

# **Stormwater Retrofit Program Plan**

*April 22, 2019*



## **Purpose**

This Stormwater Retrofit Program Plan (Plan) documents the current Clean Water Services' (CWS or District) retrofit strategy and meets the requirements of Schedule A, Section 2.d.vi.D and Section 2.d.vii.F of District's National Pollutant Discharge Elimination System Watershed-Based Waste Discharge Permit (Permit) issued April 22, 2016. CWS is required to develop, document and implement a stormwater retrofit program by April 22, 2019.

## **Permit Requirements**

The Permit requirement to develop a Stormwater Retrofit Strategy is contained in Schedule A, Section 2.d.vi.D:

***D. Retrofit Strategy.*** *By April 22, 2019, the permittee must implement a stormwater retrofit program that applies to developed areas identified by the permittee as impacting water quality and that are insufficient or lacking stormwater quality and flow controls. The permittee must document its stormwater retrofit program in a plan, and submit its plan to DEQ by April 22, 2019. The permittee must use this plan to guide the implementation of its storm water retrofit program. The program must meet the following requirements:*

- 1. The stormwater retrofit program must be designed to implement a permittee-defined set of stormwater retrofit objectives and a comprehensive evaluation of a range of stormwater retrofit control measures and their appropriate use. The permittee-defined objectives must be designed to assure progress towards applicable TMDL wasteload allocations. The permittee must provide opportunity for public comment and consider public input for the development of the stormwater retrofit program.*
- 2. The permittee must include the following components in its stormwater retrofit plan:*
  - a. A stormwater retrofit strategy statement and summary, including objectives and rationale.*
  - b. Summary of current stormwater retrofit control measures implemented within the permittee's jurisdiction, and a current estimate of annual program resources directed towards stormwater retrofits.*
  - c. Identification of high priority retrofit areas.*
  - d. The examination of new or additional stormwater retrofit control measures.*
  - e. The preferred retrofit structural control measures, including rationale.*
  - f. A retrofit project or approach priority list, including rationale, identification and map of potential storm water retrofit locations, where appropriate, and an estimated timeline and cost for implementation of each project or approach.*
- 3. The permittee must identify, at a minimum, five stormwater quality improvement retrofit projects. The identified projects must be designed, and constructed or implemented, to effectively reduce applicable TMDL pollutant parameters by April 22, 2021.*
- 4. The permittee must include a summary report describing the status of the retrofit program in each annual report.*

An additional reference to the content of the Stormwater Retrofit Strategy is contained in Section 2.d.vii.F of the Permit:

*F. Assess flood control projects to identify potential impacts on the water quality of receiving water bodies and determine the feasibility of retrofitting structural flood control devices for additional stormwater pollutant removal. The permittee must consider and incorporate the results of this assessment as part of the Stormwater Retrofit Strategy Development required in Schedule A.2.d.vi.D.*

### **Introduction**

All of the District's programs, including the Stormwater Retrofit Program (SRP), are developed and implemented to support the District's overarching goal to improve watershed health. The District has required stormwater treatment for new development since 1990 and began investigating possible retrofit activities as part of the District-wide comprehensive Watersheds 2000 efforts documented in the *Healthy Streams Plan* (2005). The District has implemented a stormwater retrofit capital program since 2007.

### **General Requirement (Permit Section 2.d.vi.D.1)**

*1. The stormwater retrofit program must be designed to implement a permittee-defined set of stormwater retrofit objectives and a comprehensive evaluation of a range of stormwater retrofit control measures and their appropriate use. The permittee-defined objectives must be designed to assure progress towards applicable TMDL wasteload allocations. The permittee must provide opportunity for public comment and consider public input for the development of the stormwater retrofit program.*

The permittee-defined objectives and discussion of the retrofit control measures and their use and evaluation are discussed under items 2.a-e in the Program Components section of this Plan.

A discussion of the public input opportunities and process for project identification is included in item 2.c in the Program Components section of this Plan. The District solicited comments on the draft Plan through posting on the Newsroom section of the District's homepage and directly requesting comments from the Tualatin Riverkeepers, co-implementers and the Clean Water Advisory Committee. Comments were received from three co-implementer jurisdictions (Cornelius, Hillsboro and Beaverton) and from the Tualatin Riverkeepers. This Plan includes modifications made in consideration of those comments.

### **Program Components (Permit Sections 2.d.vi.D.2, D.3 and 2.d.vii.F)**

*a. A stormwater retrofit strategy statement and summary, including objectives and rationale.*

The purpose of the SRP is to identify and retrofit developed areas where stormwater quality and flow control are insufficient or lacking. Projects are selected and implemented within an integrated watershed context to reduce impacts from pollutant loading and hydromodification risk.

The Objectives of the SRP and the rationale for their implementation are:

1. Select projects that “assure progress towards applicable TMDL wasteload allocations,” as required in the Permit (Schedule A, Section 2.d.vi.D.1). The Permit is the main regulatory driver for the SRP and is implemented by the District and its co-implementers including Washington County, and the cities of Banks, Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, North Plains, Sherwood, Tigard and Tualatin. Water quality monitoring data and regional understanding of stormwater pollutant generation are used to help identify and prioritize capital retrofit project locations in high pollutant loading areas.
2. Include operations-based program components that can be routinely implemented as part of the District and co-implementer maintenance programs. The operations-based program components include retrofits of existing components of the stormwater infrastructure, e.g., replacing unsumped catch basins with sumped structures; installation of water quality manholes; and rehabilitation of water quality facility function through reconstruction, large-scale planting/replanting, levee/bank maintenance and biomass removal.
3. Leverage partnership and funding opportunities to implement retrofit capital projects. Under the SRP, the District actively seeks opportunities to add stormwater management to planned public capital projects, especially in areas that have potential for high pollutant loads (e.g., high traffic corridors, industrial/commercial areas or parking lots). By modifying budgeted capital projects to introduce a retrofit component, projects meeting the SRP Objectives can be accomplished quickly and efficiently.
4. Use an integrated stormwater management approach in evaluating all potential stormwater projects, e.g., linking retrofit activities at outfalls with enhancement opportunities in the adjacent stream corridor and applying site suitability criteria to implement projects that provide both water quality treatment, and where possible, flow control benefits. Outfall retrofits focus actions immediately upstream of receiving waters, reduce energy of stormwater discharges, provide water quality treatment and promote opportunities for improving stream corridor resiliency to address hydromodification impacts.
5. Implement developed area retrofit capital projects throughout the District’s service area, including areas within all co-implementer jurisdictions and within all watersheds in the District’s service boundary. Although projects are prioritized and implemented in accordance with Objectives 3 and 4, potential projects have been identified throughout the entire service area to ensure overall watershed health is considered.
6. Provide opportunities for public comment on potential retrofit projects and consider input in the development of prioritization criteria and in the identification, selection and implementation of retrofit capital projects. The District and co-implementers place a high value on meaningful stakeholder engagement.
7. Use an adaptive management approach for regular evaluation and adjustment of the program and approaches.

b. *Summary of current stormwater retrofit control measures implemented within the permittee's jurisdiction, and a current estimate of annual program resources directed towards stormwater retrofits.*

CWS Design and Construction Standards (Standards) outline the requirements for stormwater management for new development and redevelopment. Accepted stormwater treatment approaches are contained in the Standards and in the 2016 Low Impact Development Approaches (LIDA) Handbook (<http://www.cleanwaterservices.org/permits-development/design-construction-standards/>). Techniques included in the Standards and LIDA Handbook have been tested and demonstrated to provide the intended water quality benefit when designed, constructed and maintained according to the Standards.

The following types of stormwater retrofit control measures are included in the Standards and used within the District's service area.

- Sumped catch basins.
- Sumped water quality manholes.
- Proprietary treatment systems.
- Vegetated/LIDA swales.
- Extended dry basins.
- Constructed water quality wetlands.
- Infiltration planters/rain gardens.
- Landscape filter strips.
- Vegetated corridor as filter strip.
- Street side planters.
- Green roofs.
- Porous pavement.
- Flow-through planters.

#### *Annual Program Resources*

For fiscal year (FY) 2018-19 (July 1, 2018 – June 30, 2019) the District and co-implementers have total estimated expenditures of \$54.7 million for stormwater and related watershed operations and capital project investments and stormwater funding sources of \$98.3 million, including beginning balances, operating reserves and capital reserves.

The District's Outfall Retrofit Program is part of the comprehensive stormwater program and has had a capital budget since FY 2007-08. The District anticipates continuing to fund this program in compliance with the Permit requirements. The District and co-implementers have spent over \$740,000 since June 1, 2016, when the current Permit went into effect and have approved capital project budgets of over \$430,000 in the current fiscal year (FY 2018-19) associated with outfall retrofit projects.

District and co-implementers spend approximately \$750,000-\$800,000 annually to perform the operations-based program components associated with this Plan. These components are funded within the District and co-implementers storm and surface water operating budgets.

c. *Identification of high priority retrofit areas.*

The SRP is focused on outfall retrofits as a means of optimizing control in “storm-sheds” (i.e., areas draining to specific storm outfalls) that currently do not have adequate stormwater treatment. Per Plan Objectives 3 and 4, the SRP includes a planning level review of these outfalls that might be future candidates for retrofit in subsequent Permit cycles.

As part of its Watersheds 2000 *Healthy Streams Plan* effort, the District originally identified 68 high priority outfalls and during further analysis identified 205 Significant Storm Water Outfalls. These outfalls are characterized as draining commercial, industrial and high-traffic areas with a potential high pollutant loading. In 2018, using updated analysis tools, the District identified 228 outfalls that are the focus of the current SRP. Table 1 and Table 2 summarize these outfalls by co-implementer jurisdictional boundary area and by watershed, respectively.

These tables are used to determine the level to which the SRP is meeting Objective 5 — identification of projects throughout multiple jurisdictions and watersheds. Further assessment will similarly evaluate outfalls with regard to their water quality impact (Objective 1).

**TABLE 1: Stormwater Outfalls with Retrofit Opportunity, by Jurisdiction**

<b>Jurisdiction Boundary Area</b>	<b>Total Drainage Area, acres</b>	<b>Number of Outfalls</b>
Beaverton	3,840	32
Cornelius	694	6
CWS/Washington County	5,065	88
Durham	50	2
Forest Grove	1,051	7
Hillsboro	3,133	33
King City	428	2
Portland	182	3
Sherwood	194	3
Tigard	2,081	36
Tualatin	1,462	16
<b>Total</b>	<b>18,180</b>	<b>228</b>

**TABLE 2: Stormwater Outfalls with Retrofit Opportunity, by Watershed**

<b>Watershed (includes smaller order streams)</b>	<b>Total Drainage Area, acres</b>	<b>Number of Outfalls</b>
Ash Creek	740	7
Ball Creek	258	3
Beaverton Creek	2,567	48
Butternut Creek	121	8
Chicken Creek	194	3
Cedar Mill/N Johnson Creeks	3,295	19
Council Creek	1,729	14
Dairy Creek	695	4
Fanno Creek	2,265	33
Gales Creek	119	1
Hedges Creek	70	3
McKay Creek	1,507	15
Red Rock Creek	269	3
Rock Creek	1,717	28
Summer Creek	457	6
Tualatin River	1,775	23
Willow Bronson Creeks	402	10
<b>Total</b>	<b>18,180</b>	<b>228</b>

Additional triggers for developing potential capital retrofit projects include:

- Existing, untreated stormwater outfalls.
- Modification of existing facilities to target additional pollutants.
- Exposed sanitary sewer mains and laterals.
- Streams with severe incision.
- Redevelopment opportunities.
- Non-stormwater capital projects by co-implementers, e.g., transportation, public buildings, etc.
- Non-stormwater capital projects by agencies other than co-implementers, e.g., school districts, park districts, etc.
- Projects identified by area stakeholders, including neighborhood associations, stream advocacy groups or other nonprofit organizations.

The District uses multiple means to obtain public input to inform the selection of projects implemented under the SRP. The District regularly identifies potential capital retrofit projects that can be implemented in partnership with anticipated private development and public capital projects, with an emphasis in evaluating opportunities for projects in areas that have potential for high pollutant loads (e.g., high traffic corridors, industrial/commercial areas or parking lots).

The District reviews private development plans and capital project plans to identify where project modifications can be made to provide stormwater treatment elements on non-stormwater projects or to add treatment for untreated drainage area from outside the project boundary.

Additionally, potential capital retrofit projects are identified as District and co-implementer staff observe stormwater conditions in the urban portions of the Tualatin Basin or as project opportunities or impaired conditions are identified by members of the public. Potential projects are also identified through master plan efforts, customer complaints and maintenance and repair activities. The District is also open to project suggestions and implementation assistance directly from other stakeholders.

The District and co-implementers assess and prioritize retrofit project opportunities based on the objectives described in Section 2a. The selection process tracks project watershed and jurisdictional locations, to address the objective of improving water quality throughout the District's service area. Following further analyses, potential retrofit projects are then included in District and co-implementers Capital Improvement Program budget requests and documented in the District's *Stormwater Annual Report*. Both the budget process and annual report are accessible to the public. As individual projects enter the design and implementation phase, public input is solicited from community members near the proposed project site.

*d. The examination of new or additional stormwater retrofit control measures.*

As mentioned above, the District's accepted methods for stormwater treatment are listed in the Design and Construction Standards. The District maintains a robust process for reviewing any new stormwater management techniques before adding them to the approved list of treatment measures. The District's ongoing treatment evaluation effort, which is organized by the Oregon Department of Transportation and the Association of Clean Water Agencies, reports on effectiveness of facility types, design details, and construction and maintenance techniques and provides feedback into development of the Design and Construction Standards. As new techniques are vetted, they may be incorporated into selected retrofit projects on a pilot basis.

With respect to retrofit projects to address hydromodification, the District anticipates developing sub-basin specific stormwater management strategies throughout the service area over the next several years. A key component of these strategies is the mitigation of hydromodification impacts through a mix of onsite retention (infiltration and other LIDA) at the project scale, regional stream corridor enhancement, regional upland detention and project-specific fee-in-lieu. During the course of building the sub-basin strategies, the District will evaluate development patterns and identify regional stormwater management projects, initially targeting favorable stream corridor reaches with access potential and enhancement need and/or opportunity as defined below:

- Access: Land is in public ownership, private ownership with a surface water management easement or in private ownership with significant development limitations (e.g., regulatory floodplain, drainage hazard area, vegetated corridor, wetlands, steep slope) and willing landowners (public or private).
- Need: Projects also address upgrades or protection of sanitary or storm infrastructure (e.g., exposed sewer lines or to protect other public infrastructure (roads, bridges)).



District and co-implementers identify projects during an annual capital project prioritization process.

- Opportunity: Project is adjacent to public road, trail or park project, in an urban renewal district, or other location with investment of public funds.

e. *The preferred retrofit structural control measures, including rationale.*

Table 3 presents the District-accepted stormwater treatment measures from the Standards and 2016 LIDA Handbook and summarizes general selection criteria for their use. These measures are preferred for use in the listed site conditions as proven Best Management Practices (BMP) for reducing TMDL pollutants with established operations and maintenance procedures.

**TABLE 3: Preferred BMPs for Site Conditions**

Site Condition	Green Roof	Porous Pavement	Flow-Through Planter	Infiltration Planter/Rain Garden	Vegetated Filter Strip	LIDA Swale	Street Side Planter	Sumped CB & WQMH
Reduce imperviousness	✓	✓						
Infiltrate		✓		✓	✓	✓	✓	
Detention/flow control		✓		✓			✓	
Provide habitat			✓	✓	✓	✓	✓	
Near vegetated corridor			✓	✓	✓	✓	✓	✓
Private property	✓	✓	✓	✓	✓	✓	✓	✓
Private street		✓	✓	✓	✓	✓	✓	✓
Public street /ROW			✓	✓	✓	✓	✓	✓
On or next to building	✓		✓					✓
Parking lot		✓	✓	✓	✓	✓	✓	✓
Landscaped area			✓	✓	✓	✓		✓
Steep slope	✓		✓				✓	✓
Soils with low infiltration rate	✓	✓	✓		✓	✓	✓	✓
High groundwater table	✓		✓		✓	✓		✓
Contaminated soils	✓		✓					✓

f. A retrofit project or approach priority list, including rationale, identification and map of potential storm water retrofit locations, where appropriate, and an estimated timeline and cost for implementation of each project or approach.

The potential outfall retrofit projects presented in Table 4 and shown as green stars on Figure 1 have been identified and prioritized based on partnership opportunities. As the evaluation of the feasibility and effectiveness of these potential projects continues, some may be delayed, or even eliminated.

**TABLE 4: Potential Retrofit Projects for Further Evaluation and Ranking**

Outfall Retrofit Project Number	Outfall Retrofit Project Name	Implementer	Current Status (P/D/C/O)	Proposed Fiscal Year of Start-up	Watershed	Proposed Project Budget	Estimated Drainage Area, acres
1	Watson Ave Retrofit	City of Beaverton	D	FY 2020	Beaverton Creek	\$2,500,000	78
2	141 <sup>st</sup> Ave Retrofit	City of Beaverton	D	FY 2020	Beaverton Creek	\$855,000	16.5
3	Commercial St WQF	City of Tigard	P	FY 2021	Fanno Creek	\$385,000	TBD
4	Gleneagle Area WQFs	City of Sherwood	P	FY 2021	So Rock Creek	\$240,000	TBD
5	Oregon St WQF	City of Sherwood	P	FY 2021	Cedar Creek	\$535,000	TBD
6	Pamela Court Storm Improvement	District	P	FY 2021	Fanno Creek	\$240,000	9
7	177 <sup>th</sup> & Vincent Storm Improvement	District	P	FY 2021	Beaverton Creek	\$300,000	13

P = in planning; D = in design; TBD = to be determined; WQF = water quality facility

3. The permittee must identify, at a minimum, five stormwater quality improvement retrofit projects. The identified projects must be designed, and constructed or implemented, to effectively reduce applicable TMDL pollutant parameters by April 22, 2021.

Table 5 presents information on six retrofit projects that have been completed within the existing Permit period, demonstrating that the District has already met the requirements for the current Permit. The completed projects are shown as red stars on Figure 1.

The District has stormwater wasteload allocations for bacteria, phosphorus and settleable volatile solids (with total suspended solids as a surrogate). Based on analysis of TMDL wasteload allocations (first described in the District’s 2008 Stormwater Management Plan) and the District’s Design and Construction Standards that prioritize low impact development approaches, current and proposed retrofit projects are typically low impact development facilities such as swales, planters or other vegetated facilities intended to treat runoff from several acres. Facility types and configurations used for retrofits are targeted at one or more of the TMDL stormwater pollutants that the District must address based on performance insights obtained from experience

of other jurisdictions in the region (as noted in Section 2.d) and through the International BMP Effectiveness database.

Progress toward meeting TMDL waste load allocations is assessed at a sub-basin scale using data from the District’s ambient and stormwater monitoring as described in the District’s Stormwater Management Plan. Not all sub-basins are monitored, and implementation of retrofit projects is not restricted to those areas incorporated into the monitoring program.

**TABLE 5: Retrofit Projects Completed in the Current Permit Cycle**

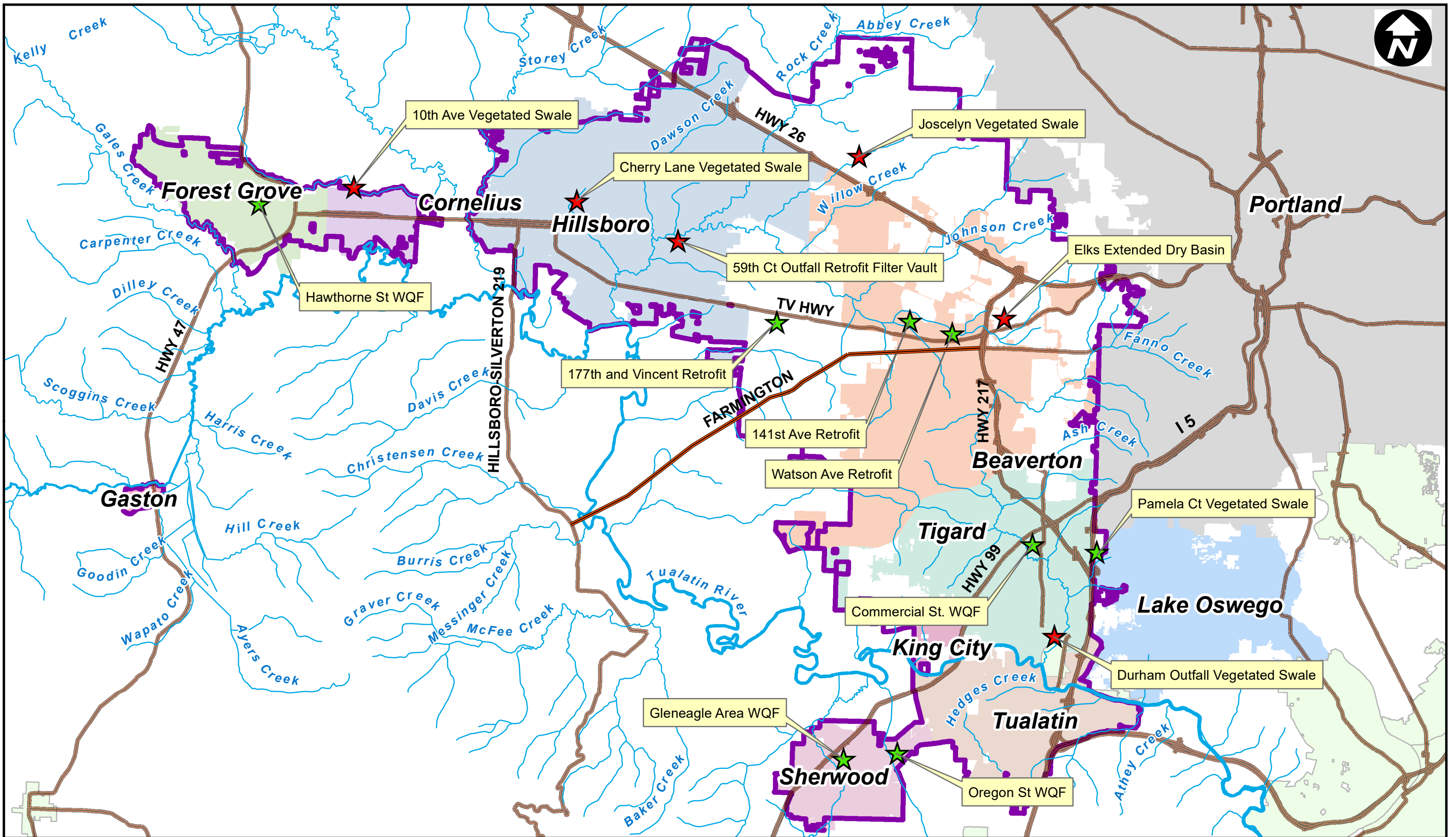
<b>Outfall Retrofit Project Number</b>	<b>Outfall Retrofit Project Name</b>	<b>Implementer</b>	<b>Current Status</b>	<b>Fiscal Year of Start-up</b>	<b>Watershed</b>	<b>Actual Retrofit Budget</b>	<b>Total Drainage Area, acres</b>
1	Elks Extended Dry Basin	District	Operational	FY 2017	Beaverton Creek	\$88,000	15.0
2	Durham Vegetated Swale	District	Operational	FY 2018	Fanno Creek	\$320,000	100.8
3	Joscelyn Vegetated Swale	District	Operational	FY 2018	Bronson Creek	\$170,000	18.5
4	59 <sup>th</sup> Court Storm Filter Vaults	City of Hillsboro	Operational	FY 2018	Rock Creek	\$70,000	6.1
5	Cherry Lane Vegetated Swale	City of Hillsboro	Operational	FY 2019	Orengo Creek	\$334,000	2.7
6	10 <sup>th</sup> Avenue Vegetated Swale	City of Cornelius	Operational	FY 2019	Council Creek	\$ 95,000	7.4

4. *The permittee must include a summary report describing the status of the retrofit program in each annual report.*

A summary report of the status of the SRP will be included with the MS4 Annual Report, due annually on November 1.

**Section 2.d.vii.F.** *Assess flood control projects to identify potential impacts on the water quality of receiving water bodies and determine the feasibility of retrofitting structural flood control devices for additional stormwater pollutant removal. The permittee must consider and incorporate the results of this assessment as part of the Stormwater Retrofit Strategy Development required in Schedule A.2.d.vi.D.*

The District and the co-implementers do not construct, manage or maintain any flood control facilities and, therefore, did not provide an assessment of the feasibility of retrofitting structural flood control devices for additional stormwater pollutant removal.



E:\Capital Projects\Projects\6237 Stormwater Outfall Retrofit Program\1 - FINAL REPORTS & PRESENTATIONS\1- REPORT (Updated: 04-17-2019)

**FIGURE 1: STORMWATER RETROFIT PROJECTS FY 2017-2021**  
Washington County, Oregon

- ★ Complete Projects
- ★ Potential Sites