016. Final design in 2019. Construction in 2020.
Boston Harbor Boat Launch	**Priority #19** Stormwater from a parking lot and streets drain directly to Puget Sound without treatment. This project will construct a biofiltration swale and treatment vault to remove pollutants before discharging to the Sound.	Design in 2019 and construction in 2020
Sherwood Firs	**Priority #20** Reduce local flooding and provide WQ treatment	Feasibility analysis and concept design in 2016. Final design in 2020 with construction in 2021.
Stuart Place	**Priority #21** Reduce local flooding and provide WQ treatment	Feasibility analysis and concept design in 2014. Final design in 2020 with construction in 2021.
SR 507 & Connor Road SE Retrofit	**Priority #22** Stormwater from Connor Road discharges directly to the Skookumchuck River without	Design in 2019 and construction in 2020

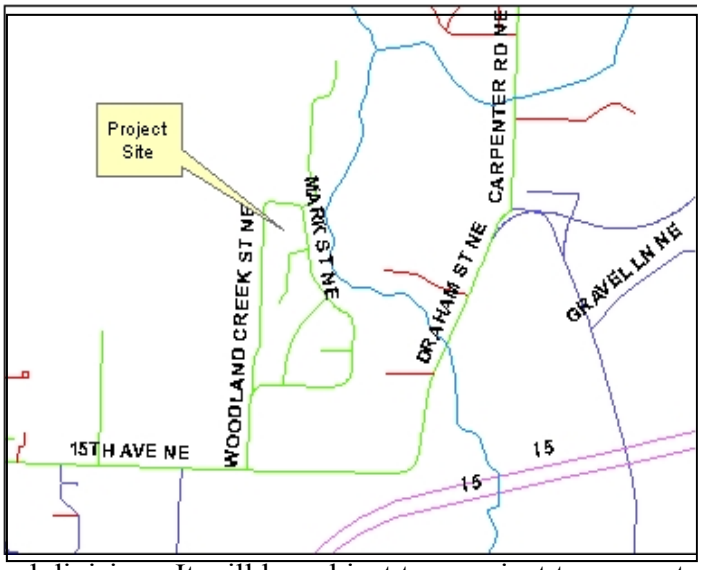
Capital Project	Priority/Why Needed	Status
	treatment. This project will construct a biofiltration area to treat the water and infiltrate it prior to discharge.	
JOINT PROJECTS WITH PUBLIC WORKS – PUBLIC WORKS DEPT. PRIORITIZES		
Waddell Creek Rd. @ Pants Creek	Culvert replacement to reduce local flooding and improve fish passage	Continued monitoring required prior to start of design. Design in 2018 with construction in 2018. Joint project with Public Works.
Cedar Flats Road at Swift Creek	Culvert replacement to reduce local flooding and provide fish passage	Planning and design begins 2022. Construction in 2022. Joint project with Public Works.
CAPITAL FACILITY PLANNING AND PLACE HOLDERS		
Stormwater Retrofit Studies	Using similar methodology to study completed for Woodard Creek Basin additional basins within Thurston County will be studied to identify at least 5 retrofit projects for further programming and construction.	Complete one study approximately every 2 years. Need to prioritize basins for studies. Eld/McLane and Lower Deschutes are potential candidates during this 6-year plan.
Future Retrofit Projects	Projects identified in additional basin retrofit studies, drainage studies, citizen input, and through other means such as technical assists, will be programmed for design and construction.	Specific project identification will result from the stormwater retrofit studies proposed for basins throughout the county.
Thurston County In-lieu Fee Program Property	**Project underway** Pilot project In-lieu-fee habitat	Purchase of initially identified property not completed. New property

Capital Project	Priority/Why Needed	Status
Acquisition/Wetland Mitigation	enhancement and wetland restoration	being considered and purchase anticipated in 2017/2018.
Land Acquisition	**Opportunity** Land acquisition is executed as opportunities supported by the Board of County Commissioners are authorized.	Land acquisition is executed as opportunities supported by the Board of County Commissioners are authorized.
Reserve For Future Capital replacement	Built facilities depreciate annually, a future replacement fund preserves the Utility's infrastructure.	Annual contributions began in 2011.
Reserve – Emergency replacement fund	Acts of nature can damage facilities and infrastructure. This fund is available to help offset emergency response and damage caused by natural disasters costs so they don't impact the capital projects	Lump sum contribution in 2016

III. SUMMARY/OVERVIEW

The SSWU Capital Facility Project rate was originally established in late 1998 to fund six (6) years of capital construction beginning in 1999. From 1999 to 2004, capital projects were constructed to alleviate flooding, address water quality, and improve habitat. The Board of County Commissioners acted in early 2004 to continue the Capital Facility Project rate in perpetuity based on both the success of construction efforts and a need to address future capital needs relative to flooding, water quality and habitat issues. An increased rate for capital facility funding from the Stormwater Utility took effect in 2015. This rate change is a result of the increased emphasis on retrofitting existing development as outlined in the Puget Sound Partnership's action agenda and anticipated future NPDES Stormwater Permit requirements.

Woodland Creek Estates



DESCRIPTION: Investigate retrofit projects such as bioretention, retrofitted drywells, ponds, or storm filters to provide water quality treatment and/or flow control.

LOCATION: Lacey UGA, Woodland Creek Estates Subdivision located north of 15th Avenue NE in vicinity of N. Thurston High School.

JUSTIFICATION (Need/Demand): This area is identified as one of the major sources of fecal coliform bacterial pollution to Woodland Creek which is passes through the northern part of the subdivision. It will be subject to a project to convert septic systems to sewer in 2013. The 1995 Woodland/Woodard Creek Basin Plan and the 2006 TMDL study by the Washington State Department of Ecology have shown fecal coliform bacteria pollution in Woodland Creek.

I**MPLICATION OF NOT DOING THE PROJECT(S):** Continuation of water quality impairment in Woodland Creek and Henderson Inlet that has contributed to closed shellfish harvesting areas. An opportunity to tie this project with the sewer system installation will be lost.

LINKS TO OTHER PROJECTS OR FACILITIES: Tanglewilde Retrofits.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9; Woodland and Woodard Creek Basin Plan: WL8, WL15A, WL15C, WL17A

Woodland Creek Estates

LEVEL OF SERVICE (LOS): Service level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$57,500	$40,000						$40,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$40,000						$40,000
GRANTS/Loans	$0						$0

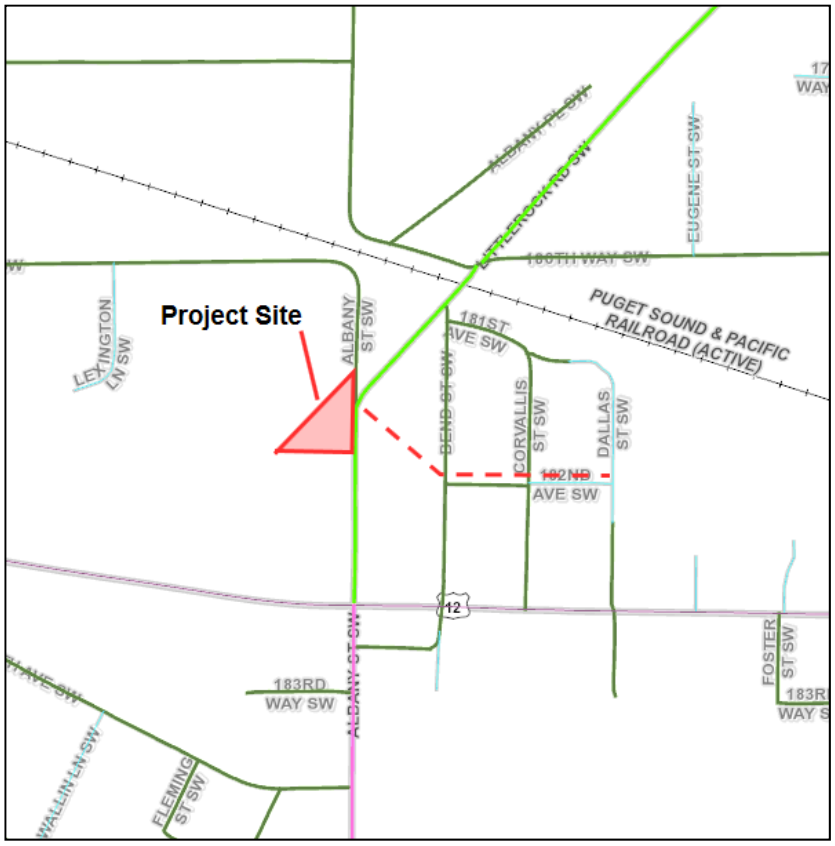
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $5,000 (approximately)
Estimated Revenues – SSWU Rates
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
X Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Albany Street Stormwater Pond Retrofit



DESCRIPTION: Construct an infiltration pond on Albany St. SW and replace storm sewer pipe and catch basins in residential neighborhood to reduce localized flooding.

LOCATION: Along Albany St. SW and 102nd Ave. SW in Rochester. Section 31 Township 16 Range 3W Quarter SE SE SS-1072 LT

JUSTIFICATION (Need/Demand):

The project is located in Rochester at the intersection of Littlerock Rd SW and Albany St SW and along 102nd Ave SW. Water Resources staff has been contacted repeatedly regarding localized flooding that occurs in the ditches along Albany St SW and partially floods the travel lane there and in residences along 102nd St SW. A storm sewer pipe carries water from the street and residences along 102nd St SW across a play field and empties into the ditch at the intersection of Albany St SW and Littlerock Rd SW. There is an outfall into a man-made ditch on the other side of Albany St SW, however, due to the flat nature of the site and problems with other culverts and pipes leading to the outfall, the water does not make it to the outfall. The proposed solution would construct an infiltration pond with a culvert under Albany St SW that would drain the ditch and allow an increase in the slope of the storm sewer pipe. This would allow more water to flow from the residential area and into the pond where it could be infiltrated. An overflow will be provided from the pond to the drainage ditch where the current outfall empties.

IMPLICATION OF NOT DOING THE PROJECT(S): On-going flooding to Albany St SW and residences along 102nd Ave SW.

LINKS TO OTHER PROJECTS OR FACILITIES: *N/A.*

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Natural Environment: C. Surface Water; D. Frequently Flooded Areas; E. Transportation: C. Existing County Roadway System

Albany Street Stormwater Pond Retrofit**LEVEL OF SERVICE (LOS):** Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0	$215,000						$215,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$215,000						$215,000
REET/GRANTS /Loans							

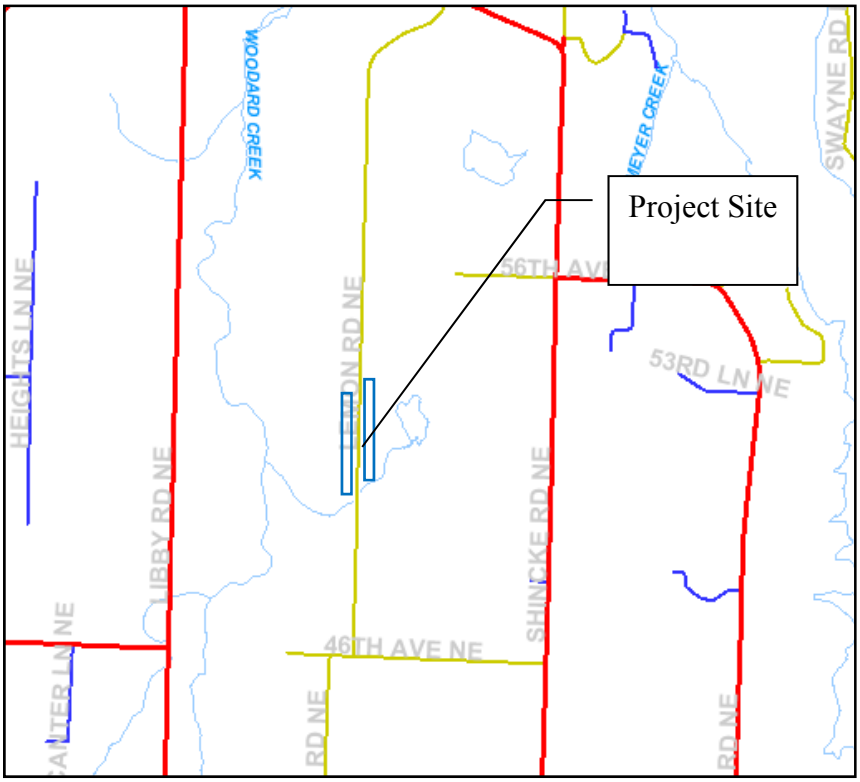
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	**X Rural SW**
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Woodard Creek Site 5



DESCRIPTION: Install enhanced ditches and a filter vault within the Thurston County road Right-of-Way, before discharging to a tributary of Woodard Creek. This project was one of 5 projects identified in the 2014 Woodard Retrofit Study.

LOCATION: Along both sides of Lemon Rd. NE approximately 2,600 feet north of 46th Ave. NE. Sec. 30, T19N - 01W.

JUSTIFICATION (Need/Demand):

The project is located in the Woodard Creek Basin of the Henderson Inlet Watershed. In 2006 the Washington State Department of Ecology published the *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study*. The purpose of the proposed improvements is to improve the water quality of stormwater which is a possible source of bacteria in Woodard Creek, Woodard Bay, and Henderson Inlet. In addition, the *Henderson Inlet Watershed Fecal Coliform Water Quality Implementation Plan* identified needed reductions in fecal coliform bacteria in the Woodard Creek basin. The project will further Thurston County's efforts to comply with the TMDL requirements.

IMPLICATION OF NOT DOING THE PROJECT(S): Further contamination of Woodard Creek with pollutants from stormwater and non-compliance with TMDL requirements

LINKS TO OTHER PROJECTS OR FACILITIES: *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study. Woodard Creek Basin Stormwater Retrofit Study (2014).*

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9; Woodland and Woodard Creek Basin Plan: WL8, WL15A, WL15C, WL17A

Woodard Creek Site 5

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0	$10,000						$10,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$10,000						$10,000
REET/GRANTS /Loans							

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	**X Rural NE**	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

92nd Court SE Retrofit

Description: Shorten outfall pipe and install an infiltration trench to provide water quality treatment and flow control before discharging into Deschutes River.
Location: 92nd Court SE
Justification (Need/Demand): Currently water is collected from the subdivision parcels and street and routed directly to the Deschutes River without treatment. This project would remove the outfall pipe and create an infiltration trench that will provide water quality treatment and flow control. The facility would infiltrate over 95% of the stormwater runoff. The rest will be discharged to the Deschutes River.
Implication of not doing the project: Untreated water will continue to be discharged to the Deschutes River.
Links to other related projects or facilities: None.
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9; **Check basin plans**
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
	$80,000						$80,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$80,000						$80,000
REET/GRANTS/Loans							$ 0

Annual Operations and Maintenance:

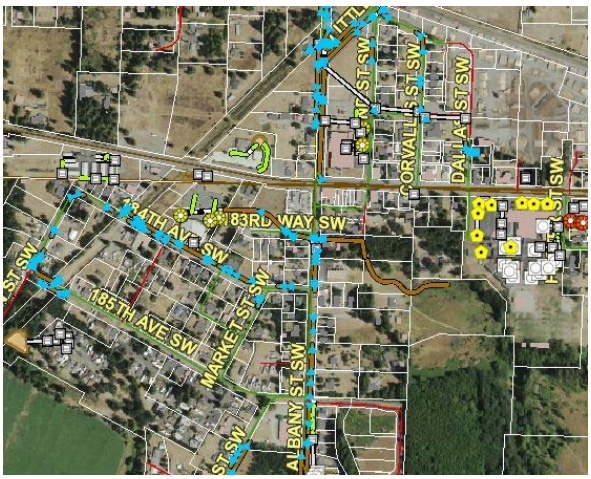
92nd Court SE Retrofit

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location:

□	Rural NW	□	Rural NE	□	Rural SW
X	**Rural SE**	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Rochester Area Drainage Study



Description: Conduct a drainage study in the Rochester area south of Highway 12.

Location: South of Highway 12 from Gresham St SW on the east to Leon St SW on the west and 187th Ave SW to the south.

Justification (Need/Demand): The area around Rochester has some very flat terrain in places. This causes stormwater to drain slowly from these areas. Ditches were dug in the past to help drain stormwater more quickly; however, flooding still occurs in this area and in some cases residents of the area have filed claims against Thurston County for flood related damages. This project will take a comprehensive look at the drainage facilities in the area and propose projects that could alleviate flooding.

Implication of not doing the project: Flooding will continue to occur and Thurston County might be held responsible for losses.

Links to other related projects or facilities: C

Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;

Level of Service (LOS):

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
	$100,000						$100,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$100,000						$100,000
REET/GRANTS /Loans							$ 0

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location:

□	Rural NW	□	Rural NE	**X**	**Rural SW**
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Boston Harbor Vicinity Drainage Study

Description: Drainage study of the Boston Harbor area on either side of Boston Harbor Road NE from approximately 72nd Ave NE to 77th Way NE to identify projects that could reduce or eliminate flooding.
Location: Boston Harbor Vicinity
Justification (Need/Demand): The roadside ditches and culverts in this area are often overwhelmed during heavy rain events and cause flooding of the roads, driveways and yards. The high flows have caused erosion and cutting into the ditch bottoms resulting in deep ditches with steep sides. This project would conduct a study of the entire drainage system in this area and recommend changes to reduce or eliminate flooding. In addition, there is currently no water quality treatment of the stormwater before discharging into Puget Sound. This project would also identify treatment options and locations.
Implication of not doing the project: Flooding of roads, driveways, and yards will continue.
Links to other related projects or facilities: Boston Harbor Outfall Replacement Project and Boston Harbor Boat Launch Project.
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9; **Check basin plans**
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
	$100,000						$100,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$100,000						$100,000

Boston Harbor Vicinity Drainage Study

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location:

□	Rural NW	**X**	**Rural NE**	□	Rural SW
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Boston Harbor Road NE Outfall and Culvert Project

Description: Repair/replace failing outfall on Boston Harbor Road and add a culvert under Boston Harbor Road to reduce flooding.
Location: Boston Harbor Rd NE and 73rd Ave NE.
Justification (Need/Demand): The outfall on Boston Harbor Road NE is failing and needs to be repaired or replaced. The failure is causing damage to driveway and yard at 7325 Boston Harbor Road NE. In addition, the roadside ditches are too small and cannot handle the flows in large rain events nor do they provide treatment to meet today's stormwater standards. This project would repair or replace the failing outfall, install a culvert under Boston Harbor Road connecting to the new outfall. This will alleviate flooding that occurs when the water fills the ditch and goes over the road and floods driveways and yards before flowing into the Sound.
Implication of not doing the project: Water will continue to erode the yard and driveway at 7325 Boston Harbor Road NE and flow untreated into Puget Sound.
Links to other related projects or facilities: Boston Harbor Boat Launch Vicinity Stormwater Retrofit Project
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
	$33,000	$82,000					$115,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$33,000	$82,000					$115,000
REET/GRANTS/Loans							$ 0

Boston Harbor Road NE Outfall and Culvert Project

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location: Northeast

□	Rural NW	**X**	**Rural NE**	□	Rural SW
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Item	Unit	Quantity	Unit Price	Total
Mobilization	L.S	1	$ 6,000.00	$ 6,000.00
Contengency	L.S	1	$ 18,000.00	$ 18,000.00
TESC	L.S	1	$ 1,000.00	$ 1,000.00
Traffic Control	L.S	1	$ 5,000.00	$ 5,000.00
Catch Basin Type 1L	Each	1	$ 2,500.00	$ 2,500.00
Catch Basin Type 2	Each	3	$ 4,000.00	$ 12,000.00
Culvert 18"	LF	40	$ 70.00	$ 2,800.00
Storm Pipe 36"	LF	225	$ 130.00	$ 29,250.00
HMA Section	ton	2	$ 500.00	$ 1,000.00
Compost	Acre	0.06	$ 20,000.00	$ 1,200.00
Seeding and Mulching	Acre	0.06	$ 10,000.00	$ 600.00
Outfall protection	Ton	55	$ 10.00	$ 550.00
Asphalt Pavement Cutting	LF	60	$ 5.00	$ 300.00
Crushed surfacing base Course	Ton	16	$ 100.00	$ 1,600.00
				$ -

				$ -
				$ -
				$ -
Total				**$ 81,800.00**
Preliminary Engineering (20% of Construction Cost)				$ 16,360.00
Construction Engineering (10% of Construction Cost)				$ 8,180.00
Permitting (10% of Construction Cost)				$ 8,180.00
Geotechnical				
Total Engineering				**$ 32,720.00**
Project Total				**$ 114,520.00**

Madrona Beach Road NW Vic. Retrofits

Description: Fix five locations along Madrona Beach Road NW where the stormwater infrastructure is failing or inadequate to handle stormwater flows.
Location: Madrona Beach Road NW between Sexton Ave NW and 1330 Madrona Beach Road NW.
Justification (Need/Demand): The stormwater infrastructure at these 5 locations are either undersized or failing which causes flooding and damage to the roadway or driveways. The damage causes erosion which washes sediment and pollutants into Mud Bay and Eld Inlet.
Implication of not doing the project: Flooding and damage to the road and driveways and sediment deposition to Eld Inlet will continue.
Links to other related projects or facilities: None
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
		$86,000	$209,000				$295,000

Madrona Beach Road NW Vic. Retrofits

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$86,000	$209,000				$295,000
REET/GRANTS/Loans							$ 0

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

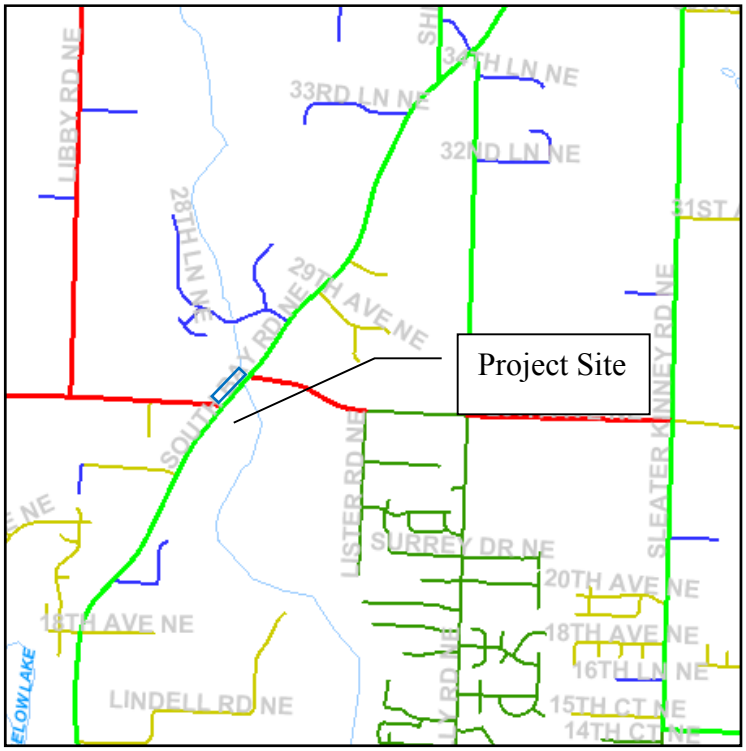
Quadrant Location:

X	Rural NW	□	Rural NE	□	Rural SW
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Item	Unit	Quantity	Unit Price	Total
Mobilization	L.S	1	$ 17,000.00	$ 17,000.00
Contengency	L.S	1	$ 51,000.00	$ 51,000.00
Catch Basin Type 2	Each	5	$ 4,000.00	$ 20,000.00
Topsoil Type A	CY	320	$ 40.00	$ 12,800.00
Roadway Excavation	CY	550	$ 25.00	$ 13,750.00
Perforated pipe 6"	LF	125	$ 21.00	$ 2,625.00
12" Culvert	LF	140	$ 70.00	$ 9,800.00
12" Pipe	LF	420	$ 50.00	$ 21,000.00
Drywell 48"	Each	1	$ 4,000.00	$ 4,000.00
Asphalt	Ton	15	$ 110.00	$ 1,650.00

Aggregate Base	Ton	30	$ 25.00	$ 750.00
Seeding and Mulching	Acre	0.2	$ 10,000.00	$ 2,000.00
Mountable Curb	LF	100	$ 75.00	$ 7,500.00
TESC	L.S	1	$ 5,000.00	$ 5,000.00
Traffic Control	L.S	1	$ 40,000.00	$ 40,000.00
				$ -
Total				**$ 208,875.00**
Preliminary Engineering (20% of Construction Cost)				$ 41,775.00
Construction Engineering (10% of Construction Cost)				$ 20,887.50
Permitting (10% of Construction Cost)				$ 20,887.50
Geotechnical				$ 2,500.00
Total Engineering				**$ 86,050.00**
Project Total				**$ 294,925.00**

Woodard Creek Site 1



DESCRIPTION: Install a bioretention swale and a filter vault within the Thurston County road Right-of-Way, before discharging directly into Woodard Creek. This project was one of 5 projects identified in the 2014 Woodard Retrofit Study.

LOCATION: Along South Bay Road NE near the intersection of 26th Ave. NE. Sec. 06, T18N - 01W.

JUSTIFICATION (Need/Demand):

The project is located in the Woodard Creek Basin of the Henderson Inlet Watershed. In 2006 the Washington State Department of Ecology published the *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study*. The purpose of the proposed improvements is to improve the water quality of stormwater which is a possible source of bacteria in Woodard Creek, Woodard Bay, and Henderson Inlet. In addition, the *Henderson Inlet Watershed Fecal Coliform Water Quality Implementation Plan* identified needed reductions in fecal coliform bacteria in the Woodard Creek basin. The project will further Thurston County's efforts to comply with the TMDL requirements.

IMPLICATION OF NOT DOING THE PROJECT(S): Further contamination of Woodard Creek with pollutants from stormwater and non-compliance with TMDL requirements

LINKS TO OTHER PROJECTS OR FACILITIES: *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study. Woodard Creek Basin Stormwater Retrofit Study (2014).*

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;

Woodland and Woodard Creek Basin Plan: WL8, WL15A, WL15C, WL17A

Woodard Creek Site 1

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0	$145,000	$330,000					$475,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$13,000	$330,000					$343,000
REET/GRANTS /Loans	$96,000						$96,000

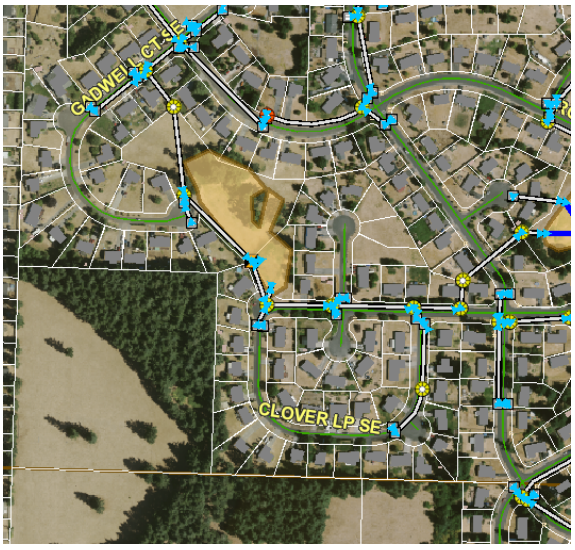
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	**X Rural NE**	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Meadows Subdivision Pond 4C Retrofit



Description: The project will retrofit the existing Meadows Subdivision Pond 4C by regrading the site and replacing inlet and outlet structures to meet current water quality treatment and flow control standards.
Location: Meadows Subdivision between Clover Loop SE and Gadwell Ct. SE between Steilacoom Rd. SE and Pacific Hwy SE.
Justification (Need/Demand): The subdivision and pond were built in the mid-1980's to the stormwater flow and treatment standards current at the time. These standards do not meet the current standards for water quality and flow control. This project will retrofit the pond and structures to improve water quality and add flow control to meet current standards, i.e., Core Requirements #6 and #7.
Implication of not doing the project: This system eventually discharges to Little McAllister Creek. If the project is not completed then high flows of untreated stormwater will continue to degrade Little McAllister Creek and McAllister Creek.
Links to other related projects or facilities: This pond is the first pond in a string of ponds that serve the Meadows subdivision including Mallard Pond a former county CFP project. Future retrofit projects will address the downstream ponds.
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9; **Check basin plans**
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
		$141,000	$323,250				$464,250

Meadows Subdivision Pond 4C Retrofit

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$141,000	$323,250				$464,250
REET/GRANTS/Loans							$ 0

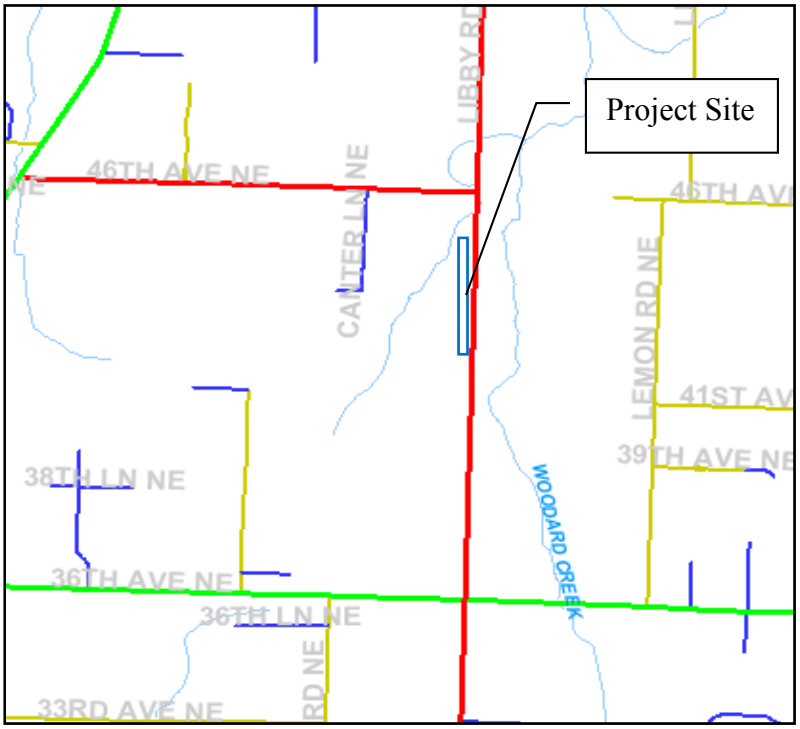
Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location:

□	Rural NW	□	Rural NE	□	Rural SW
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
X	**Lacey UGA**	□	Yelm UGA	□	Rainier UGA

Woodard Creek Site 2



DESCRIPTION: Install an enhanced ditch, compost amended biofiltration swale or a bioretention swale and a filter vault within the Thurston County road Right-of-Way. This project was one of 5 projects identified in the 2014 Woodard Retrofit Study.

LOCATION: Along Libby Road Road NE south of the intersection with 46th Ave. NE. Sec. 36, T19N - 01W.

JUSTIFICATION (Need/Demand):

The project is located in the Woodard Creek Basin of the Henderson Inlet Watershed. In 2006 the Washington State Department of Ecology published the *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study*. The purpose of the proposed improvements is to improve the water quality of stormwater which is a possible source of bacteria in Woodard Creek, Woodard Bay, and Henderson Inlet. In addition, the *Henderson Inlet Watershed Fecal Coliform Water Quality Implementation Plan* identified needed reductions in fecal coliform bacteria in the Woodard Creek basin. The project will further Thurston County's efforts to comply with the TMDL requirements.

IMPLICATION OF NOT DOING THE PROJECT(S): Further contamination of Woodard Creek with pollutants from stormwater and non-compliance with TMDL requirements

LINKS TO OTHER PROJECTS OR FACILITIES: *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study*. *Woodard Creek Basin Stormwater Retrofit Study (2014).*

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;

Woodland and Woodard Creek Basin Plan: WL8, WL15A, WL15C, WL17A

Woodard Creek Site 2

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0	$62,000	$250,000					$312,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$62,000	$250,000					$312,000
REET/GRANTS /Loans							

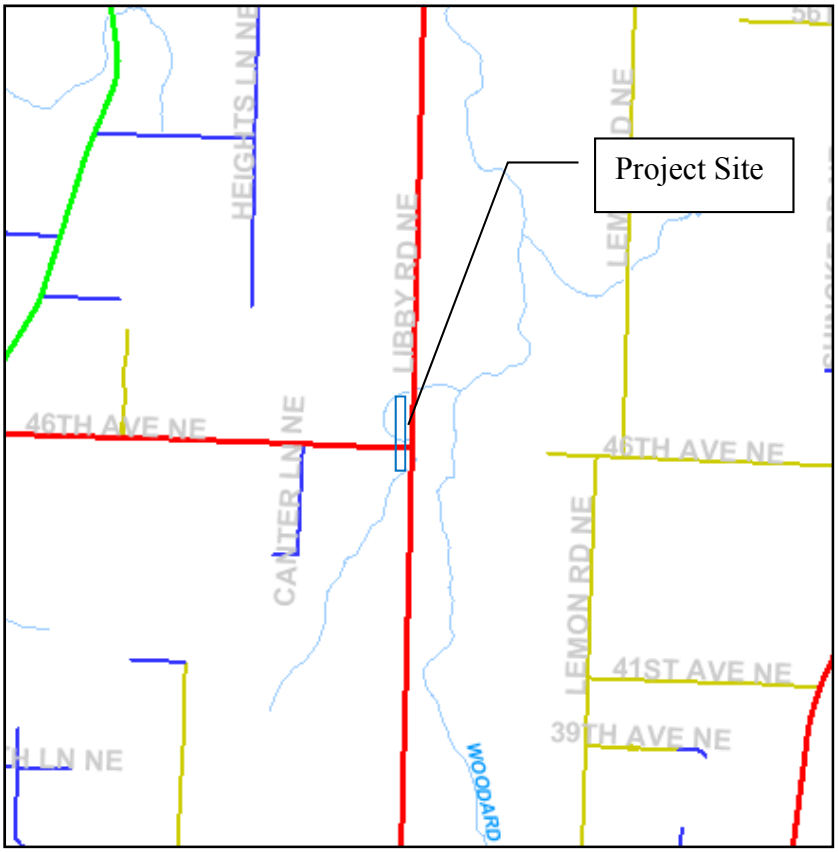
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	**X Rural NE**	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Woodard Creek Site 3



DESCRIPTION: Install bioretention cells within the Thurston County road right-of-way to filter the water before discharging to a tributary of Woodard Creek. This project was one of 5 projects identified in the 2014 Woodard Retrofit Study.

LOCATION: Along Libby Road NE immediately south and north of the intersection with 46th Ave. NE. Sec. 36, T19N - 02W.

JUSTIFICATION (Need/Demand):

The project is located in the Woodard Creek Basin of the Henderson Inlet Watershed. In 2006 the Washington State Department of Ecology published the *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study*. The purpose of the proposed improvements is to improve the water quality of stormwater which is a possible source of bacteria in Woodard Creek, Woodard Bay, and Henderson Inlet. In addition, the *Henderson Inlet Watershed Fecal Coliform Water Quality Implementation Plan* identified needed reductions in fecal coliform bacteria in the Woodard Creek basin. The project will further Thurston County's efforts to comply with the TMDL requirements.

IMPLICATION OF NOT DOING THE PROJECT(S): Further contamination of Woodard Creek with pollutants from stormwater and non-compliance with TMDL requirements

LINKS TO OTHER PROJECTS OR FACILITIES: *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study. Woodard Creek Basin Stormwater Retrofit Study (2014).*

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C,

Woodard Creek Site 3

Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;

Woodland and Woodard Creek Basin Plan: WL8, WL15A, WL15C, WL17A

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0	$10,000						$10,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$10,000						$10,000
REET/GRANTS /Loans							0

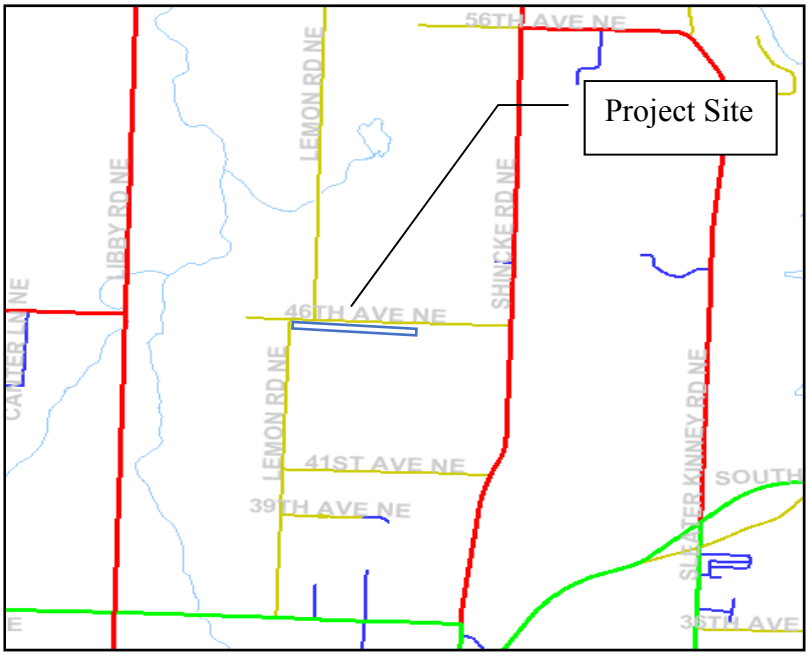
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	**X Rural NE**	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Woodard Creek Site 4



DESCRIPTION: Install bioretention swales within the Thurston County road right-of-way to filter the water before discharging to a tributary of Woodard Creek via roadside ditches. This project was one of 5 projects identified in the 2014 Woodard Retrofit Study.

LOCATION: Along the south side of 46th Ave. NE between the westerly intersection of Lemon Rd NE and the Chehalis Western Trail. Sec. 31, T19N - 01W.

JUSTIFICATION (Need/Demand):

The project is located in the Woodard Creek Basin of the Henderson Inlet Watershed. In 2006 the Washington State Department of Ecology published the *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study*. The purpose of the proposed improvements is to improve the water quality of stormwater which is a possible source of bacteria in Woodard Creek, Woodard Bay, and Henderson Inlet. In addition, the *Henderson Inlet Watershed Fecal Coliform Water Quality Implementation Plan* identified needed reductions in fecal coliform bacteria in the Woodard Creek basin. The project will further Thurston County's efforts to comply with the TMDL requirements.

IMPLICATION OF NOT DOING THE PROJECT(S): Further contamination of Woodard Creek with pollutants from stormwater and non-compliance with TMDL requirements

LINKS TO OTHER PROJECTS OR FACILITIES: *Henderson Inlet Watershed Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Temperature Total Daily Maximum Load Study. Woodard Creek Basin Stormwater Retrofit Study (2014).*

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;

Woodland and Woodard Creek Basin Plan: WL8, WL15A, WL15C, WL17A

Woodard Creek Basin Site 4

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0	$278,000	$441,000					$719,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$278,000	$441,000					$719,000
REET/GRANTS /Loans							

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	**X Rural NE**	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Littlerock Area Stormwater Retrofit

Description: Install approximately 1,100 feet of biofiltration swales and bioretention areas around Littlerock Elementary School, 127 Ave SW, and 128th Ave SW to improve water quality before discharging to the Black River and Beaver Creek
Location: Along Littlerock Road SW, 127 Ave SW, and 128th Ave SW in the vicinity of Littlerock Elementary
Justification (Need/Demand): Untreated stormwater runoff discharges directly to tributaries of the Black River and Beaver Creek from parking areas and roads. Chinook, Coho, Chum, and Steelhead Salmon use the Black River and Beaver Creek for spawning and rearing. Untreated stormwater runoff has been shown to be detrimental to aquatic organisms in general and these species in particular. Biofiltration is effective at removing pollutants from stormwater runoff and improving water quality.
Implication of not doing the project: Untreated stormwater runoff will continue to be discharged into the Black River and Beaver Creek and affect salmon species and other aquatic organisms.
Links to other related projects or facilities: None
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
0		$59,000	$135,000				$194,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$59,000	$135,000				$194,000
REET/GRANTS/Loans							

Littlerock Area Stormwater Retrofit

Annual Operations and Maintenance:

Estimated Costs - $500 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location:

□	Rural NW	□	Rural NE	**X**	**Rural SW**
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Assumptions: The main part of the project is going to entail installing or reshaping current ditches to a bioswale with a 2-4 foot flat bottom. Native soils would be amended with 4" of compost and lightly tilled in to 6-8" (total depth from the top of the compost blanket). Cost for the compost assumed to be $50.00/cy installed and incorporated. Assume the total bioswale width is 11 feet and the total length is 1,100 feet. WSDOT bid analysis, ditch excavation is used to estimate the cost of excavation and shaping the swales. Assume approximately 500 cy of ditch ex at $40/cy.

Item	**Unit**	**Quantity**	**Unit Price**	**Total**
Mobilization	L.S	1	$ 10,000	$ 10,000
Contengency	L.S	1	$ 30,000	$ 30,000
TESC	L.S	1	$ 2,500	$ 2,500
Traffic Control	L.S	1	$ 20,000	$ 20,000
Compost	Acre	0.3	$ 20,000	$ 6,000
Ditch Excavation	CY	1000	$ 40	$ 40,000
Catch Basin Type 2 48"	Each	2	$ 4,000	$ 8,000
Culvert 12"	LF	100	$ 70	$ 7,000
Clearing and Grubbing	Acre	0.3	$ 8,000	$ 2,400
Seeding and Mulching	Acre	0.3	$ 10,000	$ 3,000
HMA Pavement Section	Est	1	$ 5,000	$ 5,000

Sawcut Asphalt Pavement	LF	200	$ 5	$ 1,000
				$ -
				$ -
				$ -
Total				**$ 134,900**
Preliminary Engineering (20% of Construction Cost)				$ 26,980
Construction Engineering (10% of Construction Cost)				$ 13,490
Permitting (10% of Construction Cost)				$ 13,490
Geotechnical				$ 5,000
Total Engineering				**$ 58,960**
Project Total				**$ 193,860**

Item	**Unit**	**Quantity**	**Unit Price**	**Total**
Mobilization	L.S	1	$ 10,000	$ 10,000
Contengency	L.S	1	$ 30,000	$ 30,000
TESC	L.S	1	$ 2,500	$ 2,500
Traffic Control	L.S	1	$ 20,000	$ 20,000
Compost	Acre	0.3	$ 20,000	$ 6,000
Ditch Excavation	CY	1000	$ 40	$ 40,000
Catch Basin Type 2 48"	Each	2	$ 4,000	$ 8,000
Culvert 12"	LF	100	$ 70	$ 7,000
Clearing and Grubbing	Acre	0.3	$ 8,000	$ 2,400
Seeding and Mulching	Acre	0.3	$ 10,000	$ 3,000

HMA Pavement Section	Est	1	$ 5,000	$ 5,000
Sawcut Asphalt Pavement	LF	200	$ 5	$ 1,000
				$ -
				$ -
				$ -
Total				**$ 134,900**
Preliminary Engineering (20% of Construction Cost)				$ 26,980
Construction Engineering (10% of Construction Cost)				$ 13,490
Permitting (10% of Construction Cost)				$ 13,490
Geotechnical				$ 5,000
Total Engineering				**$ 58,960**
Project Total				**$ 193,860**

Item	**Unit**	**Quantity**	**Unit Price**	**Total**
Mobilization	L.S	1	$ 10,000	$ 10,000
Contengency	L.S	1	$ 30,000	$ 30,000
TESC	L.S	1	$ 2,500	$ 2,500
Traffic Control	L.S	1	$ 20,000	$ 20,000
Compost	Acre	0.3	$ 20,000	$ 6,000
Ditch Excavation	CY	1000	$ 40	$ 40,000
Catch Basin Type 2 48"	Each	2	$ 4,000	$ 8,000
Culvert 12"	LF	100	$ 70	$ 7,000
Clearing and Grubbing	Acre	0.3	$ 8,000	$ 2,400

Seeding and Mulching	Acre	0.3	$ 10,000	$ 3,000
HMA Pavement Section	Est	1	$ 5,000	$ 5,000
Sawcut Asphalt Pavement	LF	200	$ 5	$ 1,000
				$ -
				$ -
				$ -
Total				**$ 134,900**
Preliminary Engineering (20% of Construction Cost)				$ 26,980
Construction Engineering (10% of Construction Cost)				$ 13,490
Permitting (10% of Construction Cost)				$ 13,490
Geotechnical				$ 5,000
Total Engineering				**$ 58,960**
Project Total				**$ 193,860**

Fairground Low Impact Development Demonstration Project

Description: Install a variety of green stormwater infrastructure (GSI) best management practices (BMP) around the Thurston County Fairgrounds to manage stormwater and provide educational opportunities.
Location: 3054 Carpenter RD SE
Justification (Need/Demand): The NPDES permit requires that low impact development techniques be used in new and redevelopment projects. It also has an education and outreach requirement. The Thurston County Fairgrounds has very few stormwater management features because it was built before they were required, therefore it is in need of retrofitting to manage stormwater. In addition the Fairgrounds is a destination for many Thurston County residents during the county fair and at other times of the year. This project would retrofit parts of the Fairgrounds by installing GSI BMPs to help manage stormwater, both quality and quantity, and provide educational opportunities for Thurston County citizens to learn about low impact development techniques.
Implication of not doing the project: Parts of the fairgrounds will continue to have untreated stormwater discharges and missed educational opportunities.
Links to other related projects or facilities: None
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
		$81,000	$191,000				$272,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$81,000	$191,000				$272,000
REET/GRANTS/Loans							$ 0

Fairground Low Impact Development Demonstration Project

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

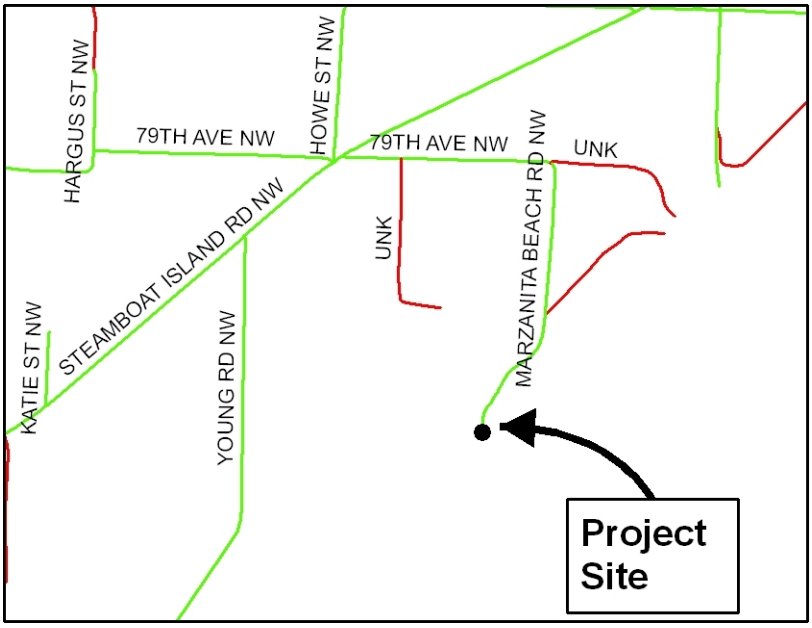
Quadrant Location:

□	Rural NW	□	Rural NE	□	Rural SW
X	**Rural SE**	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Item	Unit	Quantity	Unit Price	Total
Mobilization	L.S	1	$ 15,000.00	$ 15,000.00
Contingency	L.S	1	$ 45,000.00	$ 45,000.00
TESC	L.S	1	$ 2,000.00	$ 2,000.00
Pervious Pavers	SF	5000	$ 8.00	$ 40,000.00
Excavation	CY	1030	$ 25.00	$ 25,750.00
Crushed Surfacing Base Course	Ton	765	$ 25.00	$ 19,125.00
Leveling Course	CY	50	$ 25.00	$ 1,250.00
Topsoil Type A	CY	140	$ 75.00	$ 10,500.00
PSIPE Shrubs	Ea	318	$ 20.00	$ 6,360.00
Psipe Groundcover	Ea	140	$ 10.00	$ 1,400.00
Mulch	CY	30	$ 40.00	$ 1,200.00
Compost	CY	4	$ 50.00	$ 200.00
Pervious Pavement	CY	145	$ 110.00	$ 15,950.00
Drain Rock	CY	30	$ 150.00	$ 4,500.00
Green Roof	SF	80	$ 30.00	$ 2,400.00

				$ -
				$ -
				$ -
Total				**$ 190,635.00**
Preliminary Engineering (20% of Construction Cost)				$ 38,127.00
Construction Engineering (10% of Construction Cost)				$ 19,063.50
Permitting (10% of Construction Cost)				$ 19,063.50
Geotechnical				$ 5,000.00
Total Engineering				**$ 81,254.00**
Project Total				**$ 271,889.00**

Manzanita DR NW



DESCRIPTION: Stormwater outfall on a high bank marine bluff.

LOCATION: 7402 Manzanita Dr NW. Sec. 17, T19N - 02W.

JUSTIFICATION (Need/Demand):

The storm drainage system installed in the 1960's as part of the Boston Harbor Water Front Acre Tracts Division No. 2 development has deteriorated and is causing bank erosion. This is a drainage facility that the county has ownership and maintenance responsibility for due to its age and previous work and repairs made in the past.

IMPLICATION OF NOT DOING THE PROJECT(S): Damage to private property due pipe failure causing erosion of shoreline bank

LINKS TO OTHER PROJECTS OR FACILITIES: N/A.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Stormwater #4. Natural Environment: E-1, E-10, H-Obj.1-6, H-Obj.2-8

Manzanita DR NW

LEVEL OF SERVICE (LOS):

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$25,000	$55,000	$280,000					$335,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$55,000	$280,000					$335,000
REET/GRANTS /Loans							

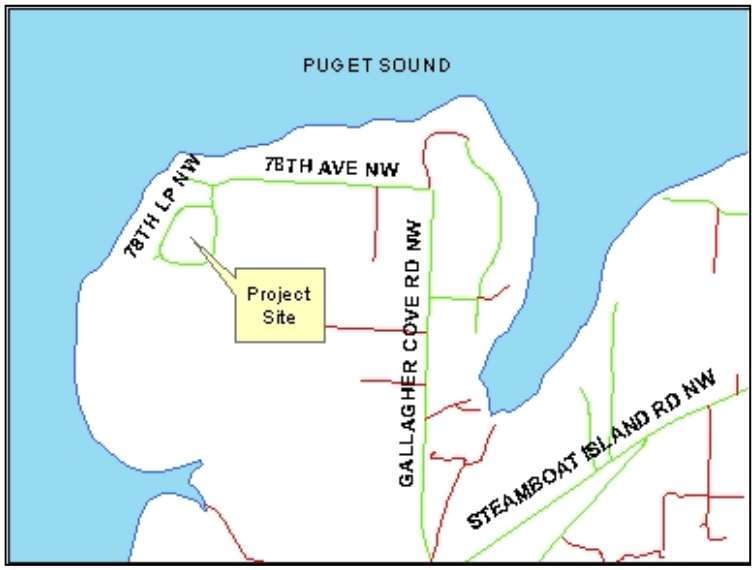
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $ 250 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

X	**Rural NW**	☐	Rural NE	☐	Rural SW
☐	Rural SE	☐	Olympia UGA	☐	Tumwater UGA
☐	Lacey UGA	☐	Yelm UGA	☐	Rainier UGA
☐	Tenino UGA	☐	Grand Mound UGA		

Cedar Shores



DESCRIPTION: Improve and expand existing stormwater pond to meet current standards for flow control and water quality treatment. Evaluate improvements to roadside swales to improve water quality treatment.

LOCATION: Steamboat Island vicinity. Cedar Shores Subdivision at 78th Avenue NW and 78th Loop Northwest. Discharge from subdivision's stormwater pond is to a steep ravine discharging to Totten Inlet.

JUSTIFICATION (Need/Demand):

The storm drainage pond was installed in the early 1980's as part of the Cedar Shores Subdivision. The pond is undersized and has deteriorated to the point where limited flow control is provided to prevent downstream erosion. Downstream erosion of steep channels is causing sediment transport to beaches of Totten Inlet and potentially future slide conditions and property damage including potential for damage to public roadway. This is a drainage facility that the county likely has ownership and maintenance responsibility for due to its age.

IMPLICATION OF NOT DOING THE PROJECT(S): Damage to private property and beach due to deposition of sediments and pollutants. Pollutants discharging to Puget Sound (Totten Inlet) potentially adversely affecting shellfish beds and water quality. Continued erosion of steep ravine possibly resulting in slides and property damage to private property and public roads.

LINKS TO OTHER PROJECTS OR FACILITIES: None

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:

Comprehensive Plan: Stormwater #4. Natural Environment: E-1, E-10, H-Obj 1-6, H-Obj. 2-8

Cedar Shores

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$11,500		$45,000	$107,000				$152,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$45,000	$107,000				$152,000
GRANTS/Loans							

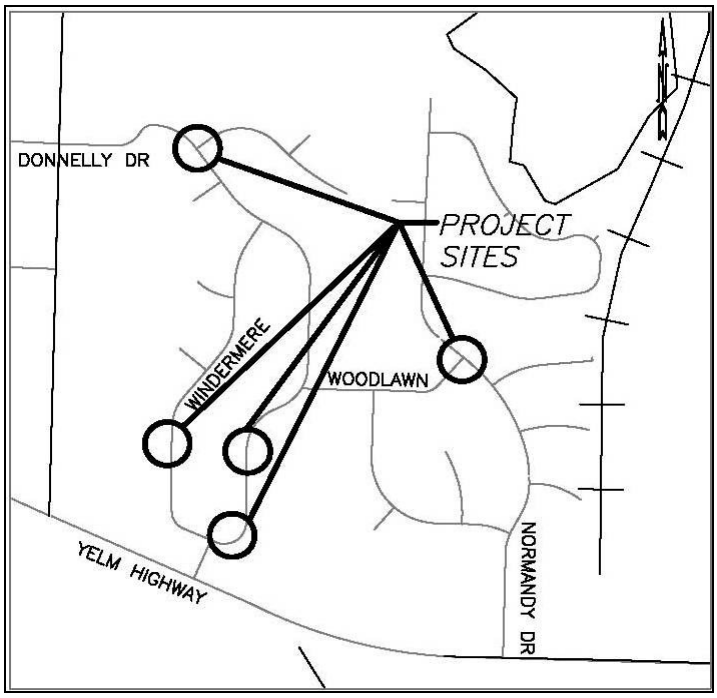
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $500 (approximately)
Estimated Revenues – SSWU Rates
Anticipated Savings Due to Project – Not Identified
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION:

X	**Rural NW**	☐	Rural NE	☐	Rural SW
☐	Rural SE	☐	Olympia UGA	☐	Tumwater UGA
☐	Lacey UGA	☐	Yelm UGA	☐	Rainier UGA
☐	Tenino UGA	☐	Grand Mound UGA		

Donnelly Drive Infiltration Gallery



DESCRIPTION: Install treatment devices and infiltration systems at five locations along Donnelly Drive.

LOCATION: Donnelly Drive SE, from Wiggins Road SE to Yelm Highway SE, and Woodlawn Drive SE at Normandy Drive SE, Sec.32, T18N - 01W

JUSTIFICATION (Need/Demand): Portions of Donnelly Drive SE, and Normandy Drive SE flood during major rainfalls and impacts public property and reduces public safety. Roads Maintenance has routinely responded to calls from residents for assistance. Project will reduce flooding of public streets and improve water of runoff reaching groundwater and Chambers Ditch.

IMPLICATION OF NOT DOING THE PROJECT(S): Local streets will continue to flood causing transportation delays and potentially increase the risk of flood related traffic accidents and property damage. Stormwater runoff from urban streets will flow untreated into Chambers Ditch resulting in water quality degradation.

LINKS TO OTHER PROJECTS OR FACILITIES: None

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:

Comprehensive Plan: Capital Facilities, Goal 1, Objective B, Policy 1 & 2; Capital Facilities, Goal 3, Objective A, Policy 1; Natural Environment, Goal 1, Objective B, Policy 4; Natural Environment, Goal 2, Objective A, Policy 4 & 5; Natural Environment, Goal 2, Objective B, Policy 1 & 3; Natural Environment, Goal 2, Objective C, Policy 1 & 6; Natural Environment, Goal 2, Objective F, Policy 2; Land Use, Goal 1, Objective A, Policy 8

Chambers/Ward/Hewitt Comprehensive Drainage Basin Plan, Recommendation 6.1.6: Existing inadequate and failing stormwater facilities that discharge to Chamber's Ditch should be enlarged or rebuilt to reduce flooding and peak flows, where possible.

Donnelly Drive Infiltration Gallery

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0		$67,000	$150,000	$250,000			$467,000

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU Rates		$67,000	$150,000	$250,000			$467,000

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $ 500
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Water and Waste Management

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	☐ Rural SW
☐ Rural SE	**X** **Olympia UGA**	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Boston Harbor Boat Launch Vicinity

Description: Install treatment devices and a new outfall structure to enhance water quality.
Location: The vicinity of 73rd Ave NE and Bayview Drive NE near the Boston Harbor boat launch.
Justification (Need/Demand): Currently water flows off the WDFW parking lot, 73rd Ave NE, and Bayview Drive NE through pipes and a short section of ditch and directly into Puget Sound without any treatment. Pollutants from vehicles is allowed to discharge directly in the Sound without any treatment.
Implication of not doing the project: Polluted water will continue to discharge into Puget Sound and impair water quality.
Links to other related projects or facilities: Boston Harbor Road NE.
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
		$96,000	$229,000				$325,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$96,000	$229,000				$325,000
REET/GRANTS/Loans							$ 0

Boston Harbor Boat Launch Vicinity

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

Quadrant Location:

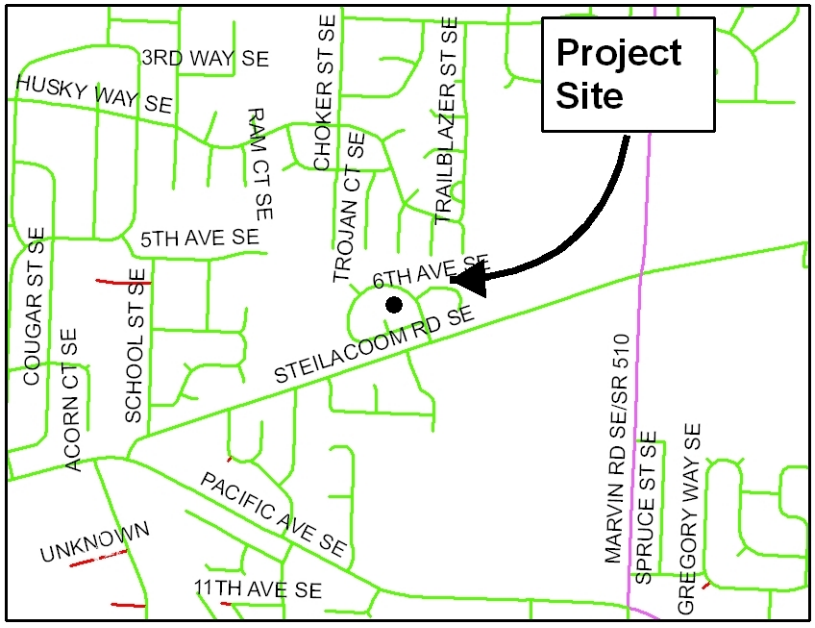
□	Rural NW	**X**	**Rural NE**	□	Rural SW
□	Rural SE	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Project Assumptions: The design concept would be to install one or more hydrodynamic separators or other treatment device in place of the catch basin in the WDFW parking lot or in the kayak parking lot and enhance the ditches to the maximum extent practicable. It might be possible to reconfigure the outfall to have a cascading cells down to the beach to enhance water quality. Other work that may be necessary to complete the project include culvert and catch basin replacement.

Item	Unit	Quantity	Unit Price	Total
Mobilization	L.S	1	$ 20,000.00	$ 20,000.00
Contingency	L.S	1	$ 60,000.00	$ 60,000.00
Treatment system	Each	1	$ 60,000.00	$ 60,000.00
Roadway excavation	CY	50	$ 25.00	$ 1,250.00
Compost	Acre	0.03	$ 10,000.00	$ 300.00
Seeding and mulching	Acre	0.03	$ 5,000.00	$ 150.00
Concrete wall (for water fall)	SF	960	$ 60.00	$ 57,600.00
Streambed cobbles	Ton	110	$ 40.00	$ 4,400.00
12" Concrete Culvert	LF	100	$ 60.00	$ 6,000.00
Type 2 Catch Basin	Each	1	$ 4,000.00	$ 4,000.00
PSIPE Red Osier Dogwood	Each	11	$ 20.00	$ 220.00

PSIPE Vine Maple	Each	5	$ 20.00	$ 100.00
PSIPE Carex	Each	15	$ 12.00	$ 180.00
TESC	LS	1	$ 2,000.00	$ 2,000.00
Traffic Control	LS	1	$ 12,000.00	$ 12,000.00
				$ -
Total				**$ 228,200.00**
Preliminary Engineering (20% of Construction Cost)				$ 45,640.00
Construction Engineering (10% of Construction Cost)				$ 22,820.00
Permitting (10% of Construction Cost)				$ 22,820.00
Geotechnical				$ 5,000.00
Total Engineering				**$ 96,280.00**
Project Total				**$ 324,480.00**

Sherwood Firs - Phase II



DESCRIPTION: Retrofit / rehabilitate existing drywells; determine if conveyance system is in need of being upgraded.

LOCATION: Sherwood Firs Subdivision, Pamela Dr SE and Steilacoom Rd SE. Sec. 14, T18N - 01W.

JUSTIFICATION (Need/Demand):

The storm drainage system installed in the 1970's as part of the Sherwood Firs Subdivision is no longer functioning as designed. Over the years the drywells and infiltration trenches have filled with fines and are no longer infiltrating and previous rates. This is a drainage facility that the county has ownership and maintenance responsibility for due to its age and previous work and repairs made in the past to. Road Maintenance has brought this to the SSWU attention since staff is called out on a frequent basis to deal with localized road flooding.

IMPLICATION OF NOT DOING THE PROJECT(S): Damage to private property due to flooding.

LINKS TO OTHER PROJECTS OR FACILITIES: N/A.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Stormwater #4

Sherwood Firs – Phase II

LEVEL OF SERVICE (LOS):

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$			$58,000	$370,000			$428,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP			$58,000	$370,000			$428,000
REET/GRANTS /Loans							

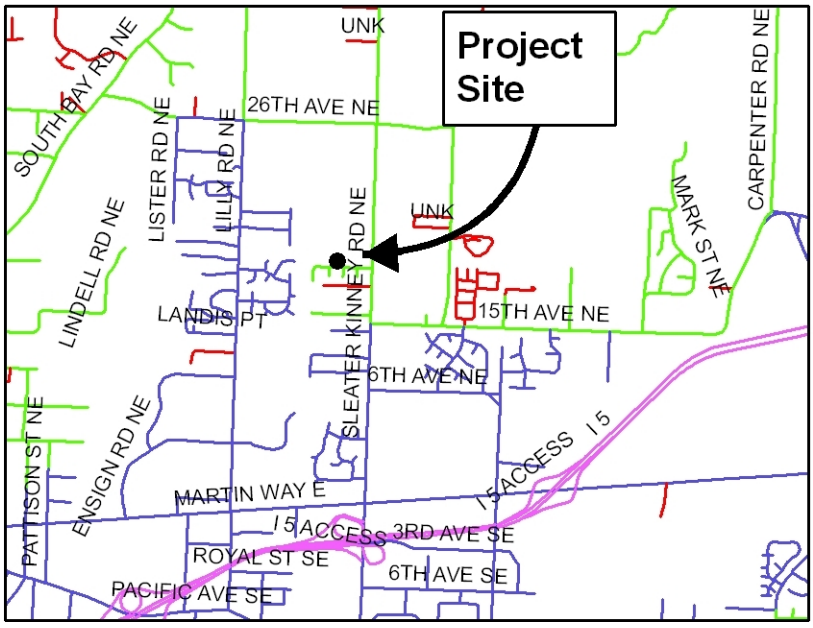
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $ 500 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	☐ Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
X **Lacey UGA**	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Stuart Place



DESCRIPTION: Repair / restore swale leading from catch basin at Stuart St NE east to Sleater Kinney Rd NE.

LOCATION: Stuart Place Subdivision, 18th Ave NE and Sleater Kinney Rd NE. Sec. 08, T18N - 01W.

JUSTIFICATION (Need/Demand):

The storm drainage system installed in the 1970's as part of the Stuart Place Subdivision is no longer functioning as designed. Over the years, as lots have developed and ownership has changed hands the drainage ditch providing conveyance from Stuart St NE to Sleater Kinney Rd NE has been filled in or modified and no longer provides a continuous flow path. This is a drainage facility that the county has ownership and maintenance responsibility for due to its age and previous work and repairs made in the past. During larger storm events the water now flows between homes and septic system drain fields near Vicki Ct NE.

IMPLICATION OF NOT DOING THE PROJECT(S): Damage to private property due to localized flooding.

LINKS TO OTHER PROJECTS OR FACILITIES: N/A.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS: Stormwater #4

Stuart Place

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$25,000			$55,000	$280,000			$335,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP			$55,000	$280,000			$335,000
REET/GRANTS /Loans							$0

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $500 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	☐ Rural SW
☐ Rural SE	**X Olympia UGA**	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

SR 507 & Connor Road SE Retrofit

Description: Install a bioretention area to treat runoff from Connor Road SE and SR 507.
Location: SR 507 & Connor Road SE
Justification (Need/Demand):
Implication of not doing the project:
Links to other related projects or facilities:
Comprehensive Plan and Functional Plan(s) Citations: Comprehensive Plan: Capital Facilities, Goal 1, Objective 1C, Policies 1-9; Natural Environment, Goal C, Objective 1, Policies 1-13; Natural Environment, Objective 3; Natural Environment, Goal E, Policies 9&10; Natural Environment, Goal G, Objective 1, Policies 1-8, Objective 2, Policies 2,3,4,9;
Level of Service (LOS): C
Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
		$15,500	$33,000				$48,500

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP		$15,500	$33,000				$48,500
REET/GRANTS/Loans							$ 0

Annual Operations and Maintenance:

Estimated Costs - $1000 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Division Responsible for Operations – SSWU

SR 507 & Connor Road SE Retrofit

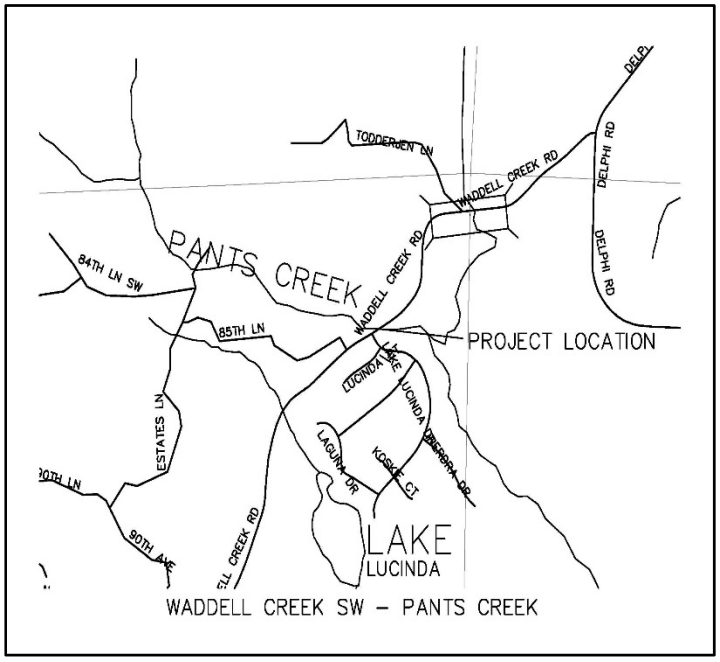
Quadrant Location:

□	Rural NW	□	Rural NE	□	Rural SW
X	**Rural SE**	□	Olympia UGA	□	Tumwater UGA
□	Lacey UGA	□	Yelm UGA	□	Rainier UGA

Item	**Unit**	**Quantity**	**Unit Price**	**Total**
Mobilization	L.S	1	$ 2,500.00	$ 2,500.00
Contengency	L.S	1	$ 7,500.00	$ 7,500.00
TESC	L.S	1	$ 1,000.00	$ 1,000.00
Traffic Control	L.S	1	$ 10,000.00	$ 10,000.00
Topsoil Type A	CY	50	$ 100.00	$ 5,000.00
Stormwater Pipe 12"	LF	110	$ 50.00	$ 5,500.00
Excavation	CY	70	$ 25.00	$ 1,750.00
				$ -
				$ -
				$ -
				$ -
Total				**$ 33,250.00**
Preliminary Engineering (20% of Construction Cost)				$ 6,650.00
Construction Engineering (10% of Construction Cost)				$ 3,325.00
Permitting (10% of Construction Cost)				$ 3,325.00
Geotechnical				$ 2,000.00
Total Engineering				**$ 15,300.00**

Project Total				**$ 48,550.00**

Waddell Creek Road – Pants Creek Improvements



DESCRIPTION: Replace existing 36" concrete culvert with a new pipe arch culvert to relieve flooding and provide fish passage.

LOCATION: Waddell Creek Road SW at Pants Creek, 75' north of Lake Lucinda Drive SW. Section 15 Township 17 Range 3W

JUSTIFICATION (Need/Demand): The existing culvert does not have the capacity to pass larger storms. Pants Creek has flooded Waddell Creek Road the past couple years. Prior to the past couple of years, it flooded every 2 years. The flooded road poses a risk to motorists and puts at risk the County road and right of way. In addition, Washington Department of Fish and Wildlife have identified this culvert as a barrier to fish passage per WDFW phone conversation and Thurston County Barrier Culvert Inventory prepared by WDFW. Fish present in Pants Creek are coho, cutthroat, and steelhead.

IMPLICATION OF NOT DOING THE PROJECT(S): Continued flooding of Waddell Creek road during major storms that will put motorists at risk, jeopardize the county road and right of way, and may impact private property. Each closure affects 1258 Vehicles per day or more than a 100 residents. There will continue to be a blockage for fish migration.

LINKS TO OTHER PROJECTS OR FACILITIES: None

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:

Natural Environment: C. Surface Water; D. Frequently Flooded Areas; E. Important Fish, Wildlife, and Plant Habitat. Transportation: C. Existing County Roadway System

There is no basin plan.

Waddell Creek Road – Pants Creek Improvements

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$3,000	$128,000						$128,000*

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP	$128,000						$128,000*
Grants/Loans							

*Joint project with Public Works – Only SSWU costs are shown.

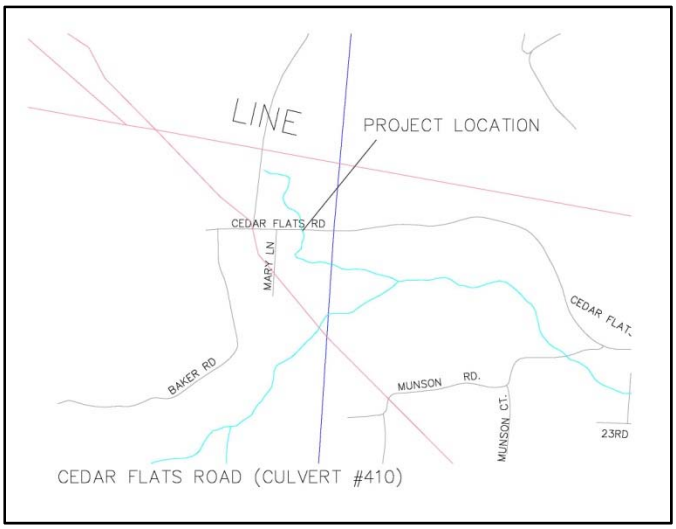
ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $ 1,500 (approximately)
Estimated Revenues – Road Fund
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Public Works

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	**X** Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Cedar Flats Road – Swift Creek Improvements



DESCRIPTION: Replace existing 30" concrete culvert with a new pre-cast slab bridge to relieve flooding and provide fish passage.

LOCATION: Cedar Flats Road SW at Swift Creek, 3300' northwest of Munson Road SW. Section 22 Township 18 Range 3W

JUSTIFICATION (Need/Demand):

The existing culvert does not have the capacity to pass larger storms. Swift Creek has flooded Cedar Flats Road on average 1-2 times every year. The flooded road poses a risk to motorists and puts at risk the County road and right of way. In addition, Washington Department of Fish and Wildlife have identified this culvert as a barrier to fish passage per WDFW phone conversation and Thurston County Barrier Culvert Inventory prepared by WDFW. Fish present in Swift Creek are chinook, chum, and steelhead.

IMPLICATION OF NOT DOING THE PROJECT(S): Continued flooding of Cedar Flats Road during major storms that will put motorists at risk, jeopardize the county road and right of way, and may impact private property. Each closure affects 20 residents. There will continue to be a blockage for fish migration.

LINKS TO OTHER PROJECTS OR FACILITIES: Munson Rd @ Swift Creek Culvert Upgrade. This project should occur either at the same time or after the Munson Road project.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:

Natural Environment: C. Surface Water; D. Frequently Flooded Areas; E. Important Fish, Wildlife, and Plant Habitat. Transportation: C. Existing County Roadway System

There is no basin plan.

Cedar Flats Road – Swift Creek Improvements

LEVEL OF SERVICE (LOS): Service Level B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0						$284,000	$284,000

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU CFP						$284,000	$284,000
Grants/Loans							

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs - $ 1,500 (approximately)
Estimated Revenues - Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Public Works

QUADRANT LOCATION:

☐ Rural NW	☐ Rural NE	**X** Rural SW
☐ Rural SE	☐ Olympia UGA	☐ Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Stormwater Retrofit Studies

DESCRIPTION: Identify stormwater retrofit projects within stormwater basins (sub-watersheds) of Thurston County using the results of Watershed Characterizations, LIDAR, Aerial Photography, storm utility mapping, as-built drawings, and site investigations. Prioritize identified projects and select five within each basin for preparation of pre-design reports.

LOCATION:
Thurston County stormwater basins throughout the County. Preliminarily identified basins include McLane Creek/Eld Inlet and Lower Deschutes.

JUSTIFICATION (Need/Demand):
This project will expand the process used to identify stormwater retrofit projects in a basin yet to be determined in 2016. It will use a formal process and assistance of a consultant to identify projects and prepare pre-design reports. This project will result in a systematic identification and prioritization of potential stormwater retrofits within watersheds throughout the county.

IMPLICATION OF NOT DOING THE PROJECT(S):
This project applies a systematic approach to identifying and prioritizing stormwater retrofit projects. If not done, project identification for retrofit projects to improve water quality and stream flows would continue on an emergent basis and may not reflect the highest priority and best location for stormwater retrofits, reducing the environmental improvement that could occur within a stormwater basin. Also, grant funding will be less likely if retrofit project identification is not based on a systematic approach.

LINKS TO OTHER PROJECTS OR FACILITIES:
This work will uses the methodology and lessons learned from the Woodard Creek Stormwater Retrofit Study completed in 2014. It will complement TMDL's, Basin Plans and other studies on the selected basins.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Chapter Nine – Natural Environment
II. BACKGROUND: B. Water Resources
III.GOALS, OBJECTIVES AND POLICIES 9-6
B. Groundwater and Aquifer Recharge Areas: Policies: 2, 3, 11; Action Needs: 5. C. Surface Water: Goal. Objective 1, Policies: 1, 3, 12; Action Needs: 2, 4. E. Important Fish, Wildlife, and Plant Habitat: Goal. Objective, Policies: 1, 5, 6, 8, 9, 10, 13, 15; Action Needs: 2, 3. H. Management Approaches: Goal. Objective 1, Policies: 1, 4, 5, 7; Action Needs: 1, 2. Objective 2, Policies: 2, 3, 4, 5, 6.

Stormwater Retrofit Studies

LEVEL OF SERVICE (LOS): To be determined on a project basis

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$300,000	$300,000		$300,000		$300,000		$900,000

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU Rates	$300,000		$300,000		$300,000		$900,000
Ecology Grant							

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – $0 – Planning Project
Estimated Revenues – N/A
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION:

X Rural NW	☐ Rural NE	**X** Rural SW
☐ Rural SE	**X** Olympia UGA	**X** Tumwater UGA
☐ Lacey UGA	☐ Yelm UGA	☐ Rainier UGA
☐ Tenino UGA	☐ Grand Mound UGA	

Future Retrofit Projects

DESCRIPTION: At least five high priority projects will be identified as part of additional Stormwater Basin retrofit studies and pre-design reports prepared. These projects will be programmed into the Capital Facilities Plan for construction.

LOCATION:
Yet to be determined, depends on basin in which retrofit study is conducted. Preliminary consider is being given to Lower Deschutes and McLane Creek/Eld Inlet basins.

JUSTIFICATION (Need/Demand):
The five projects identified in each basin retrofit study will be prioritized and ranked based on numerous water quality, location, and feasibility criteria. These five projects are the highest rated of the projects identified in each study and will provide water quality benefits to support the stream water quality, shellfish protection, Puget sound water quality.

IMPLICATION OF NOT DOING THE PROJECT(S):
Depending on the basin in which the projects are designated, failure to complete this project may contribute to continued violations of water quality standards and shellfish closures and not contribute to efforts to cleanup Puget Sound.

LINKS TO OTHER PROJECTS OR FACILITIES:
Select Basin Retrofit Studies, Basin Plans, TMDL's, and other water quality studies and plans in selected basins.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Chapter Nine – Natural Environment
II. BACKGROUND: B. Water Resources
III.GOALS, OBJECTIVES AND POLICIES 9-6
B. Groundwater and Aquifer Recharge Areas: Policies: 2, 3, 11; Action Needs: 5. C. Surface Water: Goal. Objective 1, Policies: 1, 3, 12; Action Needs: 2, 4. E. Important Fish, Wildlife, and Plant Habitat: Goal. Objective, Policies: 1, 5, 6, 8, 9, 10, 13, 15; Action Needs: 2, 3. H. Management Approaches: Goal. Objective 1, Policies: 1, 4, 5, 7; Action Needs: 1, 2. Objective 2, Policies: 2, 3, 4, 5, 6.

Retrofit Study Projects

LEVEL OF SERVICE (LOS): To be determined on a project basis

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$0		$540,000	$160,000	$1,075,000	$1,050,000	$1,007,292	$3,132,292

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU Rates				$1,075,000	$1,050,000	$1,007,292	$3,132,292
Ecology Grant							

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – Unknown – To be determined on a project basis
Estimated Revenues – N/A
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION: To be Determined

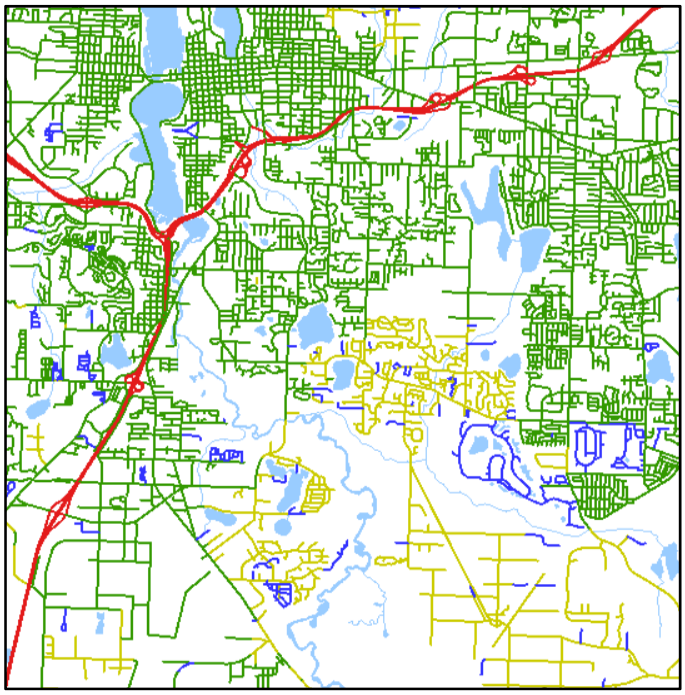
☐ Rural NW ☐ Rural NE ☐ Rural SW

☐ Rural SE ☐ Olympia UGA ☐ Tumwater UGA

☐ Lacey UGA ☐ Yelm UGA ☐ Rainier UGA

☐ Tenino UGA ☐ Grand Mound UGA

Thurston County In-lieu Fee Program Property Acquisition/Wetland Mitigation



DESCRIPTION:
The project includes the acquisition of a site within the Deschutes Watershed to provide wetland restoration and enhancement to support a new fee in-lieu wetland mitigation program.

LOCATION:
Deschutes Watershed (could be within Tumwater or Olympia UGA's or rural area).

JUSTIFICATION (Need/Demand):
This is a grant funded project that targets preservation and restoration of wetlands, additional side channel wetlands, for habitat enhancement and flood storage, as well as riparian buffer establishment, large woody debris placement, and bank stabilization efforts adding complexity to a degraded and altered system.

IMPLICATION OF NOT DOING THE PROJECT(S):
If not preserved, important habitat and natural resources areas could be threatened or lost by continued development. This is a unique opportunity provided through the use of grant funds in lieu of local stormwater capital rates.

LINKS TO OTHER PROJECTS OR FACILITIES:
The Deschutes Basin Landscape Characterizations identifies important resource sites for restoration and preservation.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Chapter Nine – Natural Environment;
III.GOALS, OBJECTIVES AND POLICIES 9-6
A. Geologic Hazard Areas 9-6; B. Groundwater and Aquifer Recharge Areas 9-7; C. Surface Water 9-11; D, Important Fish, Wildlife, and Plant Habitat 9-15; F. Greenspaces 9-19; G. Air Quality 9-22; H. Management Approaches 9-23

Thurston County In-lieu Fee Program Property Acquisition/Wetland Mitigation

LEVEL OF SERVICE (LOS): Level of Service B

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$2,900,000	$1,427,140						$1,427,140

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
Grant	$1,427,140						$1,427,140

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – $2,500
Estimated Revenues – Grants and Stormwater Utility Rates
Anticipated Savings Due to Project - NA
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION:

☐	Rural NW	☐	Rural NE	☐	Rural SW
X	Rural SE	☐	Olympia UGA	☐	Tumwater UGA
☐	Lacey UGA	☐	Yelm UGA	☐	Rainier UGA
☐	Tenino UGA	☐	Grand Mound UGA		

LAND ACQUISITION / CONSERVATION FUTURES

DESCRIPTION:
A financial reserve used to administer or partner in land acquisition opportunities that support stormwater basin planning objectives of flood prevention, water quality and aquatic habitat protection.

LOCATION: Undetermined

JUSTIFICATION (Need/Demand):
Regional scientific studies suggest that in many Puget Lowland areas, constructed stormwater capital facility projects may not adequately mitigate or prevent the degradation of aquatic resources; prevent water quality degradation; or prevent flooding from stormwater runoff. These studies suggest that maintaining significant forest canopy and undisturbed native soils is the most effective method of mitigating or preventing stormwater impacts. When feasible, the stormwater utility will administer or partner with other jurisdictions, government agencies, or nonprofit organizations to acquire properties that meet the above mentioned objectives.

IMPLICATION OF NOT DOING THE PROJECT:
By not being prepared to acquire a property that meets this need when it is available, a valuable once in a lifetime opportunity may be lost forever.

LINKS TO OTHER PROJECTS OR FACILITIES:
The Utility may partner with other county departments, such as parks and link some acquisitions based project locations.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Comprehensive Plan: Regional Non Structural Management Program RecommendationR-3, R-4.
Green Cove Basin Plan 1998, Recommendation 8.2.

LAND ACQUISITION RESERVE/CONSERVATION FUTURES

LEVEL OF SERVICE (LOS): A

Previous Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
	$0	$50,000	$50,000	$50,000	$50,000	$50,000	$250,000

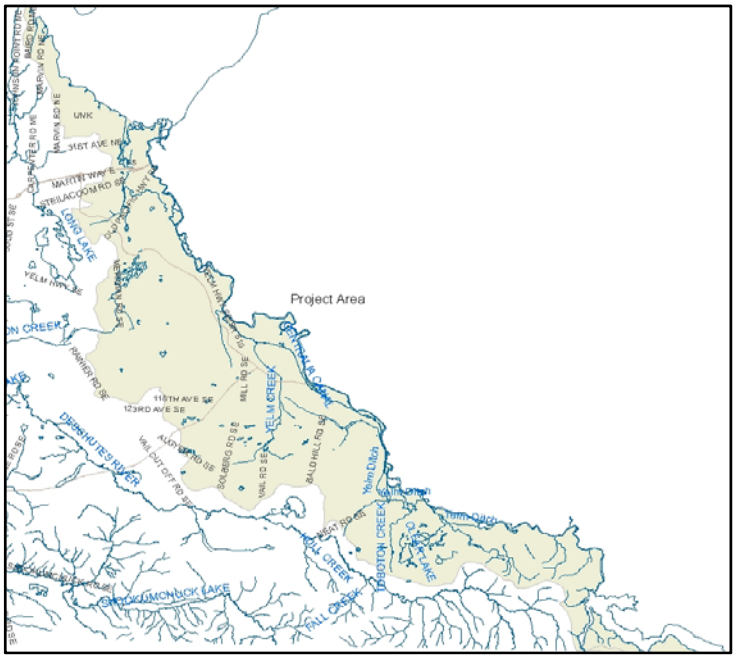
FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU rates	0	$30,000	$30,000	$30,000	$30,000	$30,000	$150,000
Conservation Futures/ Donations	$0	$20,000	$20,000	$20,000	$20,000	$20,000	$100,000

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – To be determined during acquisition process
Estimated Revenues - N/A
Anticipated Savings Due to Project - Undetermined
Department Responsible for Operations – To Be Determined

QUADRANT LOCATION: (To Be Determined)

Capital Facilities Replacement Assessment



DESCRIPTION: Assess the functionality and performance of existing stormwater capital facilities that are approach end of design life to determine whether to shift individual project replacements to the Capital Facilities Plan.

LOCATION:
Varies based on location of existing Capital Facilities to be assessed.

JUSTIFICATION (Need/Demand):
As previously constructed facilities approach the end of their useful life an assessment is necessary to determine if replacement is necessary earlier or later than predicted by the Capital Replacement Schedule.

IMPLICATION OF NOT DOING THE PROJECT(S):
The Stormwater Utility has built numerous capital facilities over the past 20 years and some of these facilities will be reaching the end of their originally projected useful life. An assessment of these facilities on a regular basis and at a minimum 7 years prior to their schedule replacement date is necessary to properly schedule replacement projects on the 6-year capital facilities plan.

LINKS TO OTHER PROJECTS OR FACILITIES:
This project applies to all previously built capital facilities within the stormwater utility. During the 6-year planning period 2015-2020 nine of the 54 County owned and maintained stormwater capital facilities will be assessed for performance and remaining life. This includes 3 facilities in 2015, 3 facilities in 2016, and one each in 2017, 2018 and 2019.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:

Chapter Six – Capital Facilities
II. GOALS, OBJECTIVES AND POLICIES 6-3
III. LEVEL OF SERVICE STANDARDS 6-7
Chapter Nine – Natural Environment
III.GOALS, OBJECTIVES AND POLICIES 9-6
C. Surface Water 9-11; D. Frequently Flooded Areas 9-14; E. Important Fish, Wildlife, and Plant Habitat 9-15; H. Management Approaches 9-23

Capital Facilities Replacement Assessment

LEVEL OF SERVICE (LOS): N/A

Capital Costs:

Prior Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$40,000	$22,000	$4,000	$5,000	$2,000		$11,000	$44,000

Funding Sources	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU Capital Facilities Replacement Fund	$22,000	$4,000	$5,000	$2,000		$11,000	$44,000

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – Not identified
Estimated Revenues – Stormwater Utility Rates
Anticipated Savings Due to Project - Not identified
Department Responsible for Operations – Resource Stewardship & Public Works

QUADRANT LOCATION: Varies

□ Rural NW	□ Rural NE	□Rural SW
□ Rural SE	□Olympia UGA	□Tumwater UGA
□Lacey UGA	□Yelm UGA	□Rainier UGA
□Tenino UGA	□Grand Mound UGA	

Reserve – Capital Facility Replacement

DESCRIPTION:
The Utility is establishing a reserve fund to accrue annual allocations for future replacement of previously constructed stormwater capital facilities.

LOCATION: Defined by project to be replaced.

JUSTIFICATION (Need/Demand): The construction of capital facilities began in 1998. Between 1998 and 2014, 59 facilities were built. They have a future replacement value of $19.33 million. These facilities have an effective functional life of 20-50 years. Establishing the future replacement fund enables the Stormwater Utility to preserve the drainage infrastructure while continuing to address failures of legacy drainage facilities.

IMPLICATION OF NOT DOING THE PROJECT:
Public facilities will fail, causing flooding which will result in property loss and water quality degradation.

LINKS TO OTHER PROJECTS OR FACILITIES:
To be determined.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Generally Capital Facilities policies 3 and 4

Reserve - Capital Facility Replacement

LEVEL OF SERVICE (LOS): Generally Level B

Capital Costs:

Previous Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$1,276,000	$284,000	$298,000	$313,000	$330,000	$350,000	$350,000	$1,924,975

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU Rates	$284,000	$298,000	$313,000	$330,000	$350,000	$350,000	$1,924,975

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – Varies by facility
Estimated Revenues - N/A
Anticipated Savings Due to Project – To Be Determined
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION: (Varies by facility**)**

Reserve – Emergency

DESCRIPTION:
The Utility is establishing a reserve fund for emergency response and replacement or repair of existing infrastructure that is damaged by a natural disaster.

LOCATION: Defined by project to be replaced.

JUSTIFICATION (Need/Demand): Past natural disasters or floods have caused infrastructure failures. This fund is a reserve to cover the cost of replacement or emergency response.

IMPLICATION OF NOT DOING THE PROJECT:
Public facilities will fail, causing flooding which will result in property loss and water quality degradation. If there isn't an emergency fund to draw on then the money will need to be taken from the capital projects funds which will delay those projects.

LINKS TO OTHER PROJECTS OR FACILITIES:
To be determined.

COMPREHENSIVE PLAN AND FUNCTIONAL PLAN(S) CITATIONS:
Generally Capital Facilities policies 3 and 4

Reserve - Emergency

LEVEL OF SERVICE (LOS): Generally Level B

Capital Costs:

Previous Years	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
$250,000			$250,000				$500,000

FUNDING SOURCES	2018	2019	2020	2021	2022	2023	6 YR. TOTAL
SSWU Rates			$250,000				$500,000

ANNUAL OPERATIONS AND MAINTENANCE:

Estimated Costs – Varies by facility
Estimated Revenues - N/A
Anticipated Savings Due to Project – To Be Determined
Department Responsible for Operations – Resource Stewardship

QUADRANT LOCATION: (Varies by facility**)**