

Annual Compliance Report No. 21

Fiscal Year 2015 – 2016
(July 1, 2015 to June 30, 2016)

**National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Discharge Permit No. 101314**

Prepared for:
Oregon Dept. of Environmental Quality

Submitted by:
City of Portland
Port of Portland

Date:
November 1, 2016



Portland, Oregon

National Pollutant Discharge Elimination System (NPDES)

Municipal Separate Storm Sewer System (MS4)

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Executive Summary

Introduction

This 21st *Annual Compliance Report* is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit # 101314 (hereinafter referred to as the MS4 permit or permit) issued to the City of Portland and the Port of Portland (the co-permittees) by DEQ on January 31, 2011. The report provides information about activities that have been accomplished in accordance with the co-permittees' *Stormwater Management Plans* (SWMPs) during fiscal year (FY) 2015/16 (July 1, 2015 through June 30, 2016). It also includes a monitoring report that summarizes sampling and monitoring activities conducted during FY 2015/16.

Notable Accomplishments

The **City of Portland's** information is provided in **Section I** of the report. Notable accomplishments this year for the City included:

- ✓ Conducted public involvement/education activities as a significant element of the Stormwater Program. Key activities included providing water quality education, outreach and curriculum resources for approximately 17,795 K-12 students; awarding 13 stewardship grants and 19 mini grants totaling \$105,800; involving over 14,500 community participants in events/ activities; and providing educational materials through avenues such as the City's website, newsletter, bill inserts, Facebook and green blogs.
- ✓ Conducted ongoing assessment, cleaning, maintenance, and repair of MS4 components including the cleaning of 103 structural and non-structural BMPs, 11,372 catch basins and inlets, 32,054 lineal feet of ditch, and 15,363 lineal feet of culvert. Also swept major arterials four to six times during the year and continued to sweep residential streets approximately once every 10 months.
- ✓ Administered 217 Industrial Stormwater NPDES Discharge Permits with requirements to maintain BMPs for stormwater runoff; Inspected 291 commercial and industrial facilities to assess the need for permit coverage and stormwater controls; and maintained 42 facilities within the City that are currently certified under the EcoBiz Program including 33 automotive and 9 landscape businesses.
- ✓ Issued 28 enforcement actions against 18 responsible parties for prohibited discharges to the MS4, and conducted 140 inspections at 109 major outfalls to identify illicit discharges.
- ✓ Managed 170 active public construction projects (citywide) with erosion control components, conducted 6,053 erosion control-related inspections of private construction sites, and issued 54 associated enforcement actions.
- ✓ Reviewed 8,571 building permits and inspected 1,150 private stormwater management permit projects and associated facilities. This included requirements for 1,443 source control measures at commercial and industrial properties. Associated inspections occurred

at 1,194 properties and 2,292 associated private stormwater management facilities for operations and maintenance requirements.

- ✓ Worked on finalizing updates to the 2014 Stormwater Management Manual.
- ✓ Completed the construction of a host of additional water quality retrofit projects treating a total drainage area of 336 acres. Retrofits also included the conversion of 4,700 linear feet of ditches to swales or porous shoulders.
- ✓ Acquired 13.2 acres of land and planted 11,555 trees and 36,966 shrubs along 9,935 linear feet of streambank covering 96 acres. Also, in partnership with Friends of Trees, planted 3,046 street trees and 706 yard trees in City of Portland rights-of-way, on school properties, and in private yards.
- ✓ Updated the *Monitoring Plan for Stormwater and Surface Water Sampling* to make refinements where needed and initiate efforts to evaluate trends at long-term stormwater monitoring locations.

The **Port of Portland's** information is presented in **Section II** of the report. Notable accomplishments this year for the Port included:

- ✓ The Port continues to conduct annual maintenance of the storm sewer system components, structural controls, and regular sweeping on specific Port-managed properties.
 - This effort included maintaining over 990 catch basins, inspection and maintenance of Port-owned water quality treatment facilities, cleaning 12,262 feet of storm line, and 4,489 hours of street sweeping. Together these tasks diverted 594 tons of potential pollutants from Port receiving waters.
- ✓ Port staff continued to implement the Illicit Discharge Detection and Elimination Program. The program involves field screening of priority outfalls and investigation of potential illicit discharges.
 - Dry-weather field screening inspections were conducted at 72 outfalls Port-wide. No potential illicit discharges were observed.
- ✓ Port staff continued to implement the Industrial Facility Inspection Program, inspecting a total of 37 priority industrial facilities Port-wide in fiscal year 2016. Staff provided technical assistance during these visits, while also setting timelines for correction of any deficiencies where appropriate.
- ✓ Port operating area staff received training on a variety of stormwater-related subjects, including pesticide application (13), stormwater pollution prevention and spill response (176), and erosion prevention (19). In addition, 78 new employees are trained on the importance of preventing pollutants from entering stormwater in the Port's new employee orientation program.
- ✓ The Port continued its support of organizations which work to promote watershed health including the Columbia Slough Watershed Council, the Regional Coalition for Clean Rivers and Streams, SOLVE, Friends of Trees, Lower Columbia Estuary, The Intertwine Alliance, and Willamette Partnership, Oregon Environmental Council, Oregon Association of Clean Water

Agencies, Columbia Riverkeeper, Willamette Riverkeeper and the KOIN 6 Water... Do Your Part Clean Water Partners.

- ✓ The Port continues to coordinate with the Portland co-permittees, particularly the City of Portland, with regards to monitoring and compliance with MS4 deliverables in addition to the annual report.
- ✓ The Port continues to improve the process for implementing the Design Standards Manual.
 - The Port has developed an accounting system to track the number of acres treated and the total number of acres requiring treatment per calendar year.
 - Currently, the Port needs to provide treatment for at least 20.94 acres of impervious surface. Based on current planning estimates of acres of treatment needed, the Port is planning to be in full compliance by 2017. Actual acres of treatment per project is verified as part of close-out and reconciled with the accounting system.

A Monitoring Report that summarizes monitoring activities conducted through the year is provided in **Section III** of the report. The raw monitoring data will be provided to DEQ electronically.

Permit Areas

The permit areas for the co-permittees are as follows:

City of Portland: Approximately 15,233 acres within the City of Portland's urban services boundary drain to the City's MS4.

Port of Portland: The Port owns approximately 5,497 acres within the City of Portland's urban services boundary. Much of this property drains to the Port's municipal separate storm sewer system and is regulated by the MS4 permit. This acreage includes Portland International Airport (PDX), four marine terminals, several industrial parks occupied by commercial tenants, mitigation sites, and undeveloped land.

Permit History

DEQ issued the first MS4 permit to the City and other co-permittees within the Portland urban services boundary on September 7, 1995. DEQ renewed the permit for a second permit term in March 2004 and subsequently revised and reissued that permit on July 27, 2005. The co-permittees submitted a permit renewal package to DEQ on September 2, 2008 and DEQ subsequently issued the third-term permit on January 31, 2011. The co-permittees submitted a renewal package to DEQ on July 31, 2015 for the fourth permit-term. The 2011 permit expired on January 30th, 2016 and has been administratively extended.

Program Coordination

The co-permittees share information about program development and implementation, Best Management Practice (BMP) effectiveness, monitoring, and other issues related to the MS4 permit. This coordination avoids duplication and promotes cost-effective use of resources. To further ensure ongoing collaboration and efficiency, the City and Port have an Intergovernmental Agreement that allocates responsibilities and resources.

The co-permittees also coordinate and address stormwater permit implementation issues with other jurisdictions in the state through the Oregon Association of Clean Water Agencies (ACWA). Co-permittee representatives participate in ACWA’s water quality, stormwater, and groundwater committees.

Document Organization

The following table (Table E.1) outlines the organization of this annual report document, with respect to the annual reporting requirements per Schedule B(5) of the City’s MS4 NPDES permit.

Table E.1: Annual Reporting Requirements for Permit Year 21 (FY 2015-16)

	Location in Document	
	City of Portland	Port of Portland
a) Status of implementing SWMP elements, including progress in meeting measurable goals.	I-2 through I-13	II-7.1.1 through 7.1.8
b) Status of any public education effectiveness evaluation conducted during the reporting year, and a summary of how results were used in adaptive management.	-- ^a	-- ^a
c) Summary of the adaptive management process implementation during the reporting year including new BMPs.	I-1	II-8.0
d) Any proposed changes to SMWP program elements to reduce TMDL pollutants to the MEP.	NA	II-8.0
e) A summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year.	I-1	II-4.0
f) A summary of monitoring program results, including monitoring data that is accumulated throughout the reporting year.	III	III
g) Any proposed modifications to the monitoring plan necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	I-1.2 and III	I-1.2 and III
h) A summary describing the number and nature of enforcement actions, inspections, and public education programs.	-- ^b	-- ^c
i) An overview, as related to MS4 discharges, of concept planning, land use changes and new development activities that occurred within the UGB expansion areas during the previous year, and those forecast for the following year. Include the construction permits issued, and an estimate of the total new and replaced impervious area related to new and redevelopment projects.	I-1 and I-10	I-1 and I-10
j) Additional submittals listed in Schedule B.5.j due November 1, 2014	-- ^a	-- ^a

- a. These requirements were fulfilled in Permit Year 19 and are addressed in the Permit Year 19 annual report.
- b. Enforcement actions, inspections, and public education programs are included in the City’s SWMP as BMPs, and are reported along with the status of implementing all components of the SWMP in Sections I-2 through I-13.
- c. Enforcement actions, inspections, and public education programs are included in the Port’s SWMP as BMPs, and are reported along with the status of implementing all components of the SWMP in Sections II-7.1.1 through 7.1.8).

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CITY OF PORTLAND

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Abbreviations & Acronyms

ac	acre(s)
ACWA	(Oregon) Association of Clean Water Agencies
BES	Bureau of Environmental Services
BMP	best management practice
City	City of Portland
CSO	Combined Sewer Overflow
CSWC	Columbia Slough Watershed Council
DEQ	(Oregon) Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FOT	Friends of Trees
GIS	geographic information system
IDDE	Illicit Discharge Detection & Elimination
LA	load allocation
MIP	Maintenance Inspection Program
MS4	municipal separate storm sewer system
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
ODOT	Oregon Department of Transportation
O&M	operations and maintenance
OLCA	Oregon Landscape Contractors Association
PCB	polychlorinated biphenyl
PLRE	pollutant load reduction evaluation
PPRP	Private Property Retrofit Program
PP&R	Portland Parks and Recreation Department
SDCs	system development charges
SMF	stormwater management facility
SWMM	stormwater management manual
SWMP	stormwater management plan
SWNI	Southwest Neighborhoods, Inc.
TB-PAC	Tualatin Basin Public Awareness Committee
TMDL	total maximum daily load
UIC	underground injection control
WLA	waste load allocation
WRC	Watershed Resource Center

Section 1

Introduction

This annual report fulfills reporting requirements of the City of Portland's NPDES MS4 Discharge Permit No. 101314. Annual reporting related to key accomplishments and measurable goals is included in this section. Monitoring activities are reported in Section III. This section provides a summary of the activities the City has conducted to implement the City's 2011 *Stormwater Management Plan* (SWMP) during the 21st fiscal year (July 1, 2015 through June 30, 2016) of the permit program. Some activities outlined in the SWMP are also conducted to fulfill obligations under the City's TMDL Implementation Plan for the Willamette River and Tributaries. A separate annual report is submitted to DEQ to summarize TMDL compliance.

1.1 Program Authorization & Management

The Portland City Council passed a resolution supporting the NPDES MS4 permit application in June 1995. In that resolution, the Council designated the Bureau of Environmental Services (BES) as the lead for the City's implementation of the stormwater program. The City of Portland continues to maintain and update legal authority to implement the programs outlined in the SWMP, as demonstrated in Part 1 of the City's original 1991 NPDES MS4 permit application.

The City's MS4 Program Manager is responsible for overall project management, compliance reporting, policy development, and coordination within the City of Portland, as well as for co-permittee coordination. BES section managers and staff members serve as leads for the BMPs contained in the SWMP. Because the permit is citywide, many City staff members outside BES are also involved with stormwater program development, implementation, and reporting.

1.2 Adaptive Management

The City submitted its adaptive management approach to DEQ on November 1, 2011. The City's approach includes two elements:

- An **annual process** to determine if the City's stormwater program is being implemented in accordance with the SWMP; determine if measurable goals are being met or progress is being made towards meeting them (as applicable); and identify whether any program adjustments are needed.
- A more comprehensive process to identify proposed program modifications submitted as part of the City's **permit renewal** package, including the modification, addition, or removal of best management practices (BMPs) incorporated into the SWMP and associated measurable goals.

The City provided its *Permit Renewal Submittal* to DEQ on July 31, 2015. Section III of the submittal included a description of the adaptive management process that was conducted to assess the existing MS4 program and develop a proposed SWMP for the next permit term.

In fiscal year (FY) 2015-16, the City continued to implement the adaptive management process. Two notable adaptive management changes to the program included revisions to the *Monitoring Plan for Stormwater and Surface Water Sampling* (Monitoring Plan) and updates to the City's 2014 *Stormwater Management Manual* (SWMM). A description of these adaptive management changes follows:

Monitoring Plan Updates

Changes to the Monitoring Plan included a reduction in the number of underground injection control (UIC) stormwater monitoring locations and the addition of several fixed land use stations that were historically sampled for direct stormwater monitoring of the MS4. In addition, the City discontinued macroinvertebrate monitoring specifically in the Columbia Slough, resulting in a small reduction in the number of sites sampled for this monitoring element. The reason for the change was that most metrics used to evaluate the health of aquatic insect communities are developed for pool-riffle stream systems and are not effective in addressing low gradient systems like the Columbia Slough. The City is considering use of a more viable biological index that may be substituted in the Slough.

Under the revised Plan, the City elected to resurrect four MS4 land use sites that were historically monitored between 1991 and 2011. Revisiting these sites will allow the City to assess whether there have been significant changes or detectable trends in the quality of stormwater runoff over many years, particularly in light of the BMP and green infrastructure implementation that has increased significantly in recent years. The fixed land use monitoring will entail flow-weighted sampling during three storms per year at each of the four sites. Given the labor-intensive nature and cost of the fixed land use monitoring coupled with the robust UIC stormwater dataset that the City has collected over the past 10-plus years, the value of the information gained compared to the reduction of UIC monitoring locations is justified. The re-allocation of resources in this manner brings value and diversity to the City's MS4 monitoring program, as determined per our adaptive management strategies. The program will continue to remain compliant with the permit conditions as the monitoring continues to be focused on addressing the monitoring objectives as outlined in Schedule B.1.a. of the permit.

A summary of updates to the Monitoring Plan and the rationale for the updates can also be found in Section 1.4.1 of the Monitoring Plan which is accessible online at the following address:

<https://www.portlandoregon.gov/bes/article/387705>

SWMM Updates

During FY 2015-16, the City continued to revise and update the 2014 SWMM. The main purposes of the update were to reinforce the stormwater management hierarchy, update the user interface for the Presumptive Approach Calculator used to size BMPs, separate source control requirements into a separate manual and shift from citywide flow control and pollution reduction requirements to system-specific (i.e., MS4, UIC or CSO) requirements. The updated SWMM will become effective in the fall of 2016. These updates are mentioned in Section II-10 of this annual report and can be found online at the following address:

<https://www.portlandoregon.gov/bes/64040>

1.3 Permit-Required Actions

The 2011 MS4 permit identifies activities that were to be implemented by specified dates. During the five year permit term, the City completed the activities to meet these requirements. In addition to the required annual reports and the permit renewal application submittal, these activities included the following items as required in Schedules A.7, B.1.b, D.2 and D.3 of the permit:

- ✓ Documentation of IDDE enforcement response procedures.
- ✓ Development of IDDE pollutant parameter action levels.
- ✓ Mapping of dry-weather screening priority locations.
- ✓ Implementation of an industrial and commercial facility inspection and stormwater control program.
- ✓ Completion of an education and outreach effectiveness evaluation.
- ✓ Implementation of an updated post-construction site runoff program.
- ✓ Completion of a municipal operations inventory and assessment.
- ✓ Implementation of a structural stormwater controls operations and maintenance program.
- ✓ Preparation of a hydromodification assessment.
- ✓ Development of a stormwater retrofit strategy.
- ✓ Identification of a stormwater quality improvement project.
- ✓ Construction of a stormwater quality improvement project.
- ✓ Updated monitoring plan.
- ✓ 303(d) Evaluation.
- ✓ TMDL Pollutant Load Reduction Evaluation.
- ✓ Waste Load Allocation Attainment Assessment.

The permit, which expired on January 30, 2016, is currently under administrative extension. Other than regular SWMP implementation, monitoring implementation and annual report preparation, the only permit-required action that occurred during this past year was related to monitoring. As described in the previous section, adaptive management changes were made to the 2011 monitoring plan. The City submitted the updated monitoring plan to DEQ on June 13, 2016 and provided a 30-day notice period in accordance with Schedule B. No response was received by the DEQ and, therefore, the updated plan will be in effect beginning FY 2016-17. Per the following clause of Schedule B.2.f., the City is required to provide documentation of the monitoring plan changes in the subsequent annual report (i.e., this annual report):

Modification to the monitoring plan in accordance with Schedule B.2.e. must be documented in the subsequent annual report by describing the rationale for the modification, and how the modification will allow the monitoring program to remain compliant with the permit conditions.

This required documentation is provided in the previous section regarding adaptive management.

1.4 Urban Growth Boundary Expansion Areas

There were no expansions to the urban growth boundary in FY 2015-16.

1.5 Stormwater Program Expenditures & Funding

The City of Portland has invested more than \$1.343 billion in stormwater management services and facilities during permit years 1 through 21. The revenue requirements for permit year 21 totaled approximately \$118.5 million, allocated shown in Table 1.1, below:

Table 1.1: Stormwater Program Expenditures

Major Program Category	Requirements	Percentage Share
Enforcement and Development Review	\$13.7 million	12
Watershed Program & Habitat Restoration	\$14.7 million	12
Facilities Operations and Maintenance	\$30.4 million	26
Capital Improvements*	\$59.7 million	50
Total Revenue Requirements	\$118.5 million	

* Includes debt service, facilities planning and engineering, construction engineering, and construction contracts.

Ninety-two percent of these revenue requirements are financed through direct monthly user fees. The remaining revenue sources include direct charges for new private development (system development charges), service charges, permit fees, and regulatory charges and penalties. More details on City revenues are provided below.

In permit year 22, the City plans to invest \$122.5 million in stormwater management services and facilities. Direct monthly user fees will pay for 95% percent of these investments.

1.6 Stormwater Management Charges

The Portland City Council approves revised stormwater monthly user fees and stormwater system development charges (SDCs) at the start of each fiscal year. Monthly user fees are adjusted to reflect operating, maintenance, and capital costs of the City’s sanitary sewer and drainage system. The rate adjustments are based upon cost of service principles, ensuring equity by charging ratepayers according to the amount of sewer and drainage service they use. Table 1.2 reports the monthly single-family stormwater management charge and the monthly stormwater rate per 1,000 square feet of impervious area for the last five permit years:

Table 1.2: Stormwater Management Charges and Rates

Charge/Rate	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Single-Family Residential Charge	\$21.79	\$22.36	\$23.90	\$24.88	\$25.72	\$26.59
Residential rate per 1,000 square feet of impervious area	\$9.08	\$9.32	\$9.96	\$10.36	\$10.72	\$11.08
Non-residential rate per 1,000 square feet of impervious area	\$9.66	\$9.97	\$10.55	\$10.97	\$11.19	\$11.55

At the close of FY 2015-16, City Council increased the monthly stormwater management charge for single-family residences from \$26.59 to \$27.44. The residential rate increased from \$11.08 to

\$11.43 per 1,000 square feet of impervious surface per month, and the commercial rate increased from \$11.55 to \$11.95 per 1,000 square feet of impervious area per month.

Stormwater System Development Charges

The methodology for assessing SDCs for new development and significant redevelopment includes two components. One component represents the charge for stormwater facilities that handle runoff from individual properties. For permit year 21, this onsite portion was assessed based on \$183.00 per 1,000 square feet of impervious area. Riparian properties that drain directly to the Columbia Slough, Columbia River, or Willamette River are exempt from this portion of the SDC. The other portion represents the cost of stormwater facilities that handle runoff from public rights-of-way. This portion was assessed based on the use of the transportation system, using road frontage and vehicle trips to allocate the costs. For permit year 21, the rates were \$5.84 per linear foot and \$3.12 per vehicle trip. At the end of permit year 21, City Council increased the rates for stormwater SDCs to \$190.00 per 1,000 square feet of impervious area, \$6.05 per linear foot of frontage, and \$3.24 per daily vehicle trip.

Discounts may be granted only for the “onsite” part of the charge for facilities constructed as part of new development. Discounts range from 80 percent for retention of the 100-year event to no discount for control of the 10-year storm.

Section 2

Public Involvement 1 (PI-1)

Implement public information, education, involvement, and stewardship activities that will raise awareness, foster community stewardship, and promote pollution prevention and stormwater management.

2.1 Key Accomplishments

2.1.1 Clean Rivers Education Programs

BES provides free water quality classroom and field science education programs for grades K through 12 and beyond within the City of Portland. These hands-on programs teach students about the causes and effects of water pollution and what individuals can do to protect rivers and streams. The Clean Rivers Education Programs include a variety of activities reaching a significant number of students. Our classroom programs provide hands-on interactive science education about stormwater and other environmental issues. Our field education programs offer watershed investigations and field assessments, stormwater tours, boat tours, and restoration experiences. The “Stormwater – Soak It Up” program includes a 75-minute classroom session for multiple grades, teachers and special interest groups. The Watershed Awareness program focuses on non-point source pollution and pollution prevention. The education activities and number of students from FY 2015-16 are summarized in Table 2.1:

Table 2.1: Educational Activities and Student Participation

Education Activity	Number of Students					
	Columbia Slough	Fanno & Tryon Creeks	Johnson Creek	Willamette River	Non-Watershed Specific	Total
Classroom Programs	1,127	514	271	3,588		5,500
Field Programs	1,517	270	214	1,222		3,223
Canoe Trips	312					312
Stormwater - Soak it Up Class	56	44		217		317
Stormwater Management Facility Tours					142	142
Led Tours at the WPCL ^a					224	224
Watershed Awareness Class	145	24		329		498
Futures Working for Clean Rivers class and field program.	27					27
Total						10,243

a. WPCL is the City's Water Pollution Control Laboratory. Tours focus on pollution prevention, onsite stormwater management and water quality based career awareness.

2.1.2 Community Stewardship Grants Program

BES's Community Watershed Stewardship Program, in place since 1995, provides up to \$10,000 per project to citizens and organizations to encourage watershed protection. Projects must be within the City of Portland, promote citizen involvement in watershed stewardship, and benefit the public.

The program awarded 13 stewardship grants and 19 mini grants in FY 2015-16, totaling \$105,800 as listed below:

Eastside Watersheds¹

- Depave Saints Peter & Paul Episcopal Church (\$10,000)
- Dharma Rain Zen Center Siskiyou Community Garden (\$7,448)
- Zomi Community Youth Garden and Watershed Project (\$6,000)
- Lents Springwater Habitat Restoration Project (\$9,875)
- Oregon Bhutanese Community Organization Community Garden (\$6,000)
- Rose CDC Lents Youth Initiative (\$9,885)
- Portland Youth Builders (PYB) Educational Ecoroof (\$5,352)

Westside Watersheds²

- Linnton Neighborhood Association Restoration (\$6,200)
- Friends of Tryon Creek Environmental Education for All (\$8,700)
- Southwest Neighborhoods (SWNI) African Youth Community Organization (AYCO) Watershed Team (\$6,000)

Columbia Watershed³

- Columbia Slough Watershed Council (CSWC) Youth Leadership in Restoration (\$8,600)
- Habitat for Humanity Cully Rain Gardens in the Home and on the Street (\$9,940)
- Iraqi Society of Oregon Mesopotamians on the Banks of the Willamette (\$6,000)

Citywide

- The Community Watershed Stewardship Program also developed a partnership with Portland State University's Indigenous Nations Program to provide two students to oversee the program and to provide outreach and technical assistance to underserved groups to develop project ideas and apply for grants.
- The Community Watershed Stewardship Program awarded 19 mini grants, totaling \$5,800, for native plants to help start or maintain projects beneficial to Portland watersheds, including stormwater management.
 - Eastside watersheds received nine mini-grants totaling \$3,850.
 - Westside watersheds received eight mini-grants totaling \$1,700.
 - Columbia watersheds received two mini-grants totaling \$250.

¹ Johnson Creek, plus tributaries and the east-side Willamette watersheds.

² Subwatersheds west of the Willamette mainstem, including Fanno and Tryon Creeks and smaller tributaries draining directly to the Willamette and the Tualatin Rivers.

³ Columbia Slough and areas of the Columbia River watershed that are within the City of Portland.

2.1.3 Stewardship Activities

The key accomplishments of the City's stewardship activities are listed below by watershed area.

Columbia Watershed

- Co-sponsored and/or participated in 38 community events with the Columbia Slough Watershed Council. Events included Slough 101, Groundwater 101, Explorando El Columbia Slough, Canoe the Slough events, the Columbia Slough Regatta, Aquifer Adventure, the Iraqi Society Paddle, Soup on the Slough event, one where stormwater was a topic of instruction. The City was a co-sponsor of the Columbia Slough Watershed Awards program which recognizes leadership in Columbia Slough stewardship activities. BES sponsored the Columbia Slough Watershed Council's "Stewardship Saturdays" at Kelley Point Park, Columbia Children's Arboretum, Smith and Bybee Lake, Wilkes Creek Headwaters, Baltimore Woods, Johnson Lake and Eastern Western Cooperation engaging **250 volunteers**. The total participation included approximately **3,500 people**.
- Conducted public involvement and information activities for the Outfall 104B Stormwater Retrofit Project via one drop in - open house event and one neighborhood association meeting. Local feedback was collected at the 30% design level and will be incorporated, where feasible.

Willamette Watershed

- Conducted public involvement and information activities for Willamette watershed projects via presentations to neighborhood associations, newsletter articles, an annual open house, and an annual street fair. Participated in over 20 community events, reaching over **1,500 citizens**, including Multnomah Days, Sunday Parkways, rain garden workshops with East Multnomah Soil & Water Conservation District, neighborhood association meetings, and The Art of Stormwater exhibitions.
- Hosted citizens at the SW Watershed Resource Center (WRC); provided technical assistance and project support to neighborhood and Friends groups in the SW Willamette River watersheds. [Also in NS-1]
- In partnership with Portland Parks and the Mt. Tabor Park Weed Warriors, **486 community volunteers** spent 1,900 volunteer hours to enhance over 7 acres of parkland. [Also in NS-1]

Johnson Creek Watershed

- Continued working with the Johnson Creek Watershed Council and streamside property owners to encourage watershed stewardship.
- Through the Johnson Creek Watershed Interjurisdictional Committee, continued to work with multiple agencies and jurisdictions throughout the Johnson Creek Watershed to conduct watershed-wide monitoring, including water quality and macroinvertebrates.

- Supported the Johnson Creek Watershed Council’s 18th Annual Johnson Creek Watershed-wide Restoration Event, where **283 volunteers** participated in watershed improvement activities.
- Supported the Johnson Creek Watershed Council’s Annual Creek Cleanup, which involved **160 volunteers** in cleaning up Johnson Creek by removing 3 tons of trash.
- Continue to support the Johnson Creek Watershed Council and the Crystal Springs Partnership in their efforts to remove invasive species and improve conditions along Crystal Springs, a tributary to Johnson Creek.
- Worked with community partners, including the Crystal Springs Partnership, Native Americans, Portland Office of Transportation and Portland Parks & Recreation, to host a Salmon Celebration and watershed health event at Westmoreland Park. Approximately **3,000 people** attended. Provided information about salmon in Portland’s streams, native plants, tree planting, green streets and restoration work at and near the park.
- Hosted a public event at the Foster Floodplain Natural Area in May 2016, with about **400 people** attending. Provided information about City efforts to improve water quality, mitigate flooding and enhance wildlife habitat at the site, as well as information about native wildlife, water quality issues in urban watersheds, tree planting and community greening efforts.
- Provided support to Friends of Zenger Farm, which provides environmentally friendly farming and wetland education programs. Zenger Farm employs stormwater management techniques in all aspects of farming and infrastructure. Features include permeable pavers, green roofs, catch basins, bio-swales and sustainable farming techniques. In addition, the farm is the site of a job training program by Wisdom of the Elders for Native American adults who are learning about environmental restoration. The farm hosts about 10,000 visitors a year, most of which are students. In FY 2015-16, 7,552 students visited the farm and about **540 Zenger Farm volunteers** logged almost 1,300 hours of service.

Westside Watersheds

- Conducted public involvement and information activities for Fanno and Tryon Creek watershed projects for FY 2015-16 via direct mail, presentations to neighborhood associations and coalition committees, newsletter articles, an advisory committee, an annual open house, and an annual street fair. Projects included SW Boones Ferry Road culvert replacement, Beaverton-Hillsdale Highway stormwater retrofits, SW Stephenson and Hamilton roadside swales, SW 45th at Fanno Creek culvert replacement project, SW 19th Stormwater Facility and Green Street, Balch Creek Trashrack Rehabilitation, Palatine Crest Slope Stabilization and Green Street, SW Frank Manor Drive Green Street, and stream day-lighting projects at Albert Kelly Park and Jackson Middle School.
- Worked with Southwest Neighborhoods Inc. (SWNI) to provide public information about watershed improvement and pollution prevention work conducted by the City and partner organizations. In FY 2015-16, SWNI hosted a watershed open house and published monthly watershed articles in its newsletter, which is distributed to over 9,000 homes and is available

on-line. Additionally, BES published two, 4-page color inserts into the newsletter – one about Capital Improvement Projects and one about community efforts to eradicate garlic mustard.

- Responded to over **33 citizen concerns** relating to stormwater issues, invasive plants, project ideas, wildlife issues, pollution or dumping concerns, and requests for stewardship and involvement.
- Sponsored the Friends of Tryon Creek State Park to support field trip scholarships for **100 students**.
- Hosted neighbors at the SW Watershed Resource Center (WRC), located in the Southwest Neighborhoods, Inc. office at Multnomah Arts Center. Provided technical assistance and project support to neighborhood and Friends groups in the Willamette River and Fanno and Tryon Creek watersheds. Activities included:
 - Hosting of visitors in the WRC room, open during regular business hours
 - 23 stewardship events
 - Over **800 volunteers** contributed roughly 1,380 hours
 - 19 presentations and outreach events, with over **590 total attendees**
 - **33 landowner inquiries**, with 15 onsite consultations
 - 39 restoration tool and equipment checkouts
- Worked with the Tualatin Basin Public Awareness Committee (TB-PAC), a partnership of agencies and non-profits working to educate and involve Tualatin Basin residents. BES contributed \$900 to support stormwater education activities, including:
 - Discovery Day sponsorship
 - Rumba al Rio sponsorship
 - Bus funding for watershed field trips
 - Will Hornyak “Living Streams” presentations
 - Stream sign inventory project
 - Printing of “Natural Yard Care” brochure
 - Jackson Bottom Wetlands Preserve Education Center exhibits

Citywide

- The grant programs listed in the previous section engaged local community members in natural area restoration, stormwater management, community gardens, pollution prevention and watershed awareness. The grant program included **993 volunteers** that contributed over 4,342 hours.
- Continued the permanent storm drain curb marker program. Participating community and school volunteers also distributed door-hangers with stormwater pollution prevention messages and clean river tips to nearby residences. There were **76 participants** in the program in FY 2015-16.

- The Green Street Steward Program continued to educate and recruit volunteer Greenstreet Stewards. In FY 2015-16, the program reached over **1,500 individuals** through tabling events and trainings. **Twenty-eight people** volunteered to become Green Street Stewards and adopt 93 Green Street facilities.
- BES's Tree Program conducted the following activities:
 - Provided staff support and resources through a contract with Friends of Trees (FOT) to foster recruitment, retention, and education of volunteers, with the purpose of maximizing tree planting, community involvement, and long-term survival of FOT-planted trees.
 - Provided support for outreach and educational programming through a partnership with Portland Parks Urban Forestry to foster a more tree-literate populace, with the purpose of maximizing urban forest education and outreach, community involvement and awareness, and long-term stewardship of the urban forest.
 - Provided information at community events to educate Portlanders about the importance of urban trees for clean rivers, healthy watersheds, and livable, sustainable communities; reached **548 people** at 7 events.

2.1.4 Public Outreach

- Mailed **RiverViews**, the BES annual newsletter, to more than 292,500 residential ratepayer properties. The focus of this year's edition was the city's aging collection system and large-scale construction projects to repair or replace miles of aging pipes with a request to readers for their cooperation at construction sites around the city. Readers learned of steps they can take at home to prevent collection system blockages and problems and about how to sign up for tours of the city's main wastewater treatment plant.
- Included inserts in City water/sewer bills mailed to more than 190,000 ratepayer properties:
 - Fall Insert (Sept, Oct, Nov 2015): "Floodplains, Watersheds, Clean Rivers" provided information on hydrology (one of the four factors of watershed health measured in the Portland Watershed Report Cards) and covered information for residents who live and work in the floodplain.
 - Winter Insert (Dec, Jan, Feb 2016): "Protecting Portland Waterways" provided information about water quality (one of the four factors of watershed health measured in the Portland Watershed Report Cards) and BES work to protect and improve water quality in Portland's rivers and streams.
 - Spring Insert (March, April, May 2016): "Restoring Habitat for Fish and Wildlife" provided information on habitat and fish and wildlife (two of the four factors of watershed health measured in the Portland Watershed Report Cards) and culvert replacement projects that have improved both factors along Crystal Springs Creek in Portland.
 - Summer Insert (June, July, Aug 2016): "What Not to Flush" provided information on what not to flush in order to protect pipes and the treatment plants; how to safely dispose of medications; and how to keep fats, oils and grease from clogging sewers.

- Updated and posted fact sheets, brochures, and educational materials on the BES website about:
 - Sustainable stormwater management (129,194 page views)
 - Treebate incentive for planting yard trees (18,514 page views)
 - Green Street Stewards Program (18,424 page views)
 - Native plant resources (4,076 page views) and invasive plant resources (52,970 page views)
 - Brownfield Program (35,676 page views)
- Maintained the City Green blog and Facebook page to highlight BES’s green infrastructure work and the work of partner organizations, including watershed councils, Friends of Trees, stewardship groups, soil and water conservation districts, and local governments. Posted 76 articles and received over 294,000 hits.

2.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for PI-1.

Measurable Goal	Status as of 6/30/2016
Provide outreach to approximately 15,500 K-12 students annually (classroom programs, education field programs).	Provided or supported outreach to approximately 17,795 students (10,243 from the Clean Rivers Education Programs and 7,552 students that visited Zenger Farm).
Award at least \$50,000 in community stewardship grants annually.	Awarded 13 stewardship grants and 19 mini grants totaling \$105,800 in FY 15/16.
Involve approximately 10,000 participants in community events, workshops, stewardship projects, and restoration events annually.	Involved over 14,500 participants citywide.
By May 2011, develop and distribute a public education bill insert to over 200,000 water and sewer customers.	Mailed newsletter to more than 292,500 ratepayers. Provided four separate inserts into quarterly water/sewer bills for more than 190,000 ratepayer properties.

All measurable goals were met for PI-1 during the permit year.

Section 3

Operations and Maintenance 1 (OM-1)

Operate and maintain components of the municipal separate storm sewer system (MS4) to remove and prevent pollutants in discharges from the MS4.

The City manages a highly varied inventory of public stormwater infrastructure that includes many miles of pipes and drainage conveyances along with green streets and other structural and non-structural stormwater management facilities. New stormwater facilities and features are constructed every year. The City maintains and updates the MS4 facility inventory and maintenance database and continues to evaluate and implement improved maintenance practices to protect water quality. The Stormwater Operations & Maintenance (O&M) section of BES includes designated staff who evaluate system components and create work orders to identify needed maintenance activities and priorities in a given area. The Portland Bureau of Transportation Maintenance and Operations workgroup also works to schedule and complete a variety of related maintenance tasks. Most routine maintenance is driven by inspections, condition assessments and specific action triggers.

3.1 Key BMP Accomplishments

- Made debris screen/trash rack inspection and maintenance visits to 350 locations citywide. These locations are inspected multiple times per year.
- Inspected all public stormwater management facilities (SMFs) at least once during the year. These included:
 - 150 structural BMPs (sedimentation manholes, StormFilters, Vortechinics, Stormceptors, etc.)
 - 248 vegetated and non-structural BMPs (swales, wetlands, ponds, sand filters, etc.)
 - 1,989 Green Streets
- Cleaned:
 - 103 structural and non-structural BMPs
 - 11,372 catch basins and inlets
 - 32,054 lineal feet of ditch and 15,363 lineal feet of culvert
 - 1,806 UIC⁴ sedimentation and sump manholes
- Repaired 4 vegetated and non-structural BMPs.

⁴ The City's Underground Injection Control, or UIC, facilities are not technically part of the MS4 system and are regulated under a different City permit (WPCF Permit # 102830).

- Repaired or constructed 299 inlets and inlet leads and 265 lineal feet of culvert.
- Continued to incorporate newly constructed stormwater system components into the City’s inspection and maintenance database (Hansen), as well as maintenance information about existing components.

3.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for OM-1.

Measurable Goal	Status as of 6/30/2016
Develop a training handbook for PBOT-MO staff during the permit term.	The PBOT Maintenance Environmental Handbook was completed in 2011. It includes guidance for maintenance procedures, preferred seasonality of work and materials management.
Provide the following maintenance actions over the 5-year permit cycle: <ul style="list-style-type: none"> • Clean 31,000 lineal feet of culverts. • Repair 10,000 lineal feet of culverts. • Clean 250,000 lineal feet of ditches. • Clean 38,000 inlets and catch basins. • Repair 1,500 inlets and inlet leads. • Clean 135 major stormwater management facilities/pollution reduction facilities. • Repair 40 pollution reduction facilities. 	Maintenance actions completed in FY 2015-16*: <ul style="list-style-type: none"> • Cleaned 15,363 lineal feet of culverts. [138,019 LF] • Repaired 265 lineal feet of culverts. [10,509 LF] • Cleaned 32,054 lineal feet of ditches. [301,849 LF] • Cleaned 11,372 inlets and catch basins. [76,825 inlets and catch basins] • Repaired 299 inlets and inlet leads. [1,416 inlets and inlet leads] • Cleaned 103 major stormwater management facilities/pollution reduction facilities. [705 facilities] • Repaired 4 pollution reduction facilities. [61 facilities]

*Bracketed numbers show cumulative total to date during this permit term.

The City met the measurable goals for OM-1 during the permit year and throughout the permit term. The number of repaired inlets and inlet-leads (1,416) fell just short of the stated permit-cycle goal of 1,500. This is due to the probability that 1,500 inlets were not identified as being in need of repair. The total amount of catch basin/inlet-lead pipe repaired over the past five years was approximately 14,700 linear feet. Furthermore, the City exceeded measurable goals for cleaning MS4 components by wide margins, which highlights the City’s increased focus on preventative maintenance and asset management, helping to identify potential problems before they occur.

Section 4

Operations and Maintenance 2 (OM-2)

Operate and maintain components of public rights-of-way, including streets, to remove and prevent pollutants in discharges from the municipal separate storm sewer system.

The City implements a number of practices in and around rights-of-way to prevent and limit pollutant discharges to the MS4 from roadways including street sweeping, spill control, erosion control, material testing and other BMPs related to the operation and maintenance of city rights-of-way.

4.1 Key BMP Accomplishments

- Continued to implement BMPs within the rights-of-way to protect water quality, including:
 - Following ODOT's Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices.
 - Using the trenchless liner repair system.
 - Using bio-pillows for sediment control on impervious surfaces to trap sediment during all sediment-disturbing activities.
 - Using low-disturbance sign installation methods to avoid or minimize digging.
 - Using mild cleaners, with no solvents, to clean signs.
 - Monitoring weather conditions during asphalt grinding.
 - Hand-applying asphalt where necessary to prevent these materials from entering the storm drain system.
 - Using rubberized mats on inlets to prevent fog seal material from entering the system.
 - Using water-based asphalt emulsions and biodegradable asphalt release agents.
- Continued to pilot test alternative methods, products, and practices to reduce pollutant discharges to the MS4. PBOT is now installing a UV-protection and anti-graffiti coating on new street signs which will reduce chemical use during cleaning of the signs in the field.
- All licensed pesticide applicators at PBOT Maintenance Operations must receive 40 hours of training over their five-year licensing period. PBOT-MO has a total of seven certified applicators that have met all of their training requirements.
- The City swept major arterials four to six times during the year and continued to sweep residential streets approximately once every 10 months.

- The Bureau of Transportation continues to implement a leaf removal program in 30 leaf service areas (areas that have streets lined with large, mature trees). Under the program, PBOT schedules and implements one or two leaf collection days per zone.

4.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for OM-2.

Measurable Goal	Status as of 6/30/2016
Sweep arterials six times/year.	Swept arterials four to six times/year.
Develop a training handbook for PBOT-MO staff during the permit term.	The PBOT Maintenance Environmental Handbook was completed in 2011. It includes guidance for maintenance procedures, preferred seasonality of work, and materials management.

The City strives to sweep larger arterial streets six times per year, but there are some circumstances that occasionally prevent crews from meeting that frequency, such as inclement weather, roadway conditions and urgent street-cleaning issues that divert resources to higher priority areas. The City also sweeps residential streets approximately every 10 months and targets some higher trafficked areas, such as the downtown core, with a much higher frequency (even nightly in some areas). The City also targets roadway areas with debris and trash build-up more frequently in the interest of water quality and bike safety. Given the City's level of effort on arterial and other roadways and the prioritization of areas that pose a greater threat to safety and water quality, the measurable goals for this BMP category have been met.

Section 5

Operations and Maintenance 3 (OM-3)

Operate and maintain other City facilities and infrastructure (not included in OM-1 or OM-2) to remove and prevent pollutants in discharges from the municipal separate storm sewer system.

5.1 Key BMP Accomplishments

- The Water Bureau continued to submit requests to the Bureau of Environmental Services (BES) for discharges of potable water from flow tests of hydrants and tank and reservoir drains. Discharges are approved on a case-by-case basis with a letter of authorization. The authorization requires DEQ/BES BMPs to reduce the impacts of flow rate, volume, and suspended solids from these activities, in addition to the state guidelines for chlorinated discharges. A report is required for each discharge in order to track volume and respond to any complaints.
- The City engages in green purchasing best practices in order to spend public funds on goods and services that minimize negative impacts on human health and the environment. In FY 2015-16, Procurement Services continued to support City bureaus in including environmentally preferable product and service specifications in City solicitations and resulting contracts. Examples of solicitations where stormwater pollution prevention was specifically addressed include construction services and architectural/engineering design services. Specifications referenced best practices such as, but not limited to, zero-sediment runoff at construction sites, design of on-site stormwater management features (ecoroofs, rain gardens, etc.) and use of untreated wood for boardwalks and similar exterior wood features.
- Continued to control discharges from non-emergency fire-fighting training by routing the discharges to the sanitary sewer system.
- The City is in the process of developing a master plan for the maintenance facilities. A contractor was recently selected to support the City in completing this work. Planning is anticipated to be a multi-year process with implementation to follow. Stormwater controls will be included as part of the master plan.
- PBOT's is participating in the Salmon Safe certification process. This program will look at stormwater best management practices on the maintenance yards and make recommendations for improvement.

- Pollution Prevention (P2) teams and BES met as needed to evaluate and track maintenance procedures, pilot test new products and techniques, evaluate work processes, and monitor developments in related fields. Topics relevant to stormwater quality protection included:
 - Water quality protection needs associated with vehicle and equipment washing.
 - Evaluation of spill kit usage and appropriate absorbents.
 - Management of vehicle and equipment leaks in maintenance yards and parking lots.
 - Spill reporting requirements.
 - Ecoroofs
- Monitored and cleaned an oil water separator at the vehicle wash facilities at Albina Yard.
- Inspected, and cleaned as necessary, all stormwater and water quality facilities in maintenance yards and lots. Continued to implement stormwater controls, which encompasses installation, inspection, and maintenance of filtration and absorbent media at selected stormwater inlets. Specific activities include:
 - Maintain the stormwater collection system in City equipment parking areas and other selected inlets vulnerable to leaks and spills.
 - Store most collection bins for recycled materials indoors under cover.
 - Clean out subsurface vaults below the sweeper debris pile approximately two times per year.
 - Clean out debris from sweeper wash facility vaults as needed.
 - Clean debris vaults at the truck bed washout facility as needed.
- Continued to comply with practices required for Salmon Safe certification, including Integrated Pest Management, reducing water and fertilizer inputs on park properties, restoring riparian and upland habitats, and using alternatives to pesticides. Portland Parks & Recreation was originally certified Salmon Safe in 2004 and recertified in 2012.
- Continued program with vendors to provide pesticides at individual golf course sites on an as-needed basis to reduce pesticide storage.
- Continued the use of a specially formulated slow-release fertilizer on park turf, which possesses an ideal formulation of components that reduces leaching and waste elements in runoff. Water quality testing results confirm the efficacy of this formulation.
- Continued the standard use of special equipment for precise application amounts, timing, and distribution of fertilizer on all five City golf course fairways and greens.
- Maintained pesticide-free parks management at three parks (Arbor Lodge Park, Lair Hill Park and Sewallcrest Park).
- Held five work parties for volunteers at the Arbor Lodge pesticides-free park.
- Continued a public/private partnership to fund new practices at key park sites to renovate athletic fields. These practices include aeration and over-seeding to reduce fertilizer use and increase water infiltration.

- Continued to perform aeration, topdress, and over-seed activities on 28 highly used sports fields at 20 different sites to achieve structural soil changes that improve plant health and optimize use of water and fertilizers.
- Continued to implement activities to reduce water usage on park sites. Utilized Turf Techs for ongoing irrigation system improvements/irrigation tune-ups. Activities included the following:
 - Modernized irrigation components.
 - Conducted staff training in irrigation system maintenance & efficiency awareness.
 - Piloted new technologies.
 - Prioritized areas receiving irrigation (based on frequency and volume).
 - Reviewed new park designs to minimize open turf areas.
 - Continued to update existing facilities to the Central Irrigation Control (CIC) platform.
 - Included new park facilities (i.e., incorporated CIC components)
- Over the past several years, PP&R has been installing the necessary components to monitor irrigation flow through interactive water features.
- PP&R consolidates activities and materials from distributed maintenance operations to reduce the potential for impact throughout the MS4 system. The Mount Tabor Yard functions as the central location for equipment and vehicle washing. Recyclable and recoverable waste products are moved to the site, stored appropriately and hauled off-site by specialized vendors and contract services.
 - Used transportation maintenance wastes (oil, antifreeze, solvents, tires, dry cell batteries), paper and cardboard, scrap wood and metal, excess paint and fluorescent lamps are managed at the site.
 - The wash rack for mowers and trucks includes a trench sump that captures grass, leaves, sediments and pet waste prior to connection with the combined sanitary system. The trench is cleaned by a contractor as needed.

5.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for OM-3.

Measurable Goal	Status as of 6/30/2016
Inspect, and maintain as necessary, all stormwater and stormwater containment and pollution prevention facilities in City maintenance yards annually.	Completed.

All measurable goals were met for OM-3 during the permit year.

Section 6

Industrial Stormwater Management 1 (IND-1)

Implement the Industrial Stormwater Management Program to control the discharge of pollutants from industrial and commercial facilities (both existing and those undergoing changes in operations) to the municipal separate storm sewer system.

The Industrial Stormwater Program (ISW) administers General NPDES Industrial Stormwater Discharge Permits in Portland through an intergovernmental agreement with DEQ. Program staff conduct annual compliance inspections of permitted sites, provide technical assistance on BMP implementation and issue enforcement referrals for instances of noncompliance.

The ISW Program also performs inspections of non-permitted sites to assess the need for permit coverage and evaluates sites with No Exposure Certifications to verify that their permit exemption is valid.

6.1 Key BMP Accomplishments

Table 6.1 highlights the key accomplishments completed by the ISW Program for FY 2015-16:

Table 6.1: Industrial & Commercial Activities

Permits	Administered ^a	Issued	Terminated
<i>By drainage</i>			
MS4	133	5	4
Non-MS4 ^b	84	2	1
<i>By permit type</i>			
1200-Z	93	5	4
1200-COLS	120	2	1
1200-A	4	0	0
<i>TOTAL</i>	<i>217</i>	<i>7</i>	<i>5</i>
Inspections	Permitted	Non-Permitted	Total
	219	72	291

a. Administered permits also include those that were terminated midway through the fiscal year.
 b. Most are permits for direct discharges through private outfalls although some facilities discharge to the Port of Portland, ODOT's system, or Multnomah County Drainage District managed waters.

- Collected and analyzed one sample from a permitted facility for investigative purposes.
- Continued to locate and map non-City outfalls (industrial and business) located in the riparian area that discharge directly to receiving streams and to identify the sources that drain to these outfalls.

- Continued to re-inspect industries that were previously identified as having no exposure and were not required to apply for a permit. Of the 56 industries that had a No Exposure Certification (NEC) expiring in FY 2015-16; 16 were either no longer in operation or did not have an applicable SIC code. One site received permit coverage due to increased exposure and 3 sites were pending renewal at the end of the permit year. The City approved the renewal of NECs to 36 facilities and processed new NECs for another 10 facilities.
- Continued to survey newly identified industrial facilities to determine the need for NPDES permits. Issued permits and no exposure certifications where applicable.

6.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for IND-1.

Measurable Goal	Status as of 6/30/2016
Inspect all permitted (1200Z, 1200COLS) facilities once per year.	Completed.
Review each permitted facility's monitoring and annual report each year.	Completed.
Survey 100 percent of newly identified facilities to determine the need for NPDES permits.	Completed.
Every 5 years, inspect industries (individual sites) previously identified as having no exposure and not required to obtain a permit.	Completed.
Complete revision of City Code Title 17.39 by 2012.	Completed. City Council adopted code revisions in September 2011.

All measurable goals were met for IND-1 during the permit year.

Section 7

Industrial Stormwater Management (IND-2)

Provide educational programs and materials and technical assistance to reduce industrial and commercial pollutant discharges to the municipal separate storm sewer system.

7.1 Key BMP Accomplishments

7.1.1 Industrial Stormwater Online Outreach

Over 20 BMP fact sheets are posted on BES's Industrial Stormwater Program website, which provides technical assistance information to the public, specifically targeting commercial and industrial site operators. During FY 2015-16, the most-viewed BMP materials related to sand-blasting and painting operations (approximately 700 views), catch basin maintenance (approximately 688 views), and preparing emergency response and spill cleanup plans (approximately 234 views). Other BMP materials include information on dewatering activities, loading and unloading materials, and outside container storage and waste disposal.

7.1.2 P2O Team & EcoBiz Outreach

The City works with and provides oversight of the Regional Pollution Prevention Outreach Team (P2O Team) and the Eco-Logical Business Program (EcoBiz) to reduce pollutant discharges to the MS4 from commercial business operations. The City participates on the EcoBiz Automotive and Landscape Eco-Logical Advisory Subcommittees, which certifies businesses in the Portland metropolitan region to ensure sustainable and environmental practices. This involves performing site visits and technical assistance during consultations where business managers and operators receive guidance on ways to:

- ✓ Reduce and eliminate pollutants like VOCs and chlorinated solvents
- ✓ Prevent spills by adding secondary containment for tanks over 55 gallons
- ✓ Provide employee spill response trainings
- ✓ Properly manage and dispose of hazardous materials
- ✓ Conserve water in the office, shop, and on managed landscaped areas
- ✓ Wash vehicles and equipment using environmentally responsible systems
- ✓ Adopt sustainable purchasing and inventory policies
- ✓ Reduce greenhouse gas emissions by purchasing re-refined oil and upgrading to energy efficient lighting and equipment
- ✓ Adopt the principles of Integrated Pest Management (*landscapers*)
- ✓ Reduce or eliminate the use of pesticides (*landscapers*)

The EcoBiz program is voluntary and, thus, the number of participating businesses varies from year to year. Barriers to obtaining certification or re-certification can include: business closure or ownership changes, lack of willingness to participate, cost-prohibitive improvements needed to qualify and site conditions that preclude certification. In assisting facility owners in overcoming some of these barriers, EcoBiz representatives provide technical assistance during site consultation

and provide spill kits and containment pallets as funding allows. Activities performed during FY 2015-16 included:

Table 7.1: EcoBiz Activities

Activities	Site Visits	Re-Certifications	New Certifications	Current Total
Landscapers	6	1	2	9
Automotive ^a	32	9	3	33
Total	38	10	5	42

a. Includes repair service and car washing facilities.

- Distributed 30 spill kits with spill response plans during public outreach site consultations.
- Purchased two, full-page ads promoting EcoBiz facilities in the Chinook Book. The Chinook Book promotes and provides discounts to environmentally-conscious businesses.
- Conducted outreach and hosted a booth at the 2015 Oregon Landscape Contractors Association (OLCA) NW Landscape Expo.
- Attended three OLCA chapter meetings.
- Partnered with Portland State University's Community Environmental Services (CES) on a 2016 EPA Pollution Prevention Grant Application. The project was not selected for funding but the City will continue to pursue additional funding opportunities.
- Conducted presentations on EcoBiz to local and statewide staff with the Department of Environmental Quality.

Sustainability at Work

Sustainability at Work continued to assist Portland businesses with resources and information to help them green their operations. The program is administered by the City's Bureau of Planning and Sustainability in partnership with the Portland Water Bureau, Metro and the Energy Trust of Oregon. The program conducted the following activities in FY 2015-16:

- Conducted site visits at 284 businesses, providing assistance across a broad range of topics, including water conservation, stormwater management, hazardous waste, energy efficiency, renewable power, alternative transportation, and waste prevention. Assisted an additional 505 businesses on these topics by phone and email.
- Distributed an e-newsletter twice monthly to 4,000 Sustainability at Work customers, providing tips, case studies, and best practices in the above-mentioned topic areas.
- Administered Sustainability at Work Certification, recognizing businesses that have taken measurable steps to conserve resources and reduce their greenhouse gas emissions. In FY 2015-16, the program completed 97 certifications and renewals (for businesses at the end of their three-year certification period). As of June 30 2016, 213 businesses were certified and there were over 20,000 employees in a certified workplace.

- Reached entrepreneurs of color and built relationships with partner organizations to foster equity in SAW’s outreach efforts by attending 35 events with a combined audience of over 3,000 and by attending over a dozen individual meetings with six community organizations.

Columbia South Shore Well Field Wellhead Protection

Completed the 13th year of providing education and outreach to affected residents and one-on-one technical assistance to businesses to help them comply with requirements of the Columbia South Shore Well Field Wellhead Protection Program. Program requirements include structural and operational BMPs to reduce the occurrence of spills and minimize spill impacts. Technical assistance and outreach by the Portland Water Bureau, Columbia Corridor Association (CCA), and Columbia Slough Watershed Council during FY 2015-16 included:

- Made over 2,500 individual outreach contacts
- Provided technical assistance to over 30 businesses
- Published newsletter articles on the protection program
- Distributed free spill kits, required signs, and secondary containment pallets
- Maintained the CCA and City of Portland webpages on the Groundwater Protection Program with information for businesses and residents

7.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for IND-2.

Measurable Goal	Status as of 6/30/2016
Under the Eco-Logical Business Program, certify 10 additional auto shops and 20 additional landscape firms that provide services within the City of Portland by 2015.	42 facilities within the City are currently certified under the EcoBiz Program including 33 automotive and 9 landscape businesses. This represents an increase from 2011 totals which included 28 EcoBiz certified businesses including 22 automotive and 6 landscape businesses.
Evaluate one new business sector for implementation of the Eco-Logical Business Program.	Expanded the program into the car washing sector in FY 10/11 (as reported in Annual Compliance Report No. 16).

The City generally met the measurable goals for IND-2 during the permit term. Although the current number of certified landscape firms appears to have fallen short of the stated goal of 20 additional certifications, the goal had likely been met during the permit-cycle but the number has since declined. As indicated in Section 4.1.2, the number of certified businesses fluctuates from year to year depending on business turnover, financial factors in the private sector and the barriers noted previously. The goal for automotive facilities was met and the total number of certifications increased by 50 percent.

Section 8

Illicit Discharges (ILL-1)

Identify, investigate, control, and/or eliminate illicit discharges (illicit connections, illegal dumping, and spills) to the municipal separate storm sewer system. Evaluate and, if appropriate, control non-stormwater discharges to the municipal separate storm sewer system.

The City implements a number of programs to address illicit discharges and spills to the MS4. BES's Illicit Discharge Detection and Elimination (IDDE) Program performs inspections of MS4 outfalls and priority locations in order to identify and eliminate illicit discharges or cross-connections to the system. The City's Spill Response Program operates a 24-hour spill response hotline and investigates associated pollution complaints that have the potential to impact the MS4. The Industrial Stormwater Program (discussed in the IND-1 section of this report) ensures that BMPs relating to spill prevention and reporting are properly implemented at industrial facilities covered by a general NPDES industrial stormwater discharge permit.

8.1 Key BMP Accomplishments

- The IDDE Program conducted 140 dry-weather inspections of 109 City-owned major and priority outfalls. Flow was observed at 47 outfalls. Based on samples and follow-up investigations, one (1) illicit discharge was identified. The illicit discharge was corrected when the City repaired a damaged sanitary line that dye-tested positive for impact to the storm sewer.
- Hosted two Regional Spill Response Committee coordination meetings in FY 2015-16. The committee includes representatives from the Oregon Department of Environmental Quality (DEQ), Water Environment Services (WES), Port of Portland, City of Gresham, City of Portland Water Bureau and Fire Bureau, and BES.
- Continued to operate the BES Spill Response Hotline. Activities in FY 2015-16 included:
 - Received and responded to approximately 2,000 calls (citywide) regarding pollution complaints, spills, sanitary sewer overflows, and dye tests.
 - Received approximately 1,500 additional day-time information-only calls (citywide) and responded by providing agency referrals, industrial information, technical assistance, and regulatory information.
- Continued to respond to pollution complaints and issue enforcement actions for violations of Portland City Code 17.39 for prohibited discharges. During FY 2015-16, 28 enforcement actions were issued, with proposed penalties and costs totaling \$20,516. Details by type of enforcement are presented in Table 8-1, below.

Table 8.1: IDDE Enforcement Actions

Enforcement Type	Number of Actions	Number of Responsible Parties	Penalties and Costs, \$
Notice of Violation	22	18	14,450
Notice of Assessment of Costs	4	4	6,066
Compliance Order	2	2	0
Totals	28	18	20,516

- Conducted training for duty officer staff on the BES spill response hotline, sanitary sewer overflows (SSO) reporting, and Duty Officer procedures, including specific responses to potential discharges or spills to the MS4.
- The Industrial Stormwater Program administered 217 general NPDES industrial stormwater discharge permits with requirements to maintain spill prevention and response procedures. The program evaluates permit compliance of industrial facilities to ensure that best management practices relating to spill prevention and reporting are properly implemented.
- To help prevent illegal dumping, continued to implement curbside collection services (residential garbage, recycling, yard debris and food scrap collection). Continued the City’s partnership with Neighborhood Coalition Offices and Metro to administer community collection events; on average, about 50 events take place throughout the city.

8.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for ILL-1.

Measurable Goal	Status as of 6/30/2016
Conduct dry weather sampling at all major City-owned outfalls at least once annually.	Completed.
Inspect the priority outfalls a minimum of three times a year.	Completed.
Expand the IDDE (formerly IDEP) program to include the CSO system below diversion structures, where the outfalls discharge stormwater only and should have no dry-weather flows. Currently, the program addresses all of the westside outfalls and 25 percent of the eastside outfalls. Expand the program to all eastside outfalls by December 2013.	Completed.
Maintain the spill response hotline 24 hours a day.	Completed.

All measurable goals were met for ILL-1 during the permit year.

Section 9

New Development Standards (ND-1)

Control erosion, sediment, and pollutant discharges from active construction sites.

9.1 Key BMP Accomplishments

9.1.1 Private Sites

- All private development sites with qualifying ground disturbance areas were inspected for temporary and permanent erosion control measures at the beginning and near or at completion of the project. At interim checks conducted during the course of regular building inspections, the inspector notes any identified erosion control deficiencies, and the site operator is required to implement corrective action.
- There were 4,358 active private construction permits subject to erosion control requirements citywide.⁵ The Bureau of Development Services (BDS) conducted 6,053 erosion control-related inspections of private construction sites.
- As a result of erosion control inspections, the City issued:
 - 3 Stop Work Orders
 - 50 Correction Notices⁶
 - 1 Notice of Violation
- Tracked erosion control complaints (received through the complaint hotline or staff referrals) through the City's building permit tracking program, TRACS. A total of 18 cases were received and responded to.
- Provided erosion control training for conducting residential inspections to BDS staff on February 16, 2016.
- Continued the pre-permit-issuance site meeting program, where the applicant's team can choose to meet with staff onsite to discuss erosion control and other sensitive site issues. No applicants requested a pre-permit-issuance site visit this fiscal year.

⁵ Even though a permit is active, there may be times when no activities are occurring that require erosion control inspection.

⁶ Does not include correction notices issued for residential properties.

9.1.2 Public Sites

- There were 170⁷ active public construction projects (citywide) with erosion control components. In general, public sites are inspected daily during construction.
- Provided annual construction inspector training to BES inspection staff on December 1, 2015.

9.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 15/16 measurable goals for ND-1.

Measurable Goal	Status as of 6/30/2016
Evaluate the Erosion and Sediment Control Manual and update as needed (at least once during the 2011-2016 permit cycle); conduct public involvement on updates.	Evaluated and determined that no update is necessary.
Inspect public sites with erosion control permits daily during construction.	Completed.
Inspect 100 percent of active private development construction sites subject to erosion control requirements. At a minimum, inspections will occur (1) after initial temporary erosion control measures are installed, and (2) near completion of development after permanent erosion control measures are in place. Conduct interim checks as part of routine building permit inspections.	100 percent of requested erosion control inspections for active private development construction sites were performed and documented. Sites were inspected for temporary and permanent erosion control measures at the beginning and near completion of the project(s). Interim checks were conducted during the course of regular building inspections.

The City met the measurable goals for ND-1 during the permit year. A gap was identified in the pre-construction inspection request process specific to some demolition permits, resulting in missed initial inspections of those sites, but final inspections were completed. While the discrepancy is very limited in scope and does not affect fulfillment of the measurable goals, the City is working to address the oversight.

⁷ This number appears as a significant decrease from previous years due to a revised counting methodology for Water Bureau projects. In previous years, lateral connections to a main line construction project were counted as individual construction projects.

Section 10

New Development Standards (ND-2)

Implement and refine stormwater management requirements for new development and redevelopment projects to minimize pollutant discharges and erosive stormwater flows.

10.1 Key BMP Accomplishments

10.1.1 Stormwater Management Manual (SWMM) Implementation

The City continued to review new and re-development projects for applicability with SWMM requirements. The following activities were conducted in FY 2015-16:

Table 10.1: SWMM Implementation Activities

Land Use Review & Early Assistance^a	
Land Use Reviews Conducted	582
Early Assistance Request Responses & Pre-app Conferences	462
Project & Permit Review	
Public Works Project Permit Approvals	28
Private Building Permit Reviews	8,571
Private Permits/SMFs Constructed ^b	1,150
Impervious Area Treated by Constructed SMFs (acres)	350.7
Operations & Maintenance	
O&M Agreements Recorded	287
Private SMFs associated with O&M Agreements	657
Properties (taxlots) associated with O&M Agreements	298
Impervious Area Managed under O&M Agreements (acres)	174.5
a. Numbers do not reflect Pollution Prevention Source Control activities, which are described later in this report section.	
b. The number of Stormwater Management Facilities, or SMFs, is slightly higher than the value provided because some permit projects have more than one SMF.	

- Continued work to revise and update the 2014 SWMM. After a public comment period, the revised SWMM was adopted and became effective in August 2016 with implementation set to occur in November 2016.
- Provided training and technical assistance on the proposed 2016 SWMM updates to City staff and the development community. Continued to contribute to regional materials and presentations on stormwater maintenance.

10.1.2 Pollution Prevention & Source Control Reviews

- BES Pollution Prevention Plan Review continued to conduct land use review and early assistance activities associated with commercial and industrial properties subject to City pollution source control requirements in Chapter 4 of the SWMM. The team conducted 123 land use reviews; 112 early assistance appointments; 93 pre-application conferences; and 12 exempt land use reviews and meetings for contaminated sites for a total of 340 case reviews.
- BES Pollution Prevention Plan Review required and approved 1,443 source control measures at commercial and industrial properties.⁸
- Worked towards adoption of a City Source Control Manual to separate these requirements from the SWMM (currently Chapter 4). The Source Control Manual is scheduled to become effective in early FY 2016-17.

10.1.3 Stormwater Management Facility Installation Inspections

- Inspected 1,150 private stormwater management permit projects and associated facilities to ensure construction was consistent with development permit requirements.⁹ These facilities account for treatment of 350.7 acres of impervious area.

10.1.4 Operations and Maintenance Inspections

The Maintenance Inspection Program (MIP) ensures that property owners follow site-specific, BES-approved operation and maintenance (O&M) agreements. Program staff conduct inspections, provide technical assistance to property owners on the O&M of their on-site SMFs and provide guidance on pollution prevention BMPs for site activities that may impact the functionality of the SMFs. The program also collects information on SMF deficiencies and corrective actions taken to address deficiencies. MIP activities in FY 2015-16 included:

- Inspected 1,194 properties (tax lots) with 2,292 associated private stormwater management facilities.
- Mapped MIP data, including MIP properties, facilities, inspections, and O&M plans.
- Issued 36 Warning Notices, 5 Notices of Violation, and 1 Voluntary Compliance Agreement

10.1.5 Monitoring and Evaluation

Conducted the following monitoring and evaluation activities:

- Continued monitoring of green streets and ecoroofs. The evaluated facilities are located throughout the City and represent a variety of facility types, configurations, ages, and land

⁸ The City reviews and requires source control measures for some projects that never materialize due to development issues, project financing, etc. This metric reflects projects that eventually received final building and occupancy permits and, therefore, were actually constructed. The number includes properties that re-enter the permitting process from previous years, such as re-development or tenant improvement projects.

⁹ The number provided represents the number of permitting projects that were 'finalized', i.e., constructed. The number of individual stormwater management facilities (SMFs) is roughly equivalent, but may be slightly under-reported due to projects that include more than one facility.

uses. The monitoring data covering through the end of 2016 will be published in FY 2016-17 in a series of tech memos.

- Continued implementing and evaluating the practice of using less imported soil media in green street facilities to improve and promote better plant health and drought tolerance.
- Expanded monitoring of modified drain systems in stormwater planters (including orifices) for improved performance.
- Continued to implement and evaluate soil blends with slightly more fines to improve water retention and plant health in vegetated stormwater management facilities and improve performance in lined facilities.
- Conducted soil bench-testing study in partnership with Portland State University with various soil additives to test for water quality.
- Continued facility soil sampling for heavy metals, PCBs, and other contaminants concentration/accumulation.

10.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for ND-2.

Measurable Goal	Status as of 6/30/2016
Inspect 1,500 private stormwater facilities or 450 properties annually. Use education and enforcement tools to ensure that stormwater management operations and maintenance plans are followed.	Under the Maintenance Inspection Program (MIP), inspected 2,292 private stormwater facilities associated with 1,194 properties. Provided technical assistance and education to ensure facilities are sufficiently operated and maintained. Issued 36 Warning Notices, 6 Notices of Violation, and 1 Voluntary Compliance Agreement.
Revise the SWMM during the 2011-2016 permit term.	Completed updates to the SWMM including the soliciting of internal and external comments. Adoption of the updated manual scheduled for early FY 17.
Track number, type, size, drainage area ¹⁰ and location of private facilities constructed annually.	Completed.

All measurable goals were met for ND-2 during the permit year.

¹⁰ Drainage area is tracked for all private stormwater management facilities subject to the SWMM (under an O&M plan).

Section 11

Structural Controls (STR-1)

Structurally modify components of the storm drainage system to reduce pollutant discharges. Implement structural improvements on existing development to reduce pollutants in discharges from the municipal separate storm sewer system.

11.1 Key BMP Accomplishments

The City continued to implement retrofits to the existing storm drainage system (e.g. roadside ditches to swales or porous shoulder). These retrofits are reported by watershed in the following sections. Please note that some public involvement activities associated with the retrofits described in STR-1 are documented in PI-1.

Columbia Slough Watershed

- Completed construction and installation of a filter vault treating stormwater runoff from approximately 2 acres of City right-of-way within outfall basin 77a. This basin receives runoff from NE Columbia Blvd., a high-traffic industrial roadway, and discharges runoff to a small natural cove in the Whitaker Slough between NE 59th Place and NE 63rd Ave. This cove was the subject of a DEQ sediment cleanup during the winter of 2013.
- Completed the 60% design phase for treating stormwater runoff in outfall basin 104B. The basin is comprised of almost 200 acres (30 of which are City right-of-way) and discharges runoff to the Whitaker Slough.
- Constructed four vegetated facilities to treat stormwater runoff from NE 112th Avenue, between NE Marx Street and the Columbia Slough that discharges via outfall 92.

Johnson Creek Watershed

- Continued to monitor existing floodplain restoration projects to ensure effectiveness at Luther Road, Brookside, Kelley Creek, Tideman Johnson, Errol Creek, Foster Floodplain, and Schweitzer.
- Continued working with representatives from the City of Portland, Metro, State of Oregon, Lents industrial landowners, and Lents residents to develop concepts to integrate floodplain management and economic development in the Foster corridor 100-year floodplain.

Willamette Watershed

- Completed design and initiated construction of the Centennial Oaks Stormwater Project in Willamette Park. The project will treat stormwater from 1.4 acres of impervious area runoff from a parking lot and street. Project completion anticipated in FY 2018-19.

- Continued planning for a green street on SW Palatine Hill Road/Corbett Lane. The objective of the project is to manage stormwater runoff that currently flows untreated to the headwaters of a stream channel in Riverview Natural Area.
- Completed pre-design and began design for SW Palatine Hill Rd/Lewis & Clark green street. The project consists of a green street and re-vegetation of a roadside ditch. The green street will detain and treat stormwater from approximately 3,590 square feet (sf) of impervious roadway that ultimately discharges to the headwaters of a stream in the Riverview Natural Area.
- Completed pre-design and began design to restore failing culverts along Leif Erikson Drive in Forest Park. The project will replace non-functioning culverts that are a source of sediment to drainage basins that discharge to the Willamette River.

Westside Watersheds

- Completed construction of roadside drainage (ditch) and shoulder improvements on SW Stephenson between SW 35th and SW Boones Ferry Road and on SW Hamilton between SW Shattuck and SW 40th. About 4,700 feet of ditches were improved.
- Designed Phase 1 of a stormwater management improvement for the intersection of SW Shattuck and Beaverton-Hillsdale Hwy to improve water quality and stream health in Fanno Creek.
- Began design, with the Portland Bureau of Transportation, of the SW 19th Stormwater Facility and green street to reduce pollutants from a gravel road.
- Began design of two stream day-lighting projects at Albert Kelly Park and Jackson Middle School to slow stormwater and reduce erosion in open channels below the project sites on Falling Creek and Restoration Creek.

11.1.1 Stormwater System Plan

Continued work on the Stormwater System Plan, a multi-year project to fully define and plan for the City's stormwater system needs.

- Continued development of a citywide risk assessment which will inform the MS4 retrofit strategy.
- Continued development of a citywide risk assessment for stormwater quality.
- Continued development of a citywide risk assessment for approvable stormwater discharge points. Initiated development of citywide rapid assessments for a number of other risk categories. This initial pass will be iteratively improved over time.
- Continued pre-design of several water quality and flow control projects in the Stephens Creek watershed, in partnership with the Willamette Watershed team.
- Continued preliminary design and community outreach to explore retrofit options for the underserved Errol Heights neighborhood in southeast Portland, in partnership with the Johnson Creek Watershed team.
- Continued preliminary design and community outreach to explore retrofit options for Capitol Highway in southwest Portland, in partnership with the Fanno Tryon Watershed Team.

11.1.2 Green Streets

Completed construction of the following green street projects:

- Two green street curb extensions to manage 32,800 sf of runoff from NE 102nd Avenue, between NE Skidmore and NE Shaver that would otherwise drain to the Columbia Slough. [E10571]
- Seven green street facilities built by private development to meet the requirements of the City's SWMM. The seven facilities manage 9,645 sf of public right-of-way runoff that would otherwise drain directly to Fanno Creek, Tryon Creek, or the Willamette River:
 - SW Plum (east of Taylors Ferry): 1–1200 sf, Tryon Creek [EP9270]
 - SW 25th Ave (north of Huber): 1–1345 sf, Tryon Creek [EP9388]
 - SW Hume Ct (west of 12th): 1–2200 sf, Willamette River [EP115]
 - SW 50th Ave (south of Marigold): 2–2230 sf, Fanno Creek [EP095]
 - SW 50th Ave (further south of Marigold): 2–2670 sf, Fanno Creek [EP096]

11.1.3 Technical Assistance, Incentives, and Grants Programs

- Continued to provide technical assistance for projects that incorporate green building principles, including stormwater pollution prevention and management. In total, four building construction and EcoDistrict development projects were served by the Bureau of Planning and Sustainability's Green Building and Development program in FY 15/16. Additional green building events and activities related to stormwater management included 31 presentations and tours to a variety of sustainability- and building-related organizations, reaching a total of approximately 1,212 people.
- Continued to coordinate and offer Fix-It Fairs, a free neighborhood-oriented event that offers workshops and exhibits on home and garden topics. At each fair, over 100 workshops, how-to demos and exhibits provided residents with self-help information and resources on topics including stormwater management, Naturescaping, and water conservation. During FY 2015-16, 1,479 people attended three fairs.
- Through the Sustainable Stormwater Management Program (now integrated into the Stormwater System Planning Division), staff fielded public requests for information and technical assistance and provided technical assistance to a variety of projects:
 - Received over 45 requests for tours and speaking engagements. Conducted tours for professional planners, designers, developers, politicians, and staff from national and international jurisdictions.
 - Received over 16 requests for a green street.
 - Received requests for assistance from non-profit groups, students, and other jurisdictions in the form of design review and information sharing.
 - Presented information at ten local, regional, and national seminars and conferences.
 - Received about 14,000 on the City Green blog that provides relevant information, examples, and announcements for citywide green infrastructure approaches; and about 12,000 visits on the Green Street Stewards website.
 - Continued to develop fact sheets, educational materials, and tour information for distribution and web publication for the watershed, and tree canopy programs. Examples include green infrastructure and green street steward profiles for social media Facebook page.

- Clean River Rewards (CRR) provides information about how to manage stormwater onsite and receive discounts on utility bills to the extent that flow rate, pollution and volume of stormwater are controlled on an individual's private property. FY 2015-16 activities included:
 - Provided technical assistance on managing stormwater and discount registration information on the CRR website, which registered approximately 152,652 external hits.
 - Shared site specific stormwater retrofit and discount registration assistance via telephone and email to approximately 200 people upon request.
 - Conducted 135 site audits of commercial and multifamily residential accounts upon discount registration. Site audits included verification of impervious area, stormwater facility type and location, and operation and maintenance of facilities.
 - BES Engineering Services conducted four downspout disconnection and stormwater management workshops; three were held at the Fix-it-Fairs in November of 2015, January and February of 2016 and one was held at the Community Energy Project in April of 2016. About 65 people attended these four events. Engineering Services also conducted a rain garden class at the Portland Nursery in September of 2015 and at Backyard Habitat Volunteer training in May of 2016.
 - The Private Property Retrofit Program (PPRP) constructed 48 rain gardens on individual private properties. An additional 50 private properties were evaluated for stormwater retrofits. Engineering Services provided technical and registration assistance to another 93 properties.
 - From Portland's billing system (Cayenta), created CRR custom reports and a GIS layer to put CRR data in a query-able format to more accurately and efficiently respond to information requests.
 - Entered into 2,120 new CRR contracts; 57 were on commercial accounts, 78 were on multifamily accounts, 1,983 were on single family accounts and two contracts were on other account classes.
 - At the end of the FY 2015-16, a total of 33,286 active contracts were applied to active utility accounts; 616 were on commercial accounts, 1,084 were on multifamily accounts, 31,496 were on single family residential accounts and 90 were on other account classes. These contracts encompassed a total of 3,525 acres of impervious area; 1,193 acres were associated with commercial accounts, 299 acres were associated with multifamily residential accounts, 1,737 acres were associated with single-family residential accounts and 296 acres were associated with other accounts.
 - Upon request, shared the status of the CRR program with the Public Utility Board in June of 2016.

11.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 15/16 measurable goals for STR-1.

Measurable Goal	Status as of 6/30/2016
Construct the following public facilities to provide treatment for stormwater runoff from approximately 336 acres:	Total acreage treated for stormwater runoff exceeded 336 acres as a result of construction of the facilities below, plus construction of additional facilities, as identified in previous annual reports.
Construct the NE 148th Avenue stormwater management facility by FY 14/15.	Completed construction in FY 14/15, treating stormwater runoff from 180 acres.
Construct stormwater management facilities in the NE 122nd Ave subbasin by December 2012 (Columbia Slough Watershed).	Completed construction of eight water quality planters along NE 122nd Avenue between NE Fremont and NE Shaver, designed to treat stormwater runoff from 2.89 acres.
Convert 5,000 linear feet of roadside ditches to swales or porous shoulder (Tryon Creek and Fanno Creek watersheds) during the permit term.	Completed construction of roadside drainage (ditch) and shoulder improvements on SW Stephenson between SW 35th and SW Boones Ferry Road and on SW Hamilton between SW Shattuck and SW 40th. About 4,700 feet of ditches were improved. [Total conversions to date during this permit term is approximately 9,371 linear feet.]
Construct stormwater management facilities along SW Beaverton-Hillsdale Highway and SW Barbur Blvd. and in commercial and multi-family residential areas (Tryon Creek and Fanno Creek watersheds) during the permit term.	Continued design and construction of stormwater management facilities, as described under the Westside Watersheds section above. [Total facilities constructed to date during this permit term treat a total of 42.2 acres.]
Track the number, type, drainage area, and location of public facilities constructed annually.	Completed (using GIS to track this information)

The City generally met the measurable goals for STR-1 for the permit term. The measurable goal to conduct storm system retrofit projects included a projected area estimate (336 acres) for a specific set of projects that were identified prior to publication of the City's April 2011 SWMP. In September 2011, the area for the largest project was revised downward (presumably due to design or construction constraints) from 294 to 180 acres. Although the projects specified in the measurable goal total 201 acres, the City constructed and has reported on a host of additional retrofit projects during the permit term. These additional projects included multiple green streets facilities, a water quality facility at I-5 and SW 26th and the substantial Mason Flats Wetland Enhancement Project. The total drainage area associated with all the reported projects is 850 acres, far exceeding the original goal of 336 acres. In addition, the goal of converting 5,000 linear feet of ditches in the Fanno and Tryon watersheds to swales or porous shoulders was greatly exceeded with a total of 9,371 linear feet converted.

Section 12

Natural Systems (NS-1)

Protect and enhance natural areas and vegetation that help prevent pollutants from entering into the municipal separate storm sewer system.

12.1 Key BMP Accomplishments

12.1.1 Land Acquisition and Protection

The City acquired 1.2 acres in the Stephens Creek subwatershed, 2 acres in the Johnson Creek watershed, and 10 acres in the Columbia Slough watershed as part of the Grey to Green and Johnson Creek Willing Seller Programs.

12.1.2 Land Use Planning

- Continued planning processes that include goals and policies focusing on watershed health and environmental quality. Work in FY 2015-16 included:
 - Adopted the *2035 Comprehensive Plan*, which includes goals and policies, updated land use designations, and other citywide systems plans that will support watershed health throughout the city over the next 20 years.
 - Continued work on the *Central City 2035 Plan*, which sets a 20-year vision for the Central City and is a culmination of over five years of planning and public involvement. The plan includes a range of policies related to the climate change resilience, sustainable development, and management of the Willamette River and its adjacent uses, among others. An updated Natural Resources Inventory for the Willamette River was prepared as part of this effort.
 - Began the process of evaluating policies and development regulations in the floodplain to prepare for expected changes in Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) as a result of the National Marine Fisheries Service (NMFS) Biological Opinion on the NFIP.
 - Continued coordinating the City's partnership with the non-profit Salmon-Safe Inc. to reach the City of Portland's Salmon-Safe certification for five bureaus that own or manage property, programs and activities that could positively impact salmon. Salmon-Safe Science Team assessments were conducted on the bureau's relevant facilities, operations and activities, and resulted in draft certification conditions that were reviewed by participating City staff. A draft certification report was released in June 2016.
- Continued the Subwatershed Improvement Strategies process for six northwest Willamette subwatersheds (Balch, Kittridge, Saltzman, Doane, Linnton and Miller) to identify opportunities to protect and improve conditions in these areas.

12.1.3 Tree Code

- Continued implementation of Title 11, Trees. Title 11 includes tree preservation and planting requirements on development sites and standardizes the City’s tree removal permit system. These new regulations help to preserve, expand, regenerate, and improve the quality of Portland’s tree canopy.
- Developed draft tree canopy targets for the Central City, as a part of the Proposed Draft of the *Central City 2035 Plan*. These targets will be achieved through policies, programs, and regulations in the plan. Twenty-year targets were generated for each sub-district within the Central City. These tree canopy targets will be updated further and finalized in FY 16-17.

12.1.4 Climate Change Planning

- City Council adopted the *2015 Climate Action Plan*, Portland’s updated climate plan focused on reducing local carbon emissions and building resilience to the projected impacts of climate change.
- Continued implementation of the 5-year actions outlined in the *Climate Change Preparation Strategy* (CCPS; adopted in 2014). The CCPS recognizes the critical role of the urban forest and natural systems in making the City more resilient to potential climate-related changes in summer air and water temperatures, urban heat island, storm intensity and flooding patterns, and frequency of landslides and wildfires. CCPS actions underway include the development of a resiliency plan for wastewater and stormwater infrastructure, as well as evaluating potential flooding of the Willamette River in downtown Portland under different climate change scenarios.

12.1.5 Watershed Revegetation Program

Under the Watershed Revegetation Program, many public agencies, businesses, and other landowners participated in and helped fund revegetation projects on their properties and neighboring properties. The program is currently managing 1,397 project acres on both public and private property. Activities in FY 2015-16 included:

Table 12.1: Watershed Revegetation Program Activities

Watershed Revegetation Efforts						
Watershed	Trees		Shrubs	Total Plants	Streambank (linear ft)	Acreage
	Deciduous	Coniferous				
Willamette River	250	460	10,613	11,323	0	18.5
Columbia Slough	4,705	550	7,665	12,920	6,096	50.4
Johnson Creek	2,565	1,825	13,073	17,463	2,237	19.5
Tryon Creek	125	125	1,600	1,850	270	2
Fanno Creek	450	500	4,015	4,965	1,332	5.6
Totals	8,095	3,460	36,966	48,521	9,935	96

12.1.6 Partnerships with Other Organizations

- In partnership with Portland Parks & Recreation (PP&R) and the Mt. Tabor Park Weed Warriors, used community volunteers to enhance over 7 acres of parkland. [also in P1-1].
- Through PP&R, partnered with a number of non-profits, community groups, and schools to involve volunteers in the enhancement of natural areas. Activities include invasive plant species removal, native plant installation, trail building, installing fencing for sensitive resources, youth education, wildlife surveying and litter removal. Numbers reported may be under-counted for some locations.

Table 12.2: Volunteer Hours by Watershed

Watershed	Events	Volunteers	Volunteer Hours Worked	Native Plants Installed	Area of Invasives Removed (acres)
Columbia Slough*	69	1,802	4,663	2,811	2.26
Willamette River	441	3,172	19,812	6,907	<i>no data</i>
Fanno Creek	45	699	1,921	671	<i>no data</i>
Tryon Creek	10	182	622	408	<i>no data</i>
Johnson Creek	<i>no data</i>	3,207	17,398	12,604	8.99
Totals	565	9,062	44,416	23,401	11.24

Notes:
 Results presented should be considered estimates only, due to varying tracking methods between program coordinators. Staff turnover also resulted in some data gaps.
 * Numbers do not include the first half of FY 2015-16.

- In partnership with Friends of Trees, planted 3,046 street trees and 706 yard trees in City of Portland right-of-way, on school properties and in private yards.
- In partnership with the SW Watershed Resource Center:
 - Facilitated the restoration (invasive removal, erosion control, and/or native planting) on 60 linear feet of streambank and 50 feet of slope above a streambank
 - Installed 964 native plants
 - Removed 5,496 square feet of invasive plants
 - Reduced stormwater runoff by at least 15,400 gallons per year to reduce soil erosion through amendments, installation of porous walkways, native plants and other stormwater management best practices
- Supported the Johnson Creek Watershed Council’s 18th annual Johnson Creek Watershed-wide Restoration Event, where 283 volunteers planted 5,311 native trees and shrubs and cleared 800 square feet of invasive plant material. (Also in PI-1)

12.1.7 Technical Assistance, Incentives, and Grants Programs

- Under BES’s Community Stewardship Grants Program, awarded 13 stewardship grants totaling \$100,000 for projects that included planting approximately 5,346 native trees, shrubs, and groundcover (See PI-1 for project names and watershed locations.). The grants program also awarded 19 mini-grants totaling \$5,800 in FY 15/16. Mini-grants provided a variety of community groups and private property owners with native plant gift certificates for riparian and upland restoration and revegetation projects in all Portland watersheds. Approximately 1,450 trees, shrubs and groundcover were planted with mini- grants. (Also in PI-1)
- Through the Treebate Program, provided incentives for residential property owners to plant 207 yard trees to improve local stormwater management.

12.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for NS-1.

Measurable Goal	Status as of 6/30/2016
Plant 20,000 trees and initiate revegetation work on 70 acres by the end of the permit cycle.	Planted 11,555 trees (8,095 deciduous and 3,460 coniferous) on 96 acres in FY 2015-16. [Total to date during this extended permit term: Planted 194,682 trees (147,267 deciduous and 47,415 coniferous) on 1,200.9 acres]
Acquire 50 acres of land by the end of the permit cycle.	Acquired 13.2 acres of land in FY 2015-16. [Total to date during this extended permit term: 566.7 acres]
Update the <i>Portland Plan</i> (an update to the City’s <i>Comprehensive Plan</i>) by December 2013.	Completed. City Council adopted the <i>Portland Plan</i> on April 25, 2012.

All measurable goals were met for NS-1 during the permit year and for the permit cycle.

Section 13

Program Management (PM-1)

Conduct program management, coordination, and reporting activities.

13.1 Key BMP Accomplishments

- Coordinated with numerous other City bureaus and jurisdictions to continue implementation of the Stormwater Management Plan (as reported under the individual BMPs).
- Coordinated permit implementation activities with the Port of Portland.
- Submitted a letter to DEQ regarding proposed monitoring program modifications on June 13, 2016.
- Submitted the NPDES MS4 annual compliance report 20 for FY 2014-15 on November 1, 2015.

13.2 Measurable Goals

As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation. The following table provides the status of meeting FY 2015-16 measurable goals for PM-1.

Measurable Goal	Status as of 6/30/2016
Submit annual reports by November 1 of each year.	Submitted the FY 14/15 annual report on November 1, 2015. Anticipate submittal of FY 15/16 report on or by November 1, 2016.

All measurable goals were met for PM-1 during the permit year and for the permit cycle.

Section II
PORT OF PORTLAND



PORT OF PORTLAND

**National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System Permit
Permit Number 101314**

ANNUAL REPORT NO. TWENTYONE

July 1, 2015 – June 30, 2016

Prepared for:
Oregon Department of Environmental Quality

November 1, 2016

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APPENDICES

Appendix A Monitoring Objective Matrix

ACRONYMS

BMP – Best Management Practice

DEQ – Department of Environmental Quality

EMS – Environmental Management System

FOG – Fats, Oil, and Grease

HAZWOPER – Hazardous Waste Operations and Emergency Response

IDDE – Illicit Discharge Detection and Elimination

IGA – Intergovernmental Agreement

IPM – Integrated Pest Management

MEP – Maximum Extent Practicable

MFM – Marine Facilities Maintenance (Marine's general maintenance group)

MS4 – Municipal Separate Storm Sewer System

NOAA – National Oceanic and Atmospheric Administration

NPDES – National Pollutant Discharge Elimination System

PDX – Portland International Airport

PIC – Portland International Center

SPCC – Spill Prevention Control and Countermeasure

SWMP – Stormwater Management Plan

SWPCP – Stormwater Pollution Control Plan

TMDL – Total Maximum Daily Load

USB – Urban Services Boundary

USCG – United States Coast Guard

1.0 INTRODUCTION

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from Port of Portland (Port) property through the Municipal Separate Storm Sewer System Discharge Permit No. 101314 (MS4 permit) and other National Pollutant Discharge Elimination System (NPDES) stormwater permits, including the 1200-Z, 1200-COLS and 1200-CA permits. This annual report describes activities specifically related to implementation of the Port's MS4 permit.

The Port and City of Portland are co-permittees on MS4 permit #101314. As required under Schedule B.5 of the permit, each co-permittee must submit an annual report. This report documents activity from July 1, 2015 to June 30, 2016 related to the Port's stormwater management efforts under the permit and associated December 28, 2012 Stormwater Management Plan (SWMP). The report emphasizes efforts and activities associated with individual best management practices (BMPs) from the Port's SWMP (as summarized in Section 7.0). Schedule B.5.a-i of the permit states the specific annual reporting requirements. These requirements are addressed within the report as follows:

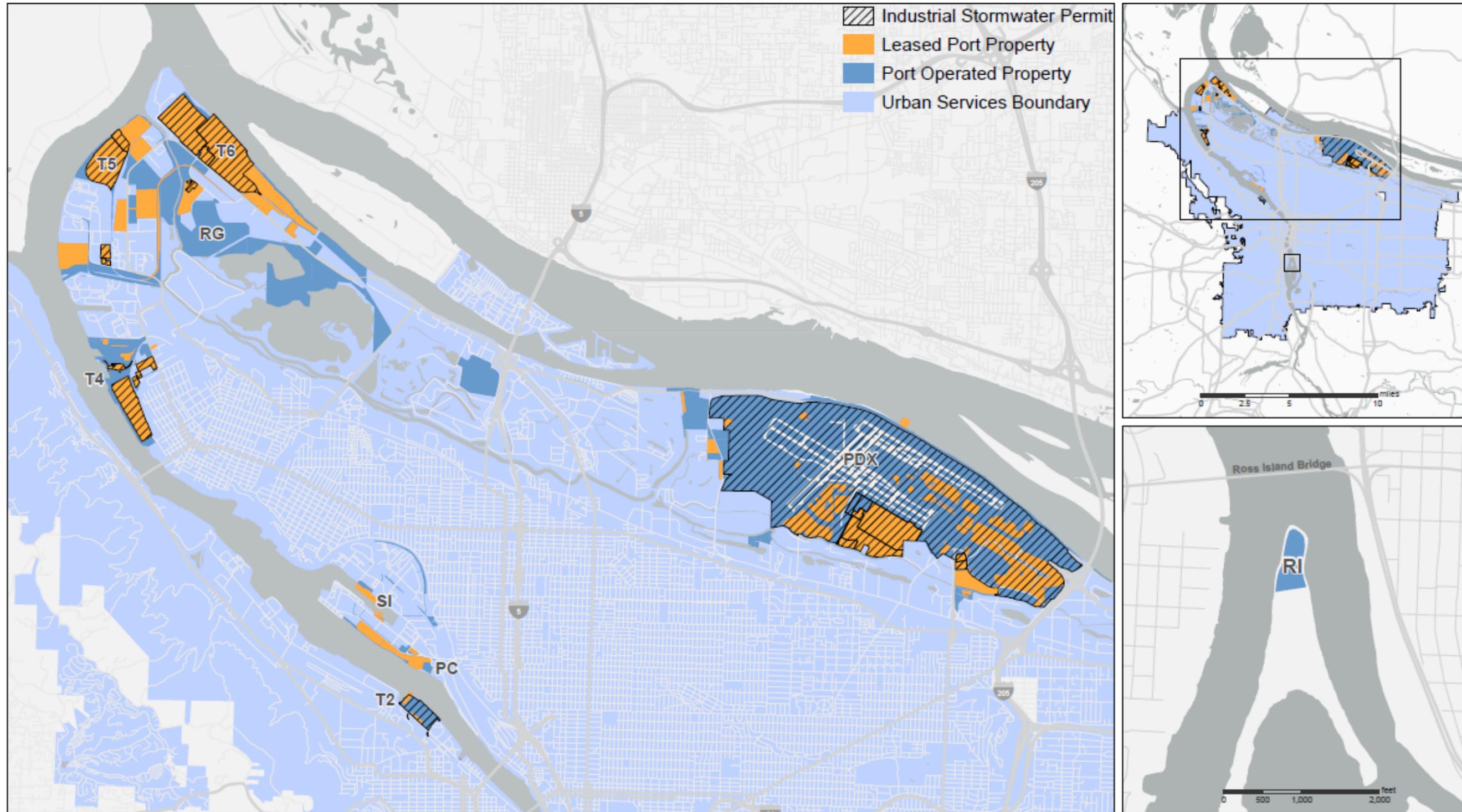
1. **Status of SWMP implementation:** Section 7.1.1 through 7.1.8
2. **Status of the public education evaluation:** Section 7.1.4
3. **Summary of the adaptive management process:** Section 8
4. **Proposed changes to the SWMP:** Section 8
5. **Summary of stormwater program expenditures:** Section 4.0
6. **Summary of monitoring results:** *See Section IV Monitoring Compliance Report of the combined report. Section 6.1 of this document explains the Port's monitoring coordination with the City.
7. **Proposed changes to the monitoring plan:** *See Section IV Monitoring Compliance Report of the combined report. Section 6.1 of this report explains the Port's monitoring coordination with the City.
8. **Summary describing Port's Illicit Discharge Program:** Section 7.1.1
9. **Overview of planning, land use changes, and new development:** Section 2.1

2.0 PORT OF PORTLAND PERMIT AREA AND RESPONSIBILITIES

The Port of Portland owns approximately 5,505 acres within the City of Portland (City) Urban Services Boundary (USB). Port property is divided into three primary Business Lines under the Operations Division: 1) Aviation, 2) Marine, and 3) Industrial Development. Within the City USB, the Aviation Business Line consists of Portland International Airport (PDX), the Marine Business Line includes Marine Terminals 2, 4, 5 and 6, and the Industrial Development Business Line consists of the following industrial parks: Swan Island, Mocks Landing, Rivergate, Cascade Station, and Portland International Center (PIC). Figure 1-1 (pg. 2) shows the Port's permit area, breaking out leased property and facilities with Industrial Stormwater General Permits.

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Figure 1 Port of Portland MS4 Permit Boundary Area



Port of Portland geospatial data is gathered, maintained and primarily used for internal reference and analysis, and is only updated as resources permit. Geospatial data refers to data and information referenced to a location on the Earth's surface such as maps, charts, air photos, satellite images, cadastre and land and water surveys, in digital or hard copy form. Geospatial data may be gathered and maintained by more than one person or department within the Port, and data distributed by one person or department may not reflect the most recent data available from the Port or from other sources. Port geospatial data is not intended for survey or engineering purposes or to describe the authoritative or precise location of boundaries, fixed human works, or the shape and contour of the earth. The Port makes no warranty of any kind, expressed or implied, including any warranty of merchantability, fitness for a particular purpose, or any other matter with respect to its geospatial data. The Port is not responsible for possible errors, omissions, misuse, or misrepresentation of its geospatial data. Port geospatial data is not intended as a final determination of such features as existing or proposed infrastructure, conservation areas, or the boundaries of regulated areas such as wetlands, all of which are subject to surveying or delineation and may change over time. No representation is made concerning the legal status of any apparent route of access identified in geospatial data.

PORT OF PORTLAND
Portland, Oregon




Geographic Data Standards
Projected Coordinate System:
NAD 1983 HARN State Plane,
Oregon North, Intl Feet
Map Projection Name:
Lambert Conformal Conic



Figure 1-1
Port of Portland MS4 Permit Area
Port Property within City of Portland
Urban Services Boundary

Justin McCarley | DGS Program | August 2016
Prepared for Danelle Peterson, Environmental Affairs

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The Port also owns a number of undeveloped properties within the USB including wetland mitigation sites, natural areas, and vacant tax lots. The Port is in a unique situation with regard to the typical municipal planning, permitting, and land use modification processes. The City of Portland is responsible for these activities and the Port complies with their process. For the purposes of this report, all reporting on these activities contained in section B.5.i will be satisfied in the City's section. With respect to the impervious surface reporting requirement in B.5.i the Port estimates during the 2015-16 reporting period it had 2,164 acres of impervious surface. This represents 39% of total Port property within the City of Portland USB.

PDX, the marine terminals, and the industrial parks are partially occupied by tenants. The Port manages those tenant properties through lease agreements. Leased property represents approximately 32% of Port property within the USB. A more detailed description of Port operating areas is included in Section 2.1.

Property owned by the Port is primarily zoned for commercial and industrial use. Many of these areas accommodate industrial activities that require DEQ-issued NPDES industrial stormwater general permits (1200-Z and 1200-COLS permits) or individual permits addressing stormwater discharge. Within the USB, 67% of the Port's holdings are regulated under these permits. PDX and portions of Terminal 2 are operated by the Port under DEQ-issued industrial stormwater discharge permits. In addition, some tenants occupying leased property on Terminals 2, 4, 5, 6, and the industrial parks also operate under 1200-Z, 1200-COLS or individual NPDES stormwater permits. For Port operations within these areas, several of the MS4 permit requirements are satisfied through implementation of industrial stormwater permit requirements, addressed in their Stormwater Pollution Control Plans (SWPCPs). Section 2.2 addresses how these activities are coordinated with the Port's MS4 permit responsibilities.

2.1 MS4 Permit Area

2.1.1 Portland International Airport

PDX comprises an area of approximately 2803 acres and is located in Northeast Portland between the Columbia River and the Columbia Slough. The facility is owned and operated by the Port. However, numerous aviation-related tenants also conduct operations at PDX.

Stormwater runoff from PDX property discharges into the Columbia Slough through a series of pipes, open channels, and 9 major outfalls. These stormwater discharges are permitted under PDX's NPDES 1200-COLS Industrial Stormwater General Permit issued and administered by DEQ. The 1200-COLS permit is structured to specifically address Columbia Slough Total Maximum Daily Load (TMDL) parameters, including dissolved oxygen, pH, nutrients, bacteria, and toxics. Currently, the Oregon Air National Guard and Yoshida Foods international have their own 1200-COLS permits. PDX tenants whose operations trigger the need for a stormwater permit and have comingled stormwater with other PDX airfield tenants are required to be a co-permittee under PDX's 1200-COLS permit.

In addition to the 1200-COLS permit, PDX also holds an NPDES a 1200-CA Construction Discharge Permit, a Water Pollution Control Facility (WPCF) 1700-B Wastewater Permit, a

NPDES Anti-icing/Deicing Waste Discharge Permit, and a pre-treatment permit issued by the City of Portland for deicing discharges to the sanitary system.

2.1.2 Marine Terminals

The Port has four active shipping terminals that are managed by the Port's Marine Business Line. The terminals collectively occupy approximately 1009 acres along the Willamette River (Terminals 2, 4, and 5) and Columbia River/Slough (Terminal 6). They handle the shipping, receiving, and temporary storage of finished goods, agricultural products, and raw materials.

The industrial stormwater discharge permits required for Terminal 6 discharges into the Columbia River and the Columbia Slough are covered by 1200-COLS permits held by the tenants. The Port continues to hold a 1200-Z permit for the Port-managed area of Terminal 2. A number of properties located at Terminals 2, 4, and 5 are also leased to tenants. Several of these tenants hold 1200-Z or individual permits that are issued by DEQ and administered by the City.

2.1.3 Industrial Parks

The Port's Industrial Development Business Line manages the Port-owned industrial parks, Swan Island, Mocks Landing, Rivergate, Cascade Station, and Portland International Center (PIC), totaling approximately 1,518 acres. Several industrial park tenants also hold 1200-COLS or 1200-Z permits that are issued by DEQ and administered by the City.

2.1.4 Undeveloped Properties

The Industrial Development Business Line also manages approximately 1,520 acres of undeveloped property within the City's USB. This does not include West Hayden Island, which is within the unincorporated USB and does not receive city services at this time. Stormwater management activities for undeveloped properties discharging into the Port's MS4 are conducted under the MS4 permit.

2.2 MS4 Permit Responsibilities

Many of the requirements of the industrial stormwater general discharge permits overlap with requirements of the MS4 permit. A large proportion (67%) of the area included in the Port's MS4 permit area is also regulated under industrial stormwater permits, which have been issued to either the Port or its tenants.

The City of Portland and Port are co-permittees on MS4 Permit #101314. The City regulates stormwater on a city-wide basis with some implementation overlapping the Port's MS4 area. The Port and City coordinate permit management activities through an intergovernmental agreement (IGA).

Table 1 (Permit Requirements and Responsibilities) was developed to explain the complex relationship between the Port's management of stormwater through its MS4 permit, the City's overlapping stormwater management activities through its MS4 permit, and DEQ's regulation of industrial stormwater on some Port property through other NPDES permits. This tool was included in the Port's 2012 SWMP to show specific program coverage for each MS4 permit requirement. Table 1 lists the SWMP requirements from the Port's MS4 permit along the left

hand column. Responsibility descriptions for each SWMP requirement are split according to the following two categories: (1) Port MS4 permit areas that do not have industrial stormwater permits (1200-Z or 1200-COLS permits), and (2) Port MS4 permit areas where the Port or its tenant has a general industrial stormwater permit (1200-Z or 1200-COLS permits). The two responsibility categories are further split between tenants and Port operations. For some tenants and Port operating areas (Terminals 2 and PDX) with an industrial stormwater permit, several of the MS4 permit requirements related to specific activities are addressed through implementation of the industrial stormwater permits. These requirements are shown shaded in gray on Table 1. In addition, permit requirements within the Port's jurisdiction covered by the City's stormwater management activities are also shaded in gray on Table 1. Areas left unshaded on Table 1 are addressed by BMPs in the Port's 2012 SWMP. These unshaded areas list the specific BMPs that meet each corresponding permit requirement.

Section 7.0 of this annual report outlines the BMPs listed in the Port's 2012 SWMP and specifies responsible parties for each BMP implementation task. In addition, Section 7.0 describes the Port's SWMP implementation during the permit year to address tracking measures and progress toward meeting measurable goals under each BMP.

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Port of Portland MS4 Permit Requirements and Responsibilities (Areas shaded in gray are MS4 permit requirements that are not addressed by BMPs in the Port’s SWMP because the requirements are either covered by the City of Portland, or are covered under an industrial stormwater permit. Unshaded Areas are covered by the Port’s SWMP BMPs listed below in Table 1.)

Table 1 Port of Portland MS4 Permit Requirements and Responsibilities

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	Port Operations	Tenants	Port Operations
Schedule A.4.a Illicit Discharge Detection and Elimination.				
i. Prohibit, through ordinance or other regulatory mechanism, illicit discharges	BMP: Implement the Illicit Discharge Detection and Elimination Program			
ii. Describe enforcement response procedures	BMP: Implement the Illicit Discharge Detection and Elimination Program			
iii. Develop pollutant parameter action levels	BMP: Conduct Dry-Weather Field Screening			
iv. Conduct annual dry weather inspection activities including field screening	BMP: Conduct Dry-Weather Field Screening			
v. Identify response procedures to investigate portions of the MS4 where relevant information indicates the likely presence of illicit discharges	BMP: Conduct Dry-Weather Field Screening			
vi. Maintain a system for documenting and procedures for responding to illicit discharges	BMP: Conduct Dry-Weather Field Screening			
vii. Appropriate action for illicit discharge removal	BMP: Implement the Illicit Discharge Detection and Elimination Program		Spill response activities address employee reporting and are covered under 1200-Z and 1200-COLS permits ¹	
			BMP: Implement the Illicit Discharge Detection and Elimination Program	
viii. Spill prevention and response	BMP: Implement a Spill Response Program for Port Operated Property		Covered under 1200-Z and 1200-COLS permits ²	
ix. Notify affected municipality of illicit discharge originating within the permittee's permit area	BMP: Implement the Illicit Discharge Detection and Elimination Program			
x. Notify responsible municipality of illicit discharge affecting the permittee, originating outside of the permittee’s permit area	BMP: Implement the Illicit Discharge Detection and Elimination Program			
xi. Maintain maps showing major MS4 outfalls	BMP: Conduct Dry-Weather Field Screening			
xii. Unless identified as a significant source of pollutants, the following non-stormwater discharges are not considered illicit discharges (see Schedule A.4.a.xii)	BMP: Implement a Water Line Flushing Procedure			
Schedule A.4.b Industrial and Commercial Facilities				
i. Screen existing and new industrial facilities	BMP: Screen Existing and New Industrial Facilities		These areas are already covered by an industrial stormwater NPDES permit	
ii. Notify DEQ and facility if subject to an industrial NPDES permit	BMP: Screen Existing and New Industrial Facilities		These areas are already covered by an industrial stormwater NPDES permit	
iii. Inspection of industrial or commercial areas identified as significant sources of pollutants	BMP: Implement an Inspection Program for Significant Pollutant Source Areas			
Schedule A.4.c Construction Site Runoff Control				
i. Ordinance that requires erosion and sediment controls	Implemented through the City of Portland’s erosion control ordinance; may also be covered under a 1200-C permit	Implemented through the Port’s 1200-CA Permit, the City of Portland’s erosion control program and related contract	Implemented through the City of Portland’s erosion control ordinance; may also be covered under a 1200-C permit	Implemented through the Port’s 1200-CA Permit and related contract specifications
ii. Require construction site operators to develop site plans and implement erosion and sediment control BMPs				

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	Port Operations	Tenants	Port Operations
iii. Require construction site operators to prevent/ control non-stormwater waste		specifications.		
iv. Erosion control site plan review				
v. Perform on-site inspections				
vi. Maintain enforcement response procedures				
Schedule A.4.d Education and Outreach				
i. Implement a documented public education and outreach strategy	BMP: Implement Public Education Measures to Protect Stormwater Quality.			
ii. Provide educational material to the community or conduct equivalent outreach activities	BMP: Implement a Tenant Stormwater BMP Program	N/A	BMP: Implement a Tenant Stormwater BMP Program	N/A
	BMP: Implement Public Education Measures to Protect Stormwater Quality			
iii. Provide public education on pesticide, herbicide, fertilizer, and other chemicals	BMP: Require Training and Licensing for Staff Conducting Pest Management Activities BMP: Implement a Tenant Stormwater BMP Program			
iv. Provide public education on proper operation and maintenance of privately-owned/ operated stormwater quality facilities	BMP: Implement a Tenant Stormwater BMP Program BMP: Implement a Program for the Tracking and Maintenance of Private Structural Controls			
v. Provide notice to construction site operators regarding training for erosion and sediment control	BMP: Provide Erosion Prevention and Sediment Control Training for Construction Inspectors			
vi. Conduct/ participate in a public education effectiveness evaluation	BMP: Participate in a Public Education Effectiveness Evaluation			
vii. Include training for municipal employees involved in MS4 activities	BMP: Implement a Spill Response Training Program. BMP: Implement a Municipal Staff Training Program for Stormwater Pollution Prevention BMP: Require Training and Licensing for Staff Conducting Pest Management Activities		Covered under 1200-Z and 1200-COLS permits ³	
viii. Promote, publicize, and facilitate public reporting of illicit discharges	BMP: Implement the Illicit Discharge Detection and Elimination Program			
Schedule A.4.e Public Involvement and Participation				
e. Implement a public participation process for receiving and considering comments on the SWMP and TMDL benchmarks	BMP: Provide for Public Participation with SWMP and Benchmark Submittals			
e. Implement a public participation approach that provides opportunities for the public to effectively participate in the implementation of the co-permittee's stormwater management program	BMP: Implement a Public Participation Approach that Provides Opportunities for the Public to Effectively Participate in the Implementation of the Stormwater Management Program			

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	Port Operations	Tenants	Port Operations
Schedule A.4.f Post-Construction Site Runoff				
i. Implement a post-construction stormwater pollutant and runoff control program	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
ii. Identify, and where practicable, minimize or eliminate ordinance, code and development standard barriers	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
iii. Develop or reference an enforceable post-construction stormwater management manual	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
vi. Review, approve, and verify proper implementation of post-construction site plans	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
v. Require off-site stormwater management for locations limited in their ability for on-site stormwater capture and treatment or flow reduction	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
vi. Describe inspection and enforcement response procedures to address compliance issues with post-construction stormwater management performance standards	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
Schedule A.4.g Pollution Prevention for Municipal Operations				
i. Operate and maintain public streets, roads, and highways	The City of Portland is responsible for operation and maintenance of the public right-of-way			
	BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program			
ii. Implement a program to control the use and application of pesticides	BMP: Limit Landscape Maintenance Activities Impact on Stormwater BMP: Require Appropriate Training and Licensing for Pest Management Activities BMP: Implement a Tenant Stormwater BMP Program			
iii. Inventory, assess, and implement a strategy to reduce the impact of stormwater runoff from facilities that treat, store, or transport municipal waste, not already covered by a 1200 series permit	No tenant properties currently accommodate municipal facility waste	The Port does not operate any facilities that fall under this requirement and are not covered under a 1200 series permit.	N/A	N/A
iv. Implement controls to limit infiltration of seepage from the municipal sanitary system	BMP: Implement a Program to limit infiltration from Port-owned sanitary sewer system to the MS4			
v. Implement a strategy to prevent or control the pollutant discharge from firefighting training activities	The only firefighting training facility is located at PDX, which is covered by a 1200-COLS permit			
vi. Retrofitting flood control facilities	The City of Portland manages water quality improvements on a master planning level. Any potential flood control retrofits will be considered as part of the Retrofit Analysis			
Schedule A.4. h Structural Stormwater Controls Operations and Maintenance				
i. Implement a program to verify structural control facilities and controls are inventoried, mapped, inspected, operated and maintained	BMP: Implement a Stormwater System Cleaning and Maintenance Program BMP: Implement a Program for Tracking and Maintenance of Private Structural Controls		Covered under 1200-Z and 1200-COLS permits ⁴	Covered under 1200-Z and 1200-COLS permits ⁴
ii. Develop and implement a plan or approach to guide the	BMP: Implement a Stormwater System Cleaning and Maintenance Program		Covered under 1200-Z and 1200-COLS	Covered under 1200-Z and 1200-COLS

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	Port Operations	Tenants	Port Operations
long-term maintenance and management of all publically-owned and privately owned stormwater facilities	BMP: Implement a Tenant Stormwater BMP Program.		permits ⁴	permits ⁴
Schedule A.6.c Stormwater Retrofit Project				
ii. Identify one stormwater quality improvement project, at a minimum, to be <u>initiated</u> constructed and/or implemented during the permit term	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
Schedule B1-B4 Monitoring Component Requirements				
The Port must assist with monitoring efforts in conjunction with requirements as stated in Table B-1, Schedule B.1.b	Pursuant to an IGA, the Port of Portland and the City of Portland have a joint monitoring program conducted by the City to meet the requirements specified under Schedule B			

Table 1 Port MS4 Permit Requirements 1

Notes:

¹The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Non-Stormwater Discharges.”

²The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Spill Prevention and Response Procedure.”

³The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Spill Prevention and Response Procedure” and “Employee Education.”

⁴The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Preventative Maintenance”, “Control Measures for Technology Based Effluent Limits” and “Required (SWPCP) Elements”

3.0 PORT OF PORTLAND ORGANIZATIONAL STRUCTURE

The Port's Environmental Operations Department is responsible for administering the MS4 permit and the SWMP. The Water Quality Manager serves as the MS4 permit manager. Staff from Environmental Operations and each of the three business lines (Aviation, Marine, and Industrial Development) is responsible for implementing Port environmental programs to ensure permit compliance. As a means of coordinating Port-wide programs and policies, environmental program managers regularly meet with cross-functional teams that include Port operating area staff. One means of coordination between Port staff is through the Stormwater Issues Coordination group (SWIC). This group includes staff from Environmental Operations, Legal, Aviation, Marine, Industrial Development, Public Affairs, and Engineering. The SWIC generally meets monthly and is responsible for providing input on Port-wide stormwater policy issues, water quality, and permit implementation. The Senior Water Resource Manager serves as the lead for the (SWIC).

With respect to implementation of the Port's industrial stormwater discharge permits, Environmental Operations staff prepares, updates, and ensures implementation of the PDX SWPCP in coordination with the co-permittees as well as the Terminal 2 SWPCP. Tenants with industrial stormwater discharge permits are also required to prepare, maintain and implement SWPCPs. The City (DEQ's agent) coordinates directly with Port tenants holding these permits.

4.0 STORMWATER EXPENDITURES

The Port's state-mandated mission is to enhance the region's economy and quality of life by providing efficient cargo and air passenger access to global and national markets. In support of this mission, the Port annually undertakes budget and business planning to identify areas of focus and actions needed to address them.

The Port derives almost all revenue from business transactions with the users and tenants of Port facilities. A small proportion (approximately three to four percent) of the Port's overall revenue is from property tax. Business transactions generally occur between the Marine Business Line, the Aviation Business Line (Commercial Aviation and General Aviation), the Industrial Development Business Line, and associated users and tenants of those properties. Industrial Development Business Line revenue sources can also include sales of property. The Port also receives revenue from the U.S. Army Corps of Engineers for dredging services.

Commercial Aviation (PDX) resources are derived primarily from charges to airline passengers and air cargo customers, airport parking, rental car revenue, passenger facility charges, Federal grants, and tenant fees. PDX resources cannot be comingled with any other resources of the Port and are restricted for use at Aviation facilities by bond ordinances and Federal Aviation Administration (FAA) regulations.

The Port annually budgets resources to fund projects and programs identified in the Strategic and Business Line Plans. Program expenses are allocated among Business Lines and departments involved in implementation of the program. Specifically, stormwater resources are allocated across the following business lines, Information Technology (IT), Legal, Engineering, Marine and Industrial Development and Aviation. Stormwater program expenditures include the cost of staff salary (including fringe costs), permit fees, contractor and consultant fees, stormwater

infrastructure, City of Portland stormwater fees, disposal of collected material, sample analysis, stormwater training, and outreach materials.

The estimated stormwater program expenditures are broken out by area and in total for fiscal year 2015-16 and the estimates for 2016-2017 in Table 2. Marine and Industrial Development Business Lines are shown together.

Table 2 Summary of Port Stormwater Expenditures

Department	Estimated 2015-16 Stormwater Expenditures	Projected 2016-17 Stormwater Expenditures
Marine, and Industrial Development Business Lines	\$1,062,923	\$1,062,923
Aviation Business Line	\$ 4,383,027	\$3,971,912*
Engineering	\$ 3,031,794	\$3,000,000
IT	\$35,672	\$35,672
Legal	\$24,960	\$25,000
Totals	\$ 8,538,375.86	\$8,112,462

**Expenditure reduction due to the completion of the stormwater master plan and the completion of the deicing system treatment plan.*

5.0 DEMONSTRATION OF CONTINUED LEGAL AUTHORITY TO IMPLEMENT THE PROGRAMS OUTLINED IN THE SWMP

The Port has authority to implement programs outlined in the SWMP through ordinance, permits, and contracts.

The Port has statutory authority to enact ordinances to regulate stormwater sewers that it owns, operates, maintains, or controls. The Port Commission adopted Ordinance No. 361 in 1992, which asserts the Port’s regulatory authority over its stormwater system and discharges into that system. Section 3 prohibits any person from making, causing, or allowing an illicit discharge into a storm sewer owned or operated by the Port. Section 4 requires written permission from the Port in order to make a connection to a Port storm sewer. Section 5 authorizes the Port to inspect Port-owned property for violations of the Ordinance or applicable law that governs the conveyance or disposal of stormwater. In addition, the Ordinance provides the Port with authority to control the contribution of pollutants to storm sewers owned or operated by the Port; the quality of stormwater discharged from the sites of industrial activity on land owned by the Port; and the discharge to storm sewers owned or operated by the Port of pollutants from spills, dumping, or the disposal of materials other than stormwater.

In addition to the Ordinance, the Port has legal authority to control the contribution of pollutants to the municipal storm sewer through contracts with Port tenants. However, the Port has no legal authority over stormwater runoff from private and public property that discharges stormwater into the Port’s MS4 but is not owned by the Port. Lease and operating agreements require compliance with the Port’s MS4 permit. Through these regulatory and contractual mechanisms, the Port works with tenants and users of Port facilities to implement BMPs that control the contribution of pollutants to Port storm sewers.

6.0 STORMWATER MONITORING

The Port's monitoring program consists of environmental and BMP monitoring elements. Activities within these groups are in place to meet Schedule B monitoring requirements, including the following MS4 monitoring objectives:

1. Evaluate the source(s) of the 2004/2006 303(d) listed pollutants applicable to the co-permittee's permit area;
2. Evaluate the effectiveness of BMPs in order to help determine BMP implementation priorities;
3. Characterize stormwater based on land use type, seasonality, geography, or other catchment characteristics;
4. Evaluate long-term trends in receiving water quality associated with storm water discharges;
5. Assess the chemical, biological, and physical effects of MS4 runoff on receiving waters;
6. Assess progress towards meeting TMDL pollutant load reduction benchmarks.

Appendix A explains how each monitoring program activity within the two elements relates to these objectives. A description of each monitoring program element is provided below.

6.1 Environmental Monitoring

The Port satisfies the MS4 environmental monitoring requirements through an IGA with the City of Portland. The IGA specifies the terms and conditions regarding how the Port shares costs with the City for environmental monitoring efforts. The City's Quality Assurance Monitoring Plan (QAMP) consists of in-stream (event), in-stream (continuous), stormwater, pesticide, mercury, and macroinvertebrate monitoring elements. The plan can be downloaded at <https://www.portlandoregon.gov/bes/article/387705>. A discussion of this program and its operations during FY2016 is included in City of Portland's Monitoring Compliance Report (Section IV of the Annual Report).

6.2 Best Management Practice (BMP) Monitoring

The Port's BMP monitoring activities are described as tracking measures and measureable goals in the most recently approved SWMP, submitted to DEQ on December 28, 2012. These monitoring activities are specific indicator metrics that help document the completion of tasks and assess the relative effectiveness of BMPs. The implementation tasks, tracking measures, and measurable goals associated with each Port BMP are provided in Sections 7.1.1 through 7.1.8.

6.3 Additional Elements

The following additional elements listed in Schedule B.5.j were submitted to the City separately for November 1, 2014 deadline:

- The TMDL Pollutant Load Reduction Evaluation.
- The Wasteload Allocation Attainment Assessment.
- The 303(d) evaluation.
- Stormwater Retrofit Strategy

6.4 Additional Stormwater Monitoring Activities

The Port collects and submits additional stormwater monitoring data to DEQ as required by the Port's various NPDES Stormwater permits. Data collected for these permits is not included in the MS4 permit annual report, but is available upon request.

This monitoring provides data about stormwater discharges from Port industrial properties. Information resulting from these sampling events has been used to manage the stormwater programs at these facilities and may continue to be useful for understanding water quality impacts from different types of industrial sources.

The Port submitted stormwater monitoring data to DEQ for the following industrial stormwater discharge permits in FY2016:

- NPDES 1200-COLS Industrial Stormwater Discharge Permits, DEQ File No. 107220 (PDX)
- NPDES 1200-Z Industrial Stormwater Discharge Permit, DEQ File No. 114024 (Terminal 2)
- NPDES Deicing Permit No. 101647

7.0 ACCOMPLISHMENTS FOR PERMIT YEAR TWENTYONE (2015-16)

7.1 SWMP Implementation

The annual report content and format is based on the SWMP submitted to DEQ on December 28th, 2012. The SWMP is structured into eight major elements. These elements contain the necessary BMPs to address MS4 permit requirements included in Schedule A(4)(a-h). Reporting on tracking measures and progress towards associated measurable goals are shown in italics for each BMP below. Reporting regarding any task not addressed by the corresponding tracking measures or measurable goal response is addressed in italics directly under the task.

7.1.1 Element #1: Illicit Discharge Detection and Elimination

BMP: Implement the Illicit Discharge Detection and Elimination (IDDE) Program

Implementation Tasks:

1. Continue to implement documented illicit discharge detection and elimination procedures (Responsibility: Operations Environmental).
2. Update the illicit discharge detection and elimination procedures by November 1, 2011 per provisions consistent with the MS4 NPDES permit language (Responsibility: Environmental Affairs).
3. Implement a reporting program for potential illicit discharges by maintaining spill notification signs throughout Port property (Responsibility: Operations Environmental, Marine Properties Maintenance, Marine Facilities Maintenance (MFM), and PDX Maintenance).
 - ✓ *Operations staff continues to be trained on spill notification annually. Notification signage is maintained on both Marine and Aviation properties.*

Tracking Measures:

1. Track the status of updating the illicit discharge detection and elimination procedures.
 - ✓ *Previously completed (FY2011).*

2. Track the number, type, location, and resolution of any illicit discharge investigations conducted.

- ✓ *Aviation did not have any reportable illicit discharge investigations in FY2016. (*See summary under BMP: Conduct Dry-Weather Field Screening tracking measures.)*
- ✓ *Marine did not have any reportable illicit discharges investigations in FY2016. (*See summary under BMP: Conduct Dry-Weather Field Screening tracking measures.)*

Measureable Goals:

1. Update the illicit discharge detection and elimination procedures by November 1, 2011.
 - ✓ *Previously completed (FY2011)*

BMP: Conduct Dry-Weather Field Screening

Implementation Tasks:

1. Conduct annual dry-weather field screening activities at all priority outfall locations (Responsibility: Environmental Operations).
2. Annually, as necessary, update Port data files related to outfall locations, in accordance with dry-weather field screening activities (Responsibility: Environmental Operations).
3. Update the dry-weather field screening procedures by June 30, 2012 to be in accordance with MS4 permit requirements (Responsibility: Environmental Affairs).

Tracking Measures:

1. Track the number and location of priority outfalls inspected during dry-weather field screening activities.
 - ✓ *Aviation inspected 13 outfalls.*
 - ✓ *Marine inspected 59 outfalls.*
 - ✓ *The location of Port "Priority Outfalls" for dry-weather field screening is mapped in the Port's GIS system.*
2. Summarize dry-weather field screening inspection results and indicate outfalls requiring sampling or follow up activities.
 - ✓ *Aviation screening was conducted on 008/24/2015.*
 - **Summary:** *Thirteen outfalls were inspected. Outfalls for PDX basins, 4, and 8A displayed visible flow. Both of the outfalls with flow have been investigated in previous years and the source has been determined to be groundwater infiltration and/or landscape irrigation water (both allowable discharges). At both locations the flow was described as a trickle. Each outfall with flow has been previously sampled. Visual observations were similar to those in the past, and no other potential source of the flow could be identified to indicate an illicit discharge. PDX has an extremely high water table; studies performed for the Port have documented significant groundwater infiltration into the Port's stormwater system.*
 - ✓ *Marine screening was conducted on 08/06/2015 and 08/26/2015.*

- **Summary:** *Fifty-nine Port outfalls were inspected. No visible discharges were observed.*
- 3. Indicate the outcome and resolution of inspection activities conducted.
 - ✓ **Aviation:**
 - **Outfall 4:** *A trickle of flow was observed 08/24/2015. The flow did not have any distinguishing characteristics that would indicate it was illicit. Historically groundwater flows have been present during previous dry weather field inspections. Flow attributed to groundwater, no sources were observed during the drainage basin inspection.. In the past, samples were collected and sent to the lab for analysis of ammonia, chlorine, conductivity and temperature and pH were measured in the field. Results indicated that the flow was most likely groundwater.*
 - **Outfall 8A:** *Low flow was noted on 08/24/2015. The flow did not have any distinguishing characteristics that would indicate it was illicit. Historically groundwater flows have been present during previous dry weather field inspections. Flow attributed to groundwater, no sources were observed during drainage basin inspection. In the past, samples were collected and sent to the lab for ammonia, chlorine, conductivity. Temperature and pH were measured in the field. Results indicated that the flow was most likely groundwater.*

Measureable Goals:

1. Update dry-weather field screening procedures, in accordance with permit requirements by July 1, 2012.
 - ✓ *Previously completed (FY2011)*
2. Inspect priority outfalls annually.
 - ✓ *A total of 72 priority outfalls were inspected Port-wide as part of dry-weather field screening activities in 2015-2016.*

BMP: Implement a Spill Response Program for Port Operated Property

Implementation Tasks:

1. Implement the Port's spill response procedure and update as necessary (Responsibility: Environmental Operations).
2. Participate in the City's Spill Response Committee (Responsibility: Environmental Operations).
 - ✓ *Due to retirements at the City of Portland, the Regional Spill Committee has not maintained quarterly meetings in the 2015-2016 fiscal year. The Port will resume participation as soon as the group reconvenes. However, staff continues to participate in the Maritime Fire and Safety Association Oil Spill committee and is a member of Board. Staff participates in the Clean Rivers Cooperative annual drills and as well as with the EPA's Region 10 Regional Response Team.*
3. Ensure trained Port staff members are available for on-call spill response, in addition to ensuring current contracts with on-call spill response contractors (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of spills of a reportable quantity in which a spill response was conducted.
 - ✓ *Four reportable spills were responded to at the Aviation facilities in FY2016.*
 - ✓ *No reportable spills were responded to at the Marine facilities in FY2016.*

Measureable Goals:

1. Implement the Port's Spill response procedures.
 - ✓ *The Port continues to train appropriate employees in order to properly implement effective spill response procedures. Reportable quantity spill cleanup is conducted by on-call contractors trained and equipped to minimize discharges to the environment. Incidental spill response is performed by trained employees.*

BMP: Implement a Water Line Flushing Procedure

Implementation Tasks:

1. Implement a water line flushing procedures to ensure appropriate disposal of chlorinated water (Responsibility: PDX Maintenance, MFM).

Measureable Goals:

1. Implement waterline flushing consistent with guidelines described in the BMP description included in the December 28, 2012 SWMP.
 - ✓ *Marine and Aviation staff are aware of the requirements associated with this type of discharge and implement procedures to comply with the Port's work instruction ("Disposal of Chlorinated Water: Hydrant & Waterline Flushing") on the subject. This work instruction has been posted for operating area reference and is covered in stormwater pollution prevention training.*

7.1.2 Element #2: Industrial and Commercial Facilities

BMP: Screen Existing and New Industrial Facilities

Implementation Tasks:

1. Coordinate with the City of Portland over the permit term to develop a screening process for industrial facilities (Responsibility: Environmental Operations).

Tracking Measures:

1. Track leaseholds that have an individual or industrial stormwater permit.
 - ✓ *The Port maintains a list of tenants who hold individual and general Industrial Stormwater Permits. These include: Yoshida Foods International Limited Partnership, International Container Terminal Services, Inc., Kinder Morgan Bulk Terminal 4, Toyota Logistics Services, Inc. Auto Warehousing Company (for Hyundai), Swan Island Batch Discharge Plant (Rinker), the Oregon Air National Guard, Con Global Industries, Millbank Materials Northwest Cascade Honey Bucket and Solaicx.*

Measureable Goals:

1. Coordinate with the City of Portland on a process for screening industrial facilities over the permit term.

- ✓ *The Port has an IGA with the City which states that the City will cover the screening of Port tenants regarding the need for an industrial permit.*

BMP: Implement an Inspection Program for Significant Pollutant Source Areas

Implementation Tasks:

1. Conduct inspections of Priority Facilities annually, or more frequently if needed (Responsibility: Environmental Operations).
2. If inspections identify conditions needing improvements, coordinate with tenant and Port property manager to ensure appropriate control measures to minimize pollutant loading from priority facilities (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of facilities inspected annually.
 - ✓ *29 inspections of Aviation Priority Facilities were conducted in FY2016.*
 - ✓ *8 inspections of Marine Priority Facilities were conducted in FY2016.*
2. Track improvements made to Priority Facilities as a result of inspections.
 - ✓ *Inspection follow up letters are kept by Environmental Operations documenting any issues that require attention. In FY2016 some of the issues addressed included, maintaining spill and stormwater training documentation, updating Spill Prevention Control and Countermeasures plans, compliance with monthly inspection requirements, improper outdoor material storage, conducting required good housekeeping measures, documentation of catch basin cleaning, labeling hazardous material storage areas, covering a grain handling load out location, removal of spent sand blast material, covering dumpsters, covering battery storage and renewal of a No Exposure Certification.*

Measureable Goals:

1. Conduct Annual Inspections at Priority Facilities.
 - ✓ *Complete for FY2016. (See Tracking Measures response above).*
2. Document the procedure and rationale for selection of “Priority Facilities” by 11/1/2011.
 - ✓ *Previously completed and reported (FY2011).*

7.1.3 Element #3: Construction Site Runoff Control

Construction projects on Port property comply with the MS4 permit’s runoff control requirements through compliance with the NPDES 1200-CA Permit (for Port operations), NPDES 1200-C permits (for tenant projects and some Port projects) as required by DEQ, or the City of Portland’s erosion control ordinance (for smaller tenant projects). In addition, these requirements are incorporated into contracts to the extent construction site operators are performing work for the Port. Therefore, control of construction site runoff is addressed independently from the Port’s SWMP. Coverage for Port operations and tenants is outlined in Table 1.

7.1.4 Element #4: Education and Outreach

BMP: Implement Public Education Measures to Protect Stormwater Quality

Implementation Tasks:

1. During inspections conducted under BMP – “Implement Inspections of Significant Pollutant Source Areas”, and BMP – “Implement a Stormwater System Cleaning and Maintenance Program”, identify catch basins where it would be relevant and appropriate to apply “Dump No Waste, Drains to Stream” decals and apply decals (Responsibility: MFM, PDX Maintenance).
2. Include stormwater education materials at Port sponsored outreach events (Responsibility: Public Affairs).

Tracking Measures:

1. Track the number of “Dump No Waste, Drains to Stream” decals applied to catch basins.
 - ✓ *The Port applied 2 decals in FY2016.*
2. Track events where stormwater educational materials were made available.
 - ✓ *Seaport Celebration (Environmental Programs booth) - August 13, 2016*
 - ✓ *Columbia Slough Regatta – August 7, 2016*
 - ✓ *Explorando with the Columbia Slough Watershed Council- June 11, 2016*

Measureable Goals:

1. “Dump No Waste, Drains to Stream” decals will be applied to catch basins associated with all new Port construction annually (with the exception of FAA restricted areas).
 - ✓ **See the tracking measure response above.*
2. Provide stormwater education materials at outreach events.
 - ✓ *The Port continues to address stormwater issues in a broad variety of outreach events. The details are presented in the tracking measure response above. Moving forward, the Port intends to maintain some outreach to the general public at events. However, our primary focus will be on outreach to industrial/commercial tenants since the Port’s jurisdiction does not include any residential property. Education and outreach materials addressing target pollutants have been developed and posted to the Port’s public website for this target audience.*

BMP: Implement a Tenant Stormwater BMP Program

Implementation Tasks:

1. Maintain an inventory of all tenants or lease holders (Responsibility: Properties Management)
2. Provide technical assistance to the tenants regarding structural and non-structural/ source control stormwater BMPs (Responsibility: Environmental Operations).
3. Maintain an active property management role by conducting inspections of property vacated by tenants to ensure proper disposal of waste materials (Responsibility: Environmental Operations, Aviation and Marine Properties Management).

Tracking Measures:

1. Compile/ update a leasehold inventory annually.
 - ✓ *Marine, Aviation, and Industrial Development Properties groups provide an updated list of leaseholders annually. Tenant information is also updated on its own GIS layer within PortGIS, through a separate process. However, many of these leaseholds do not have any significant exposure to stormwater. Operating area environmental staff are familiar with the circumstances and needs of specific leaseholders. This information is taken into consideration when selecting priority facilities for inspection.*
2. Provide technical information related to structural and non-structural/ source control BMPs to tenants over the permit term.
 - ✓ *In FY2016, this was done during the Port's Priority Facility Inspections. *See issues addressed under BMP: Implement an Inspection Program for Significant Pollutant Source Areas (pg. 20). The Port has developed stormwater BMP education and outreach materials targeting industrial properties. These will be used in conjunction with the industrial inspection program and distributed to a larger group of industrial/commercial entities within the Port's jurisdiction.*

Measureable Goals:

1. Verify the completion and/ or update of a leasehold inventory.
 - ✓ *Completed in FY2016. *See tracking measure response above.*
2. Track technical assistance documentation provided to tenants.
 - ✓ *Technical assistance was provided on all stormwater issues encountered during priority facility inspections. *See a list of issues under BMP: Implement an Inspection Program for Significant Pollutant Source Areas (pg. 20).*
3. Describe property management activities for lease termination inspections.
 - ✓ *Inspections include a number of different areas including stormwater. The stormwater portion is focused on determining if the condition of the vacated property presents a source of potential stormwater contaminants. Any sources are identified and mitigated by the former tenant or by the Port and billed back to the responsible party. This means cessation of activities exposed to stormwater, such as outdoor storage. The stormwater system is surveyed and the tenant is asked to clean the catch basins and storm lines if necessary. Sweeping or clean-up of surface staining can also be requested before a tenant is released from the lease.*

BMP: Require Training and Licensing for Staff Conducting Pest Management Activities

Implementation Tasks:

1. Require all pesticide applicators to obtain and maintain licenses issued by the Oregon Department of Agriculture (ODA) (Responsibility: PDX Maintenance, PDX Landscape, Marine Properties Maintenance, and MFM).

Tracking Measures:

1. Track the Port employees who are ODA-licensed pesticide applicators.
 - ✓ *The following Port employees are ODA-licensed; Tim Cooper, Mark Griffith, Dustin Sandberg, Joe Harris, Luis Guevara, Marco Guevara, Kevin Pack, Ryan Snow, Corrine Fritz, , Shawn Groom, Tim Guymon, Andrew Glass and Michael Sands.*

Measureable Goals:

1. All pesticide applicators will be licensed by the ODA.
 - ✓ *All pesticide applicators working on Port-operated properties are licensed by the ODA. This includes five groups within the Port operating areas who work with these materials (PDX Maintenance, PDX Landscape, Marine Facilities Maintenance (MFM), Marine Property Maintenance/Landscape and Environmental Operations Natural Resources).*

BMP: Provide Erosion Prevention and Sediment Control Training for Construction Inspectors

Implementation Tasks:

1. Provide annual erosion prevention and sediment control training for all Port construction inspectors (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of employees receiving erosion and sediment control training.
 - ✓ *The Port provided a one hour training session to 19 staff members involved in construction inspection activities for Port projects. Staff trained through this process inspects projects regulated under the Port's 1200-CA permit.*

Measureable Goals:

1. Erosion prevention and sediment control training will be conducted annually for Port construction inspectors.
 - ✓ *Completed in FY2016. *See the tracking measure response above.*

BMP: Participate in a Public Education Effectiveness Evaluation

Implementation Tasks:

1. Coordinate with other local, Phase I jurisdictions in providing/ compiling information regarding a public education effectiveness evaluation by November 1, 2014 (Responsibility: Environmental Operations).

Tracking Measures:

1. Track related efforts annually.
 - ✓ *Completed in October 2014. The Port participated in a DEQ approved project with other Phase I jurisdictions to conduct a large scale Public Education Effectiveness Evaluation. The effort was spearheaded by the Association of Clean Water Agencies (ACWA).*

Measureable Goals:

1. Coordinate with other local, Phase I jurisdictions regarding a public education effectiveness evaluation by November 1, 2014.

✓ *Completed in October 2014.*

BMP: Implement a Spill Response Training Program

Implementation Tasks:

1. Distribute updated emergency contact information and spill response procedures to employees responsible for responding to spills (Responsibility: Environmental Operations).
2. Conduct general spill response training annually for designated employees (Responsibility: Environmental Operations).

Tracking Measures:

1. Document spill response training activities.
 - ✓ *Environmental Operations maintains documentation listing operations area personnel receiving annual spill response training. The criteria used to determine which employees receive training are explained under the second measurable goal below.*

Measureable Goals:

1. Annually train designated Port employees on spill response.
 - ✓ *Spill response training was provided for 71 employees at Marine facilities*
 - ✓ *Spill response training was provided for 105 employees at Aviation facilities*
2. Document the procedure to determine which employees will receive spill training by November 1, 2011.
 - ✓ *Previously completed (FY2011).*

BMP: Implement a Staff Training Program for Stormwater Pollution Prevention

Implementation Tasks:

1. Continue to conduct training for new employees during their orientation (Responsibility: Public Affairs).
2. Provide targeted annual stormwater pollution prevention training for specific staff that conducts activities relevant to stormwater (Responsibility: Environmental Operations).
3. Port staff to attend conferences and educational presentations (Responsibility: Environmental Operations).

Tracking Measures:

1. Document all staff training activities.
 - ✓ *Environmental Operations maintains documentation for all annual stormwater training provided to existing employees, as well as the new employee stormwater training provided during orientation. The Port provided stormwater pollution prevention training to 176 existing employees and 78 new employees during FY2016.*
2. Document attendance at conferences.
 - ✓ *Environmental Operations collects documentation of stormwater-related conferences attended by environmental staff. These conferences ensure Port staff is up to speed on relevant implementation, technology, and regulatory issues (examples may include, StormCon, NEBC Industrial Stormwater Conference, CASQA Stormwater Conference, Northwest Environmental Conference, and various stormwater related training courses).*

Measureable Goals:

1. Participate in water quality organizations and stakeholder groups annually.
 - ✓ *The Port continues to participate as a board member of the following organizations, Columbia Slough Watershed Council, Solve, Lower Columbia Estuary, The Intertwine Alliance, and Willamette Partnership. Other participation includes financial sponsorship, membership, volunteer assistance at events, and in-kind services for the following stakeholder groups, Oregon Environmental Council, Oregon Association of Clean Water Agencies, Columbia Riverkeeper, Willamette Riverkeeper, Clackamas River Basin Council, Northwest Steelheaders, PDX Community Advisory Committee and KOIN 6 Water... Do Your Part Clean Water Partners.*
2. Conduct annual training.
 - ✓ *Completed in FY2016. *See the tracking measure response above.*
3. Conduct new employee training.
 - ✓ *Completed in FY2016. *See the tracking measure response above.*

7.1.5 Element #5: Public Involvement and Participation:

BMP: Provide for Public Participation with SWMP and Benchmark Submittals

Implementation Tasks:

1. Provide opportunities for public comment on the SWMP and pollutant load reductions benchmarks for a minimum of 30 days prior to submittal of the permit renewal to DEQ (Responsibility: Environmental Operations and Public Affairs).

Tracking Measures:

1. Report annually on public participation in these areas.
 - ✓ *Port's Stormwater Management Plan and the Pollutant Load Reduction Benchmark Analysis report were updated as part of the MS4 permit renewal application and put on Public notice via the Portland website June 15 through July 15, 2015.*

Measureable Goals:

1. Provide for public participation on the SWMP revisions and pollutant load reduction benchmarks (developed for permit renewal).
 - ✓ *See the tracking measure response above.*
2. Provide public access to the Port's most current MS4 Annual Report via its public website.
 - ✓ *The Port's annual reports are available on-line via a link (on the "Stormwater Management Page" of the Port's public website) to the City of Portland's website <http://www.portlandonline.com/bes/index.cfm?c=50289> and are also posted on the Port's website, <http://www2.portofportland.com/Inside/StormwaterManagement>.*

BMP: Implement a Public Participation Approach that Provides Opportunities for the Public to Effectively Participate in the Implementation of the Stormwater Management Plan

Implementation Tasks:

1. Determine what projects are appropriate for public involvement (Responsibility: Environmental Operations, Public Affairs).
2. Make the public aware of the selected involvement opportunities via the Port's website, and the Columbia Slough Watershed Council (Responsibility: Environmental Operations and Public Affairs).
 - ✓ *In FY2016, the public was made aware of involvement opportunities via communications from the Environmental Outreach Coordinator using the website, email, and the Port's online newsletter, Port Currents.*
3. Implement selected projects and document public involvement (Responsibility: Environmental Operations and Public Affairs).

Tracking Measures:

1. Describe any projects implemented where the public has opportunity to participate and the extent of public involvement for each.
 - ✓ *The following FY2016 events provided the opportunity for the public to participate in implementation of the Port's stormwater program:*

- *Sponsor of 2015 Columbia Slough Regatta (September, 2015),*
- *Sponsored and lead a Port employee volunteer tree planting event at Heron Pointe Wetlands in Fairview, near Port’s Troutdale Reynolds Industrial Park. The event was coordinated in partnership with SOLVE and the City of Fairview to enhance the diversity and function of a wetland adjacent to Fairview Creek. (Nov. 8, 2015)*
- *Sponsored and participated in Friends of Trees community tree plantings to enhance the urban tree canopy: which included the following plantings: I-205 Greenspace Planting (12/12/15) Columbia Children’s Arboretum (1/30/16), Piedmont and Woodlawn neighborhoods (1/30/16), Argay, Parkrose, Parkrose Heights, Russell, and Wilkes neighborhoods (2/27/16), and Concordia and Vernon neighborhoods (3/12/2016). These events resulted in the planting of 838 trees and shrubs. Employees participated as planting volunteers. In addition, the Port funded Friends of Trees planting projects for tree canopy enhancements in areas impacted by airport operations, which included the following community events: Alameda, Hollywood, Irvington, Sullivan’s Gulch, Sabin and Grant Park neighborhoods (3/5/16), Madison South, Rose City Park and Summer Neighborhoods (3/19/16), and Jackson Bottoms Wetland Preserve (3/26/16). These events resulted in the planting of 1,020 trees and shrubs.*
- *Honoring Our Rivers – sponsorship and in-kind support of student anthology of writing and art works focusing on rivers; served as judge for student work.*

Measureable Goals:

1. Document what projects are identified as public involvement opportunities.
 - ✓ *The following have been identified as possibilities for next year:*
 - *The stormwater social marketing campaign kickoff.*

7.1.6 Element #6: Post-Construction Site Runoff Control

BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards

Implementation Tasks:

1. By January 1, 2014, adopt and implement Port-wide post-construction standards for development and redevelopment. Airport specific standards will be consistent with FAA and airport operations requirements (Responsibility: Environmental Operations)
2. By December 2012, update Intergovernmental Agreement (IGA) with the City of Portland to clarify responsibilities, so that one set of post-construction standards are applied to the Port's MS4, avoiding duplication and conflicting requirements (Responsibility: Environmental Affairs).
3. By end of permit term, design and initiate construction on a stormwater capital improvement retrofit to address at least one applicable TMDL pollutant of concern (Responsibility: Environmental Operations).

Tracking Measures:

1. Adopt Port-wide post-construction development/ redevelopment standards by January 1, 2014.
 - ✓ *The Port's Design Standards Manual (DSM) was completed November 2013.*
 - ✓ *The DSM allows for the use of regional structures to treat multiple capital projects.*
 - *The Port's DSM is currently applies to the PDX airfield and certain designated properties surrounding the airfield.*
 - *The Port has developed an accounting system to track the number of acres treated and the total number of acres requiring treatment per calendar year.*
 - *Currently, the Port needs to provide treatment for at least 20.94 acres of impervious surface. Based on current planning estimates of acres of treatment needed, the Port is planning to be in full compliance by 2017. Actual acres of treatment per project are verified as part of close-out and reconciled with the accounting system.*
2. Update IGA with the City of Portland by December 31, 2012.
 - ✓ *Completed by December 2012.*
3. Design and initiate construction on a stormwater retrofit project to address a TMDL pollutant of concern.
 - ✓ *A pavement removal project at Terminal 4 was identified as the Port's required retrofit project and completed in FY2012. It removed 1.24 acres of impervious area, and six catch basins. Thereby, infiltrating an estimated 3.6 acre feet of stormwater annually and reducing potential bacterial loading to the Willamette River.*

Measureable Goals:

1. Document the design, construction, and rationale for the retrofit project addressing a TMDL pollutant of concern.
 - ✓ **See the third tracking measures response.*

7.1.7 Element #7: Pollution Prevention for Municipal Operations

BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program

Implementation Tasks:

1. Sweep the McCarthy Park (Swan Island) parking lot annually (Responsibility: Marine Properties Maintenance).
2. Sweep Port-managed areas of the marine terminals annually. If additional sweeping is needed, Environmental Operations will coordinate with MFM staff (Responsibility: Environmental Operations, MFM).
3. Sweep Airport Way, Frontage Road, and PDX employee parking lots twice per week in winter and once per week in summer (Responsibility: PDX Maintenance).
4. Maintain and repair roadway areas to minimize pollutant impacts to stormwater as needed (Responsibility: MFM, PDX Maintenance).
5. Follow manufacturer's recommendation for application of deicing products (Responsibility: MFM, PDX Maintenance, Marine Properties Maintenance).
 - ✓ *Operating area personnel apply pavement deicing materials per the manufacturer's requirements. Application equipment is calibrated by weight and volume to apply the material at the suggested rate in order to avoid over application.*
6. As necessary, decant street sweeping wastes in covered, water-tight drop boxes (Decant Water Collection Boxes) that drain to an approved sanitary sewer discharge point (Responsibility: PDX Maintenance, MFM).
 - ✓ *Completed for FY2016*

Tracking Measures:

1. Track sweeping frequency at McCarthy Park.
 - ✓ *MFM contracts sweeping for McCarthy Park. Sweeping was conducted twice per month during the summer and spring and was increased once per week in the fall and winter.*
2. Track sweeping frequency at the marine terminals.
 - ✓ *Sweeping was conducted during October 2015 and June 2016 at Terminal 2. Terminal 4 annual sweeping was conducted between August and October, additional sweeping operations for the Kinder Morgan leased area were conducted in August, September, and December of 2015 and in May and June of 2016. The T6 601 yard and Auto West yard were swept twice as part of the regular sweeping schedule, and several other times throughout the year as requested by the Port's tenant ITCSI*
 - ✓ *The Port performed 450 hours of sweeping at the marine terminals.*
3. Track sweeping frequency at Airport Way, Frontage Road, and the PDX employee parking lots.
 - ✓ *PDX Maintenance performs regular sweeping for these areas.*
 - ✓ *The Port performed 4,087 hours of sweeping.*
4. Report the amount of materials removed. Materials will include those collected from catch basins and other structural devices.

- ✓ 238.8 tons of material were removed from catch basins and sweeping combined at Aviation facilities during FY2016. The PDX Basin 6 quiescent and detention pond system was cleaned, resulting in the removal of an additional 536.55 tons of sediment.
- ✓ 57.57 tons of material were removed from catch basins and sweeping combined at Marine facilities during FY2016.

Measureable Goals:

1. Sweep McCarthy Park parking lot annually.
 - ✓ Completed in FY2016. *See tracking measure response above.
2. Sweep Port-managed, accessible areas of the marine terminals annually.
 - ✓ Complete in FY2016. *See tracking measure response above.
3. Sweep Airport Way, Frontage Road, and the PDX employee parking lots a minimum of once per week.
 - ✓ Completed in FY2016. *See tracking measure response above.

BMP: Limit Landscape Maintenance Activities Impact on Stormwater

Implementation Tasks:

1. Apply pesticides and fertilizers, using an Integrated Pest Management approach to minimize impacts to stormwater (Responsibility: Marine Properties Maintenance, MFM, PDX Maintenance and Landscape).

- ✓ *Marine Properties Maintenance staff is responsible for the landscaping and maintenance of the Port's industrial parks, marine terminals, and mitigation sites. Staff continued to implement the IPM and Work Schedules Program for Port-owned mitigation sites. This program identifies problem plant species at each site, provides a profile for each species, recommends control methods, and outlines monitoring protocol and schedules.*

Environmental Operations provides Port maintenance staff and Port-contracted workers with the Vegetation Management Plan. The plan gives information on the appropriate herbicides and use of those herbicides to control particular invasive plant species, and it identifies the locations where specific herbicides can be applied.

MFM conducts weed control activities at marine parking areas, rail yards, and specific vegetated areas at Marine Terminals 2, 4, and 6 on an as-needed basis.

PDX Landscape staff, responsible for landscaping at PDX facilities, continues to implement BMPs aimed at improving stormwater quality at the airport. Some of the issues they focused on included testing pesticide alternatives recommended by the Oregon Department of Agriculture, reducing the concentration of pesticides/herbicides/fertilizers applied where possible, and incorporating native plants into the landscaping to reduce water and chemical requirements.

PDX Maintenance staff applies pesticides on the airfield to comply with FAA requirements. They continue to look for ways to reduce chemical usage where possible by working with different pesticide combinations to achieve required conditions.

2. Review the Port's program to control pesticides, herbicides and fertilizers annually, and update as appropriate (Responsibility: Environmental Operations, Marine Properties Maintenance, MFM, PDX Maintenance, PDX Landscape).
 - ✓ *The Port groups applying pesticides documented new approaches for consideration during FY2016. Some of the issues include: Making pesticides more effective by checking pH, and preventing crabgrass growth as a means to apply less chemical on emergent crabgrass.*
3. Maintain an inventory of pesticides used on Port property and update annually (Responsibility: Environmental Operations, Marine Properties Maintenance, MFM, PDX Maintenance, PDX Landscape).

Tracking Measures:

1. Document the annual pesticide use update.
 - ✓ *The amounts of each pesticide/herbicide/fertilizer used are presented below for each of the groups listed above.*

Table 3 Pesticide/Herbicide/Fertilizer Use

<i>PDX Landscape Maintenance</i>	
Atrimmec Growth Regulator	13 gal
T Zone, Turf Weed	1.5 gal
Dimension 2EW	18 gal
Lontrel	6 oz.
Prosedge	0.8 oz.
Triclopir 3A	8.5 gal
Simazine Pre M	14 gal
Gallery DF Pre	45 lbs.
Q4 Herbicide	29 oz.
<i>PDX General Maintenance</i>	
Alligare	468 lbs.
Direx 4L	160 gal
Crossroads	18.75 gal
Ranger Pro	39 gal
ZP Oats (Vole bait)	7,800 lbs.
<i>Undeveloped Properties</i>	
Element 3A	627.8 oz.
Roundup Custom Pro	2841.76 oz.
Rodeo	272 oz.
Transline	38 oz.
Garlon 3A	1957.4 oz.

<i>Marine Property Landscape Maintenance</i>	
Ranger Pro	4502 oz.
AquaStar	521 oz.
TriChlophr 3/A	3385 oz.
Surflan Pro	583.5 oz.
Square One	2.25 oz.
Spectical	230 oz.
Power Zone	12 oz.
Sulfomet	24 oz.
Q-4	75 oz.
Dimension 270 G	128 oz.
Gallery	48 oz.
<i>Marine Facility Maintenance</i>	
Agri Star Triclopyr 3A	55 gal
Ranger Pro	52 gal
SFM 75	171 oz.
Sulfomet	30 oz.
LI-700 Surfactant	18.5 gal

Measureable Goals:

1. Annually update the Port's pesticide use inventory.

✓ *Completed for FY2016. *See list above.*

BMP: Require Training and Licensing for Staff Conducting Pest Management Activities (partial applicability)

*See section 7.1.4 for information on implementation of this BMP.

BMP: Implement a Tenant BMP Program (partial applicability)

* See section 7.1.4 for information on implementation of this BMP.

BMP: Implement a Program to Limit Infiltration from Port-Owned Sanitary Sewer System into the MS4

Implementation Tasks:

1. Monitor pump stations electronically to ensure proper function of Aviation pump stations (Responsibility: PDX Maintenance).
✓ *MFM staff documented weekly inspections for FY2016. The MFM plumber and electricians contribute to meeting this requirement.*
2. Monitor pump stations through weekly inspections and audible/visual alarms to ensure proper function of Marine pump stations (Responsibility: MFM).
✓ *Work orders were generated to ensure the completion of this work at PDX and Marine operated sanitary lift stations.*
3. Conduct annual pump station maintenance, including flushing, float and alarm testing, and debris removal for all pump stations (Responsibility: PDX Maintenance, MFM).
✓ *PDX maintains two large grease interceptor vaults as a back-up to grease traps maintained by PDX concessions tenants under the FOG program. Documentation of this maintenance is provided to Environmental Operations.*
4. Clean Port-owned grease interceptor vaults at PDX on an annual basis (Responsibility: Aviation Facilities Maintenance).
✓ *PDX maintains two large grease interceptor vaults as a back-up to grease traps maintained by PDX concessions tenants under the FOG program. Documentation of this maintenance is provided to Environmental Operations.*
5. Continue to implement the tenant FOG (fats/oils/grease) program to ensure proper handling of these materials at PDX (Responsibility: PDX Business/Properties).

Tracking Measures:

1. Maintain a list of Port tenants implementing the FOG program.
✓ *Environmental Operations maintains a list of tenants who are inspected as part of the effort to prevent fats, oil, and grease from clogging sanitary sewer lines. These are primarily concessions tenants located in the terminal. This relates to stormwater, as it prevents overflow in obstructed sanitary lines from entering the storm system.*

Measureable Goals:

1. Document completion of implementation tasks (2-4) associated with this BMP (with PDX Maintenance, Aviation Facilities Maintenance, MFM, and PDX Business/Properties)
 - ✓ *Completed for FY2016. Environmental Operations maintains documentation for the lift station inspections/maintenance, grease vault cleaning and grease trap inspections (FOG program).*

***BMP: Implement a Stormwater System Cleaning and Maintenance Program
(partial applicability)***

- * See section 7.1.8 for information on implementation of this BMP.

7.1.8 Element #8: Structural Stormwater Controls Operations and Maintenance

BMP: Implement a Stormwater System Cleaning and Maintenance Program

Implementation Tasks:

1. Continue to implement a stormwater system feature inspection and maintenance program (Responsibility: Environmental Operations, MFM, Marine Properties Maintenance).
2. Inspect and clean catch basins (as necessary) annually in Port-managed Marine Business Line areas (Responsibility: MFM).
3. Conduct litter pickup and vegetation management activities to ensure adequate access and performance of all stormwater system features as needed (Responsibility: MFM, Marine Properties Maintenance).
 - ✓ *Marine Properties Maintenance staff maintained landscaped areas within the industrial parks at Swan Island and Rivergate and at the marine terminals. Crews removed and disposed of vegetative debris, scrap metal, and garbage. They also cleared vegetation around stormwater outfalls and associated stormwater conveyance system infrastructure on Port-owned industrial park properties to provide better access for inspections and illicit discharge monitoring.*
4. Coordinate updates of storm sewer system maps to include updated stormwater conveyance system features and Port-owned and operated structural controls (Responsibility: Environmental Operations and Engineering).
5. By June 30, 2012, review and update the existing inspection and maintenance procedures for structural stormwater controls, in accordance with requirements outlined in the Port's MS4 NPDES permit (Responsibility: Environmental Operations and Maintenance)
 - ✓ *Previously completed (FY2011)*
6. As necessary, decant storm system and catch basin cleaning wastes in covered, water-tight drop boxes (Decant Water Collection Boxes) that drain to an approved sanitary sewer discharge point (Responsibility: MFM, PDX Maintenance).
 - ✓ *Completed for FY2016.*

Tracking Measures:

1. Track number of catch basins cleaned annually.
 - ✓ *941 catch basins and manholes were cleaned at Aviation facilities in FY2016.*
 - ✓ *49 catch basins were cleaned at Marine facilities in FY2016.*
2. Track cleaning frequency for the Port owned and operated structural stormwater controls by facility type.
 - ✓ *Marine-operated water quality treatment facilities are inspected at least on a quarterly basis and cleaned as needed to maintain proper operation. Catch basins in Marine-operated areas are scheduled to be inspected and cleaned (if necessary) on an annual basis.*
 - ✓ *Aviation-owned water quality treatment facilities (with the exception of quiescent ponds) are cleaned on an annual basis. The ponds are cleaned on a rotating basis. The drainage basin 6 quiescent and detention ponds were cleaned in FY2016, resulting in the removal of 536.55 tons of material.*

- ✓ *PDX has over 3,000 catch basins. PDX Maintenance inspects and cleans those associated with industrial activity on an annual basis. Many of these facilities also have catch basin inserts that are inspected and changed as needed on a monthly basis. The balance of PDX catch basins are cleaned on a 4-year rotating basis. If necessary, catch basins are moved to a more frequent cleaning schedule or fitted with an insert based on field observations.*
3. Track storm sewer system pipe cleaning activities annually.
 - ✓ *12,062 feet of storm line were cleaned at Aviation facilities during FY2016.*
 - ✓ *200 feet of storm line were cleaned at Marine facilities FY2016.*
 4. Track updates to the stormwater system features maps.
 - ✓ *All Port storm system maps are available to operations and administrative personnel through the PortGIS interphase located on Navigator (the Port's intranet). The PortGIS system is continuously updated.*
 5. Report amount of materials removed. Materials will include those collected from catch basin cleaning and street sweeping.
 - ✓ **See BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program.*

Measureable Goals:

1. Inspect and clean all catch basins within the Port-managed areas not otherwise covered by a 1200-series industrial stormwater permit annually.
 - ✓ *PDX completed this work based on their schedule (listed above under tracking measure for this BMP).*
 - ✓ *MFM completed this work in FY2016.*
2. Inspect and maintain all Port-owned and operated structural controls within the Port-managed areas not otherwise covered by a 1200-series industrial stormwater permit annually.
 - ✓ *Completed in FY2016. (See the Tracking Measure response above).*

BMP: Implement a Program for the Tracking and Maintenance of Private Structural Controls

Implementation Tasks:

1. Work with the City of Portland to establish and maintain an inventory of existing private structural control facilities on tenant properties by December 31, 2012 (Responsibility: MID Properties Management, and Environmental Operations).
2. Develop a program in conjunction with the City of Portland to track private structural control facilities on tenant properties over the permit term (Responsibility: Environmental Operations).
3. By June 30, 2012, develop an updated inspection and maintenance procedure for structural stormwater controls for distribution to owners of private structural control facilities (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of existing and new private structural control facilities installed on Port-properties.
 - ✓ *The Port coordinated with the City of Portland to develop a complete list of water quality treatment facilities on Port property that includes tenant operated facilities.*

Measureable Goals:

1. Develop an inventory and mechanism for tracking of private structural controls on tenant properties.
 - ✓ *The Port's IGA with the City of Portland (completed in December 2012) addresses the tracking requirements. The City will cover all water quality treatment facility maintenance tracking for Port tenants outside of the PDX security fence through its Maintenance Inspection Program. The Port will track all remaining facilities on Port property.*

BMP: Implement a Tenant BMP Program (partial applicability)

- * See section 7.1.4 for information on implementation of this BMP.

8.0 ADAPTIVE MANAGEMENT PROCESS IMPLEMENTATION AND PROPOSED SWMP CHANGES

As it has, since permit year one, the Port continues to use adaptive management to modify and improve BMPs and to implement practices that reduce pollutant loading to the maximum extent practicable. This process involves direct coordination with operating area personnel who provide suggested BMP modifications.

In permit year 21, an adaptive management process was used to ensure all ideas are heard, documented, and implemented, if viable. PDX MX has continued to refine data collection for cleaning and documenting maintenance of the storm sewer system. For example more data is being collected for the condition of catch basins, status of stormwater decals and updates needed to the catch basin numbering system.

The Port is not seeking SWMP revisions at this time.

Section III
MONITORING REPORT

City of Portland, Oregon
National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101314

MONITORING REPORT

Fiscal Year 2015-2016
(July 1, 2015 – June 30, 2016)

Prepared for:
Oregon Department of Environmental Quality

Submitted by:
City of Portland

Submitted on:
November 1, 2016

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1 Introduction

1.1 PURPOSE

The purpose of this annual *Monitoring Report* is to comply with Schedule B of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit Number 101314. Schedule B of the MS4 permit (Table B-1) summarizes the required monitoring types, locations, frequency and parameters. This report summarizes monitoring activities conducted by the City of Portland (the City) during fiscal year (FY) 2015-16 in accordance with Schedule B and discusses pertinent results.

The City's sampling activities and results are summarized in Section 2 of this report and Section 3 provides a discussion of the results by watershed. The monitoring data is provided in Appendix A along with a map and tables of the associated monitoring site locations.

1.2 HISTORY

Oregon's Department of Environmental Quality (DEQ) issued Portland's current (third-term) MS4 permit on January 31, 2011. The permit expired on January 30, 2016 and has been administratively extended by the DEQ. The monitoring requirements in the permit became effective on July 1, 2011, when the DEQ gave conditional approval to the City's *MS4 Quality Assurance Monitoring Plan* (QAMP), which was submitted to DEQ on June 1, 2011 and later revised on January 29, 2013. The QAMP describes the sampling and analysis program for the collection of stormwater and surface water or "instream" water quality and biological samples.

The City fulfilled the permit-required pesticide monitoring in FY 2013-14 in accordance with the *Pesticide Monitoring Plan* that was submitted to DEQ on June 28, 2012. The City also concluded the mercury monitoring in FY 2013-14 and received approval from the DEQ on January 30, 2014 to eliminate mercury monitoring for the remainder of the permit term, per Condition 5 in Table B-1 (Environmental Monitoring) of the MS4 permit.

The City evaluated the monitoring program during the 2015 MS4 permit application renewal process and identified several adaptive management changes and new monitoring opportunities to be implemented in FY 2016-17. An updated Monitoring Plan describing these changes was submitted to the DEQ in accordance with Schedule B.2.e of the MS4 permit on June 13, 2016. The updated Monitoring Plan was initiated on July 1, 2016 and it effectively replaces the City's 2013 QAMP.

This *Monitoring Report* provides details on FY 2015-16 monitoring activities that were conducted in accordance with the requirements of Schedule B of the 2011 MS4 permit and as outlined in the 2013 QAMP. The City met its monitoring requirements for the permit term as documented in this and previous annual compliance reports. Future reports will be submitted in accordance with the administratively extended MS4 permit and the 2016 Monitoring Plan, which is posted online.

Monitoring Plan: <https://www.portlandoregon.gov/bes/article/387705>

1.3 REQUIREMENTS

Schedule B.1.a of the City's MS4 permit specifies minimum monitoring and reporting requirements. It lists the following six objectives that the monitoring program must incorporate:

- i. Evaluate the source(s) of the 2004/2006 303(d) listed pollutants applicable to the co-permittees' permit area;
- ii. Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;
- iii. Characterize stormwater based on land use type, seasonality, geography or other catchment characteristics;
- iv. Evaluate status and long-term trends in receiving waters associated with MS4 stormwater discharges;
- v. Assess the chemical, biological, and physical effects of MS4 stormwater discharges on receiving waters; and,
- vi. Assess progress towards meeting [Total Maximum Daily Load] TMDL pollutant load reduction benchmarks.

Schedule B of the MS4 permit provides additional details on the required monitoring types, locations, frequency and parameters and the City's Monitoring Plan describes how our monitoring program elements address these objectives and permit requirements.

1.4 MONITORING APPROACH

The City conducts sampling and analysis of stormwater, instream and biological (macroinvertebrate) parameters to fulfill MS4 permit requirements. The monitoring also supports and informs the City's actions in meeting Total Maximum Daily Load (TMDL) objectives related to receiving water health. The City's general approach to monitoring is outlined below. More detailed information on the monitoring strategy is described in the 2013 QAMP and the updated 2016 Monitoring Plan.

1.4.1 Stormwater

Stormwater monitoring refers to the collection of samples of stormwater runoff discharging from defined points in the stormwater system during rainfall events. Stormwater monitoring contributes to all monitoring objectives identified in Schedule B.1 of the MS4 permit. It also adds to a growing body of information that allows us to better understand the drivers of stormwater pollutant concentrations.

The City is required to collect samples of stormwater runoff for both WPCF permit compliance (for runoff to UICs) and for NPDES MS4 permit compliance. To maximize the use of monitoring resources, the stormwater sampling for this NPDES MS4 program is conducted at sites that drain to the City's Underground Injection Control (UIC) network.¹ Our probabilistic stormwater sampling approach contributes to a highly robust and statistically valid data set. It also targets smaller drainage areas, which limits the number of variables considered when evaluating factors that influence stormwater

¹ In FY 2016-17, the City will resume stormwater monitoring at four MS4 land-use sites that were historically monitored between 1991 and 2011. This update to the monitoring program is further discussed in the 2016 Monitoring Plan.

quality. For sampling purposes, potential stormwater runoff monitoring locations within the UIC network are organized into rotating panels of between 10 and 15 locations each. Select rotating panels are sampled each year.

1.4.2 Instream

Instream monitoring refers to the collection of water quality samples from streams that receive MS4 discharges. Instream monitoring contributes to monitoring objectives ii, iv, v, and vi identified in Schedule B.1 of the MS4 permit. Instream monitoring is critical for evaluating long-term trends in receiving waters and to assess the potential effects of MS4 discharges on receiving waters.

Portland has five primary watershed drainages. These watersheds represent individual stream systems that differ significantly in morphology, stressors, land-use related pollutant sources and management. As such, the City has employed several different strategies to instream monitoring. Comprehensive ambient monitoring of fixed locations has been conducted since the early- to mid-1990s.² Eleven fixed sites are targeted during both dry and wet-weather conditions for key water quality parameters.

The City also uses a probabilistic approach, instituted in 2010, to ensure data collection is consistent with nationwide watershed monitoring efforts and that results can be compared to and combined with regional and national watershed health assessments.³ This probabilistic monitoring effort is referred to as the Portland Area Watershed Monitoring and Assessment Program (PAWMAP) and it includes a wide range of chemical, physical and biological parameters. Rotating panels of 20 perennial locations are targeted for monitoring each year.⁴ There are four panels total and each individual panel is re-sampled every fifth year. Macroinvertebrates are sampled as part of the PAWMAP effort.

Macroinvertebrate monitoring refers to the annual collection of benthic macroinvertebrates in late summer from the same rotating sampling locations where instream monitoring occurs. Macroinvertebrate monitoring addresses objectives ii, iv, v and vi in Schedule B.1 of the MS4 permit. It is intended to track the status and trends of biological communities within water bodies that receive MS4 discharges. It is designed to evaluate whether and to what degree the biological conditions of streams are changing.

Instream conditions are further evaluated using data collected from select stream gages. Continuous instream monitoring refers to ongoing physical stream readings at fixed locations within streams that receive MS4 discharges. It generally consists of temperature measurements and flow readings at specific cross-sections of the stream monitoring location. The U.S. Geological Survey (USGS) operates these stream gages and the City provides partial funding for the effort. This continuous instream monitoring addresses Schedule B.1 monitoring objectives i, ii, iii, iv, v and vi.

² Results from the City's fixed site instream monitoring have been used by the DEQ to establish TMDLs in the Columbia Slough, Johnson Creek, Willamette River, Fanno Creek and Tryon Creek.

³ The probabilistic monitoring approach is based on the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program (see epa.gov/emap for more information).

⁴ The City also targets 12 intermittent sites, which are not evaluated as part of this report. These streams are small and flow is ephemeral depending on seasonal conditions. Metrics for intermittent streams have not been developed.

1.5 DATA EVALUATION METHODOLOGY

An Oregon ACWA stormwater monitoring subcommittee was formed in 2004 to identify and present recommendations on future monitoring and data evaluation methodologies for MS4 permittees. The effort was initiated to inform the permit renewal process at the time and Stormwater Management Plan (SWMP) updates. The subcommittee proposed the inclusion of receiving stream monitoring in the MS4 permits, suggesting that those data were more useful for evaluating instream and watershed trends than stormwater data. In 2007, a trend-analysis subcommittee was formed to discuss viable and consistent methods for long-term trend analysis using the instream data that was being collected. One recommendation to emerge from that effort was that data evaluation should consist of the key analytes copper, zinc, E.coli, total phosphorus and total suspended solids (TSS) for trend analysis purposes. The data evaluation presented in this report addresses those key pollutants.⁵

The criteria for total copper and dissolved zinc are calculated based on hardness using the method established by DEQ rulemaking in Oregon Administrative Rules OAR 340-041-3033(3) and OAR 340-041-8033, Table 30, Endnotes E and F, effective on 8/4/2015. For purposes in this report, criteria for fixed instream sites were calculated for individual samples based on their specific hardness results. Criteria for probabilistic instream sites were based on the average hardness of all FY samples within each watershed.

1.5.1 Comparison Criteria

The criteria used in comparison with results are given in the table below.⁶ Selecting appropriate comparison criteria can be problematic for a number of reasons. Instream water quality data from the local region are best compared with Oregon Water Quality Standards⁷, but some pollutants do not have an associated criterion/standard. Other instream pollutants have variable water quality criteria that are dependent on additional analytes.

MS4 permits do not contain numeric limits for pollutants but instead are based on controlling pollution to the “maximum extent practicable” per federal regulations. For the purposes of this report, we used stormwater comparison criteria from the state industrial stormwater permits to provide a general guide for evaluating the data, although the comparison is highly incongruent. First, the stormwater data presented in this report represents discharges to UICs, not receiving waters and, therefore, its value lies primarily in characterizing runoff from the associated land-use within the drainage area, in this case, rights-of-way. Second, industrial stormwater benchmarks were developed to regulate runoff from *industrial* sites, known to have elevated levels of pollutants due to manufacturing processes, etc. that are exposed to rainfall. That land-use characteristic is not consistent with MS4 or UIC drainage areas.

⁵ Total copper and dissolved zinc are used for instream sample result analysis in this report for consistency with and comparison to Oregon DEQ water quality criteria.

⁶ The Oregon DEQ is expected to promulgate revised copper criteria in January 2017 that are based on use of the Biotic Ligand Model (BLM) to predict the critical threshold, or instantaneous water quality criteria (IWQC) for toxicity in fish. Oregon’s current criteria for metals, including copper, are based on water hardness. EPA’s recommendations for copper derive site-specific criteria using the BLM. This model requires inclusion of 11 different water quality parameters that affect the bioavailability and toxicity of copper in freshwaters. Many studies show that this model is a better predictor of copper toxicity than water hardness alone. In anticipation of this shift in the copper criteria calculation, the City has begun to collect the additional water quality parameters necessary for implementation of the BLM in the future.

⁷ Oregon Water Quality Standards: <http://www.deq.state.or.us/wq/standards/toxics.htm>

For macroinvertebrate data, the O/E Ratio is one of a number of options that can be used to summarize and compare results. The O/E Ratio is an expression of the *observed* macroinvertebrate communities (O) within a sample over modeled *expected* macroinvertebrate communities (E) based on reference conditions. Scores or ratios below 0.85 are considered to represent the “most impacted” conditions. Scores above 0.91 are “least impacted” and scores between 0.85 and 0.91 are “minimally impacted”.

The table below presents comparison criteria and associated reference sources that were used to evaluate the stormwater and instream monitoring data.

Comparison Criteria Used in Data Evaluation					
		Instream		Stormwater	
Parameter	Units	Criteria Value	Reference Source	Criteria Value	Reference Source ³
Copper (total)	µg/L	Varies with hardness	OR Water Quality Criteria ¹	20	1200-Z benchmark
Zinc (dissolved)	µg/L	Varies with hardness	OR Water Quality Criteria ¹	none ⁴	1200-Z benchmark
<i>E.coli</i>	mpn/100mL	406	OR Water Quality Criteria ²	406	1200-COLS benchmark
Phosphorus (total)	mg/L	0.16	Columbia Slough TMDL, summer median (Apr-Oct)	0.16	1200-COLS benchmark
Total Suspended Solids	mg/L	none	N.A.	50 ⁵	1200-COLS benchmark
Notes					
<ol style="list-style-type: none"> 1. Aquatic life criteria, criterion maximum concentration (OAR 340-041-8033) 2. Single sample maximum (OAR 340-041-0009) 3. General NPDES Industrial Stormwater Permit 4. There is no criterion for <i>dissolved</i> zinc. The criterion for <i>total</i> zinc is 120 µg/L. 5. The more stringent 1200-COLS benchmark was used in favor of the statewide (1200-Z) benchmark of 100 mg/L. 					

2 Results

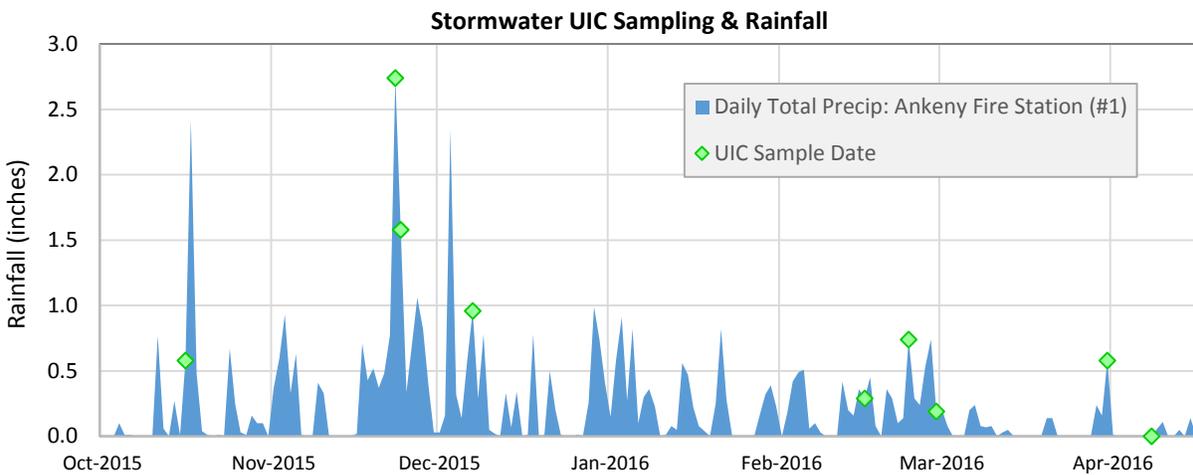
This section presents an evaluation of sampling activities and select data from the City’s instream and stormwater monitoring efforts during FY 2015-16. The City completed all permit-required monitoring during the year. The instream results are grouped and presented by watershed.

2.1 STORMWATER

2.1.1 Sampling Activities

Three UIC panels with 15 locations each were targeted for sampling in FY 2015-16. A total of 45 samples were collected (one at each of the 45 locations) during storm events. Two of the originally targeted sites were determined to be unsuitable for sampling, so alternates were used. A table listing the stormwater sampling locations is included in Appendix A.

All samples were collected on days with greater than 0.1 inches of rain. The figure below shows the stormwater UIC sampling events and the daily total rainfall.⁸ Rainfall data are obtained from the City’s HYDRA Rainfall Network of gages.⁹



⁸ UIC sample locations are spread throughout various areas of the City, which receive different amounts of rainfall at different times. For illustrative purposes, a centralized rain gauge (Ankeny Fire Station at 55 SW Ash St) is used in the figure, but it does not represent the exact rainfall conditions at every individual sample site. For example, the last sample in the chart appears to show zero rainfall for that event, but the gage closest to that sample location listed the total precipitation at 0.44” on that day. Chart to be updated with airport rain gage (Brian), then update footnote.

⁹ City of Portland HYDRA Rainfall Network: <http://or.water.usgs.gov/precip/>

2.1.2 Data Summary

The table below presents a statistical summary of the City’s FY 2015-16 stormwater sampling results.

Stormwater Monitoring – Summary Statistics of Select Parameters							
Traffic ¹	Parameter	n	Mean	Geomean	Min	Max	90 th Percentile
<1000	Copper (total), µg/L	26	5.28	3.96	1.32	19.8	11.795
<1000	E.coli, mpn/100mL	26	2895.77	341.01	< 10	> 24000	10850
<1000	Phosphorus (total), mg/L	26	0.11	0.096	0.032	0.295	0.186
<1000	Total Suspended Solids, mg/L	26	22.69	15.53	3	104	45
<1000	Zinc (dissolved), µg/L	26	11.66	8.82	2.14	39.1	21.35
>1000	Copper (total), µg/L	19	15.60	11.41	3.25	58.2	26.62
>1000	E.coli, mpn/100mL	19	1624.36	365.25	10	9200	8000
>1000	Phosphorus (total), mg/L	19	0.25	0.19	0.046	1.13	0.405
>1000	Total Suspended Solids, mg/L	19	79	39.80	12	701	114.4
>1000	Zinc (dissolved), µg/L	19	22.24	17.15	5.96	65	42.32

1. Traffic is expressed as Average Daily Vehicle Trips

2.1.3 Evaluation

The geometric mean (geomean) of the stormwater results were below criteria for all pollutants evaluated, with one exception. The geomean for total phosphorus was 0.19 mg/L, which is above the criterion of 0.16 mg/L. The table below presents the criteria comparisons by high and low traffic patterns.

Stormwater Results – Criteria Comparison				
	Copper (total) µg/L	E.coli mpn/100mL	Phosphorus (total) mg/L	Total Suspended Solids mg/L
Total exceedances (n)	4	19	18	8
Criteria met (%)	91%	58%	60%	82%
By Traffic Category				
n < 1000 ADT (low)	0	11	4	3
Criteria met (%)	100%	58%	85%	82%
n > 1000 ADT (high)	4	8	14	5
Criteria met (%)	79%	58%	26%	74%

ADT = Average Daily Vehicle Trips
n = number of samples with results above the criteria (45 total samples collected, 26 in low ADT areas and 19 in high ADT areas)

Total copper and total suspended solids were generally below criteria and within acceptable levels, with the exception of a few sites that are in higher traffic areas. E.coli and total phosphorus had a higher number of results above the criteria with 42% and 40% of the total number of samples, respectively, above criteria. However, the percentages of results above criteria for E.coli, total phosphorus and TSS were lower than the FY 2014-15 results for those parameters.

There was a difference in results between higher traffic roads and lower traffic roads for most parameters with the exception of E.coli, which had an equal percentage of results above criteria between both traffic categories. Sites serving higher traffic roadways had more TSS, total phosphorus and copper results that were above criteria.

One sample collected on April 14, 2016 from SP4_10 (UIC Node No. ADW349) had elevated concentrations of copper (58.2 µg/L), total phosphorus (1.13 mg/L), TSS (701 mg/L) and total zinc (387 µg/L). This sample location is in close proximity to a large sand and gravel facility, which possibly has a heavy amount of sediment drag-out from industrial traffic onto the roadway. The issue will be further evaluated by environmental compliance staff for response.

2.2 INSTREAM FLOW & TEMPERATURE

The continuous instream data presented in this section are collected at fixed locations within streams that receive MS4 discharges. The information provides helpful context for the macroinvertebrate and water quality results that are presented in later sections.

2.2.1 Sampling Activities

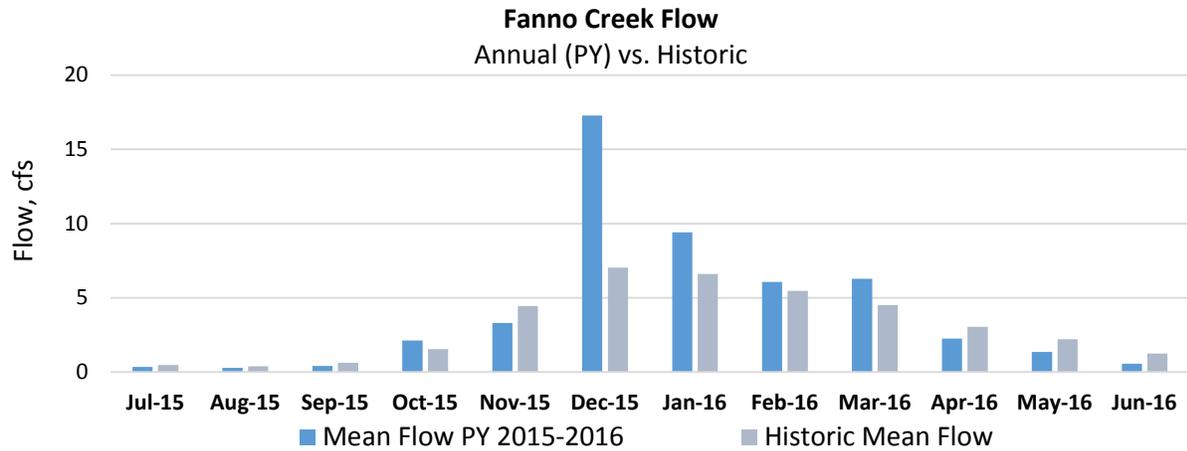
The physical stream measurements are taken at USGS-operated stream gages. The data and gage locations are available online at <http://waterdata.usgs.gov/or/nwis/rt> and select local data are summarized below.

2.2.2 Data Summary

The tables and figures below present a summary of stream flow and temperatures from Fanno Creek, Johnson Creek and the Willamette River. Data from other local gages are also available, but these three present a good overall representative picture of the conditions in Portland’s ecologically varied streams.

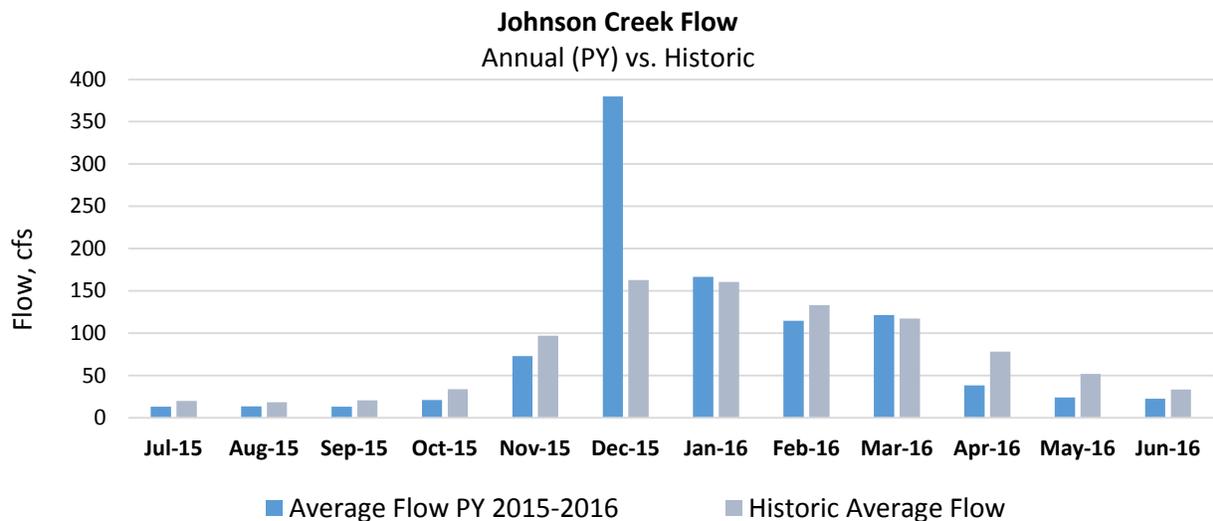
Fanno Creek – Summary of Flow Data						
Month	Average Flow	Historic Average Flow	High Flow	Historic Average High	Low Flow	Historic Average Low
Jul-15	0.3	0.5	1.7	2.8	0.04	0.2
Aug-15	0.3	0.4	5.0	3.0	0.01	0.2
Sep-15	0.4	0.6	3.1	6.3	0.09	0.1
Oct-15	2.1	1.5	30.0	13.0	0.12	0.2
Nov-15	3.3	4.4	14.0	34.4	0.63	0.5
Dec-15	17.3	7.0	80.0	42.8	2.70	1.2
Jan-16	9.4	6.6	25.0	37.6	1.70	1.5
Feb-16	6.1	5.5	16.0	30.6	2.90	1.4
Mar-16	6.3	4.5	21.0	22.0	1.20	1.3
Apr-16	2.3	3.0	10.0	13.2	0.86	1.1
May-16	1.4	2.2	8.9	12.3	0.32	0.7
Jun-16	0.6	1.2	4.3	8.1	0.06	0.4

USGS Gage #14206900 – Fanno Creek at 56th Avenue
 All data are expressed in cubic feet per second (cfs)
 Historic data from 1991 – 2015



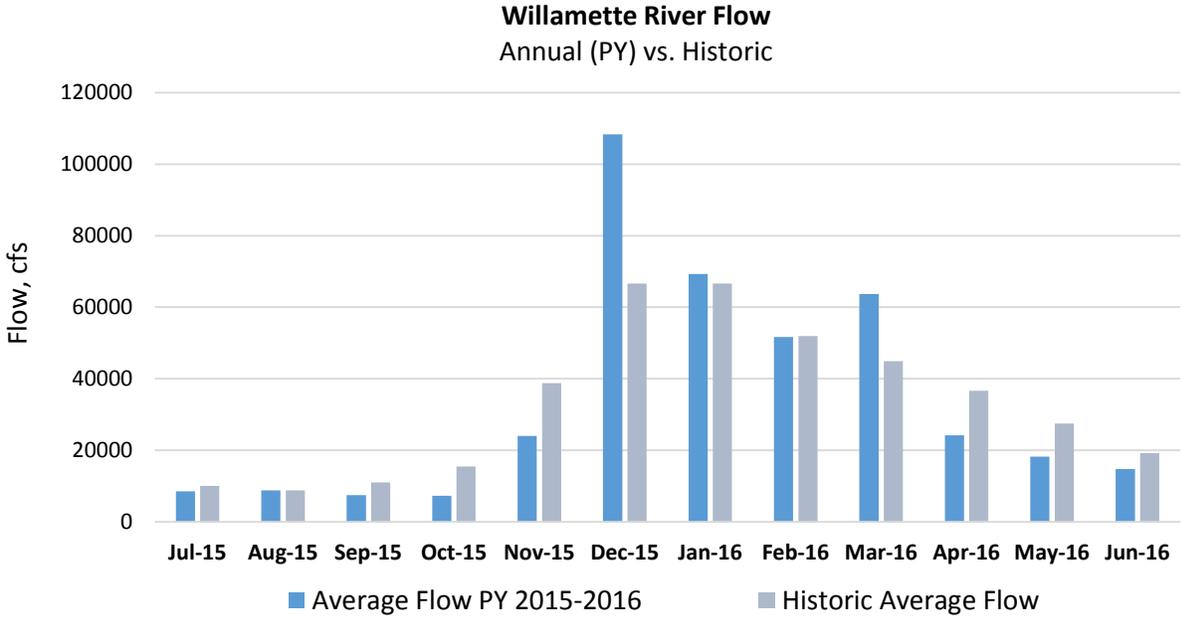
Johnson Creek – Summary of Flow Data						
Month	Average Flow	Historic Average Flow	High Flow	Historic Average High	Low Flow	Historic Average Low
Jul-15	13	20	21	37	12	11
Aug-15	14	19	43	32	12	11
Sep-15	13	21	20	40	12	13
Oct-15	21	34	157	73	12	15
Nov-15	73	97	241	244	22	19
Dec-15	380	163	1410	411	33	66
Jan-16	167	161	416	305	40	43
Feb-16	115	133	324	386	57	34
Mar-16	121	117	372	240	39	44
Apr-16	38	78	114	152	23	26
May-16	24	52	48	111	18	20
Jun-16	23	33	51	106	17	16

USGS Gage #14211550 – Johnson Creek at Milwaukie
 All data are expressed in cubic feet per second (cfs)
 Historic data from 1989 – 2016



Willamette River – Summary of Flow Data						
Month	Average Flow	Historic Average Flow	High Flow	Historic Average High Flow	Low Flow	Historic Average Low
Jul-15	8513	10007	10000	15950	5500	6541
Aug-15	8746	8730	12000	11850	7120	6136
Sep-15	7431	11017	10200	17350	5900	7431
Oct-15	7288	15430	17200	28860	4930	7288
Nov-15	24013	38754	53500	98410	10500	10300
Dec-15	108394	66641	162000	155600	17200	8894
Jan-16	69313	66641	115000	149900	27100	8795
Feb-16	51693	51979	84200	149500	32700	8050
Mar-16	63706	44883	100000	80630	37900	17980
Apr-16	24207	36658	35400	73330	20600	17630
May-16	18239	27498	21400	46730	15500	11150
Jun-16	14717	19226	17900	49430	12300	7125

USGS Gage # 14211720 - Willamette River at Portland, OR
 All data are expressed in cubic feet per second (cfs)
 Historic data from 1972 - 2016

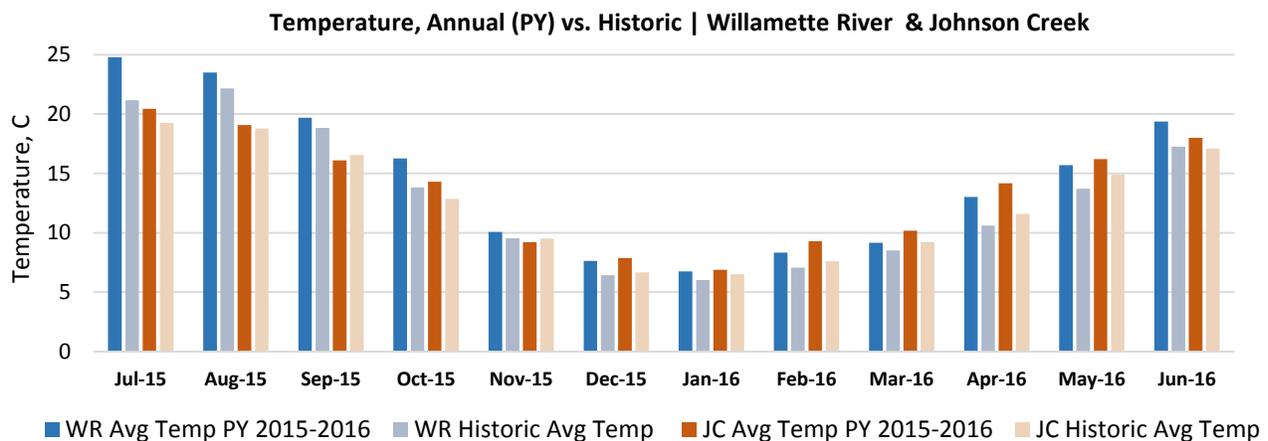


Johnson Creek – Summary of Temperature Data						
Month	Average Temp	Historic Average Temp	High Temp	Historic Average High	Low Temp	Historic Average Low
Jul-15	21.5	19.5	26.0	20.8	17.4	18.3
Aug-15	19.7	19.3	24.1	20.3	15.7	18.5
Sep-15	15.5	16.4	19.7	17.0	11.2	15.7
Oct-15	13.5	11.8	15.6	13.8	10.6	11.0
Nov-15	8.6	8.8	13.6	10.1	1.8	7.5
Dec-15	7.7	5.9	12.0	7.9	2.6	3.7
Jan-16	6.3	5.8	9.7	7.4	1.0	4.6
Feb-16	8.7	6.6	10.7	8.6	6.5	4.8
Mar-16	9.5	8.3	12.7	9.8	7.6	7.1
Apr-16	13.1	10.6	17.8	11.6	10.0	9.2
May-16	15.7	14.0	19.8	15.2	12.2	12.3
Jun-16	20.4	16.7	25.0	19.8	16.8	14.6

USGS Gage #14211550 – Johnson Creek at Milwaukie. All data are expressed in degrees Celsius. Historic Data: 2007-2016.

Willamette River – Summary of Temperature Data						
Month	Average Temp	Historic Average Temp	High Temp	Historic Average High Temp	Low Temp	Historic Average Low
Jul-15	24.8	21.2	26.9	22.7	23.3	19.0
Aug-15	23.5	22.2	24.9	23.1	22.2	21.4
Sep-15	19.7	18.8	22.2	19.6	17.8	18.1
Oct-15	16.3	13.8	18.0	15.5	13.9	12.1
Nov-15	10.1	9.5	14.0	10.2	5.4	9.2
Dec-15	7.6	6.4	10.7	8.4	4.8	4.7
Jan-16	6.8	6.0	8.9	7.3	3.9	4.8
Feb-16	8.3	7.1	9.6	9.1	7.1	5.8
Mar-16	9.2	8.5	10.4	10.6	8.2	7.1
Apr-16	13.0	10.6	15.9	12.5	10.1	9.3
May-16	15.7	13.7	17.4	16.6	12.3	11.6
Jun-16	19.4	17.2	22.2	22.0	16.4	14.3

USGS Gage # 14211720 - Willamette River at Portland, OR. All data are expressed in degrees Celsius. Historic 2009-2016.



2.2.3 Evaluation

Stream Flow Conditions

A comparison of average daily stream flow conditions throughout the 2015-16 year to historic flow data highlights the rather extreme stream flow conditions that existed this past winter, which were bracketed by lower flows both before and after the wet season. The wet period was preceded by low-flow conditions from July through November 2015 when stream flows were either close to or less than long-term averages.

Beginning in December 2015, periods of prolonged and intense rainfall resulted in average stream flows that approached or exceeded *twice* the historic averages for Fanno Creek, Johnson Creek and the Willamette River. An evaluation of gages in other local watersheds shows similar conditions. The wet weather pattern persisted through January and February 2016 approximating or exceeding historic averages. Prolonged periods of precipitation returned in March 2016, pushing stream flows above the historic averages at all gage sites, particularly on Fanno Creek and the Willamette River.

Stream flows then declined beginning in April 2016 and persisted through the end of the reporting period, showing flow rates of 30-50% *less* than the long-term record.

Temperature

A comparison of average daily temperatures throughout FY 2015-16 to historic data shows that warmer instream temperatures existed for the entire year. The extent to which the temperatures exceeded long-term averages correlates strongly to stream flow rates discussed above. When stream flows were equal to or higher than average, temperatures were warmer than normal but generally consistent with average conditions. However, when stream flows were lower than historic averages, instream temperatures were notably higher than averages.

High instream temperatures during the summer of 2015 reflect the larger pattern of drought and warm weather that started in spring of 2015. Only when stream flows increased in December 2015 did temperatures return to typical levels. Beginning in April 2016 and persisting through the end of the reporting period as stream flow declined, instream temperatures again exceeded average conditions, but to a lesser extent than the more extreme conditions of spring and summer 2015.

2.3 MACROINVERTEBRATES

2.3.1 Sampling Activities

Twenty sites were targeted for one macroinvertebrate sampling event in FY 2015-16 and all biological samples were successfully collected. As mentioned previously, macroinvertebrates are sampled as part of the instream probabilistic PAWMAP effort. Macroinvertebrate monitoring is timed to coincide with the first instream monitoring of the fiscal year so biological information is collected at the same time that summer water quality samples are collected. A data summary of results is presented below. A table of the monitoring locations are provided in Appendix A (Instream Monitoring Locations).

2.3.2 Data Summary

The table below presents a statistical summary of the City’s FY 2015-16 macroinvertebrate sampling results.

Macroinvertebrate Monitoring – Summary by Watershed			
Watershed	FY 2015-16	FY 2010-14	FY 2015-16
	Median O/E Ratio ¹		Range of O/E Ratio
Columbia Slough ²	0.24	0.28	0.19 - 0.29
Fanno Creek	0.28	0.43	0.24 - 0.37
Johnson Creek	0.38	0.48	0.24 - 0.48
Tryon Creek	0.53	0.63	0.33 - 0.73
Tualatin Tributaries	0.38	0.44	0.38
Willamette River Tributaries ³	0.56	0.66	0.47 - 0.78

1. The O/E Ratio is an expression of the *observed* macroinvertebrate communities (O) within a sample over modeled *expected* macroinvertebrate communities (E) based on reference conditions.

2. Monitoring may be discontinued in the Columbia Slough beginning in FY 2016-17, due to the lack of appropriate reference metrics for low-gradient systems like the Slough. Alternative biological analyses are being evaluated as an appropriate substitute.

3. Macroinvertebrates are not collected from the main-stem of the Willamette River, but in certain tributaries consistent with the PAWMAP sampling program.

2.4 INSTREAM WATER QUALITY

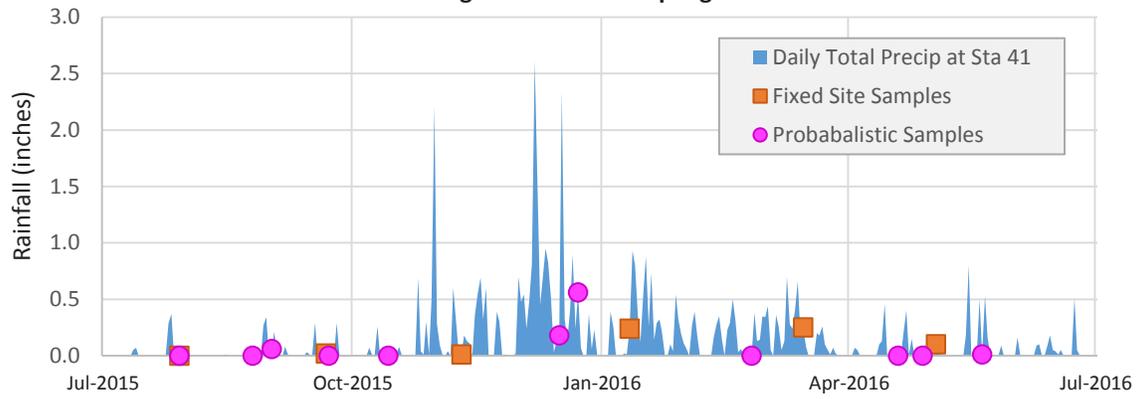
2.4.1 Sampling Activities

Eleven fixed sites and 20 probabilistic sites were targeted for sampling in FY 2015-16. A total of 105 samples were collected at fixed sites (between 6 and 12 events per site). Sixty-one of these samples were collected during the wet season (October 1 to April 30). A total of 100 samples were collected at perennial probabilistic (i.e. PAWMAP) sites (5 events per site). Sixty-five of these samples were collected during the wet season. The figures on the following pages show the sampling events and the daily total rainfall for watershed-representative rain gages. Station numbers in the legend refer to the City’s HYDRA rain gage station numbers.¹⁰

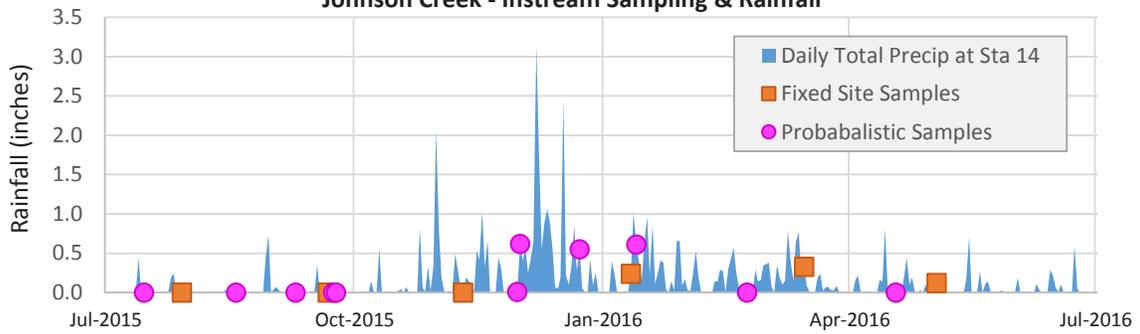
A table of the fixed and probabilistic instream monitoring locations are provided in Appendix A. The graphs on the following pages show when sampling occurred throughout the year.

¹⁰ City of Portland HYDRA Rainfall Network: <http://or.water.usgs.gov/precip/>

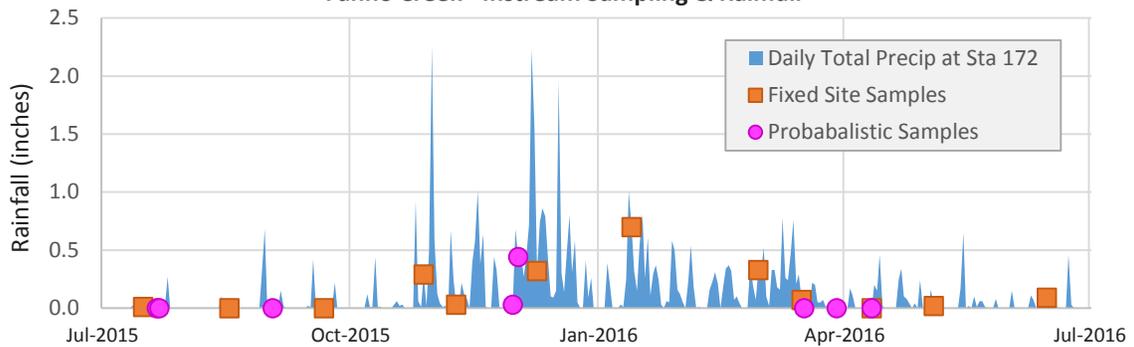
Columbia Slough - Instream Sampling & Rainfall



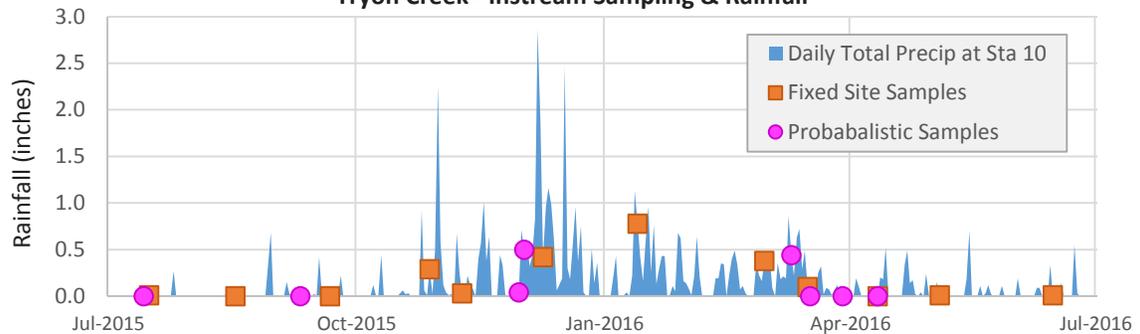
Johnson Creek - Instream Sampling & Rainfall

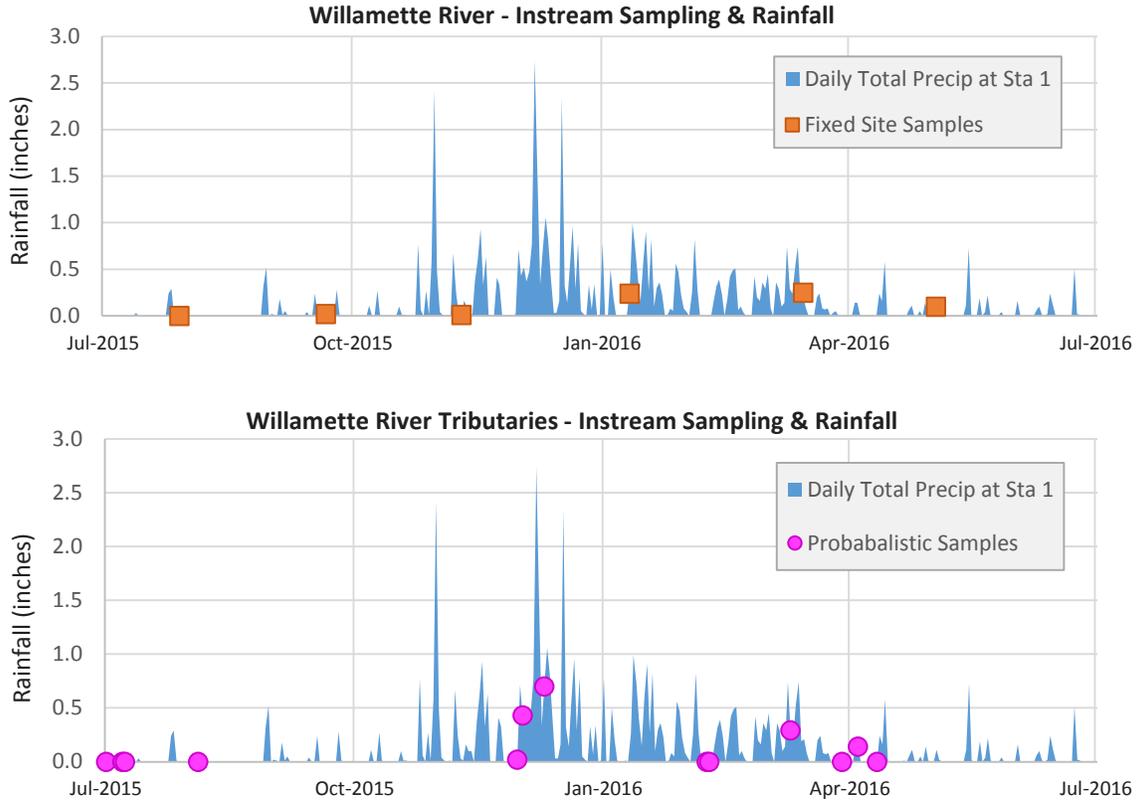


Fanno Creek - Instream Sampling & Rainfall



Tryon Creek - Instream Sampling & Rainfall





2.4.2 Data Summary

The following pages present data summaries, tables and figures of the results from the variety of instream monitoring conducted by the City during FY 2015-16. Overall citywide results are presented first, followed by a watershed-based analysis. Note that for the Willamette River watershed, the probabilistic monitoring is conducted at smaller tributaries, not the main-stem of the river.

Citywide Summary – Probabilistic & Fixed Sites

The tables on the following pages present statistical summaries and criteria exceedances of the City’s FY 2015-16 probabilistic and fixed instream sampling results. In general, criteria were met for most pollutants.

Instream Monitoring – Summary Statistics of Select Parameters						
Probabilistic Sampling						
Parameter		Columbia Slough	Johnson Creek	Fanno Creek	Tryon Creek	Willamette Tributaries
Copper, total (µg/L)	Minimum	0.65	0.52	0.93	0.76	0.32
	Maximum	2.02	4.64	4.31	4.40	6.15
	Median	0.92	0.92	1.45	1.15	0.98
	Mean	1.11	1.28	1.97	1.67	1.59
Zinc, dissolved (µg/L)	Minimum	0.71	0.53	2.31	0.5	0.5
	Maximum	18.5	6.52	18.3	40.90	52.50
	Median	3.42	1.74	5.33	8.17	1.24
	Mean	4.66	2.34	6.33	13.9	4.04
E.coli (MPN/100mL)	Minimum	10	10	10	10	10
	Maximum	310	3900	410	1400	430
	Median	75	220	75	58	36
	Geomean	61	178	49	85	42
Phosphorus, total (mg/L)	Minimum	0.063	0.03	0.049	0.046	0.03
	Maximum	0.141	0.177	0.137	0.15	0.187
	Median	0.113	0.05	0.081	0.071	0.072
	Mean	0.106	0.065	0.089	0.085	0.083
Total Suspended Solids (mg/L)	Minimum	2	2	2	2	2
	Maximum	6	128	11	61	92
	Median	3	2	3	4	7
	Mean	4	14	4	11	14
Fixed Sampling						
Parameter		Columbia Slough	Johnson Creek	Fanno Creek	Tryon Creek	Willamette River
Copper, total (µg/L)	Minimum	1.26	0.73	1.13	0.87	0.46
	Maximum	6.22	2.94	7.24	7.84	1.72
	Median	1.56	1.35	2.09	2.71	0.80
	Mean	2.13	1.48	2.93	3.05	0.89
Zinc, dissolved (µg/L)	Minimum	0.50	0.63	1.30	2.13	0.50
	Maximum	6.17	5.7	21.4	35.2	2.51
	Median	1.31	3.10	6.00	15.20	0.71
	Mean	2.03	2.92	7.85	17.25	0.86
E.coli (MPN/100mL)	Minimum	10	20	250	10	4
	Maximum	260	5800	>24000	4900	82
	Median	63	235	790	480	17
	Geomean	64	323	1249	414	18
Phosphorus, total (mg/L)	Minimum	0.065	0.036	0.086	0.056	0.045
	Maximum	0.206	0.115	0.291	0.321	0.089
	Median	0.116	0.083	0.140	0.110	0.064
	Mean	0.123	0.081	0.156	0.122	0.064
Total Suspended Solids (mg/L)	Minimum	6	2	2	2	2
	Maximum	29	14	88	142	18
	Median	16	4	4	3	4
	Mean	15	5	14	12	6

Instream Results – Criteria Comparison					
	Exceedances/Samples (n) & Criteria Met (%)	Copper (total) µg/L	E.coli mpn/100mL	Phosphorus (total) mg/L	Zinc (dissolved) µg/L
Probabilistic Sampling					
TOTALS	Total (n)	6/100	13/100	0/100	1/100
	Criteria met (%)	94%	87%	100%	99%
Columbia Slough	(n)	0/25	0/25	0/25	0/25
	Criteria met (%)	100%	100%	100%	100%
Johnson Creek	(n)	0/25	9/25	0/25	0/25
	Criteria met (%)	100%	64%	100%	100%
Fanno Creek	(n)	2/15	1/15	0/15	0/15
	Criteria met (%)	87%	93%	100%	100%
Tryon Creek	(n)	0/10	2/10	0/10	0/10
	Criteria met (%)	100%	80%	100%	100%
Willamette Tributaries	(n)	4/20	1/20	0/20	1/20
	Criteria met (%)	80%	95%	100%	95%
Fixed Sampling					
TOTALS	Total (n)	4/108	35/107	7/96	0/108
	Criteria met (%)	96%	67%	93%	100%
Columbia Slough	(n)	0/12	0/12	1/12	0/12
	Criteria met (%)	100%	100%	83%	100%
Johnson Creek	(n)	0/12	5/12	0/12	0/12
	Criteria met (%)	100%	58%	100%	100%
Fanno Creek	(n)	0/12	10/12	2/12	0/12
	Criteria met (%)	100%	17%	83%	100%
Tryon Creek	(n)	4/36	20/36	3/36	0/36
	Criteria met (%)	89%	44%	92%	100%
Willamette Tributaries	(n)	0/36	0/35	0/24	0/36
	Criteria met (%)	100%	100%	100%	100%
<ul style="list-style-type: none"> • For metals, exceedances are based on variable criteria which are calculated for each sample based on hardness. • Exceedances of total phosphorus are only counted for samples collected between April 1 and October 31, which is the timeframe for which TMDL allocations are set for the Columbia Slough. • TSS not shown because there is no associated water quality criteria 					

2.4.3 Results by Watershed

This section of the report provides instream monitoring data charts and a brief discussion of the results by watershed. Chart styles vary between fixed sites and probabilistic sites due to differences in the sample regime. Fixed sites represent specific geographic locations monitored over extended time periods. Fixed sites are depicted along a linear time axis that compares sites within watersheds in the context of same-day and antecedent precipitation to reveal potential differences resulting from geography and response to rain events. The probabilistic sites are intended to represent general characteristics in respective watersheds, independent of specific geography and time. Probabilistic site results are depicted using statistics or scatterplots against same-day precipitation to anonymize individual sites and show extremes, central tendencies, diversity of results and potential trends.

Columbia Slough

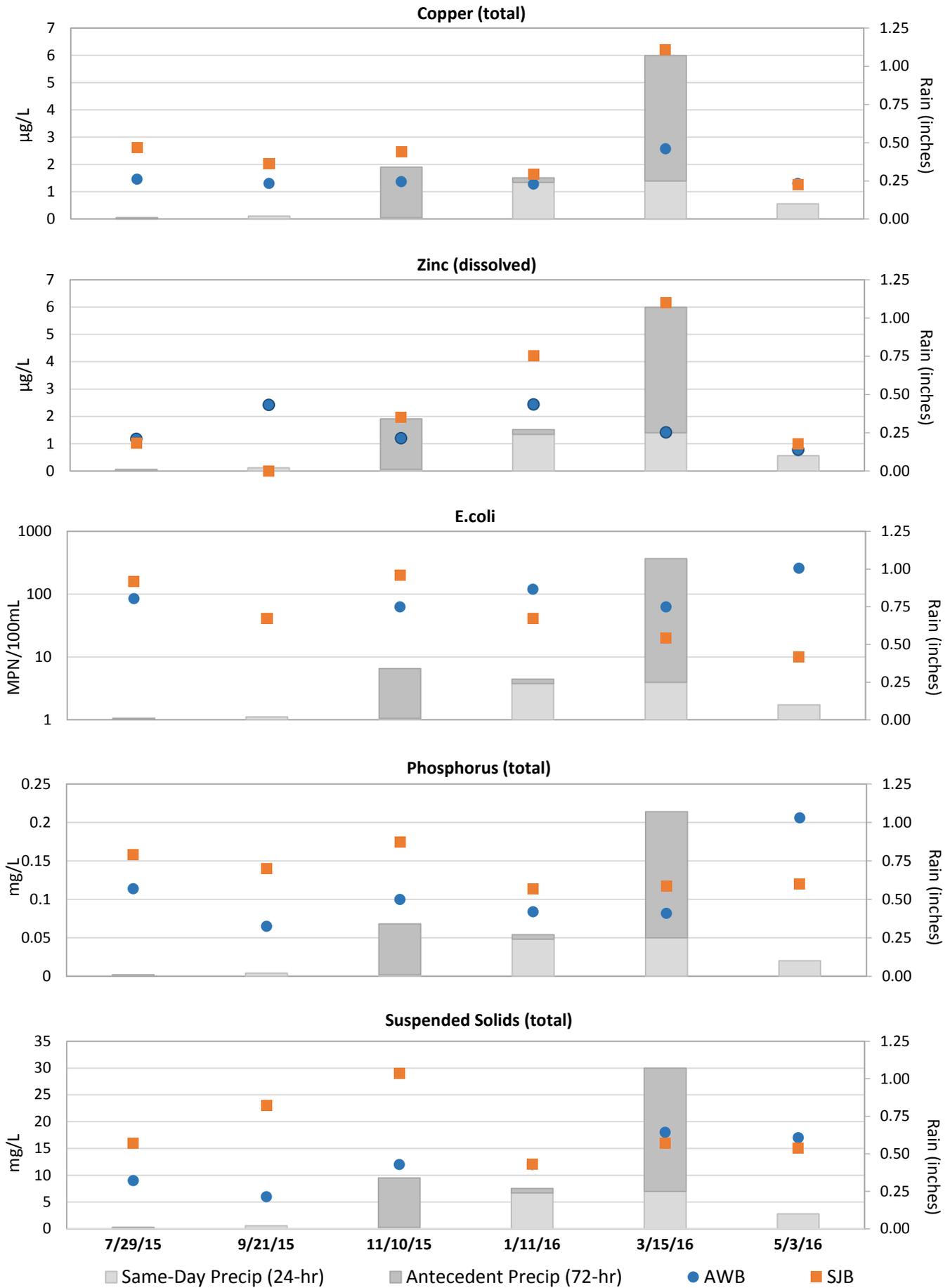
All instream pollutants evaluated from the probabilistic monitoring (100% of the samples) were below water quality criteria for the Columbia Slough. At the fixed sites, one exceedance of total phosphorus occurred during the seasonal TMDL limitation window.

The median O/E Ratio for macroinvertebrates was 0.24, which is well within the “most impacted” category. It’s important to note, however, that there is a lack of appropriate macroinvertebrate reference metrics for low-gradient systems like the Slough, so the comparison is not particularly useful.

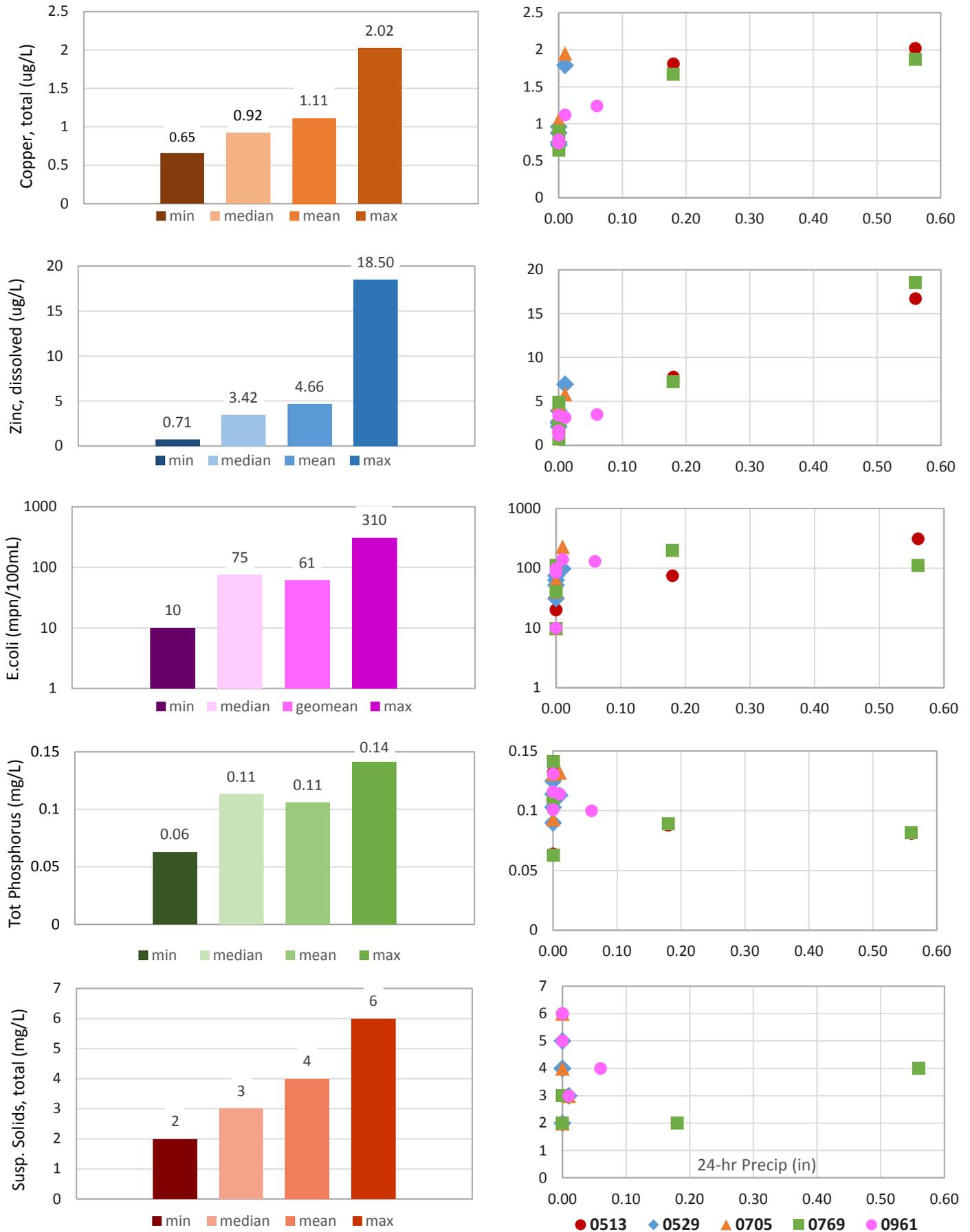
With respect to sample results and precipitation, there does not appear to be a strong correlation between rainfall amounts and elevated results in the Columbia Slough, with the possible exception of metals. Concentrations of metals at the fixed SJB site, which is in the lower Slough, appear to respond more strongly to rain events and metals from the instream probabilistic monitoring indicate a similar pattern. However, the probabilistic sampling did not include any sites located in the lower Slough, so a localized or hydrologic effect is unclear. E.coli and total phosphorus results were fairly consistent throughout the year, with averages of 61 mpn/100mL and 0.106 mg/L, respectively, for the probabilistic monitoring locations. This may be an indication of more ubiquitous or background conditions for these parameters in the Slough.

For the fixed sites, higher pollutant concentrations were observed at the lower Slough site (SJB) than the upper Slough Airport Way site (AWB). The flow dynamics and industrial land-use patterns in the lower Slough likely have a greater effect on instream sampling results. Overall, the monitoring results for the Columbia Slough were largely within acceptable ranges.

Columbia Slough Fixed Sites – Data Graphs



Columbia Slough Probabilistic Sites – Data Graphs



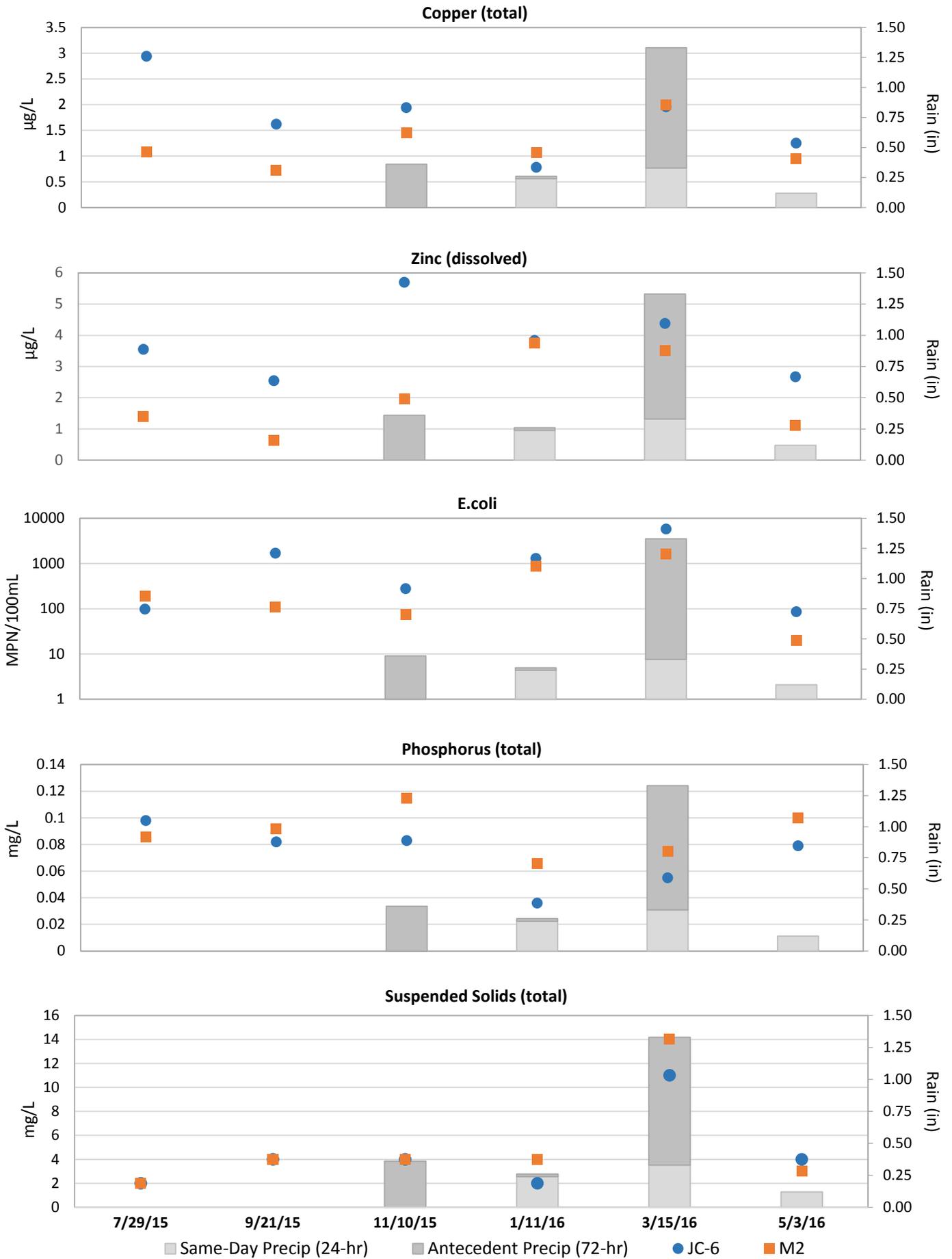
Johnson Creek

Instream pollutants evaluated at Johnson Creek generally fell below the water quality criteria with the exception of E.coli. E.coli met the criteria for most samples at fixed sites (58%) and probabilistic sites (64%). Exceedances occurred at multiple locations and across a range of dates and precipitation conditions in Johnson Creek, though the higher results are generally correlated with rain events. The most elevated results appear to be associated with either significant precipitation events or specific sites that may be contributing high levels of pollutants.

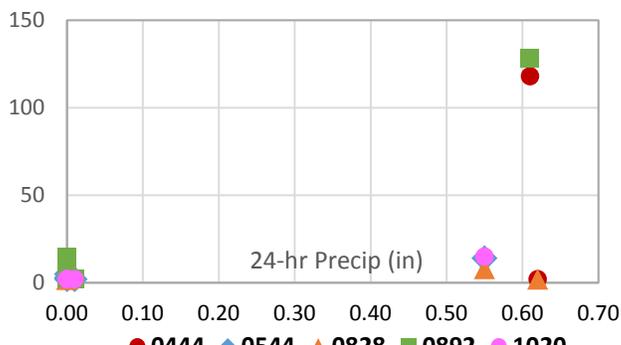
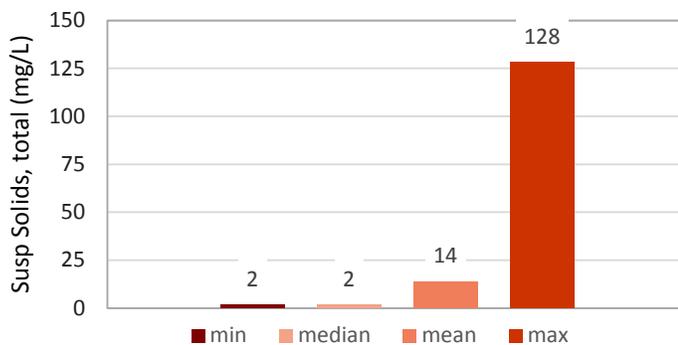
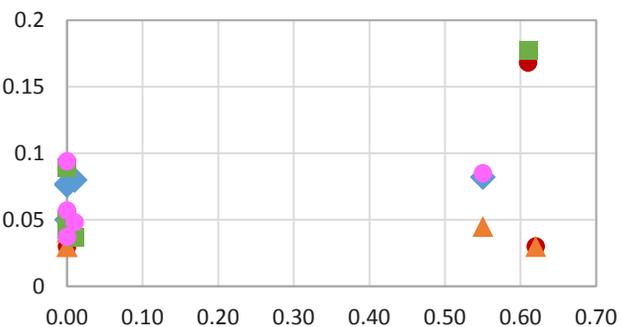
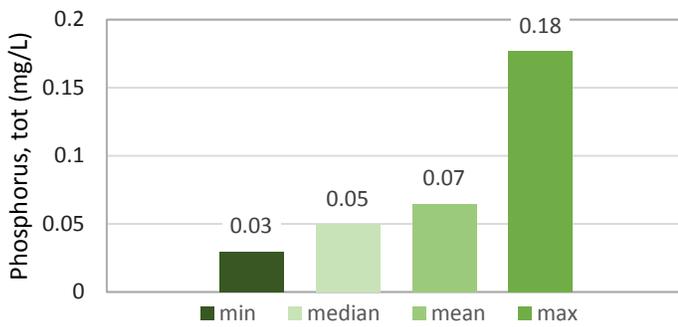
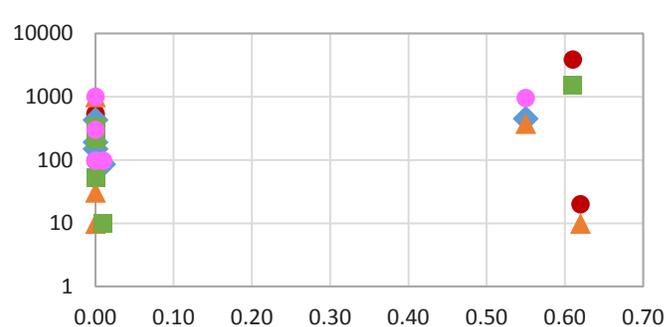
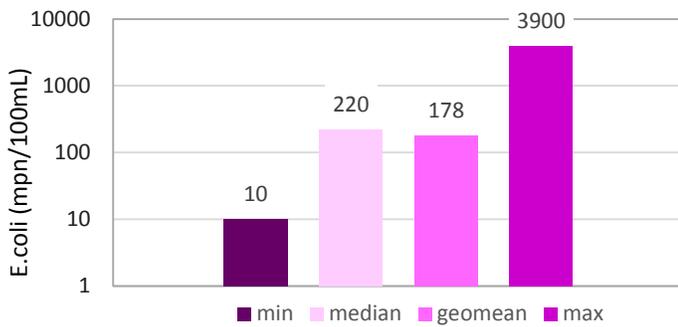
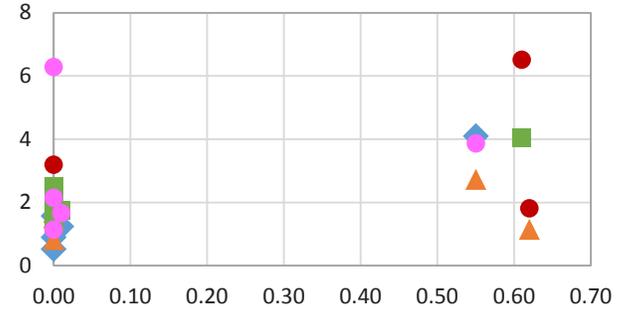
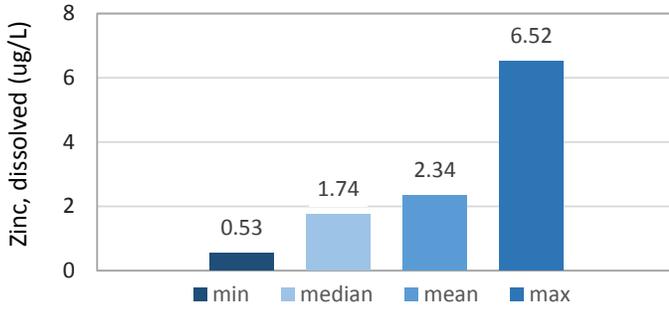
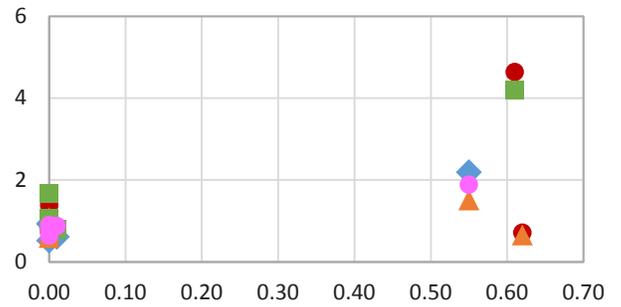
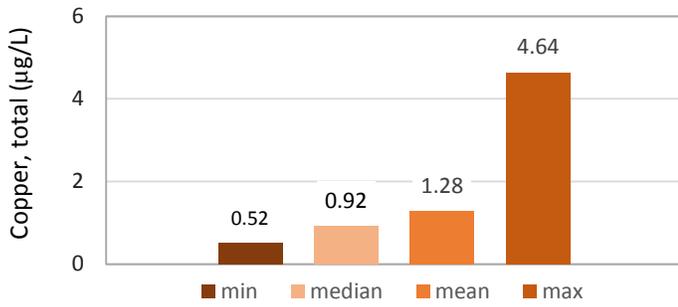
Criteria exceedances for E.coli on dry days varied widely between fixed and probabilistic sampling, with 20% of fixed site and 56% of probabilistic site exceedances occurring in the absence of same-day precipitation. Overall, 43% of E.coli exceedances occurred on dry days. The proportion of exceedances during dry days suggests that background levels may be slightly elevated. Two probabilistic sites (0444 and 0892) may exhibit increased loading during rain events, while other sites do not tend to show the same precipitation response.

Macroinvertebrate results from the summer and fall of 2015 indicate a greater level of impairment compared to previous years. The median O/E Ratio for Johnson Creek was 0.38, within the “most impacted” threshold. The stress of drought and high temperature preceding and concurrent with macroinvertebrate sampling likely explains some of the difference between this year and previous years.

Johnson Creek Fixed Sites – Data Graphs



Johnson Creek Probabilistic Sites – Data Graphs



● 0444 ◆ 0544 ▲ 0828 ■ 0892 ● 1020

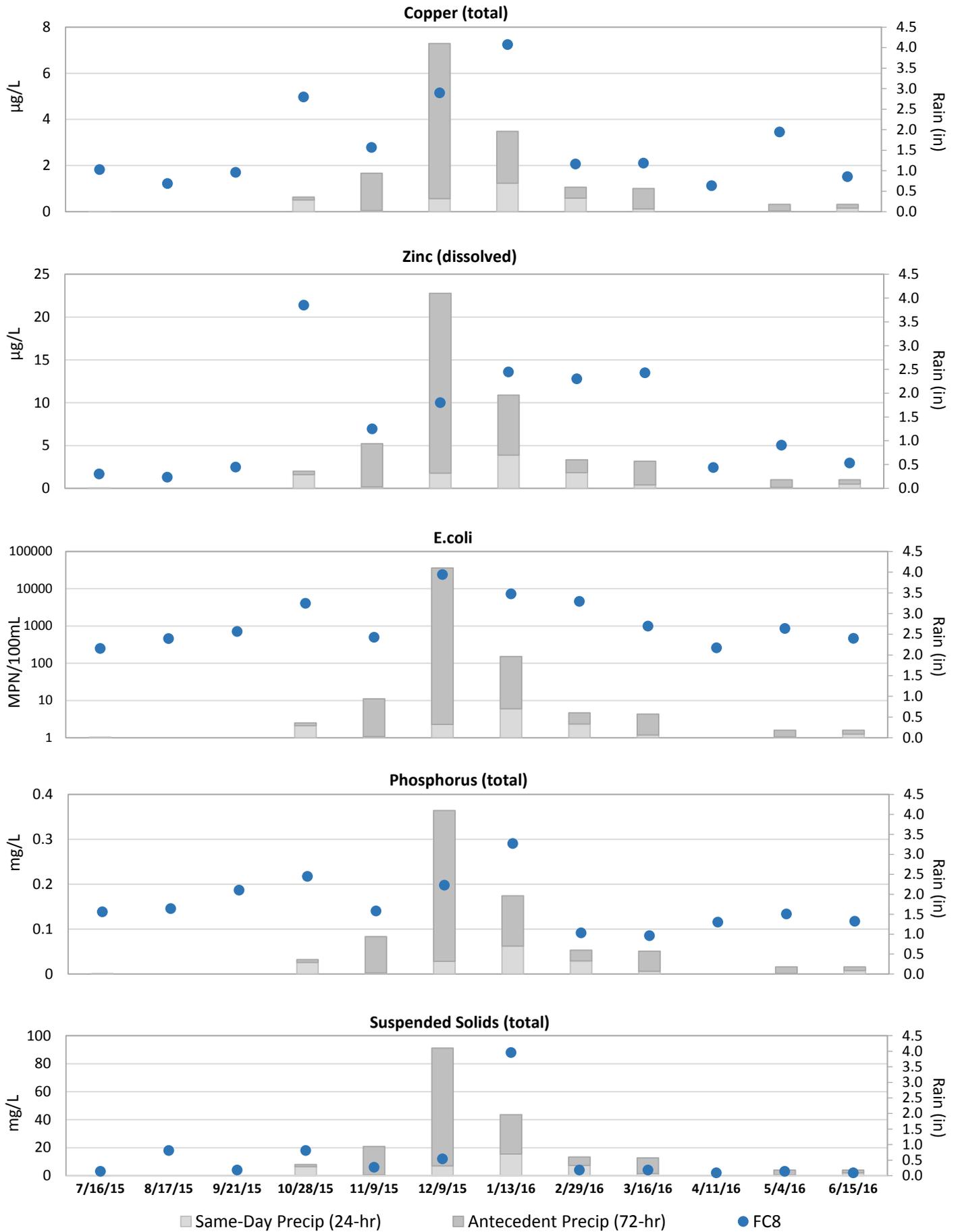
Fanno Creek

Results between the fixed site (FC8) on the upper main stem and the probabilistic sites on upper tributaries were inconsistent. Results from instream probabilistic monitoring in Fanno Creek met water quality criteria in 100% of samples for total phosphorus and dissolved zinc, 87% for total copper and 93% for E.coli. The fixed site met criteria in 100% of the samples for total copper and dissolved zinc, 83% of Apr-Oct samples for total phosphorus but only 17% for E.coli. The highest E.coli results were likely attributed to two sewage release events that were identified during the year; one from an overwhelmed diversion structure during extreme flow conditions and another from a damaged sewer line. Both incidents occurred at locations upstream of the FC8 sampling site. City crews promptly responded to and corrected both incidents and follow-up sampling in the affected areas indicated a return to baseline levels.

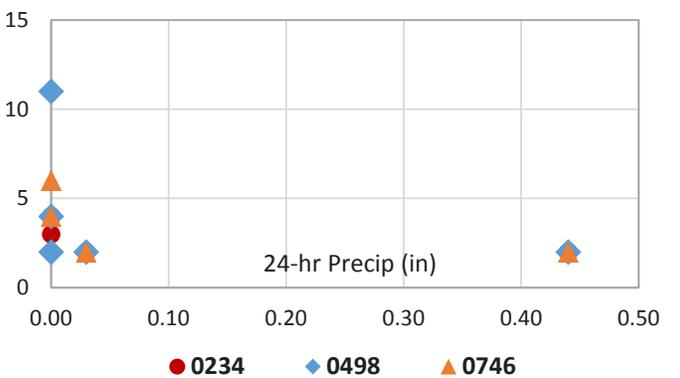
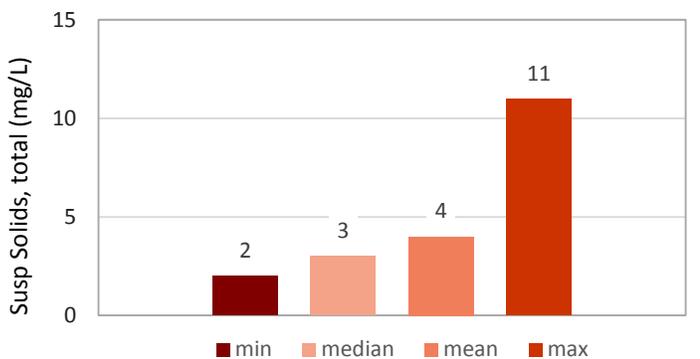
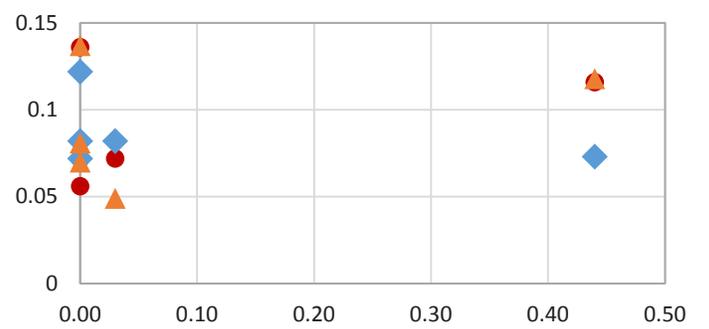
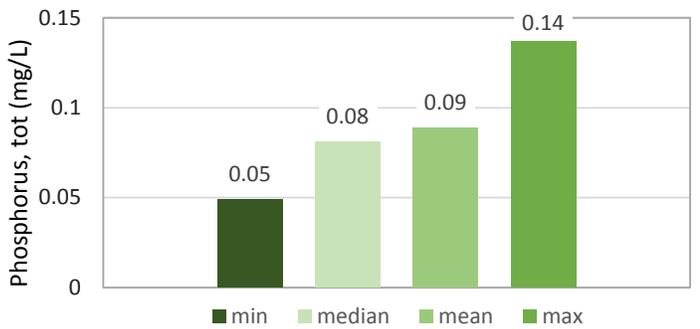
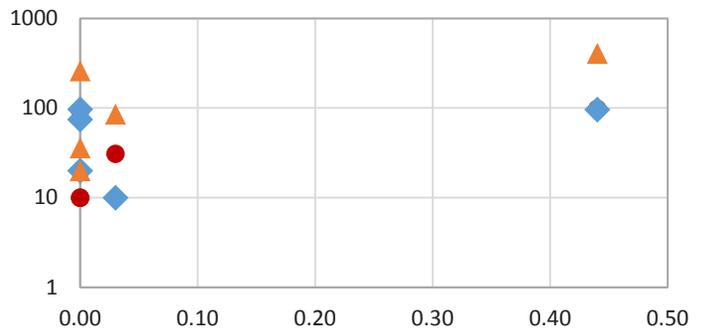
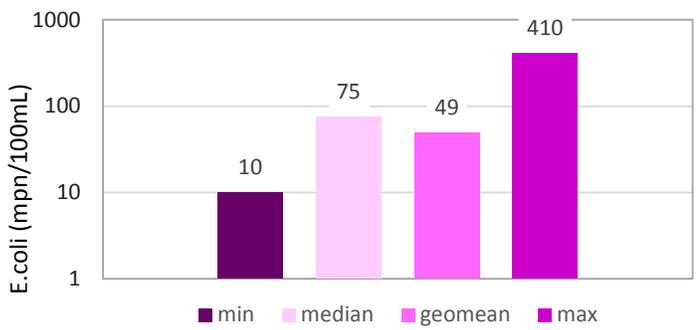
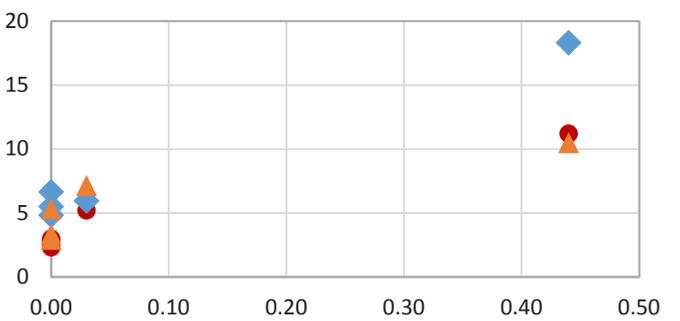
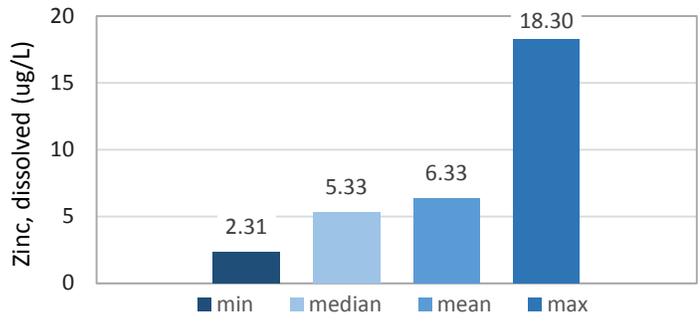
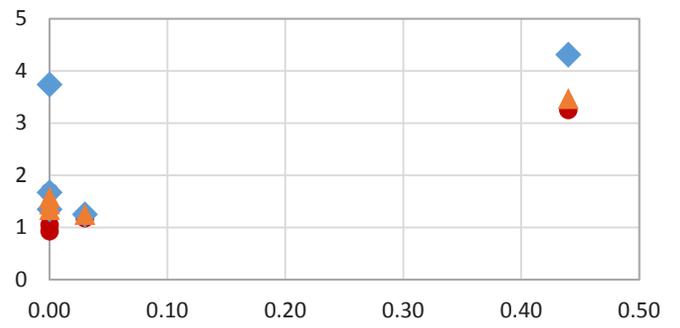
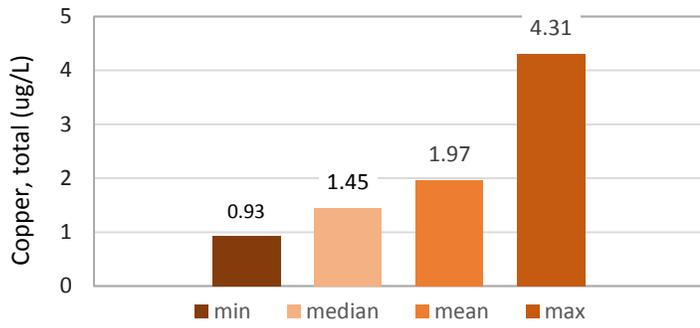
The two exceedances in the probabilistic sampling for total copper occurred at the same site (0498), located in an unnamed upper tributary. One exceedance occurred during dry weather and the other during wet weather (>0.4" rain) conditions. Site 0498 is a natural channel site that receives flow from the I-5 freeway corridor between SW 48th and SW 55th via an Oregon Department of Transportation (ODOT) storm pipe.

The median O/E Ratio for macroinvertebrates was 0.28, which is well within the "most impacted" category and is lower than the median ratio of 0.43 from FYs 2010-2014. Results in Fanno Creek are subject to greater variability from year to year due to the low number of sites relative to other watersheds in the study area.

Fanno Creek Fixed Sites – Data Graphs



Fanno Creek Probabilistic Sites – Data Graphs



● 0234 ◆ 0498 ▲ 0746

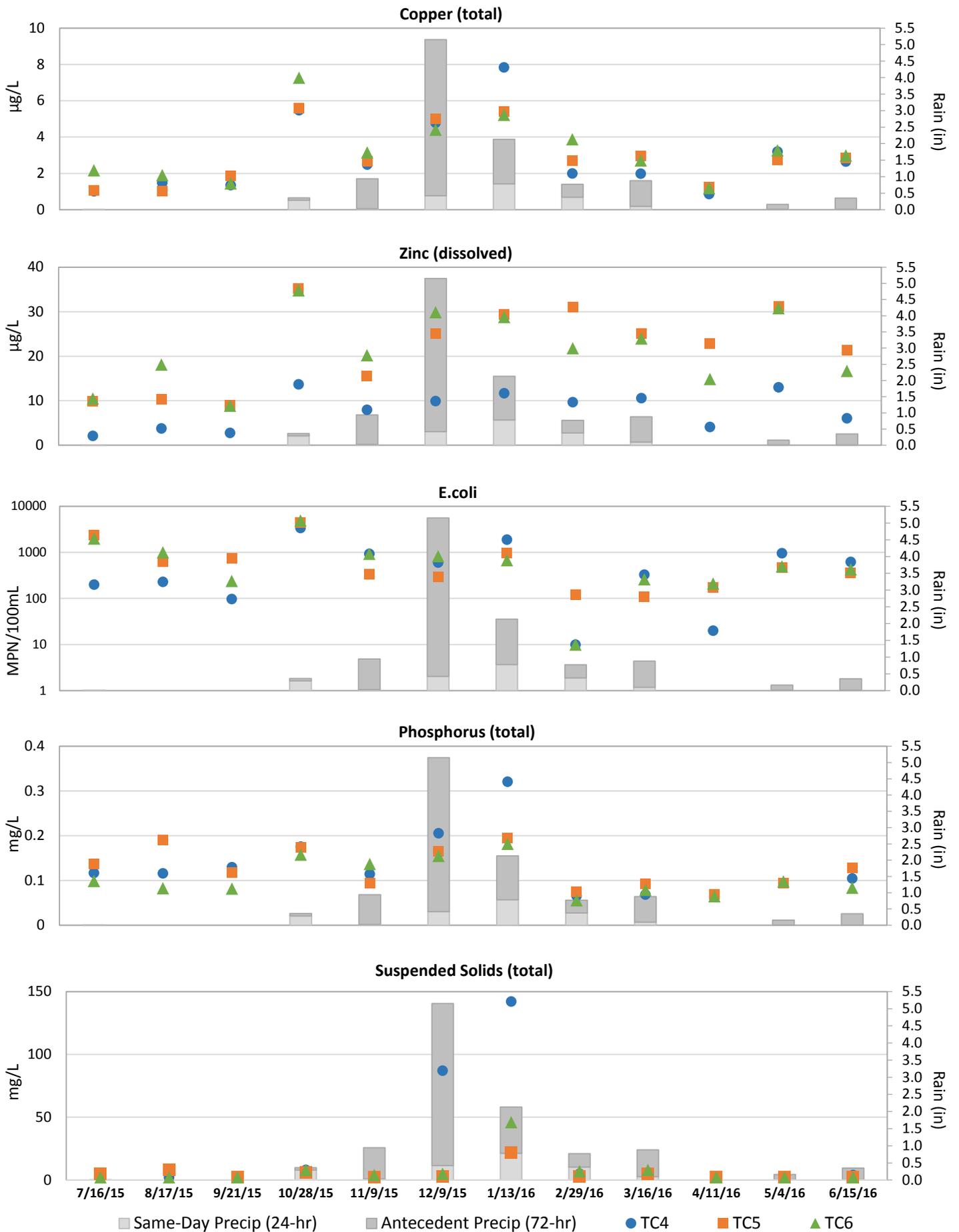
Tryon Creek

Sampled parameters in Tryon Creek generally met water quality criteria, with the exception of E.coli. For probabilistic sites, 100% of samples for dissolved zinc, total copper and total phosphorus met the criteria. For fixed sites, those same parameters were 100%, 89% and 78% within criteria, respectively. For E.coli, just 44% of fixed site samples met criteria, but 80% of probabilistic samples met criteria.

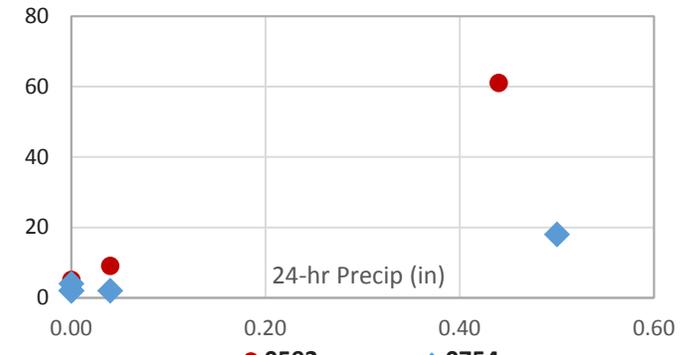
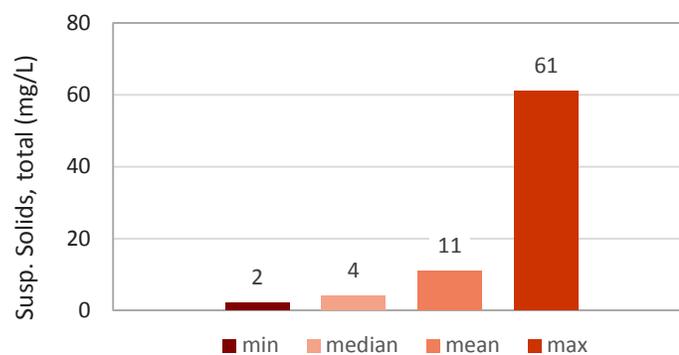
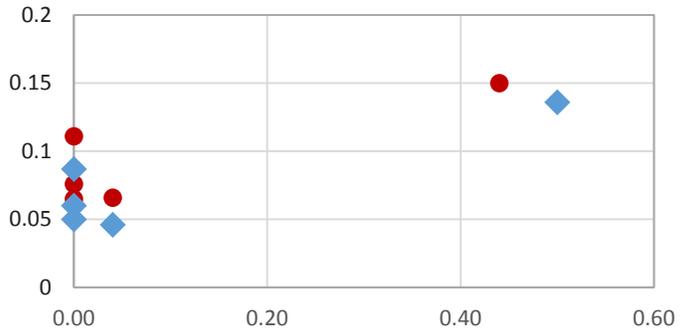
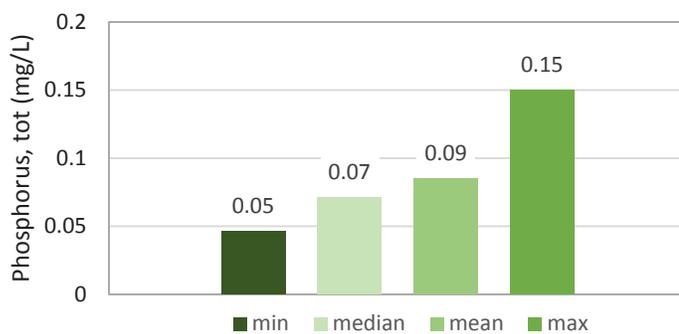
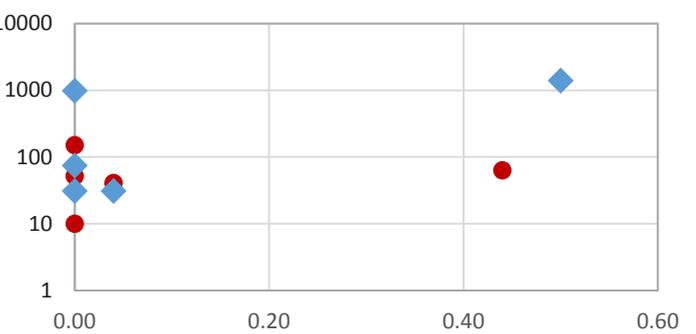
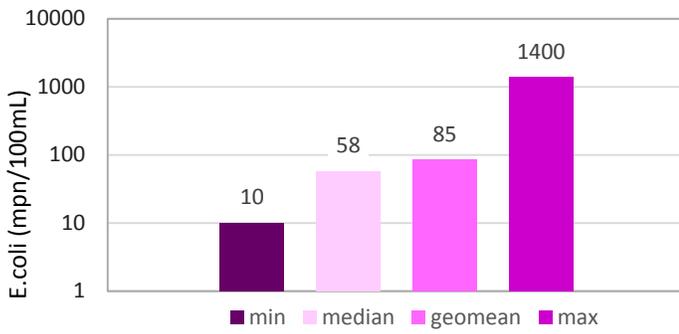
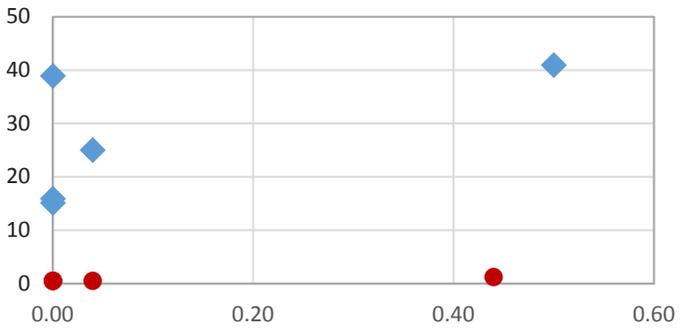
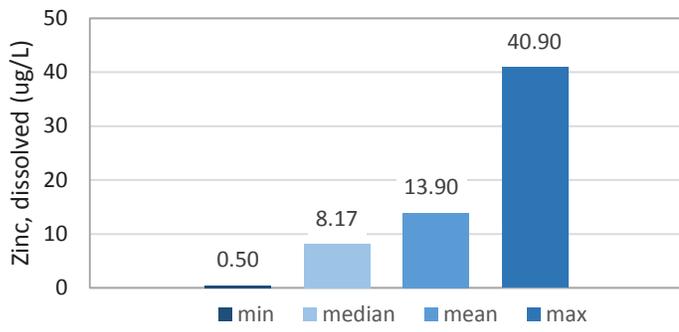
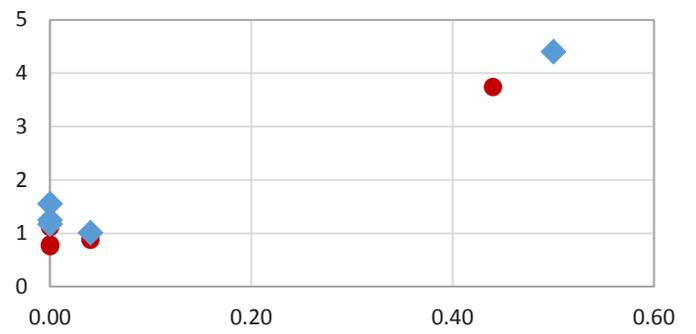
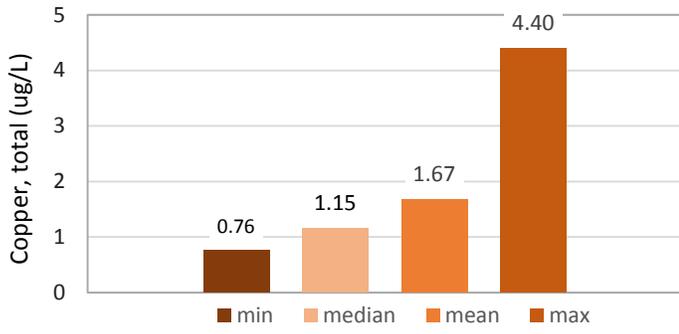
E.coli exceedances occurred at all three fixed sites and one probabilistic site. Exceedances occurred across a range of dates and precipitation conditions. The average E.coli for all fixed site samples was 896 MPN/100mL with an average exceedance value of 1470 MPN/100mL. The highest results appear to be associated with precipitation but exceedances are not exclusively correlated with rain events. Thirty-percent of the elevated E.coli results at fixed sites occurred on just two wet-weather days (10/28/15 and 1/13/16). While background E.coli levels may be slightly elevated in Tryon Creek, this year's data indicate that precipitation events may exacerbate conditions.

Macroinvertebrate results from the summer and fall of 2015 indicate a greater level of impairment compared to previous years. The median O/E Ratio for Tryon Creek was 0.53, within the "most impacted" threshold. The stress of drought and high temperatures preceding and concurrent with macroinvertebrate sampling likely explains some of the difference between this year and previous years. A tributary to Tryon Creek in Tryon Creek State Park had a ratio of 0.73. Results in Tryon Creek are subject to greater variability from year to year due to the low number of sites relative to other watersheds in the study area.

Tryon Creek Fixed Sites – Data Graphs



Tryon Creek Probabilistic Sites – Data Graphs



● 0592 ◆ 0754

Willamette River & Tributaries

The City's instream monitoring at fixed sites are located on the main-stem of the river whereas the probabilistic and macroinvertebrate monitoring is conducted at sites located in smaller tributaries.

All pollutants evaluated for the Willamette River fell below the water quality criteria for all samples. Most parameters remained stable throughout the year, with only copper, E.coli and TSS levels showing increases correlated to high levels of stream flow and local precipitation.

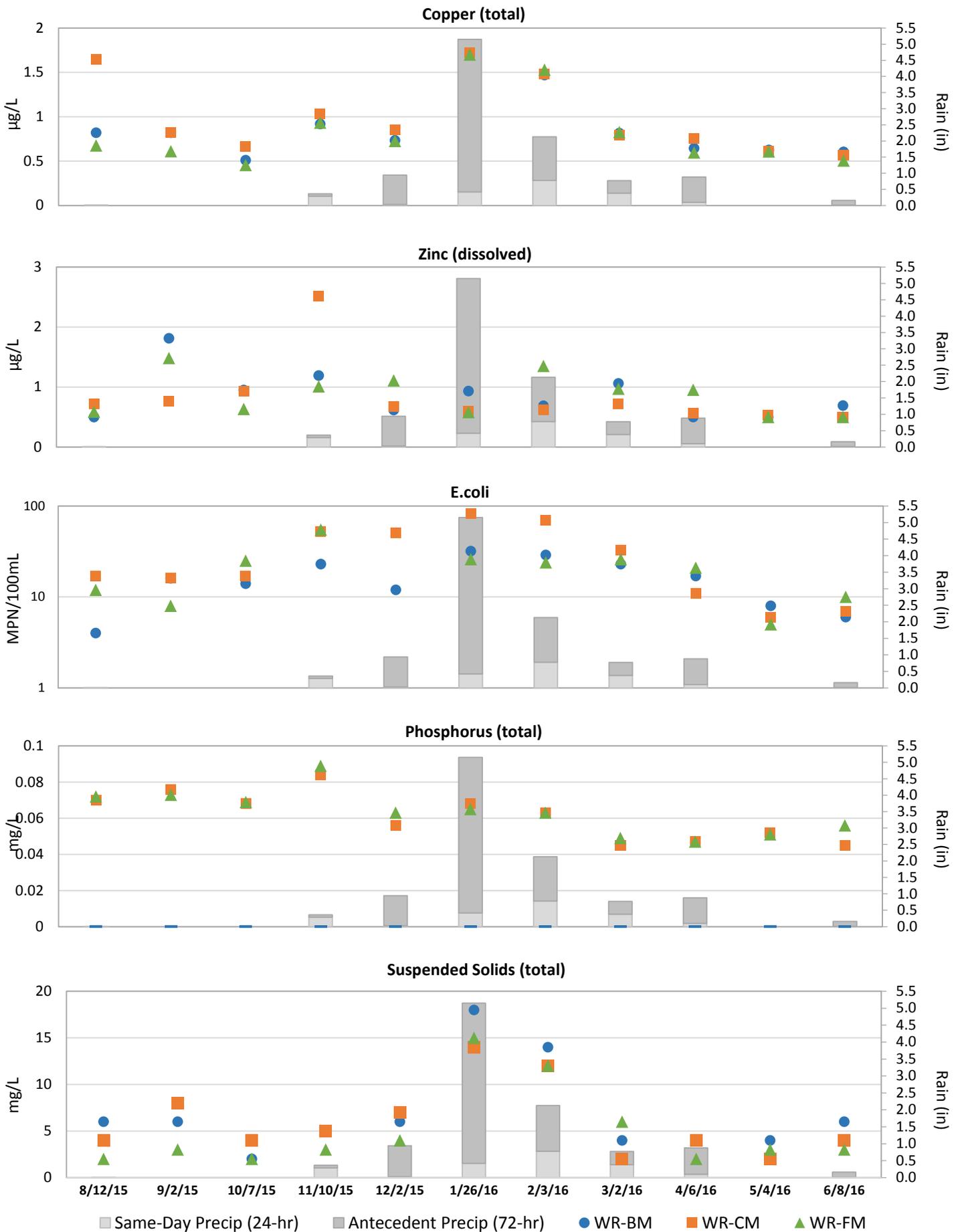
Results for the Willamette Tributaries generally fell below the water quality criteria. Exceedances occurred in two general locations: at site 0720 on an unnamed tributary on 11/30/15 and 12/10/15 and at sites 0526 and 0762 on 12/2/15, located near each other on the main stem of upper Balch Creek. Excluding those locations and dates, all other sites and parameters exhibit no exceedances across a range of locations and precipitation conditions.

Site 0720 is situated about 1700 feet upstream from the tributary's mouth at the Willamette River. The site is downstream of about 64 acres of residential and university properties and roads. The confluence is located on the west bank of the river, about 3300 feet upstream of the Sellwood Bridge. Site 0720 exhibited exceedances for copper during both minor (11/30/15) and major (12/10/15) rain events. Additional research will help determine whether upstream sources or local site conditions are factors requiring investigation and potential mitigation. When sampled on 12/10/15 during an extreme rain event, site 0720 also showed exceedances for zinc and TSS.

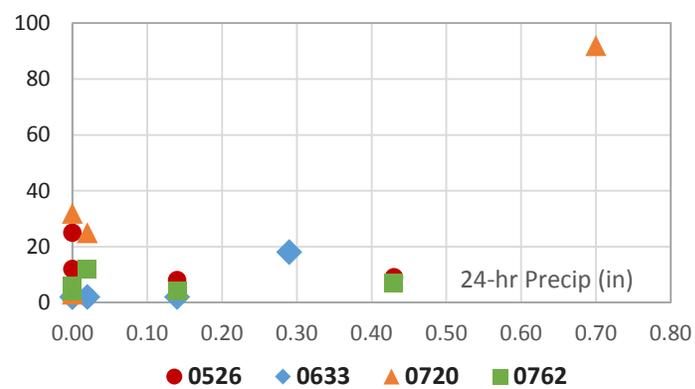
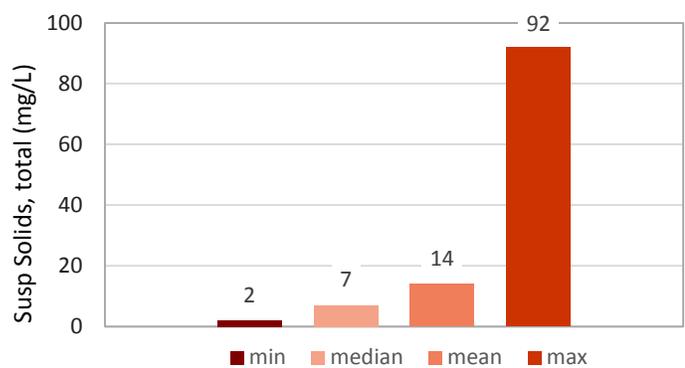
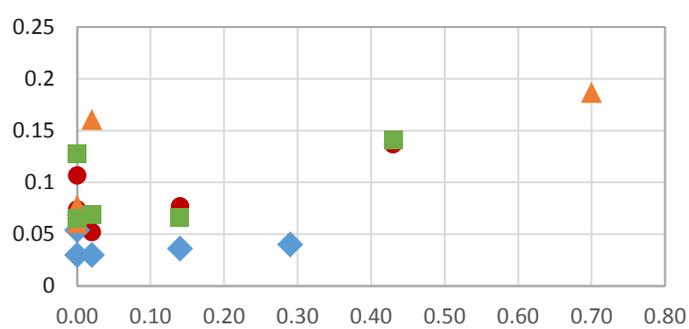
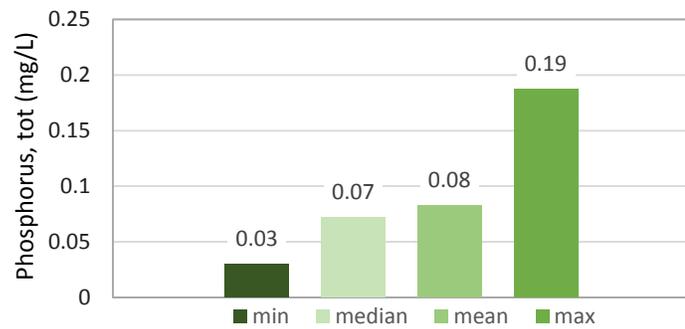
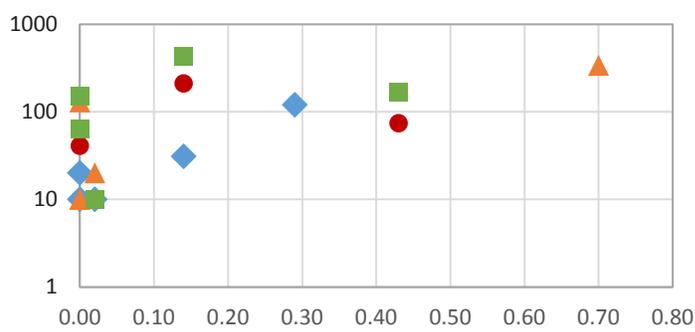
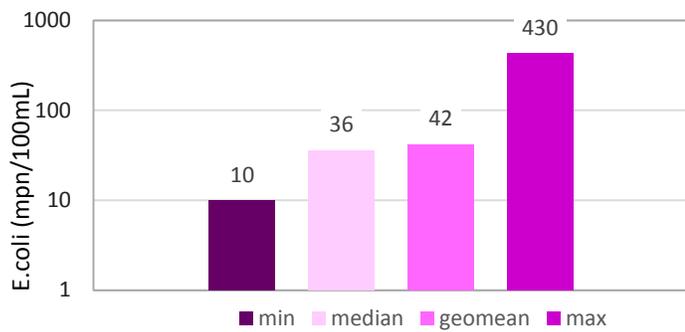
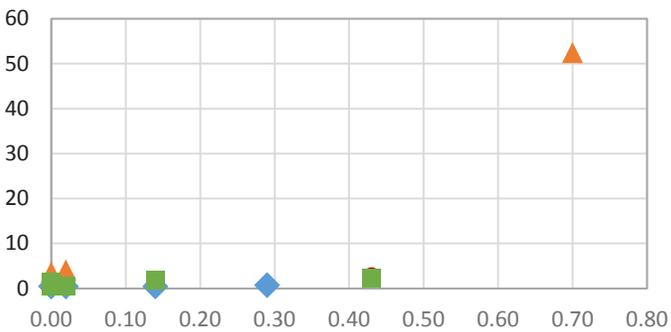
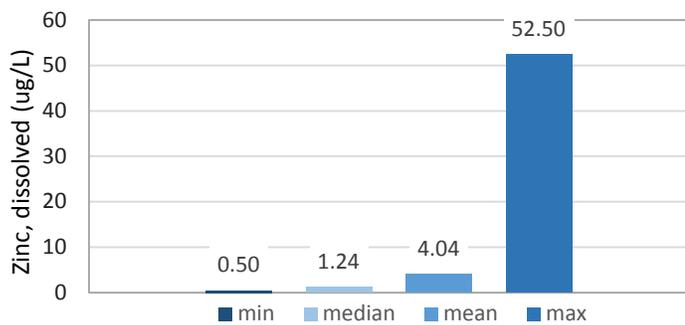
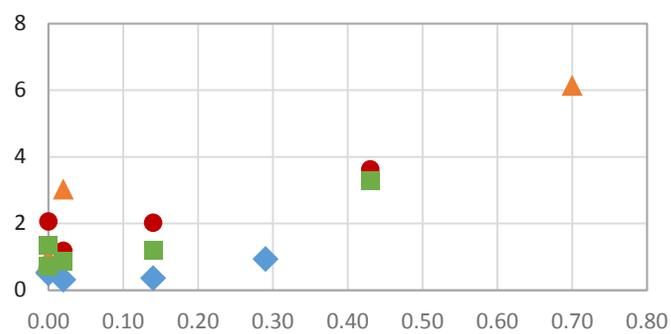
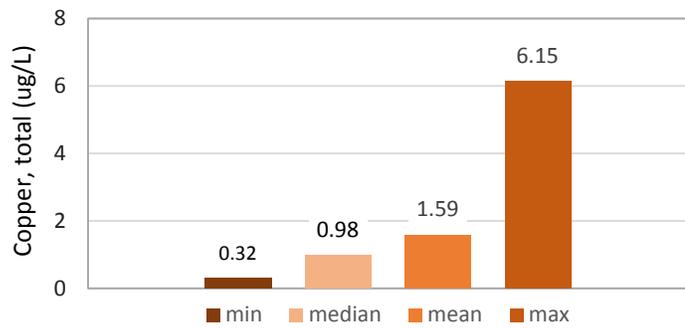
Two probabilistic sites (0526 and 0762) showed exceedances for copper during larger rain events but fell below the criteria during smaller rain events. Both are located on the main stem of upper Balch Creek flowing through Forest Park and receive tributaries draining the surrounding natural areas. Both sites, 0526 along NW Thompson Rd and 0762 along NW Cornell Rd, are adjacent to the local roadways that follow the stream valleys. NW Cornell Rd serves as an important route through the area and receives considerable traffic. The close proximity of the two sites helps explain their similar results for all parameters under all conditions. It is reasonable to consider the two copper exceedances as a single event.

Macroinvertebrate results from the summer and fall of 2015 indicate a greater level of impairment compared to previous years. The median O/E Ratio for Willamette Tributaries was 0.56, within the "most impacted" threshold. The least impacted site had a ratio of 0.73. Results among the Willamette Tributaries are subject to high variability due to the wide range of conditions in the watersheds, which range from mostly undeveloped to highly urbanized. The stress of drought and high temperature preceding and concurrent with the sampling events is believed to explain some of the difference.

Willamette River Fixed Sites – Data Graphs



Willamette River Tributaries Probabilistic Sites – Data Graphs



3 Conclusions

The City completed all permit-required monitoring during the year.

While results from the City's monitoring efforts in FY 2015-16 demonstrate overall compliance with water quality targets, E.coli in particular continues to be a challenge. Eighty-six percent of the probabilistic instream samples met E.coli criteria, while 66% of the fixed site samples met criteria. Fifty-eight percent of stormwater samples had results that were above the E.coli criteria.

It is very important to note, however, that an exceedance of the E.coli criteria of 406 MPN/100mL is often not indicative of a sewage-related release. Research has shown that other existing sources likely contribute to elevated levels, such as birds, squirrels and other warm-blooded animals.¹¹ The diversity of potential sources, coupled with a lack of data on their distribution, concentration and impact, poses challenges when trying to distinguish illicit discharges from "background" conditions.

The geometric mean of E.coli results from FY 2015-16 for every watershed was well within the 406 MPN/100mL criteria. The highly elevated results from the Fanno Creek fixed site in winter 2015 were significantly above all other E.coli results for the year. The 12/9/15 sample event followed a 12/7/15 sewer overflow event at a diversion structure. The overflow event was associated with intense precipitation and wet antecedent conditions, with over 2.2 inches of rain on 12/7/15, preceded by 3 inches of rain over five straight days of wet weather starting on 12/1/15. The 1/13/16 sample event was preceded by the 12/30/15 discovery of a broken sewer pipe and the prompt 12/31/15 repair by City crews. At the time of the repair, the duration of the discharge was unknown, so the influence on samples prior and following is uncertain.

The City has various ordinances, programs and procedural mechanisms to identify, respond to and eliminate illicit discharges and cross connections. Those controls and other elements are identified and discussed in the City's NPDES MS4 Stormwater Management Plan (SWMP), the City's TMDL Implementation Plan (TIP) and in associated annual compliance reports. In the case of the highest E.coli results that were indicative of a possible sewage release, the City's programs succeeded in identifying and eliminating the source(s).

Other pollutants monitored in 2015-16 were largely below criteria and within acceptable ranges. Elevated results at some individual sites may be attributed to localized upland site factors, but further evaluation is needed and those results do not necessarily indicate a trend or a watershed-wide pattern.

Data from the reporting period also indicate that some pollutants correlated more strongly with precipitation conditions, while others did not. Temperature and stream flow data also indicate that the year's climatic conditions may have had an impact on stream conditions, water quality and macroinvertebrate communities, in particular, as the preceding year's drought brought stream flows to all-time lows.

The City will continue to engage a robust instream and stormwater monitoring program and evaluate the results for continued programmatic improvement and watershed health.

¹¹ https://www3.epa.gov/npdes/pubs/sw_idde_bacteria.pdf

Appendix: 2015-16 Monitoring Locations & Data

Stormwater Monitoring Locations (FY 2015-16)

Site ID	Traffic Category	BES UIC Node No.	Address
SG-001	< 1000	APR303	2542 SE 18th Ave
SG-002	≥1000	ADT716	12140 SE Ramona St
SG-004	< 1000	ADU738	5031 SE 128th Ave
SG-005	< 1000	ADU744	12524 SE Schiller St
SG-007	< 1000	ADV951	8312 SE 75th Pl
SG-008	≥1000	ADT455	4332 SE 130th Ave
SG-010	< 1000	ADV187	10298 SE Ellis St
SG-011	≥1000	ADW312	11540 SE Foster Rd
SG-012	≥1000	ANA590	13250 SE Holgate Blvd
SG-015	≥1000	ANB185	6245 NE 80th Ave
SG-016	< 1000	ADT463	13236 SE Cora St
SG-017	≥1000	ADW271	5403 SE 122nd Ave
SG-018	≥1000	ADT682	5803 SE 122nd Ave
SG-019	< 1000	ADV144	5905 SE 102nd Ave
SG-020	< 1000	ADU753	13030 SE Mitchell St
SG-021	≥1000	AQT805	4754 se 122 nd Ave
P1_1	<1000	AAG769	6940 N Macrum Ave
P1_2	<1000	ADP173	2510 N Buffalo St
P1_3	≥1000	ADQ980	3716 NE 112 th Ave
P1_4	<1000	ADT881	7120 SE 67 th Ave
P1_5	≥1000	ADT773	7002 SE 45 th Ave
P1_6	≥1000	ADS508	1840 SE 164 th Ave
P1_7	≥1000	ADR184	6433 NE Tillamook St
P1_8	<1000	ADS110	20 SE 160 th Ave
P1_9	≥1000	ADQ277	4740 NE 57 th Ave
P1_10	≥1000	ADR905	10634 E Burnside St
P1_11	<1000	ADT118	1160 SE 140 th Ave
P1_12	≥1000	ANB209	15839 E Burnside St
P1_13	<1000	ADN651	6507 N Princeton St
P1_14	≥1000	ADQ898	7380 NE Prescott St
P1_15	<1000	ADP561	6125 N Mississippi Ave
SP4_1	<1000	ADT178	5420 SE Bush St
SP4_3	≥1000	ADN871	8029 N Denver Ave
SP4_4	<1000	ADT312	8006 SE Lafayette St
SP4_5	<1000	ADU615	7519 SE Steele St
SP4_6	<1000	ADP851	5645 NE 34th Ave
SP4_7	<1000	ADT195	4032 SE 60th Ave
SP4_8	≥1000	ADN663	5722 N Lombard St
SP4_9	<1000	ADQ230	4247 NE Alberta St
SP4_10	≥1000	ADW349	10475 SE Division St
SP4_11	≥1000	ADP095	8335 SE Division St
SP5_1	<1000	ADP515	5535 N Gay Ave
SP5_2	≥1000	ADS798	17020 SE Division St
SP5_3	<1000	AAL004	7000 NE Grand Ave
SP5_4	<1000	ADU617	5305 SE 77th Ave
SP5_5	<1000	ADR865	9721 SE Ankeny St

Instream Monitoring Locations (FY 2015-16)

Fixed Sites

Site ID	Location	Watershed
AWB	NE Airport Way Bridge B	Columbia Slough
SJB	St. John's Landfill Bridge	Columbia Slough
M2	1900 SE Millport Road	Johnson Creek
JC-6	SE 158th Ave. Bridge	Johnson Creek
FC-8	4916 SW 56th Avenue	Fanno Creek
TC-4	10750 SW Boones Ferry Road	Tryon Creek
TC-5	SW 26th Way and Barbur Boulevard	Tryon Creek
TC-6	9323 SW Lancaster Road	Tryon Creek
WR-BM	Morrison Street Bridge – RM 12.7	Willamette River
WR-CM	St. John's Railroad Bridge – RM 6.8	Willamette River
WR-FM	Waverly Country Club – RM 17.9	Willamette River

Probabilistic Sites

Site ID	Location	Watershed
0234	Fanno Creek Tributary - 4241 SW Tunnelwood St	Fanno Creek
0444	Johnson Creek - 3083 SW 14th Dr	Johnson Creek
0498	Ash Creek Tributary - 10536 SW 53rd Ave	Fanno Creek
0513	Middle Slough - 12002 NE Inverness Dr	Columbia Slough
0526	Balch Creek - 6131 NW Thompson Rd	Willamette River
0529	Middle Slough - 6900 NE Cornfoot Rd	Columbia Slough
0544	Johnson Creek - 9201 SE McLoughlin Blvd	Johnson Creek
0554	Cedar Mill Creek Tributary - 9742 NW Miller Hill Rd	Tualatin River
0592	Tryon Creek Tributary - Tryon Creek State Park	Willamette River
0633	Willamette River Trib - Forest Park, 2nd Order Stream	Willamette River
0705	Middle Slough - 4501 NE Crystal Ln	Columbia Slough
0720	Willamette River Tributary - 8421 SW Macadam Ave	Willamette River
0746	Ivey Creek - 4722 SW 42nd Ave	Fanno Creek
0754	Falling Creek - 9505 SW Jonathan Ct	Willamette River
0762	Balch Creek - 4300 NW Cornell Rd	Willamette River
0769	Middle Slough - 11632 NE Ainsworth Circle	Columbia Slough
0828	Johnson Creek Tributary - 7017 SE Deardorf Rd	Johnson Creek
0892	Johnson Creek - 6400 SE 101st Ave	Johnson Creek
0961	Middle Slough - 2424 NE Riverside Way	Columbia Slough
1020	Kelley Creek - 6363 SE 159th Dr	Johnson Creek

Stormwater Monitoring Results (FY 2015-16)

Stormwater Monitoring Results (FY 2015-16)			Field Parameters				Conventional				Metals						Nutrients			
Site ID	Site Location & Traffic Count	Sample Date	Dissolved Oxygen (mg/L)	pH	Temp (deg C)	Conductivity (umhos/cm)	E.coli (mpn/100 ml)	Hardness (mg CaCO3/L)	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Copper dissolved (ug/L)	Copper total (ug/L)	Lead dissolved (ug/L)	Lead total (ug/L)	Zinc dissolved (ug/L)	Zinc total (ug/L)	Nitrogen - nitrate (mg/L)	Nitrogen - ammonia (mg/L)	Phosphorus total (mg/L)	Phosphorus - Ortho phosphate (mg/L)
P1_1	6940 N Macrum Ave (<1000)	3/1/2016	11.0	7.4	10.5	8	640	3.11	1.58	6	1.84	2.96	<0.100	1.22	6.10	10.6	<0.10	0.035	0.055	<0.020
P1_2	2510 N BUFFALO St (<1000)	3/9/2016	10.7	6.5	9.3	9	10	3.63	1.87	16	0.873	2.90	0.130	4.68	4.33	13.5	<0.10	0.030	0.074	<0.020
P1_3	3716 NE 112th Ave (>1000)	3/9/2016	10.0	6.7	9.2	16	200	6.49	2.08	30	1.94	5.12	<0.100	8.05	6.98	23.1	<0.250	0.085	0.110	<0.020
P1_4	7120 SE 67th Ave (<1000)	12/21/2015	11.0	6.4	9.0	32	5800	7.52	1.32	14	1.09	3.11	<0.100	4.22	16.6	28.9	<0.10	0.047	0.111	0.026
P1_5	7002 SE 45th Ave (>1000)	3/14/2016	11.8	7.7	7.7	26	74	11.0	1.21	16	0.976	3.25	<0.100	2.05	12.4	26.8	<0.10	0.059	0.053	<0.020
P1_6	1840 SE 164th Ave (>1000)	3/9/2016	11.1	6.5	9.5	9	10	3.61	1.60	21	1.06	3.95	<0.100	0.931	7.24	26.1	<0.10	0.038	0.046	<0.020
P1_7	6433 NE Tillamook St (>1000)	4/14/2016	10.2	6.7	11.2	18	1000	7.18	12.1	38	4.86	7.67	0.167	1.91	10.2	36.6	<0.10	0.105	0.252	0.034
P1_8	20 SE 160th Ave (<1000)	12/21/2015	11.5	6.7	8.2	48	16000	11.2	1.32	8	0.935	1.97	<0.100	0.618	18.9	23.8	0.16	0.056	0.058	<0.020
P1_9	4740 NE 57th Ave (<1000)	3/9/2016	11.4	6.7	9.2	9	86	3.17	1.91	19	1.62	4.00	<0.100	2.45	6.54	16.4	<0.10	0.068	0.110	<0.020
P1_10	10634 E Burnside St (>1000)	4/14/2016	10.8	7.2	11.2	24	370	10.9	9.52	34	8.80	20.8	0.206	6.97	28.7	84.8	0.17	0.423	0.251	0.020
P1_11	1160 SE 140th Ave (<1000)	12/21/2015	11.7	6.1	7.7	28	13000	6.52	<1.00	3	1.12	1.98	<0.100	0.339	11.8	13.6	<0.10	<0.020	0.032	<0.020
P1_12	15839 E Burnside St (>1000)	3/9/2016	11.4	6.2	9.2	12	98	8.50	1.46	101	1.36	16.1	<0.100	6.96	13.4	124	<0.10	0.123	0.215	<0.020
P1_13	6507 N Princeton St (<1000)	3/1/2016	10.2	8.4	11.6	13	75	5.56	2.67	16	1.99	3.59	<0.100	1.84	7.63	16.5	<0.10	0.039	0.119	0.042
P1_14	7380 NE Prescott St (>1000)	3/9/2016	11.6	7.0	9.1	11	440	6.72	2.36	72	2.01	13.1	<0.100	9.83	9.96	69.5	<0.10	0.069	0.185	<0.020
P1_15	6125 N Mississippi Ave (<1000)	3/9/2016	8.3	6.7	9.5	60	63	27.7	2.84	4	2.11	2.77	<0.100	1.26	5.80	8.97	<0.10	0.060	0.041	<0.020
SG-001	2542 SE 18th Ave (<1000)	12/8/2015	9.6	6.6	14.8	23	200	10.2	2.79	16	1.02	2.61	<0.100	2.50	8.98	17.7	<0.10	0.031	0.089	0.031
SG-002	12140 SE Ramona St (>1000)	12/7/2015	10.2	6.5	13.7	9	550	5.12	1.97	12	1.91	4.75	<0.100	1.11	8.35	18.1	<0.10	0.075	0.076	<0.020
SG-004	5031 SE 128th Ave (<1000)	12/7/2015	10.0	6.4	13.4	8	460	5.70	3.23	27	1.18	5.11	<0.100	3.20	6.60	24.9	<0.10	0.036	0.147	0.034
SG-005	12524 SE Schiller St (<1000)	12/7/2015	10.9	6.3	10.7	5	30	6.36	1.71	38	0.551	3.66	0.155	3.78	2.14	14.4	<0.10	0.022	0.145	<0.020
SG-007	8312 SE 75th Pl (<1000)	12/8/2015	9.9	8.5	14.7	12	460	4.77	2.19	17	1.48	3.78	<0.100	1.82	4.86	16.0	<0.10	0.065	0.105	<0.020
SG-008	4332 SE 130th Ave (>1000)	12/7/2015	10.4	6.2	12.6	8	410	6.58	1.59	41	0.851	5.04	<0.100	4.46	5.96	29.3	<0.10	0.027	0.177	0.025
SG-010	10298 SE Ellis St (<1000)	12/8/2015	9.7	6.7	14.9	8	330	7.05	2.13	64	1.19	7.69	<0.100	4.33	8.35	43.7	<0.10	0.066	0.196	<0.020
SG-011	11540 SE Foster Rd (>1000)	10/30/2015	9.5	7.0	15.5	65	9200	26.6	47.2	25	11.3	21.9	0.850	3.26	41.0	90.1	0.21	0.053	0.356	0.114
SG-012	13250 SE Holgate Blvd (>1000)	12/7/2015	11.3	6.2	9.1	8	250	12.2	3.39	136	5.14	35.9	<0.100	9.37	15.0	84.4	<0.10	0.052	0.398	0.024
SG-015	6245 NE 80th Ave (>1000)	12/8/2015	9.5	8.5	14.5	50	140	4.75	6.96	18	2.87	6.19	0.283	2.61	16.3	30.2	<0.10	0.055	0.181	0.064
SG-016	13236 SE Cora St (<1000)	12/7/2015	11.5	5.7	9.1	6	<10	2.81	<1.00	9	<0.201	1.32	<0.100	0.663	2.19	7.34	<0.10	<0.020	0.053	<0.020
SG-017	5403 SE 122nd Ave (>1000)	12/21/2015	11.0	6.7	9.5	36	110	10.9	3.30	15	1.96	6.10	<0.100	1.94	24.9	40.7	<0.10	0.372	0.051	<0.020
SG-019	5905 SE 122nd Ave (<1000)	12/8/2015	9.7	6.6	14.9	6	86	3.64	3.11	20	0.765	2.98	<0.100	1.51	4.27	14.4	<0.10	0.040	0.098	0.029
SG-020	13030 SE Mitchell St (<1000)	12/8/2015	9.5	6.6	15.9	8	>24000	3.58	1.50	4	0.914	1.52	<0.100	0.239	2.82	5.00	<0.10	<0.020	0.055	0.025
SG-021	12205 SE Schiller St (>1000)	4/14/2016	9.8	7.3	11.3	64	7700	35.7	26.7	109	7.13	24.3	0.237	13.5	25.1	133	0.23	0.433	0.433	0.032
SP4_1	5420 SE BUSH ST (<1000)	4/14/2016	10.6	7.1	11.4	15	96	5.70	5.10	16	1.89	3.36	0.154	4.98	14.8	27.6	0.16	0.093	0.156	0.078
SP4_3	8029 N Denver Ave (>1000)	4/14/2016	10.2	7.3	11.3	36	9200	16.5	12.3	17	6.06	10.3	0.299	2.65	41.0	82.1	<0.10	0.071	0.204	0.076
SP4_4	8006 SE Lafayette St (<1000)	4/14/2016	10.5	6.6	11.5	15	3100	5.05	9.01	34	4.66	9.17	0.159	3.04	19.5	45.1	<0.10	0.116	0.195	0.056
SP4_5	7519 SE STEELE ST (<1000)	4/14/2016	10.9	6.5	11.0	9	20	2.03	2.66	8	1.05	1.76	<0.100	0.663	5.59	9.58	<0.10	0.100	0.070	0.033
SP4_6	5645 NE 34TH AVE (<1000)	4/14/2016	10.3	7.4	11.4	37	8700	17.3	13.6	24	5.14	9.79	0.555	3.88	20.7	50.3	<0.10	0.084	0.176	0.048
SP4_7	4032 SE 60TH AVE (<1000)	4/14/2016	10.4	7.1	12.1	11	600	3.30	3.32	5	1.93	2.76	0.118	1.24	10.7	16.9	<0.10	0.084	0.085	0.038
SP4_8	5722 N LOMBARD ST (>1000)	4/14/2016	3.3	7.0	13.5	56	130	21.3	23.0	20	17.4	21.9	0.561	4.94	65.0	85.4	0.53	<0.020	0.334	0.102
SP4_9	4247 NE ALBERTA ST (<1000)	4/14/2016	10.5	7.2	11.5	11	370	4.64	6.81	34	5.32	13.8	0.278	6.42	32.7	66.4	<0.10	0.044	0.142	<0.020
SP5_1	5535 N Gay Ave (<1000)	3/9/2016	11.2	6.8	9.3	19	580	13.3	2.72	104	2.62	17.4	0.131	31.0	8.14	99.7	<0.10	0.061	0.295	0.046
SP5_2	17020 SE Division St (>1000)	4/14/2016	9.7	6.8	12.1	28	460	11.8	9.21	50	7.22	19.3	0.170	5.79	35.1	99.7	<0.10	0.468	0.218	<0.020
SP5_3	7000 NE Grand Ave (<1000)	3/9/2016	11.4	6.9	9.1	9	130	3.60	1.65	8	1.51	3.12	0.199	1.63	22.0	31.4	<0.10	0.022	0.036	<0.020
SP5_4	5305 SE 77th Ave (<1000)	4/14/2016	10.9	6.6	10.7	10	360	5.74	4.11	52	1.69	4.48	0.103	2.04	12.0	35.3	<0.10	0.084	0.133	0.039
SP5_5	9721 SE Ankeny St (<1000)	4/14/2016	10.4	6.6	11.2	19	84	7.00	12.6	24	9.52	19.8	0.231	2.49	39.1	80.6	<0.10	0.112	0.121	0.027
SP4_10	10475 SE Division St (>1000)	4/14/2016	11.0	7.4	10.9	19	180	38.1	3.94	701	2.70	58.2	0.119	58.0	8.32	387	<0.10	0.185	1.13	0.027
SP4_11	8335 SE Division St (>1000)	4/22/2016	9.8	7.3	14.5	28	340	12.7	7.81	45	5.54	12.6	0.243	3.44	47.6	90.1	0.14	0.219	0.168	0.027

Instream Probabilistic Monitoring Results (FY 2015-16)			Field Parameters				Conventional				Metals						Nutrients			
Site ID	Site Location	Sample Date	Dissolved Oxygen (mg/L)	pH	Temp (deg C)	Conductivity (umhos/cm)	E.coli (mpn/100 ml)	Hardness (mg CaCO3/L)	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Copper dissolved (ug/L)	Copper total (ug/L)	Lead dissolved (ug/L)	Lead total (ug/L)	Zinc dissolved (ug/L)	Zinc total (ug/L)	Nitrogen - nitrate (mg/L)	Nitrogen - ammonia (mg/L)	Phosphorus total (mg/L)	Phosphorus - Ortho phosphate (mg/L)
0513	Middle Slough - 12002 NE Inverness Dr	9/22/2015	5.7	7	16.8	189	20	74.9	3.11	<2	0.715	0.956	<0.100	0.138	1.54	2.35	0.52	0.068	0.064	0.031
0513	Middle Slough - 12002 NE Inverness Dr	12/16/2015	8.8	7.2	7.9	122	75	49.8	2.53	2	1.18	1.81	<0.100	0.434	7.78	10.3	1.2	0.091	0.088	0.051
0513	Middle Slough - 12002 NE Inverness Dr	12/23/2015	9.2	7	6.9	103	310	43.9	2.13	4	1.12	2.02	0.114	0.848	16.7	24.4	0.745	0.083	0.081	0.038
0513	Middle Slough - 12002 NE Inverness Dr	2/25/2016	8.2	6.9	10.5	194	20	75.3	1.48	6	0.624	0.918	<0.100	0.228	4.72	6.25	2.2	0.124	0.114	0.042
0513	Middle Slough - 12002 NE Inverness Dr	4/28/2016	4.9	7	14.4	171	110	71.9	2.4	<2	0.536	0.825	<0.100	0.176	2.11	2.71	0.8	0.186	0.132	0.052
0529	Middle Slough - 6900 NE Cornfoot Rd	7/29/2015	8.3	7	19.9	184	75	73.7	3.16	<2	0.769	0.959	<0.100	0.122	2.54	3.04	1.6	0.077	0.09	0.061
0529	Middle Slough - 6900 NE Cornfoot Rd	10/14/2015	7.6	6.6	14.5	163	63	71.5	2.15	4	0.568	0.748	<0.101	0.119	2.69	3.38	1.67	0.055	0.103	0.067
0529	Middle Slough - 6900 NE Cornfoot Rd	2/25/2016	7.6	6.8	10.7	210	52	81.7	1.26	4	0.575	0.715	<0.100	0.149	3.94	5.14	3	0.078	0.125	0.067
0529	Middle Slough - 6900 NE Cornfoot Rd	4/19/2016	9.6	7.1	16.3	184	31	74	2.14	5	0.606	0.877	<0.100	0.126	2.13	3.36	1.5	<0.020	0.114	0.03
0529	Middle Slough - 6900 NE Cornfoot Rd	5/20/2016	7.8	7	14.8	151	98	60.5	2.32	3	1.31	1.79	<0.100	0.308	6.94	9.1	1.7	0.076	0.113	0.06
0705	Middle Slough - 4501 NE Crystal Lane	7/29/2015	6.3	6.9	19.4	185	41	76.1	4.16	<2	0.879	1.05	<0.100	0.128	3.45	3.33	1.4	0.172	0.093	0.057
0705	Middle Slough - 4501 NE Crystal Lane	10/14/2015	7.9	6.5	14.3	158	63	68.7	2.29	2	0.682	0.837	<0.101	0.11	2.81	3.36	1.6	0.056	0.131	0.058
0705	Middle Slough - 4501 NE Crystal Lane	2/25/2016	8.7	6.8	11.1	212	<10	85.4	1.7	4	0.708	0.848	<0.100	0.163	4.63	6.13	2.4	0.077	0.115	0.046
0705	Middle Slough - 4501 NE Crystal Lane	4/19/2016	9.7	7.1	16.7	185	52	76.5	2.18	6	0.622	0.97	<0.100	0.146	2.27	3.73	1.4	0.038	0.113	0.025
0705	Middle Slough - 4501 NE Crystal Lane	5/20/2016	7	7.1	15.2	156	230	63.5	2.55	3	1.46	1.95	<0.100	0.286	5.82	7.73	1.4	0.082	0.132	0.052
0769	Middle Slough - 11632 NE Ainsworth Circle	8/25/2015	5.3	7	19.5	200	110	83.4	3	2	0.478	0.647	<0.100	0.147	0.709	1.15	0.54	0.054	0.063	0.026
0769	Middle Slough - 11632 NE Ainsworth Circle	12/16/2015	8.6	7.1	8	125	200	49.2	2.57	2	1.13	1.67	0.297	0.354	7.22	9.56	1.2	0.086	0.089	0.05
0769	Middle Slough - 11632 NE Ainsworth Circle	12/23/2015	9.6	6.8	7	103	110	43.1	2.01	4	1.11	1.87	<0.100	0.651	18.5	24.7	0.76	0.06	0.082	0.031
0769	Middle Slough - 11632 NE Ainsworth Circle	2/25/2016	8.5	6.9	11	198	<10	84	1.68	3	0.782	0.902	<0.100	0.172	4.89	6.3	2	0.133	0.111	0.038
0769	Middle Slough - 11632 NE Ainsworth Circle	4/28/2016	5.7	6.9	14.6	172	41	71.8	2.47	3	0.593	0.875	<0.100	0.214	2.21	3.14	0.76	0.176	0.141	0.051
0961	Middle Slough - 2424 NE Riverside Way	9/1/2015	6.6	6.8	18.4	196	130	80.8	3.55	4	0.981	1.24	<0.100	0.136	3.51	4.43	1.3	0.091	0.1	0.049
0961	Middle Slough - 2424 NE Riverside Way	10/14/2015	10.2	6.1	14.9	184	85	79.7	2.2	6	0.555	0.784	<0.101	0.165	1.68	2.4	1.63	0.078	0.131	0.059
0961	Middle Slough - 2424 NE Riverside Way	2/25/2016	10	6.5	10.7	232	<10	93.9	1.36	5	0.638	0.741	<0.100	0.171	3.42	4.36	3.1	<0.020	0.101	0.056
0961	Middle Slough - 2424 NE Riverside Way	4/19/2016	14.7	7.3	16.7	211	98	94.6	1.89	6	0.5	0.747	<0.100	0.12	1.17	2.29	1.8	<0.020	0.116	0.025
0961	Middle Slough - 2424 NE Riverside Way	5/20/2016	10.3	7.2	15.7	203	140	81.8	1.93	3	0.836	1.12	<0.100	0.197	3.16	4.44	2	0.112	0.114	0.052
0234	Fanno Creek Tributary - 4241 SW Tunnelwood St	7/22/2015	9.4	7.9	15.1	173	93	67.6	3.39	3	1.02	1.68	<0.100	0.414	2.31	6.49	0.26	<0.020	0.136	0.092
0234	Fanno Creek Tributary - 4241 SW Tunnelwood St	11/30/2015	13.2	7.4	2.4	154	31	52.6	2.59	<2	1.05	1.18	<0.100	0.126	5.2	5.36	1.2	<0.020	0.072	0.062
0234	Fanno Creek Tributary - 4241 SW Tunnelwood St	12/2/2015	12.5	7.3	5.2	133	98	45.3	4.29	2	2.61	3.25	0.423	0.87	11.2	15.1	1.5	<0.020	0.116	0.062
0234	Fanno Creek Tributary - 4241 SW Tunnelwood St	3/29/2016	12	6.9	6.9	159	<10	55.7	1.8	4	0.696	0.928	<0.100	0.245	2.97	4.36	1	<0.020	0.056	0.041
0234	Fanno Creek Tributary - 4241 SW Tunnelwood St	4/11/2016	10.7	6.7	10.2	167	<10	57.3	1.91	4	0.809	1.05	<0.100	0.236	2.84	4.73	0.64	<0.020	0.072	0.053
0498	Ash Creek Tributary - 10536 SW 53rd Ave	9/2/2015	9	7.7	16.3	237	97	107	1.4	<2	1.17	1.35	<0.100	0.366	4.81	5.64	1.7	<0.020	0.122	0.098
0498	Ash Creek Tributary - 10536 SW 53rd Ave	11/30/2015	11.1	7.8	8.6	215	<10	96.3	1.31	<2	0.977	1.25	<0.100	0.283	5.93	7.21	1.9	<0.020	0.082	0.067
0498	Ash Creek Tributary - 10536 SW 53rd Ave	12/2/2015	10.7	7.5	9.7	212	96	86.5	3.13	2	3.68	4.31	0.984	2.09	18.3	21.6	3	<0.020	0.073	0.042
0498	Ash Creek Tributary - 10536 SW 53rd Ave	3/17/2016	10.8	7.4	10.5	179	20	68.9	2	11	2.04	3.74	1.02	3.93	6.63	14.4	2.3	<0.020	0.072	0.045
0498	Ash Creek Tributary - 10536 SW 53rd Ave	4/11/2016	10	7.6	11.7	219	75	88.4	1.09	4	0.869	1.67	<0.100	1.27	5.5	9.76	1.53	<0.020	0.082	0.058
0746	Ivey Creek - 4722 SW 42nd Ave	7/21/2015	8.4	7.3	16.5	204	36	86.7	3.27	6	1	1.45	<0.100	0.386	3.35	5.89	0.66	<0.020	0.137	0.095
0746	Ivey Creek - 4722 SW 42nd Ave	11/30/2015	13	7.4	3.6	169	86	63.5	2.54	<2	1.13	1.25	<0.100	<0.100	7.14	8.02	0.76	<0.020	0.049	0.041
0746	Ivey Creek - 4722 SW 42nd Ave	12/2/2015	12.3	7.3	6	140	410	51.9	4.58	<2	3.01	3.47	0.28	0.626	10.5	12.8	1.1	<0.020	0.118	0.067
0746	Ivey Creek - 4722 SW 42nd Ave	3/17/2016	11.6	7.5	8.8	168	20	60.2	2.13	4	1.11	1.58	<0.100	0.379	5.33	8.47	1.3	0.034	0.07	0.044
0746	Ivey Creek - 4722 SW 42nd Ave	4/11/2016	10.8	6.7	10.6	186	260	65.7	2.1	6	0.983	1.34	<0.100	0.329	2.93	5.98	0.8	<0.020	0.081	0.053
0444	Johnson Creek - 3083 SW 14th Dr	9/24/2015	8.7	7.6	13.4	144	98	45.9	3.97	3	1.09	1.38	<0.100	0.208	1.61	3.28	0.41	0.025	0.093	0.064
0444	Johnson Creek - 3083 SW 14th Dr	12/1/2015	13.2	6.6	3.2	97	20	30.4	1.78	<2	0.523	0.711	<0.100	0.133	1.82	2.88	3.3	<0.020	<0.030	<0.020
0444	Johnson Creek - 3083 SW 14th Dr	1/13/2016	11.9	5.8	6.3	60	3900	24.2	2.29	118	1.17	4.64	0.105	2.93	6.52	25.8	1.6	0.04	0.168	0.026
0444	Johnson Creek - 3083 SW 14th Dr	2/23/2016	12.2	6.9	6.7	74	540	25.3	1.29	4	0.502	0.793	<0.100	0.248	3.2	4.95	2.4	0.025	0.03	<0.020
0444	Johnson Creek - 3083 SW 14th Dr	4/18/2016	10.4	7.4	14.6	84	520	26.7	1.74	<2	0.715	0.938	<0.100	0.157	2.43	3.49	1.4	<0.020	0.047	<0.020
0544	Johnson Creek - 9201 SE McLoughlin Blvd	8/18/2015	8.8	7.5	17.4	190	190	74.2	1.34	2	0.392	0.521	<0.100	0.155	0.529	1.03	2.9	<0.020	0.076	0.059
0544	Johnson Creek - 9201 SE McLoughlin Blvd	11/30/2015	13.7	7.4	3.9	149	86	54.9	1.43	2	0.476	0.61	<0.100	0.156	1.24	1.88	3.8	<0.020	0.08	0.056
0544	Johnson Creek - 9201 SE McLoughlin Blvd	12/23/2015	11.6	6.6	8	84	450	31.1	2.32	14	1.02	2.19	<0.100	1.04	4.1	10.4	2.26	<0.020	0.082	0.029
0544	Johnson Creek - 9201 SE McLoughlin Blvd	2/23/2016	12.2	7.5	9.1	105	430	38.5	1.38	5	0.603	0.924	<0.100	0.314	1.57	3.59	2.6	<0.020	0.05	0.033
0544	Johnson Creek - 9201 SE McLoughlin Blvd	4/18/2016	11.1	7.9	17.4	137	150	48	1.71	3	0.681	0.935	<0.100	0.193	0.897	2.21	2.2	<0.020	0.077	0.046
0828	Johnson Creek Tributary - 7017 SE Deardorf Rd	7/15/2015	8.8	7.1	17.3	135	1000	50	3.48	<2	0.893	1.08	<0.100	0.132	0.832	1.86	0.68	<0.020	0.041	0.034
0828	Johnson Creek Tributary - 7017 SE Deardorf Rd	12/1/2015	12.9	7.1	5	126	10	44.3	2.08	<2	0.565	0.656	<0.100	<0.100	1.15	1.76	2	<0.020	<0.030	<0.020
0828	Johnson Creek Tributary - 7017 SE Deardorf Rd	12/23/2015	12	7	7	49	380	27.2	2.18	8	0.9	1.51	0.12	0.61	2.73	6.64	1.12	<0.020	0.045	<0.020
0828	Johnson Creek Tributary - 7017 SE Deardorf Rd	2/23/2016	12.3	7.5	7.6	88	10	32.5	1.47	<2	0.502	0.598	<0.100	0.116	1.69	2.44	1.2	<0.020	<0.030	<0.020
0828	Johnson Creek Tributary - 7017 SE Deardorf Rd	4/18/2016	9.9	7.4	14.8	104	31	36	1.53	<2	0.615	0.722	<0.100	<0.100	1.51	1.84	0.78	<0.020	<0.030	<0.020
0892	Johnson Creek - 6400 SE 101st Ave	9/23/2015	7	7.1	14.8	115	52	38.5	4.42	4	1.38	1.68	0.15	0.353	1.35	2.78	0.2	0.048	0.089	0.051

Instream Probabilistic Monitoring Results (FY 2015-16)			Field Parameters				Conventional				Metals						Nutrients			
Site ID	Site Location	Sample Date	Dissolved Oxygen (mg/L)	pH	Temp (deg C)	Conductivity (umhos/cm)	E.coli (mpn/100 ml)	Hardness (mg CaCO3/L)	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Copper dissolved (ug/L)	Copper total (ug/L)	Lead dissolved (ug/L)	Lead total (ug/L)	Zinc dissolved (ug/L)	Zinc total (ug/L)	Nitrogen - nitrate (mg/L)	Nitrogen - ammonia (mg/L)	Phosphorus total (mg/L)	Phosphorus - Ortho phosphate (mg/L)
0892	Johnson Creek - 6400 SE 101st Ave	11/30/2015	14.5	7.6	2.1	102	10	34	1.96	2	0.6	0.795	<0.100	0.134	1.74	2.69	3.1	<0.020	0.037	<0.020
0892	Johnson Creek - 6400 SE 101st Ave	1/13/2016	11.9	7	6.4	67	1500	25.4	2.61	128	1.2	4.2	0.103	2.81	4.06	21.1	1.5	0.046	0.177	0.028
0892	Johnson Creek - 6400 SE 101st Ave	2/23/2016	12	7.3	7.7	81	330	28.4	1.5	15	0.558	0.922	<0.100	0.3	2.52	4.79	2.2	0.024	0.043	<0.020
0892	Johnson Creek - 6400 SE 101st Ave	4/18/2016	10.5	7.4	15.8	93	220	30.6	2.05	3	0.651	1.07	<0.100	0.19	1.9	3.8	1.3	<0.020	0.05	0.026
1020	Kelley Creek - 6363 SE 159th Dr	9/9/2015	9.7	7.4	15	174	300	71.5	2.57	<2	0.468	0.641	<0.100	<0.100	1.14	2.01	0.64	<0.020	0.094	0.063
1020	Kelley Creek - 6363 SE 159th Dr	11/30/2015	14.5	7.5	3.4	130	98	46.8	2.75	<2	0.764	0.875	<0.100	<0.100	1.67	2.36	1.9	<0.020	0.048	0.03
1020	Kelley Creek - 6363 SE 159th Dr	12/23/2015	11.9	7	7.1	71	960	24.6	2.96	15	1.18	1.89	<0.100	0.653	3.87	8.36	1.1	<0.020	0.085	0.038
1020	Kelley Creek - 6363 SE 159th Dr	2/23/2016	12.4	7.3	6.9	87	98	32.3	1.71	<2	0.6	0.77	<0.100	0.167	2.15	3.25	1.4	<0.020	0.037	0.025
1020	Kelley Creek - 6363 SE 159th Dr	4/18/2016	10.4	7.3	13.9	115	1000	41.5	2.27	<2	0.703	0.896	<0.100	0.121	6.28	9	0.77	<0.020	0.057	0.03
0592	Tryon Creek Tributary - Tryon Creek State park	9/10/2015	9.6	7.6	14.3	243	150	102	3.29	3	0.546	0.757	<0.100	<0.100	<0.502	0.7	0.55	<0.020	0.111	0.09
0592	Tryon Creek Tributary - Tryon Creek State park	11/30/2015	13.8	7.5	3.4	203	41	83.9	2.58	9	0.619	0.881	<0.100	0.143	<0.502	1.05	0.83	<0.020	0.066	0.041
0592	Tryon Creek Tributary - Tryon Creek State park	3/10/2016	11.4	6.9	9.4	141	63	55.1	3.76	61	1.25	3.74	0.138	1.6	1.23	9.7	0.75	<0.020	0.15	0.051
0592	Tryon Creek Tributary - Tryon Creek State park	3/29/2016	11.9	7.8	8.5	175	<10	68	2.15	4	0.614	1.12	<0.100	0.357	<0.502	7.66	0.87	<0.020	0.065	0.043
0592	Tryon Creek Tributary - Tryon Creek State park	4/11/2016	11.2	7.4	10.7	190	52	71.9	2.01	5	0.565	0.787	<0.100	0.174	<0.502	1.32	0.71	<0.020	0.076	0.05
0754	Falling Creek - 9505 SW Jonathan Ct	7/14/2015	9.5	7.1	15.5	230	990	89	2.68	<2	0.849	1.17	<0.100	0.512	15.9	25.6	0.64	<0.020	0.087	0.066
0754	Falling Creek - 9505 SW Jonathan Ct	11/30/2015	12	7.7	5.9	189	31	75.9	2.2	<2	0.831	1.01	<0.100	0.139	25	29.7	1.3	<0.020	0.046	0.031
0754	Falling Creek - 9505 SW Jonathan Ct	12/2/2015	11.7	7.5	8.1	146	1400	58.4	4.31	18	2.78	4.4	0.287	1.37	40.9	60.9	2.3	<0.020	0.136	0.04
0754	Falling Creek - 9505 SW Jonathan Ct	3/17/2016	11.3	7.2	9.6	118	75	42.4	2.63	4	0.97	1.55	<0.100	0.504	38.9	48.4	0.91	0.074	0.05	0.028
0754	Falling Creek - 9505 SW Jonathan Ct	4/11/2016	10.4	7.7	11.7	214	31	79.1	2.1	2	0.91	1.25	<0.100	0.205	15.1	21.5	0.84	0.022	0.06	0.04
0554	Cedar Mill Creek Tributary - 9742 NW Miller Hill Rd	8/19/2015	8.2	7.6	19.3	203	20	79.3	2.81	10	0.908	1.14	<0.100	<0.100	<0.502	0.964	0.4	<0.020	0.062	0.051
0554	Cedar Mill Creek Tributary - 9742 NW Miller Hill Rd	11/30/2015	13.5	7.4	2.4	143	<10	54.7	2.48	<2	1.07	1.17	<0.100	<0.100	1.13	1.4	0.7	<0.020	0.045	0.038
0554	Cedar Mill Creek Tributary - 9742 NW Miller Hill Rd	12/2/2015	12.4	7.4	6	125	340	49.3	4.68	2	3.23	4.48	0.192	0.567	6.94	9.1	1.2	<0.020	0.117	0.052
0554	Cedar Mill Creek Tributary - 9742 NW Miller Hill Rd	2/8/2016	12.7	7.1	8.7	114	10	44.5	2.29	2	0.857	1.26	<0.100	0.209	1.95	3.53	0.95	<0.020	0.058	0.037
0554	Cedar Mill Creek Tributary - 9742 NW Miller Hill Rd	4/4/2016	12.1	7.9	11.1	113	180	44.1	3.35	4	6.78	9.62	<0.100	0.285	1.67	4.8	0.427	<0.020	0.074	0.038
0526	Balch Creek - 6131 NW Thompson Rd	8/4/2015	9.7	8	15	201	41	84.2	2.7	25	0.564	0.754	<0.100	<0.100	<0.500	0.729	0.36	<0.020	0.107	0.095
0526	Balch Creek - 6131 NW Thompson Rd	11/30/2015	13.6	7.5	1.4	158	<10	63.2	3.94	<2	0.946	1.18	<0.100	0.14	0.728	0.938	1.3	<0.020	0.052	0.037
0526	Balch Creek - 6131 NW Thompson Rd	12/2/2015	12.9	7	4.1	116	74	41.6	8.93	9	2.19	3.63	0.279	1.22	2.7	7.04	3.3	<0.020	0.137	0.052
0526	Balch Creek - 6131 NW Thompson Rd	2/8/2016	13.1	7	7.3	88	10	32	3.09	12	1.11	2.06	0.228	0.725	1.44	4.11	2.5	<0.020	0.074	0.03
0526	Balch Creek - 6131 NW Thompson Rd	4/4/2016	11.8	7.5	9.4	110	210	36.8	3.26	8	1.05	2.02	0.17	0.67	1.04	3.73	1.13	<0.020	0.077	0.026
0633	Willamette River Tributary - Forest Park 2nd Order Stream	7/1/2015	8.1	6.2	16.6	79	20	25.2	1.33	<2	0.297	0.504	<0.100	0.156	<0.500	0.955	1.4	<0.020	0.054	0.034
0633	Willamette River Tributary - Forest Park 2nd Order Stream	11/30/2015	13	6.6	3.5	99	<10	33.5	1.92	<2	0.249	0.317	<0.100	<0.100	<0.502	<0.500	5.5	<0.020	<0.030	0.025
0633	Willamette River Tributary - Forest Park 2nd Order Stream	2/9/2016	12.1	8	7.4	62	<10	18.3	1.67	<2	0.356	0.54	<0.100	0.169	0.515	0.999	2.6	<0.020	0.03	0.025
0633	Willamette River Tributary - Forest Park 2nd Order Stream	3/10/2016	11.7	7.1	8.7	60	120	17.7	2.26	18	0.534	0.938	0.12	0.456	0.728	2.18	2.05	<0.020	0.04	0.022
0633	Willamette River Tributary - Forest Park 2nd Order Stream	4/4/2016	11.6	5.2	9	69	31	19.5	1.42	<2	0.271	0.365	<0.100	<0.100	<0.502	0.713	2.27	<0.020	0.036	0.022
0720	Willamette River Tributary - 8421 SW Macadam Ave	7/8/2015	9.7	7.2	16.3	131	130	50.7	1.46	3	0.537	0.951	<0.100	0.258	2.1	4.51	0.62	<0.020	0.078	0.041
0720	Willamette River Tributary - 8421 SW Macadam Ave	11/30/2015	12.1	7.9	7.5	135	20	54	1.74	25	0.705	3.03	<0.100	1.35	4.15	18.6	0.7	<0.020	0.161	0.032
0720	Willamette River Tributary - 8421 SW Macadam Ave	12/10/2015	10.8	7.4	10.4	127	340	42.3	4.31	92	2.56	6.15	0.847	5.2	52.5	86.9	0.84	<0.020	0.187	0.049
0720	Willamette River Tributary - 8421 SW Macadam Ave	3/29/2016	11.1	7.6	10.3	159	<10	59.6	1.95	4	0.7	1	<0.100	0.572	3.63	6.84	0.76	<0.020	0.061	0.026
0720	Willamette River Tributary - 8421 SW Macadam Ave	4/11/2016	10.6	7.6	11.6	165	<10	60	1.65	32	0.597	0.922	<0.100	0.357	2.73	5.89	0.72	<0.020	0.075	0.036
0762	Balch Creek - 4300 NW Cornell Rd	7/7/2015	9.5	7.1	16.5	199	150	80.3	1.9	4	0.525	0.709	<0.100	0.248	<0.500	0.662	0.42	<0.020	0.128	0.1
0762	Balch Creek - 4300 NW Cornell Rd	11/30/2015	13.7	7.2	1.9	160	10	62.3	2.69	12	0.69	0.857	<0.100	0.107	0.55	0.737	1.7	<0.020	0.069	0.058
0762	Balch Creek - 4300 NW Cornell Rd	12/2/2015	13.2	6.9	4.1	120	170	44	6.29	7	2.11	3.28	0.417	1.3	2.3	6.55	3	<0.020	0.141	0.062
0762	Balch Creek - 4300 NW Cornell Rd	2/9/2016	12.1	7.7	7.4	94	63	32.9	2.34	6	0.892	1.35	0.196	0.513	1.44	3.01	2.4	<0.020	0.065	0.038
0762	Balch Creek - 4300 NW Cornell Rd	4/4/2016	11.5	7	9.3	116	430	39.2	2.51	4	0.884	1.19	0.266	0.395	1.8	2.35	1.27	<0.020	0.066	0.034

Instream Fixed Monitoring Results (FY 2015-16)			Field Parameters				Conventional				Metals						Nutrients			
Site ID	Site Location	Sample Date	Dissolved Oxygen (mg/L)	pH	Temp (deg C)	Conductivity (umhos/cm)	E.coli (mpn/100 ml)	Hardness (mg CaCO3/L)	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Copper dissolved (ug/L)	Copper total (ug/L)	Lead dissolved (ug/L)	Lead total (ug/L)	Zinc dissolved (ug/L)	Zinc total (ug/L)	Nitrogen - nitrate (mg/L)	Nitrogen - ammonia (mg/L)	Phosphorus total (mg/L)	Phosphorus - Ortho phosphate (mg/L)
AWB	NE Airport Way Bridge B, Main Channel	7/29/2015	8.3	7.9	22.4	196	85	75.9	5.18	9	1.06	1.46	<0.100	0.304	1.18	2.95	<0.10	<0.020	0.114	0.031
AWB	NE Airport Way Bridge B, Main Channel	9/21/2015	13.9	7.8	18.6	192	41	79.8	4.22	6	0.927	1.31	<0.100	0.279	2.42	6.01	<0.10	0.022	0.065	<0.020
AWB	NE Airport Way Bridge B, Main Channel	11/10/2015	10.9	7.6	10.4	135	63	65.2	3.49	12	1.19	1.37	<0.100	0.283	1.20	2.89	0.10	<0.020	0.100	0.025
AWB	NE Airport Way Bridge B, Main Channel	1/11/2016	13.8	7.6	3.6	182	120	70.4	1.89	12	0.628	1.28	<0.100	0.465	2.44	6.96	1.6	0.067	0.084	0.035
AWB	NE Airport Way Bridge B, Main Channel	3/15/2016	17.3	7.8	9.8	127	63	56.4	3.08	18	1.18	2.58	<0.100	0.570	1.42	10.5	0.37	<0.020	0.082	<0.020
AWB	NE Airport Way Bridge B, Main Channel	5/3/2016	10.3	7.6	19.0	183	260	82.7	3.31	17	0.655	1.31	<0.100	0.468	0.779	4.81	<0.10	<0.020	0.206	0.026
SJB	St Johns Landfill Bridge, Main Channel	7/29/2015	13.8	7.8	23.6	218	160	89.8	3.38	16	1.36	2.63	0.173	1.59	1.03	7.53	1.3	<0.020	0.158	0.034
SJB	St Johns Landfill Bridge, Main Channel	9/21/2015	6.5	7.6	18.6	194	41	81.8	2.25	23	0.990	2.03	0.162	1.33	<0.502	5.38	1.5	<0.020	0.140	<0.020
SJB	St Johns Landfill Bridge, Main Channel	11/10/2015	8.0	6.9	10.8	168	200	79.3	2.80	29	0.960	2.46	0.165	1.79	1.97	9.37	1.4	0.134	0.175	0.038
SJB	St Johns Landfill Bridge, Main Channel	1/11/2016	10.6	7.3	5.2	234	41	92.8	1.78	12	0.809	1.65	<0.100	2.98	4.23	41.0	2.6	0.146	0.114	0.045
SJB	St Johns Landfill Bridge, Main Channel	3/15/2016	15.9	7.7	10.0	179	20	79.6	2.53	16	2.78	6.22	<0.100	0.861	6.17	15.7	1.2	<0.020	0.117	0.021
SJB	St Johns Landfill Bridge, Main Channel	5/3/2016	13.4	7.6	18.5	207	10	91.9	1.86	15	0.709	1.26	<0.100	0.665	1.00	4.03	1.7	<0.020	0.120	<0.020
FC8	4916 SW 56th Ave (Main Channel)	7/16/2015	9.5	7.3	17.8	204	250	81.0	4.76	3	1.16	1.83	<0.100	0.192	1.68	2.67	0.15	<0.020	0.139	0.111
FC8	4916 SW 56th Ave (Main Channel)	8/17/2015	7.0	7.4	17.4	219	460	92.2	3.35	18	0.754	1.22	<0.100	0.420	1.30	4.47	0.11	0.022	0.146	0.094
FC8	4916 SW 56th Ave (Main Channel)	9/21/2015	7.2	7.4	15.7	173	720	67.3	4.51	4	1.37	1.71	0.107	0.370	2.49	4.45	0.27	0.021	0.187	0.105
FC8	4916 SW 56th Ave (Main Channel)	10/28/2015	9.6	7.5	12.6	107	4100	41.7	7.94	18	3.39	4.97	0.398	2.12	21.4	33.3	0.49	0.107	0.218	0.109
FC8	4916 SW 56th Ave (Main Channel)	11/9/2015	9.3	7.3	10.0	121	500	46.4	4.36	6	2.22	2.79	0.344	1.08	6.95	10.5	0.79	0.038	0.141	0.064
FC8	4916 SW 56th Ave (Main Channel)	12/9/2015	10.2	7.0	11.2	128	>24000	49.8	6.44	12	3.10	5.15	0.324	2.62	10.0	23.0	2.3	0.091	0.198	0.094
FC8	4916 SW 56th Ave (Main Channel)	1/13/2016	12.2	7.2	7.5	55	7300	34.5	4.73	88	2.95	7.24	0.355	5.43	13.6	41.5	1.1	0.051	0.291	0.084
FC8	4916 SW 56th Ave (Main Channel)	2/29/2016	11.4	7.4	9.9	139	4600	49.6	2.51	4	1.43	2.07	0.124	0.675	12.8	19.3	1.0	0.090	0.092	0.037
FC8	4916 SW 56th Ave (Main Channel)	3/16/2016	11.2	7.1	9.6	147	1000	57.1	2.54	4	1.29	2.11	0.174	0.785	13.5	19.9	1.2	0.034	0.086	0.041
FC8	4916 SW 56th Ave (Main Channel)	4/11/2016	11.0	7.8	11.8	188	260	69.7	2.38	<2	0.759	1.13	<0.100	0.329	2.42	5.27	0.80	<0.020	0.116	0.063
FC8	4916 SW 56th Ave (Main Channel)	5/4/2016	8.7	7.0	13.4	157	860	58.1	6.78	3	2.50	3.46	0.164	0.693	5.04	9.11	0.88	0.041	0.134	0.069
FC8	4916 SW 56th Ave (Main Channel)	6/15/2016	9.1	7.9	12.1	178	470	71.0	3.76	<2	1.20	1.52	<0.100	0.241	2.97	4.32	0.49	<0.020	0.118	0.092
JC-6	SE 158th Ave Bridge (Main Channel)	7/29/2015	7.5	7.0	19.7	147	98	48.1	8.02	2	2.37	2.94	<0.100	0.215	3.55	4.98	0.32	0.072	0.098	0.059
JC-6	SE 158th Ave Bridge (Main Channel)	9/21/2015	9.0	7.5	16.3	109	1700	38.8	4.07	4	1.58	1.62	<0.100	0.185	2.55	3.44	0.27	0.046	0.082	0.064
JC-6	SE 158th Ave Bridge (Main Channel)	11/10/2015	10.7	7.1	9.5	101	280	38.7	3.96	4	1.56	1.94	0.104	0.304	5.70	8.46	2.1	0.028	0.083	0.047
JC-6	SE 158th Ave Bridge (Main Channel)	1/11/2016	13.3	7.5	4.8	99	1300	32.7	1.64	<2	0.578	0.780	<0.100	0.173	3.84	5.36	2.4	0.050	0.036	<0.020
JC-6	SE 158th Ave Bridge (Main Channel)	3/15/2016	13.6	6.9	8.7	71	5800	26.0	1.61	11	1.03	1.96	<0.100	0.577	4.38	8.52	1.8	<0.020	0.055	<0.020
JC-6	SE 158th Ave Bridge (Main Channel)	5/3/2016	8.9	7.3	16.4	99	86	39.3	2.22	4	0.839	1.25	<0.100	0.235	2.67	4.96	1.1	0.036	0.079	0.034
M2	SE Millport Road	7/29/2015	11.0	7.3	18.7	193	190	71.1	1.86	2	0.747	1.08	<0.100	0.198	1.40	2.56	2.8	<0.020	0.086	0.059
M2	SE Millport Road	9/21/2015	12.0	7.9	17.3	175	110	68.4	1.31	4	0.502	0.725	<0.100	0.205	0.634	1.75	3.3	<0.020	0.092	0.071
M2	SE Millport Road	11/10/2015	11.6	7.3	10.1	131	75	66.9	2.63	4	1.09	1.45	<0.100	0.285	1.96	3.88	2.8	<0.020	0.115	0.075
M2	SE Millport Road	1/11/2016	13.1	7.4	6.3	138	860	50.2	1.51	4	0.721	1.07	<0.100	0.322	3.75	6.30	3.1	0.025	0.066	0.044
M2	SE Millport Road	3/15/2016	13.9	7.0	9.0	86	1600	32.3	1.71	14	0.871	1.99	<0.100	0.813	3.52	9.70	1.9	<0.020	0.075	0.025
M2	SE Millport Road	5/3/2016	10.4	7.8	18.3	153	20	63.9	1.52	3	0.698	0.942	<0.100	0.218	1.11	2.49	2.8	<0.020	0.100	0.060
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	7/16/2015	10.3	7.4	16.1	188	200	75.3	2.40	<2	0.878	1.01	<0.100	<0.100	2.13	2.96	0.58	<0.020	0.117	0.098
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	8/17/2015	9.3	7.7	16.7	196	230	82.0	3.71	<2	1.30	1.48	<0.100	0.133	3.78	5.01	0.34	<0.020	0.116	0.109
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	9/21/2015	9.8	7.7	14.4	188	97	72.8	2.76	<2	1.26	1.35	<0.100	<0.100	2.80	3.58	0.45	<0.020	0.130	0.108
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	10/28/2015	10.7	7.6	12.2	75	3400	28.8	6.82	8	3.97	5.47	0.207	1.55	13.7	24.8	0.43	0.032	0.176	0.110
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	11/9/2015	11.6	7.9	9.4	141	930	53.5	4.08	2	2.27	2.48	0.164	0.393	7.96	10.3	1.4	<0.020	0.115	0.073
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	12/9/2015	11.1	6.8	11.1	110	600	44.4	5.10	87	2.52	4.79	0.270	2.53	9.94	27.4	2.8	0.047	0.206	0.077
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	1/13/2016	12.9	7.3	7.1	44	1900	32.1	3.49	142	2.19	7.84	0.227	5.96	11.7	52.4	1.0	0.028	0.321	0.070
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	2/29/2016	11.9	7.5	9.6	96	<10	34.5	2.17	5	1.50	2.00	<0.100	0.541	9.67	17.6	0.76	0.040	0.066	0.032
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	3/16/2016	11.8	7.1	9.3	118	330	46.6	2.38	5	1.32	1.98	0.149	0.596	10.6	16.1	1.3	<0.020	0.069	0.041
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	4/11/2016	11.7	8.0	10.9	162	20	58.6	1.67	<2	0.758	0.867	<0.100	0.101	4.10	5.72	1	<0.020	0.065	0.053
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	5/4/2016	10.3	6.8	12.7	123	960	46.2	4.16	<2	2.56	3.20	<0.100	0.385	13.0	19.1	0.99	0.023	0.095	0.060
TC4	10750 SW Boones Ferry Rd (Downstream of Culvert)	6/15/2016	10.6	8.0	11.0	140	620	54.3	4.71	4	1.96	2.65	<0.100	0.441	6.07	10.8	1.0	<0.020	0.105	0.071
TC5	SW 26th Way & Barbur Blvd	7/16/2015	9.5	6.8	15.0	234	2400	92.6	3.34	5	0.622	1.07	<0.100	0.401	9.88	18.3	0.63	0.114	0.137	0.126
TC5	SW 26th Way & Barbur Blvd	8/17/2015	7.1	7.0	15.7	240	620	103	4.40	8	0.555	1.03	<0.100	0.407	10.4	19.2	0.64	0.169	0.190	0.081
TC5	SW 26th Way & Barbur Blvd	9/21/2015	7.6	7.1	14.6	240	750	96.4	4.38	<2	1.56	1.88	<0.100	0.203	9.08	11.8	1.6	0.098	0.118	0.056
TC5	SW 26th Way & Barbur Blvd	10/28/2015	9.2	7.2	13.7	108	4400	42.4	10.5	6	4.30	5.58	0.272	1.24	35.2	45.8	1.0	0.030	0.175	0.113
TC5	SW 26th Way & Barbur Blvd	11/9/2015	9.9	7.7	11.8	181	340	69.2	4.10	<2	2.36	2.68	0.147	0.434	15.5	17.7	1.9	0.032	0.095	0.067
TC5	SW 26th Way & Barbur Blvd	12/9/2015	10.2	6.8	11.2	156	290	61.6	5.95	3	4.13	4.98	0.304	1.25	25.1	31.1	3.8	<0.020	0.165	0.115
TC5	SW 26th Way & Barbur Blvd	1/13/2016	12.2	7.0	7.3	67	960	38.4	4.64	22	3.53	5.41	0.351	2.96	29.4	43.0	1.6	0.027	0.195	0.108
TC5	SW 26th Way & Barbur Blvd	2/29/2016	10.7	7.2	10.2	137	120	52.3	2.79	3	2.18	2.70	0.118	0.714	31.0	36.4	1.2	<0.020	0.075	0.048

Instream Fixed Monitoring Results (FY 2015-16)			Field Parameters				Conventional				Metals						Nutrients			
Site ID	Site Location	Sample Date	Dissolved Oxygen (mg/L)	pH	Temp (deg C)	Conductivity (umhos/cm)	E.coli (mpn/100 ml)	Hardness (mg CaCO3/L)	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Copper dissolved (ug/L)	Copper total (ug/L)	Lead dissolved (ug/L)	Lead total (ug/L)	Zinc dissolved (ug/L)	Zinc total (ug/L)	Nitrogen - nitrate (mg/L)	Nitrogen - ammonia (mg/L)	Phosphorus total (mg/L)	Phosphorus - Ortho phosphate (mg/L)
TC5	SW 26th Way & Barbur Blvd	3/16/2016	10.8	6.9	9.8	154	110	64.2	3.01	5	2.20	2.97	0.216	1.02	25.1	30.4	1.6	<0.020	0.093	0.060
TC5	SW 26th Way & Barbur Blvd	4/11/2016	9.6	7.2	11.4	201	170	73.4	2.18	<2	0.931	1.26	<0.100	0.205	22.9	26.6	1.42	0.058	0.069	0.058
TC5	SW 26th Way & Barbur Blvd	5/4/2016	9.1	6.4	12.5	174	460	65.4	3.48	<2	2.13	2.74	0.101	0.324	31.2	36.3	1.2	0.038	0.095	0.066
TC5	SW 26th Way & Barbur Blvd	6/15/2016	9.0	8.1	12.1	194	360	75.0	5.58	2	1.71	2.86	0.128	1.44	21.4	31.0	1.0	0.079	0.128	0.105
TC6	9323 SW Lancaster Rd	7/16/2015	9.3	7.3	16.1	256	2000	102	3.52	<2	1.80	2.17	<0.100	0.187	10.5	14.0	1.5	<0.020	0.099	0.075
TC6	9323 SW Lancaster Rd	8/17/2015	7.3	7.3	16.9	245	1000	102	4.58	2	1.63	1.90	<0.100	0.166	18.1	25.9	0.38	<0.020	0.083	0.070
TC6	9323 SW Lancaster Rd	9/21/2015	8.4	7.4	14.7	215	240	81.5	3.25	<2	1.22	1.45	<0.100	0.220	8.86	11.4	0.53	<0.020	0.082	0.051
TC6	9323 SW Lancaster Rd	10/28/2015	9.9	7.4	13.3	87	4900	32.8	10.6	8	4.87	7.26	0.320	1.74	34.8	52.1	0.59	0.084	0.158	0.096
TC6	9323 SW Lancaster Rd	11/9/2015	11.1	7.9	11.3	178	930	66.3	4.93	4	2.65	3.15	0.167	0.400	20.2	26.2	1.4	0.028	0.137	0.088
TC6	9323 SW Lancaster Rd	12/9/2015	10.5	6.6	11.4	138	830	54.3	5.43	5	3.74	4.40	0.307	1.27	29.9	35.9	3.1	0.024	0.155	0.104
TC6	9323 SW Lancaster Rd	1/13/2016	12.4	7.1	7.2	66	680	38.9	4.05	46	3.01	5.22	0.399	2.96	28.8	47.4	1.2	0.036	0.182	0.090
TC6	9323 SW Lancaster Rd	2/29/2016	11.2	7.4	9.5	91	<10	31.5	2.17	7	2.14	3.88	0.103	0.838	21.8	29.8	0.54	0.181	0.056	0.023
TC6	9323 SW Lancaster Rd	3/16/2016	11.2	7.1	9.8	148	260	62.1	2.78	8	1.75	2.71	0.153	0.997	24.0	32.7	1.3	<0.020	0.079	<0.020
TC6	9323 SW Lancaster Rd	4/11/2016	10.1	7.6	11.4	212	210	80.0	2.12	2	0.852	1.19	<0.100	0.255	14.9	20.2	1.1	0.052	0.065	0.038
TC6	9323 SW Lancaster Rd	5/4/2016	9.5	6.7	12.8	169	500	66.2	4.23	<2	2.51	3.27	0.131	0.379	30.8	38.7	1.1	0.034	0.098	0.062
TC6	9323 SW Lancaster Rd	6/15/2016	9.3	7.8	11.8	187	430	74.3	5.07	<2	2.38	2.99	0.119	0.342	16.7	22.2	1.1	0.029	0.084	0.060
BM	Morrison St Bridge - River Mile 12.7 Middle	7/1/2015	8.9	7.0	23.8	97	13	29.4	1.48	6	0.616	0.853	0.031	0.114	1.05	1.53	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	8/12/2015	8.6	7.3	24.2	93	4	26.9	1.44	6	0.503	0.820	0.012	0.128	<0.500	1.27	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	9/2/2015	8.0	7.1	21.6	96	16	28.5	1.45	6	0.568	0.820	0.032	0.114	1.81	1.79	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	10/7/2015	14.0	7.5	16.9	88	14	29.2	1.27	2	0.417	0.510	0.017	0.046	0.950	1.03	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	11/10/2015	11.4	7.4	11.1	81	23	26.2	2.31	5	0.644	0.918	0.049	0.132	1.19	1.72	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	12/2/2015	15.1	7.2	4.8	77	12	25.8	1.59	6	0.494	0.734	0.023	0.093	0.617	1.29	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	1/26/2016	13.4	7.5	8.2	65	32	24.3	1.71	18	0.700	1.70	0.036	0.300	0.933	2.81	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	2/3/2016	14.7	7.6	7.1	69	29	24.5	2.12	14	0.674	1.47	0.039	0.232	0.688	2.22	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	3/2/2016	13.7	6.8	9.3	74	23	25.9	1.56	4	0.507	0.816	0.032	0.118	1.06	1.70	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	4/6/2016	11.3	6.6	12.4	78	17	26.8	1.20	4	0.378	0.645	0.018	0.077	<0.502	1.01	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	5/4/2016	11.6	6.9	14.3	77	8	26.2	1.48	4	0.393	0.626	0.012	0.069	<0.502	0.885	no data	no data	no data	no data
BM	Morrison St Bridge - River Mile 12.7 Middle	6/8/2016	8.8	7.2	21.2	79	6	25.9	1.33	6	0.371	0.603	0.014	0.091	0.691	0.878	no data	no data	no data	no data
CM	St John's RR Bridge - River Mile 6.8 Middle	7/1/2015	8.5	7.0	23.9	98	9	29.9	1.60	4	0.567	0.868	0.016	0.096	0.666	1.40	0.39	0.055	0.076	0.034
CM	St John's RR Bridge - River Mile 6.8 Middle	8/12/2015	9.0	7.5	24.3	107	17	28.5	1.50	4	0.556	1.65	0.014	0.108	0.719	1.65	0.26	<0.020	0.070	0.034
CM	St John's RR Bridge - River Mile 6.8 Middle	9/2/2015	7.6	7.1	22.3	101	16	28.7	1.40	8	0.569	0.823	0.022	0.099	0.759	1.34	0.35	0.044	0.076	0.045
CM	St John's RR Bridge - River Mile 6.8 Middle	10/7/2015	13.9	7.4	17.4	109	17	32.1	1.29	4	0.463	0.666	0.019	0.056	0.923	1.44	0.36	0.026	0.068	0.044
CM	St John's RR Bridge - River Mile 6.8 Middle	11/10/2015	11.0	7.4	11.7	79	52	25.7	2.45	5	0.773	1.03	0.071	0.132	2.51	3.20	0.67	0.077	0.084	0.057
CM	St John's RR Bridge - River Mile 6.8 Middle	12/2/2015	15.2	7.2	5.1	81	51	26.6	1.64	7	0.530	0.848	0.024	0.112	0.671	1.54	0.84	0.092	0.056	0.037
CM	St John's RR Bridge - River Mile 6.8 Middle	1/26/2016	13.6	7.6	8.2	66	82	24.2	1.73	14	0.736	1.72	0.039	0.291	0.594	2.80	0.88	0.056	0.068	0.072
CM	St John's RR Bridge - River Mile 6.8 Middle	2/3/2016	14.4	7.7	7.1	69	70	24.5	1.72	12	0.677	1.48	0.033	0.227	0.617	2.22	0.84	0.051	0.063	0.030
CM	St John's RR Bridge - River Mile 6.8 Middle	3/2/2016	13.7	6.8	9.3	74	33	26.7	1.45	2	0.423	0.788	0.021	0.112	0.722	1.53	0.80	0.064	0.045	0.024
CM	St John's RR Bridge - River Mile 6.8 Middle	4/6/2016	11.0	6.7	12.5	78	11	27.2	1.30	4	0.372	0.756	0.020	0.104	0.563	1.24	0.57	0.059	0.047	0.028
CM	St John's RR Bridge - River Mile 6.8 Middle	5/4/2016	11.8	7.0	14.3	77	6	26.5	1.41	2	0.393	0.609	<0.010	0.062	0.535	0.836	0.46	0.041	0.052	0.030
CM	St John's RR Bridge - River Mile 6.8 Middle	6/8/2016	9.5	7.4	21.0	79	7	25.5	1.16	4	0.415	0.569	0.016	0.063	<0.502	0.743	0.28	<0.020	0.045	<0.020
FM	Waverly Country Club - River Mile 17.4 Middle	7/1/2015	8.6	7.1	24.1	96	30	29.4	1.45	4	0.523	0.717	0.016	0.076	0.846	1.28	0.40	0.074	0.080	0.044
FM	Waverly Country Club - River Mile 17.4 Middle	8/12/2015	8.8	7.5	24.0	91	12	27.1	1.50	2	0.438	0.675	0.012	0.045	0.587	1.05	0.34	<0.020	0.072	0.043
FM	Waverly Country Club - River Mile 17.4 Middle	9/2/2015	8.6	7.2	21.3	96	8	28.5	1.48	3	0.487	0.611	0.021	0.052	1.48	1.72	0.45	0.057	0.073	0.052
FM	Waverly Country Club - River Mile 17.4 Middle	10/7/2015	12.3	7.5	16.7	85	25	28.2	1.25	2	0.373	0.455	0.016	0.039	0.635	0.889	0.31	0.061	0.069	0.055
FM	Waverly Country Club - River Mile 17.4 Middle	11/10/2015	11.8	7.5	11.0	84	55	28.9	2.18	3	0.640	0.933	0.054	0.140	1.01	1.87	0.59	0.080	0.089	0.059
FM	Waverly Country Club - River Mile 17.4 Middle	12/2/2015	14.7	7.5	4.8	77	26	22.5	1.70	4	0.472	0.726	0.021	0.115	1.11	1.85	0.73	0.103	0.063	0.039
FM	Waverly Country Club - River Mile 17.4 Middle	1/26/2016	13.5	7.2	8.2	66	24	24.2	1.69	15	0.679	1.70	0.034	0.309	0.579	2.81	0.82	0.048	0.065	0.028
FM	Waverly Country Club - River Mile 17.4 Middle	2/3/2016	14.7	7.5	7.2	69	26	25.2	1.64	12	0.653	1.53	0.036	0.236	1.35	2.33	0.83	0.049	0.063	0.031
FM	Waverly Country Club - River Mile 17.4 Middle	3/2/2016	13.0	6.7	9.0	74	21	25.9	1.47	6	0.472	0.827	0.020	0.132	0.969	1.75	0.79	0.062	0.049	0.023
FM	Waverly Country Club - River Mile 17.4 Middle	4/6/2016	11.2	6.2	12.5	78	5	26.9	1.35	2	0.380	0.597	0.107	0.067	0.954	0.890	0.57	0.064	0.047	0.026
FM	Waverly Country Club - River Mile 17.4 Middle	5/4/2016	11.0	6.9	15.1	77	10	26.0	1.24	3	0.370	0.609	<0.010	0.071	<0.502	0.946	0.45	0.052	0.051	0.037
FM	Waverly Country Club - River Mile 17.4 Middle	6/8/2016	8.8	7.6	21.8	79		26.2	1.20	3	0.360	0.505	0.014	0.051	<0.502	0.745	0.36	0.040	0.056	0.034

Section IV
SIGNATURE & CERTIFICATION STATEMENT

Portland, Oregon
National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer System Discharge Permit
Permit Number: 101314

ANNUAL COMPLIANCE REPORT
Fiscal Year 2015/16
(July 1, 2015 – June 30, 2016)

We, the undersigned hereby submit this annual compliance report for the Municipal Separate Storm Sewer System Discharge Permit No. 101314, in accordance with Schedule B, Section 5 of that permit. We certify, as required by 40 CFR Section 122.22, under penalty of law, that this document was prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



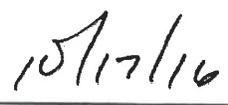
Michael Jordan
Director, Bureau of Environmental Services
City of Portland



Date



Vincent Granato
Chief Operating Officer
Port of Portland



Date

Section V
CONTACT INFORMATION

Contact Information

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