

City of Portland, Oregon

**National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4) Discharge Permit**

Permit Number: 101314

ANNUAL COMPLIANCE REPORT NO. 16

**Fiscal Year 2010-2011
(July 1, 2010 – June 30, 2011)**

Prepared for:

Oregon Department of Environmental Quality

November 1, 2011

Submitted by:

*City of Portland
Port of Portland*



CITY OF PORTLAND
ENVIRONMENTAL SERVICES



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ■ Dan Saltzman, Commissioner ■ Dean Marriott, Director

November 1, 2011

Benjamin Benninghoff
Municipal (MS4) Stormwater Coordinator
Oregon Department of Environmental Quality
811 SW Fourth Avenue
Portland, OR 97204

Dear Mr. Benninghoff:

On behalf of the City of Portland and the Port of Portland, I am pleased to submit the enclosed *NPDES Annual Compliance Report No. 16*. This report fulfills reporting requirements for the Portland NPDES Municipal Separate Storm Sewer System (MS4) Discharge Permit. It identifies accomplishments for the 16th fiscal year of the permit program (July 1, 2010 through June 30, 2011).

The report demonstrates the co-permittees' progress toward meeting the permit requirements and stormwater program goals for the past year. Each co-permittee's section of the report (Section II for the City of Portland and Section III for the Port of Portland) details the activities implemented, program status, and any initiated or proposed program changes. A Monitoring Compliance Report that summarizes monitoring activities and results is included as Section IV. The raw monitoring data are available upon request on CD-ROM.

Please call me at 503 823-5275 if you have any questions concerning this report.

Sincerely,

Patrice Mango
Stormwater Program Manager

cc: Dorothy Sperry, Port of Portland

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

ANNUAL COMPLIANCE REPORT
Fiscal Year 2010-11
(July 1, 2010 – June 30, 2011)

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.



Dean Marriott
Director, Bureau of Environmental Services
City of Portland



Bill Wyatt
Executive Director
Port of Portland

Permit Holder Information

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REPORT CONTENTS

EXECUTIVE SUMMARY

| | | |
|-------------|-------------------------------------|--------------|
| I. | GENERAL INTRODUCTION | I-1 |
| II. | CITY OF PORTLAND | II-1 |
| III. | PORT OF PORTLAND | III-1 |
| IV. | MONITORING COMPLIANCE REPORT | IV-1 |

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

INTRODUCTION

This 16th *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 (hereinafter referred to as the stormwater permit or permit), issued to the City of Portland and the Port of Portland (the co-permittees). The report provides information about activities that have been accomplished in accordance with the co-permittees' *Stormwater Management Plans* (SWMPs) during the 16th fiscal year (July 1, 2010 through June 30, 2011) of the permit program. It also includes a monitoring compliance report that summarizes monitoring activities conducted during the fiscal year.

The current (third-term) NPDES MS4 permit was issued on January 31, 2011. The City and Port submitted final SWMPs, which are consistent with the permit requirements and are adopted by reference into the permit, to DEQ on April 1, 2011. Because the current permit and SWMPs went into effect partway through the FY 2010-11 reporting term, this annual report reports on the best management practices (BMPs) and measurable goals that are contained in the April 2011 SWMPs.

The monitoring requirements in the current permit did not come into effect until July 1, 2011, when DEQ gave conditional approval to Portland's monitoring plan (which the City submitted to DEQ June 1, 2011). The monitoring compliance report included in this *Annual Compliance Report* therefore reports on monitoring activities that were conducted in accordance with the monitoring requirements in the previous (second-term) permit.

CITY OF PORTLAND

Key activities and accomplishments for permit year 16 are summarized below and further described in Section II of this annual report. The City met all of its applicable measurable goals.

- Conducted public involvement/education activities as a significant element of the Stormwater Program. Key activities included providing Clean Rivers Education Programs to students, awarding community stewardship grants, involving community participants in events and activities, and participating in the Regional Coalition for Clean Rivers and Streams.
- Conducted ongoing assessment, cleaning, and maintenance of MS4 components.
- Continued to follow the best management practices outlined in ODOT's *Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices* as guidance for transportation-related maintenance activities.
- Inspected, and maintained as necessary, all stormwater and stormwater containment and pollution prevention facilities in City maintenance yards annually.

- Inspected and administered NPDES industrial stormwater permits for 132 industries (and associated tenants) with stormwater discharge to the MS4.
- Continued to identify, investigate, control, and/or eliminate illicit discharges through the Illicit Discharges Elimination Program, Industrial Stormwater Management Program, and Spill Response Section.
- Conducted 4,092 erosion control-related inspections of private construction sites (citywide). Inspected 207 active public construction projects (citywide) with erosion control components.
- Continued to implement the City's *Stormwater Management Manual* for new development and redevelopment. Permitted 29 public works projects and 295 private projects subject to SWMM requirements.
- Continued to implement the Stormwater Management Facility Maintenance Inspection Program (MIP) for private stormwater management facilities. Inspected 589 properties and 1,211 associated stormwater management facilities.
- In accordance with *Stormwater Management Manual* requirements, signed off on permits for approximately 1,065 source control measures at sites with high-risk characteristics or activities.
- Continued the design and construction of multiple structural stormwater management facilities.
- Completed conversion of 1,715 linear feet of roadside ditches to swales or porous shoulder.
- Continued to provide technical assistance and grant funding for projects that incorporate green building principles, including stormwater pollution prevention and management.
- Continued Clean River Rewards to promote private stormwater management. At the end of FY10-11, a total of 35,344 utility ratepayers with active accounts have registered for stormwater discounts: 34,145 single-family residential ratepayers (accounting for a total of 75,842,316 square feet of impervious area managed for stormwater) and 1,199 multifamily, commercial, and industrial ratepayers (accounting for a total of 43,326,060 square feet of impervious area managed for stormwater).
- Acquired approximately 0.41 acre of floodplain property under the Johnson Creek Willing Seller Program and 213 acres of natural area through the Grey to Green Land Acquisition Program.
- Under the Watershed Revegetation Program, planted over 92,689 plants (including 41,449 trees) on 144.45 acres. The program currently manages 3,000 project acres on both public and private property.

PORT OF PORTLAND

The Port's annual report for permit year 16 fulfills the requirements of Section B(5) in the current MS4 permit (dated January 31, 2011). Section 7.0 of the Port's annual report describes the Port's specific stormwater management efforts during this permit year in accordance with implementation tasks, tracking measures, and measurable goals outlined in its April 1, 2011 SWMP. During the 2010-11 reporting period, the Port met all applicable measurable goals outlined in the current SWMP. A number of the measurable goals have completion timeframes in the future. These will be addressed when completed. The Port's key accomplishments are summarized below.

- The first seven months of the reporting year occurred under the previous permit and SWMP. However, the Port was able to anticipate the proposed permit changes and make program adjustments in order to comply with the new requirements quickly. As a result, this report is consistent with reporting requirements and SWMP implementation under the January 2011 MS4 permit.
- The Port of Portland continues to coordinate with its co-permittee, the City of Portland, with regard to monitoring and compliance with MS4 deliverables in addition to the annual report.
- The Port conducts annual maintenance of the storm sewer system components, structural controls, and regular street sweeping on specific Port-managed properties.
 - This effort included cleaning over 1,000 catch basins, maintenance of Port-owned water quality treatment facilities, line cleaning, and removal of other materials resistant to sweeping, such as runway rubber. Together these tasks diverted 396 tons (792,000 pounds) of potential pollutants from Port receiving waters.
- Port staff continues to implement the Illicit Discharge Detection and Elimination Program. The program involves dry-season field screening of priority outfalls and investigation of potential illicit discharges.
 - This included dry-weather field screening inspections at 80 outfalls Port-wide. As a result, 15 potential illicit discharges were investigated.
- Port staff continued to implement the Industrial Facility Inspection Program, inspecting a total of 19 priority industrial facilities Port-wide in 2010-11. Staff provided technical assistance during these visits, and applied timelines for correcting deficiencies as needed.
- Port operating area staff received training on a variety of stormwater-related subjects, including pest management, stormwater pollution prevention, spill response, and erosion and sediment control. In addition, the Port's employee orientation program trained all new employees during this period on the importance of preventing pollutants from entering stormwater.
- The Port continues its partnership with the Regional Coalition for Clean Rivers and Streams, which is dedicated to educating the public about the impacts of stormwater runoff pollution on the health of our rivers and streams.

Section I
GENERAL INTRODUCTION

Section I GENERAL INTRODUCTION

This 16th *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 (hereinafter referred to as the stormwater permit or permit) issued to the City of Portland and the Port of Portland (the co-permittees). The report provides information about activities that have been accomplished in accordance with the co-permittees' *Stormwater Management Plans* (SWMPs) during the 16th fiscal year (July 1, 2010 through June 30, 2011) of the permit program. It also includes a monitoring compliance report that summarizes monitoring activities conducted during the fiscal year.

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The monitoring requirements in the current permit did not come into effect until July 1, 2011, when DEQ gave conditional approval to Portland's monitoring plan (which the City submitted to DEQ June 1, 2011). The monitoring compliance report included in this *Annual Compliance Report* therefore reports on monitoring activities that were conducted in accordance with the monitoring requirements in the previous (second-term) permit.

PERMIT AREAS

The permit areas for the two co-permittees are described below.

- **City of Portland:** Approximately 15,627 acres within the City of Portland's urban services boundary drain to a separate storm sewer system. Portland's MS4 permit does not cover:
 - Stormwater areas that flow to sumps
 - Stormwater areas that flow to combined sewers
 - Natural stream systems
 - Direct stormwater discharges from private property to natural stream systems (without entering the MS4)
 - Areas with no public stormwater infrastructure
 - Areas with individual, general, or industrial stormwater permits

- **Port of Portland:** The Port owns approximately 6,218 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 BACKGROUND

DEQ issued the first stormwater permit for the MS4 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 for the third permit term to DEQ on September 2, 2008, and DEQ issued the third-term permit on January 31, 2011

PROGRAM COORDINATION

The co-permittees share information about program development and implementation, BMP effectiveness, monitoring, public involvement through the Regional Coalition for Clean Rivers and Streams, and other issues related to the 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 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.

REPORT ORGANIZATION

This 16th annual report covers the period from July 1, 2010 through June 30, 2011. It includes implementation actions and accomplishments that occurred during that period alone (i.e., it is not cumulative) unless otherwise noted. The report is organized as follows:

- **Executive Summary:** A summary of significant program activities and program status for both of the co-permittees
- **Section I: General Introduction:** An overview of the permit area, permit background, and SWMPs; program coordination; and report organization
- **Section II: City of Portland Compliance Report**
- **Section III: Port of Portland Compliance Report**
- **Section IV: Monitoring Compliance Report**

The report's goal is to convey clear, succinct program information that complies with the annual reporting requirements of the NPDES permit. The report also provides other interested parties with a status overview of the co-permittees' stormwater programs.

Section II
CITY OF PORTLAND

Section II
CITY OF PORTLAND

| |
|-----------------|
| CONTENTS |
|-----------------|

| | Page |
|---------------------------------------|-------------|
| INTRODUCTION | 1 |
| Key Accomplishments | 1 |
| Program Organization and Coordination | 1 |
| Adaptive Management Process | 2 |
| Permit-Required Actions | 2 |
| Urban Growth Boundary Expansion Areas | 2 |
| Separated Stormwater Outfalls | 2 |
| City Budget and Funding | 2 |
| | |
| BMP PI-1 | 4 |
| BMP OM-1 | 11 |
| BMP OM-2 | 13 |
| BMP OM-3 | 15 |
| BMP IND-1 | 18 |
| BMP IND-2 | 20 |
| BMP ILL-1 | 22 |
| BMP ND-1 | 25 |
| BMP ND-2 | 27 |
| BMP STR-1 | 29 |
| BMP NS-I | 34 |
| BMP PM-1 | 38 |

INTRODUCTION

This annual report fulfills reporting requirements of the City of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101314. It identifies the activities the City has conducted to implement the City's *Stormwater Management Plan* (SWMP) during the 16th fiscal year (July 1, 2010 through June 30, 2011) of the permit program.

The current NPDES MS4 permit was issued on January 31, 2011. The City submitted its final SWMP, which is consistent with the permit requirements and is adopted by reference into the permit, to DEQ on April 1, 2011. Because the current permit and SWMP went into effect partway through the FY 2010-11 reporting term, this annual report reports on the best management practices (BMPs) and measurable goals contained in the April 2011 SWMP.

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The SWMP no longer includes monitoring BMPs; rather, the City has developed a separate monitoring plan, as required by the permit. The monitoring compliance report is provided separately in Section IV of this *Annual Compliance Report*.

PROGRAM ORGANIZATION AND COORDINATION

Program Authorization

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.

Legal Authority

The City of Portland continues to maintain legal authority to implement the programs outlined in the SWMP, as initially demonstrated in Part 1 of the City's original 1991 NPDES MS4 permit application.

City Management and Coordination

BES's Stormwater 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 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.

ADAPTIVE MANAGEMENT PROCESS

The City used the adaptive management process to review and revise its best management practices and included a proposed revised SWMP in Portland's permit renewal submittal to DEQ on September 2, 2008. (Section VII of the submittal describes the adaptive management and program evaluation processes.) During permit year 16, the City updated that SWMP and submitted the updated version (dated August 13, 2010) and final version (dated April 1, 2011) to DEQ.

PERMIT-REQUIRED ACTIONS

The 2011 permit includes requirements that must be completed by specified dates. The City completed the following requirements in FY 2010-11:

- Revised the City's SWMP to incorporate the conditions identified in Schedule D.6 of the permit (due date of April 1, 2011)
- Developed and submitted a revised monitoring plan to DEQ (per Schedule B2; due date of June 1, 2011)

URBAN GROWTH BOUNDARY EXPANSION AREAS

There were no expansions to Portland's urban growth boundary in permit year 16, and no expansions are expected in permit year 17.

SEPARATED STORMWATER OUTFALLS

In FY10-11, no combined sewer outfalls were converted to stormwater-only outfalls.

CITY BUDGET AND FUNDING

The City of Portland has invested more than \$825 million in stormwater management services and facilities during permit years 1 through 16. The revenue requirements for permit year 16 totaled approximately \$91 million, allocated as follows:

| Major Program Category | Requirements | Percentage Share |
|---|------------------------|------------------|
| Enforcement and Development Review | \$ 5.8 million | 6% |
| Watershed Program & Habitat Restoration | 18.3 million | 20% |
| Facilities Operations and Maintenance | 21.0 million | 23% |
| Capital Improvements* | 45.8 million | 50% |
| Total Revenue Requirements | \$ 90.9 million | |
| * Includes debt service, facilities planning and engineering, construction engineering, and construction contracts. | | |

Eighty-five 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 17, the City plans to invest \$91.0 million in stormwater management services and facilities. Direct monthly user fees will pay for 84 percent of these investments.

Stormwater Management Charges

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.

The following table 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:

| | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 |
|---|------------------|------------------|------------------|------------------|------------------|
| Single-Family Residential Charge | \$16.82 | \$17.33 | \$18.55 | \$19.80 | \$21.79 |
| Residential rate per 1,000 square feet of impervious area | \$7.01 | \$7.22 | \$7.73 | \$8.25 | \$9.08 |
| Non-residential rate per 1,000 square feet of impervious area | \$7.56 | \$7.91 | \$8.43 | \$8.86 | \$9.66 |

At the close of permit year 16 (FY 2010-2011), City Council increased the monthly stormwater management charge for single-family residences from \$21.79 to \$22.36. The residential rate increased from \$9.08 to \$9.32 per 1,000 square feet of impervious surface per month, and the commercial rate increased from \$9.66 to \$9.97 per 1,000 square feet of impervious area per month.

Stormwater System Development Charges

The methodology for assessing system development charges (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 16, this onsite portion was assessed based on \$154.00 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 16, the rates were \$4.78 per linear foot and \$2.51 per vehicle trip. At the end of permit year 16, City Council increased the rates for stormwater system development charges to \$164.00 per 1,000 square feet of impervious area, \$5.12 per linear foot of frontage, and \$2.68 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.

PI-1: Implement public information, education, involvement, and stewardship activities that will raise awareness, foster community stewardship, and promote pollution prevention and stormwater management.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

Clean Rivers Education Programs

- Reached 8,916 students (grades K-12) with classroom programs that provide hands-on, interactive science education about stormwater and other environmental issues.
- Involved 5,533 students (K-12) in education field programs that offer watershed investigations and field assessments, stormwater tours, boat tours, and restoration experiences. Of these, 1,767 students combined education with natural area restoration service projects.
- Provided canoe trips to 300 students in the Columbia Slough and northern Willamette River watersheds. These included classroom studies and stewardship projects related to stormwater pollution.
- Checked out stormwater and watershed curriculum kits and field equipment to 8 Portland elementary and middle school teachers.
- Presented Stormwater - Soak it Up, a 75-minute classroom program for grades 4-12 and special interest groups, totaling 1,339 students and teachers.
- Presented Tours of Stormwater Solutions to 207 students. Students visited bioswales, stormwater planters, ecoroofs, porous pavement, and creative downspout disconnections.
- Presented Watershed Awareness to 760 students, grades 3-6. This program focuses on common non-point sources of pollution and pollution prevention.
- Continued the permanent storm drain curb marker program. Participating community and school volunteers also distributed doorhangers with stormwater pollution prevention messages and clean river tips to nearby residences. Number of participants: 127.
- Targeted schools with onsite stormwater facilities for extended outreach. Students learned about stormwater pollution prevention and their school's sustainable stormwater facilities and participated in maintenance activities for their facilities.
- Presented *Futures Working for Clean Rivers* career education programs to 35 students in the Willamette River and Johnson Creek watersheds.

- Continued quarterly Education Advisory Committee meetings to provide input and feedback for public education approaches and activities.

Community Stewardship Grants Program

BES’s Community Watershed Stewardship Program awarded the following 15 stewardship grants totaling \$83,201 in FY10-11.

| <i>Project Title</i> | | <i>Amount Funded</i> |
|---|--------------|----------------------|
| <i>Columbia Slough</i> | | |
| Columbia Slough Watershed Council Eyes on the Slough Project | \$ | 3,254 |
| Oregon Humane Society Natural Area Restoration | \$ | 5,400 |
| <i>Fanno and Tryon Creeks</i> | | |
| PCC Sylvania Natural Area Habitat Restoration Team | \$ | 6,036 |
| Vermont Hills United Methodist Church Community Garden | \$ | 4,000 |
| Tryon Creek Watershed Council Mentor Project | \$ | 7,300 |
| <i>Johnson Creek</i> | | |
| Friends of Crystal Springs Creek Restoration | \$ | 3,878 |
| Friends of Tideman Johnson Park Restoration | \$ | 4,388 |
| Immigrant and Refugee Community Organization Gilbert Park Native Garden | \$ | 3,993 |
| Leach Botanical Garden Riparian Restoration | \$ | 5,200 |
| Lents Springwater Habitat Restoration | \$ | 9,874 |
| <i>Willamette River</i> | | |
| Colonial Heights Presbyterian Church Raingarden | \$ | 4,840 |
| Friends of Marquam Nature Park Trailhead Improvements | \$ | 4,209 |
| Glenfair Church Community Garden | \$ | 9,995 |
| Laurelhurst School Stormwater Education | \$ | 2,540 |
| Tabor Commons Stormwater Planter | \$ | 8,294 |
| | Total | \$ 83,201 |

Watershed-specific Education and Stewardship Activities

Columbia Slough Watershed

- Co-sponsored and participated in numerous community events, including Slough 101, Wetlands 101, Groundwater 101, Explorando El Columbia Slough, two Canoe the Slough events, Columbia Slough Small Craft Regatta, Aquifer Adventure, Corps of Rediscovery, one Soup on the Slough event, two watershed cycling events, two Wild in the City events, and two neighborhood association gatherings where stormwater was a topic of instruction. The City was a co-sponsor of the Columbia Slough Watershed Awards program. The total participation was approximately 1,850 persons.
- Participated in one training program for 10 “Eyes on the Slough” volunteer monitors who report on water quality and landscape conditions.
- Participated in Friends of Force, Friends of Smith and Bybee Lakes, and Harbor Oil Superfund community advisory groups, providing stormwater, watershed, surface water, and pollution prevention education and professional guidance.

Willamette Watershed

- Participated in one community event (Multnomah Days), reaching a total of 100 citizens.
- Promoted the Oaks Bottom Habitat Enhancement Project, including two events reaching 200 people and one project update mailing sent to 20 key stakeholders.
- Promoted the Tryon Creek Habitat Enhancement Project (at the confluence of the Willamette River and Tryon Creek) with 13 project updates involving 40 citizens.
- Partnered with Southwest Neighborhood Inc. to provide information to citizens about watershed health in the Willamette Watershed.
 - Distributed information on the Backyard Habitat Certification Program, invasive/native plants, natural gardening, stormwater management, and related topics at 4 events, reaching 31 youth and 146 adults.
 - Provided technical information and referrals to 7 Willamette watershed residents.
 - Supplied tools for 2 volunteer invasive removal events in the Willamette watershed.
 - Facilitated 7 watershed group meetings with a total of 48 participants.
- Through a BES/Parks and Recreation partnership, involved citizens in their local natural areas, where 2,352 volunteers spent 8,021 volunteer hours on restoration activities; facilitated 12 Friends group meetings and 11 education events, reaching 400 people.

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, worked with multiple agencies and jurisdictions throughout the Johnson Creek Watershed to conduct watershed-wide water quality and macroinvertebrate monitoring.
- Sponsored and hosted two outdoor education events at the Veterans Creek Restoration site.
- Worked with Groundworks Portland to educate about 15 at-risk youth about watershed issues, protection, and restoration.
- Worked with the Johnson Creek Watershed Council to educate 63 elementary students and adult volunteers about watershed issues, protection, and restoration.
- Co-sponsored and participated in the Johnson Creek Watershed Council's 13th annual Johnson Creek Watershed-wide Restoration Event, where 356 volunteers planted native trees and shrubs and participated in other watershed improvement activities.
- Gave two presentations to the SMILE Neighborhood Association, with approximately 50 people attending, about culvert replacement projects, invasive animal species removal projects in Westmoreland Park, restoration projects, and stewardship along Crystal Springs Creek.
- Initiated development and provided support for a new organization to inspire long-term stewardship and advocacy for restoration in the Crystal Springs watershed. The Crystal Springs Community Collaborative is a group of community members, agency and civic partners, and local experts who are working on to engage, inspire, and educate the Crystal Springs community.
- Supported environmentally friendly farming and wetland education programs at Zenger Farm, which is the site of a renovated farmhouse with a zero net energy design and sustainable stormwater features. About 3,650 student visits were made from 91 schools and youth community organizations, and 139 students participated in the summer camps. Adult education classes were given in sustainable/environmental farming practices, with 10 percent of class participants coming from the Lents and Powellhurst-Gilbert neighborhoods.

Fanno and Tryon Creek Watersheds

- Conducted public involvement and information activities for Fanno and Tryon Creek watershed projects, including Multnomah Village green streets, Spring Garden stream daylighting, the Multnomah Art Center Lower Parking Lot retrofit, Restoration at the Confluence, roadside drainage improvements, garlic mustard control, Trimet Park and Ride stormwater retrofits, and the Middle Tryon Creek sewer project.
- Worked with Southwest Neighborhoods Inc. (SWNI), to provide public information. In FY 10-11, SWNI maintained a public involvement database of 9,900 records, attended or hosted

33 meetings and events, and published 48 articles in its monthly newsletter, which is sent to over 10,000 homes.

- 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. The group provided five Naturescaping workshops for 71 adults, rainwater harvesting for 85 participants, 9 Living Streams assembly shows for 4,620 students, sponsored the Student Watershed Research Project (SWRP), a student video contest, Tualatin Discovery Day, and Rumba El Rio.
- Hosted citizens at the SW Watershed Resource Center, located in the SW Community Center (SWCC) at Gabriel Park. Provided technical assistance and project support to neighborhood and Friends groups in the Fanno and Tryon Creek watersheds, including:
 - Hosted 877 visitors (443 adults, 437 youth) over 1,056 hours at the Watershed Resource Center.
 - Supported 15 friends groups engaged in stewardship through 60 meetings, events, and site tours for 403 participants.
 - Provided 8 education programs that reached 101 children and 114 adults. Also provided 6 education trainings for SWCC staff, school and community leaders to equip them to lead youth programs. Approximately 145 youth were reached by those trainings.
 - Assisted 47 landowners with information, referrals, and site visits.
 - Provided 18 tool checkouts to organizations for work parties, education events, and cleanups.
 - Staffed tables at 15 community events, reaching 768 adult and 100 youth participants
- Through a BES/Parks and Recreation partnership, involved citizens in their local natural areas. In the Fanno Creek Watershed, 552 volunteers spent 1,088 volunteer hours at 43 restoration events. In the Tryon Creek Watershed, 44 volunteers spent 147 volunteer hours at 4 restoration events.

Citywide

- 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 staff through an interagency agreement with Portland Parks and Recreation, City Nature to foster recruitment, retention, and education of Neighborhood Tree Stewards, with the purpose of maximizing urban forest education and outreach, community involvement and awareness, and long-term stewardship of the urban forest.

Stormwater-related Information

- Included inserts in City water/sewer bills:
 - June-Nov 2010: GreenBucks bill insert was distributed to 214,000 account holders. GreenBucks allows ratepayers to add \$1, \$3, or \$5 to their bills to help maintain sustainable stormwater management facilities at schools that serve Portland students.
 - Dec/Jan/Feb 2011: A bill insert titled “Rain - Floodplains, Watersheds, Clean Rivers” was distributed to 214,000 account holders.
 - March/April/May 2011: A Regional Coalition bill insert titled “Don’t Be a Water Hazard” with information and tips regarding stormwater runoff was distributed to 214,000 account holders.
- Updated and posted fact sheets, brochures, and educational materials on the BES website about Sustainable Stormwater Management and the Treebate program. The materials included information about the Green Streets Stewards Program, Treebate incentive for planting yard trees, ecoroof incentive for installing an ecoroof, ecoroof program activities, volunteering for watershed health projects, and how to install rain gardens and disconnect downspouts for onsite watershed management. Over the permit year, the Treebate web pages recorded 5,004 page views, and the Sustainable Stormwater Program pages recorded 248,246 views.
- Launched the Green Street Steward Program, a community involvement program that allows volunteers to adopt a Green Street and partner with the City in Green Street care and maintenance. The program conducted neighborhood workshops and developed educational and outreach materials, advertising, and a website where residents, businesses and community groups can register and download information.
- Developed and distributed a variety of educational materials at community meetings and events.

Citywide Focus Groups

- In June 2010, a BES contractor conducted four focus groups (two on the east side and two on the west side of the City) to evaluate the current level of public awareness and understanding of the work BES does and identify public recommendations for future BES priorities. Participants were ratepayers with a wide range of ages and occupations. The data analysis and report were completed in July/August 2010. Key findings included:
 - Participants identified the improvement of water quality as an environmental issue the City of Portland should be addressing in the next 5 to 10 years.
 - When asked to rate how important it is for the City to address nine environmental issues, participants gave the highest rating to improving water quality.
 - Participants appear to have gotten the message that individuals contribute to water pollution.

Regional Coalition for Clean Rivers and Streams

- In spring 2011, the coalition conducted an online survey of community members in the Portland-Vancouver metropolitan area to assess the public’s awareness of the impacts individuals have on water quality, their behaviors, and motivations for change. The survey included questions about the health and water quality of local rivers and streams, what individuals can do to maintain water quality, what behavior changes responders made within the last year, and what actions responders took in the past year (e.g., planting trees, disconnecting downspouts, building rain gardens). About 1,090 people completed the survey. Key findings included:
 - 74% felt informed about what they can do to maintain the health and water quality of rivers and streams.
 - 70% rated their household as good or very good at doing what they can to maintain water quality.
 - 55% said they made some (48%) or a significant (7%) change in the last year to protect the health and quality of local rivers and streams.

Advisory Committee

- Began to identify external stakeholders to serve on an advisory committee for the *Portland Watershed Management Plan* update during FY11-12.

MEASURABLE GOALS ¹

| Measurable Goal | Status as of 6/30/2011 |
|--|---|
| Provide outreach to approximately 15,500 K-12 students annually (classroom programs, education field programs). | Provided outreach to approximately 17,000 students. |
| Award at least \$50,000 in community stewardship grants annually. | Awarded 15 stewardship grants totaling \$83,201 in FY10-11. |
| Involve approximately 10,000 participants in community events, workshops, stewardship projects, and restoration events annually. | Involved over 17,000 participants citywide. |
| By May 2011, develop and distribute a public education bill insert to over 200,000 water and sewer customers. | Included public education inserts in three City water/sewer bills, each distributed to 214,000 account holders. |

¹ As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation.

OM-1: Operate and maintain components of the municipal separate storm sewer system (MS4) to remove and prevent pollutants in discharges from the MS4.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

- Made inlet inspection/maintenance visits to 347 locations citywide (multiple visits to some locations after major rain events).
- Inspected all public stormwater management facilities (SMFs) at least once during the year. These include:
 - 152 proprietary BMPs (StormFilter, Vortech, Stormceptor, etc.)
 - 181 surface SMFs (swales, wetlands, ponds, sand filters, etc.)
 - 811 Green Streets
- Cleaned:
 - 117 SMFs
 - Approximately 12,388 catch basins and inlets
 - Approximately 46,900 linear feet of ditch and 8,550 linear feet of culvert
- Repaired 9 SMFs.
- Repaired or constructed 174 inlets and inlet leads and 2,174 linear feet of culvert.
- Began development of draft of “Prioritization Protocol for SMF Inspections.” Maintenance trigger and service standard information specific to facility type is being compiled from existing documentation, and gaps will be filled in as needed.
- Continued to incorporate newly constructed stormwater system components into the City’s inspection and maintenance database (Hansen).
- Continued to pilot new materials and applications to protect water quality. During the reporting year, started using a new grass seed in swales that requires lower maintenance and is hardier in dry conditions.
- Worked on the Maintenance Environmental Handbook, a training handbook for Portland Bureau of Transportation-Maintenance Operations (PBOT-MO) staff that will include guidance for maintenance procedural steps, preferred seasonality of work, and materials management. Completed and implemented the materials management section of the handbook.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|--|--|
| Develop a training handbook for PBOT-MO staff during the permit term. | Completed and implemented the materials management section of the handbook. |
| <p>Provide the following maintenance actions over the five-year permit cycle:</p> <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. | <ul style="list-style-type: none"> - Cleaned 8,550 lineal feet of culverts. - Repaired 2,174 lineal feet of culverts. - Cleaned 46,900 lineal feet of ditches. - Cleaned 12,388 inlets and catch basins. - Repaired 174 inlets and inlet leads. - Cleaned 117 major stormwater management facilities/pollution reduction facilities. - Repaired 9 pollution reduction facilities. |

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.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

- Continued to implement BMPs within the right-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 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. This fiscal year, started to use a biodegradable bar oil for chainsaws to reduce environmental impacts.
- All licensed pesticide applicators at PBOT Maintenance Operations must receive 40 hours of training over their five-year licensing period. In this reporting year, one applicator needed and received training.
- The PBOT Maintenance Operations mowing and brushing group reviewed equipment cleaning operations.
- Completed and implemented the materials management section of the Maintenance Environmental Handbook, a training handbook for Portland Bureau of Transportation-Maintenance Operations (PBOT-MO) staff that will include guidance for maintenance procedural steps, preferred seasonality of work, and materials management.
- City Council adopted a fee in FY 2010-2011 to fund a leaf removal program and directed the Bureau of Transportation to implement the program. The program focuses on collecting the above-average accumulation of leaves from streets lined with large, mature trees. To implement the program, the City created 30 leaf service zones with one or two scheduled leaf collection days per zone.
- Swept major arterials six times during the year.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|---|
| Sweep arterials six times/year. | Done. |
| Develop a training handbook for PBOT-MO staff during the permit term. | Completed and implemented the materials management section of the PBOT-MO Maintenance Environmental Handbook, |

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.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY10-11)

- Continued to implement a program that requires the Water Bureau 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 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.
- Continued to inventory discharges at various Water Bureau facilities. Implemented new discharge strategies (on a facility-by-facility basis) that will have zero to acceptable impact to the MS4.
- The City continues to employ 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 FY10-11, Procurement Services continued to include environmentally preferable product and service specifications in citywide price agreements and expand options in existing contracts. Procurement Services also continues to support City bureaus in selecting environmentally preferable goods and services. These actions contribute to the City's ongoing efforts to prevent pollution by buying less toxic, safer, and environmentally sound products and services.
- Continued to control discharges from non-emergency fire-fighting training by routing the discharges to the sanitary sewer system.
- Continued to use the machine shop at Mt. Tabor Yard as one of the Parks Bureau's recycling collection points for used oil, used antifreeze, waste paper, and scrap metal.
- Installed a stormwater treatment facility (linear wetland system) at PBOT's Albina Yard to treat approximately two acres of impervious pavement used as a parking lot. Data on its effectiveness will be collected for two years.
- Began work to divert stormwater runoff from a PBOT employee parking lot (almost two acres) to vegetated planters.
- Began investigating the feasibility of collecting rainwater off the roof of PBOT's Kerby Building for reuse.
- Began investigating a recycling facility for sweeper debris.

- Pollution Prevention (P2) teams met monthly 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.
 - Review of the draft Maintenance Employee Environmental Handbook that addresses stormwater protection BMPs.
 - Ecoroofs
- Continued modifications of the facility where street sweepers are rinsed to accommodate new sweepers and improve treatment of rinse water.
- Monitored the continued use of approved wash facilities at Stanton Yard, Kerby Yard and the Inverness Pump Station.
- Inspected, and cleaned as necessary, all stormwater and water quality facilities in maintenance yards and lots. Continued to implement Phase I stormwater controls, which encompasses installation, inspection, and maintenance of filtration and absorbent media at selected stormwater inlets. Specific activities include:
 - Maintain the stormwater filtration system in 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 empty (monthly) the sump at Mt. Tabor Yard that captures the grass and dirt of Parks mowers when they clean off at the end of shift, helping to prevent that material from entering the storm system.
- Trained all PBOT Maintenance and Operations field staff on stormwater management best practices and illicit discharge identification.
- Continued to examine maintenance activities as part of annual compliance requirements for continued Salmon Safe certification, which includes Integrated Pest Management and using alternatives to pesticides.
- Continued to maintain the drip irrigation system in Mt. Tabor Nursery, as well as turf strips to prevent erosion from watering and harvesting equipment. Increased the use of coarse wood chip mulches in the growing area, in part to decrease erosion.
- Continued program with vendors to provide pesticides at individual golf course sites on an as-needed basis to reduce pesticide storage.

- Continued testing nutrient levels and the presence of pesticides in surface waters for all City golf courses on a twice-yearly basis. Results from testing continue to show that pest management and fertilization activities are not negatively impacting water quality.
- 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 five parks.
- Continued a public/private partnership to fund new practices at key park sites to renovate athletic fields. These practices include aeration and overseeding to reduce fertilizer use and increase water infiltration.
- Continued to perform aeration, topdress, and overseed 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. These included connecting parks irrigation to the Maxicom system; testing of two central irrigation controlled systems; and implementing a two-year pilot project to test a soil moisture sensing control system.
- Conducted two walk-throughs/site coordination meetings at each pesticide-free park with staff and volunteer community partners to ensure park standards are being met.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|-------------------------------|
| Inspect, and maintain as necessary, all stormwater and stormwater containment and pollution prevention facilities in City maintenance yards annually. | Done |

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.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

- Inspected and administered NPDES industrial stormwater permits for 132 industries (and associated tenants) that discharge stormwater to the MS4. Four of these permits were terminated midway through the fiscal year. Continued to perform annual compliance inspections and additional inspections, if warranted, to provide technical assistance or assess BMP implementation.
- Under a memorandum of agreement with DEQ, administered 93 additional permits for facilities not discharging to the MS4. Six of these were terminated midway through the fiscal year. Most are permits for direct dischargers, although some facilities discharge to the Port of Portland's system or Multnomah County Drainage District managed waters.
- Continued to perform inspections and evaluate the need for stormwater permits for non-permitted industries (both those that do and do not discharge to the MS4). Performed 411 inspections of permitted and non-permitted facilities during permit year 16. Identified BMPs at these industries to minimize or remove exposure of industrial activities to stormwater. Required three facilities to apply for a stormwater permit.
- Collected and analyzed two samples from two permitted industries and five samples from three non-permitted facilities for investigative purposes. Continued to monitor a selected outfall basin (OF 19 in northwest Portland) to evaluate the long-term effectiveness of the Industrial Stormwater Program as part of the MS4 land use monitoring program.
- Issued eight discharge authorizations under City Code to non-permitted sites that address concerns regarding potential spills and release of pollutants from industrial activities.
- Prompted 21 sites to remove stormwater exposure of industrial activities and other pollutant sources; as a result, these facilities were able to either terminate their permit or qualify for a no exposure certification (NEC).
- 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 42 industries that had a "no exposure certification" (NEC) expiring in FY 10-11, 11 were either no longer in business or had moved. One site was required to obtain a permit because of increased exposure. The City reissued NECs to 28 facilities and issued new NECs to another 37 facilities.

- Continued to implement activities in the following categories of industrial controls: wastewater discharge permits, accidental spill prevention plans, Pollution Complaint Program, Buildings Plan Review Section, and Fire Bureau’s SARA Title III facility review.
- Updated City Code Title 17.39, the Stormwater Discharge Code, to clarify City authority to control discharges to the MS4 and increase the City’s authority to enter private property. (The revised code was adopted by City Council in September 2011).
- Continued to conduct “sweeps” of facilities in target areas (as identified by the Columbia Slough Sediment Program), and issued permits and no exposure certifications where applicable. In FY 10-11, completed this work in the Interstate-5 to Martin Luther King Blvd. Target Area.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|--|
| Inspect all permitted (1200Z, 1200COLS) facilities once per year. | Done. |
| Review each permitted facility’s monitoring and annual report each year. | Done. |
| Survey 100 percent of newly identified facilities to determine the need for NPDES permits. | Done. |
| Every 5 years, inspect industries (individual sites) previously identified as having no exposure and not required to obtain a permit. | Done. |
| Complete revision of City Code Title 17.39 by 2012. | Made code revisions during FY 10-11 (with adoption by City Council in September 2011.) |

IND-2: Provide educational programs and materials and technical assistance to reduce industrial and commercial pollutant discharges to the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY10-11)

- Over 20 BMP fact sheets are posted on BES’s Pollution Prevention Services website, which is frequently visited by commercial and industrial site operators. During FY10-11, the most viewed BMP materials related to catch basin maintenance (over 550 views), sand-blasting and painting operations (over 500 views), and stormwater monitoring for industry (over 350 views). Other BMP materials distributed include information on dewatering activities, developing emergency spill response and cleanup plans, and outside container storage and waste disposal.
- Continued to work with the Regional Pollution Prevention Outreach Team (P2O Team), Automotive Eco-Logical Advisory Subcommittee, and Landscape Eco-Logical Advisory Subcommittee for the Portland metropolitan region to certify businesses under the Eco-Logical Business Program. Eco-Logical Business Program activities in FY2010-11 included:
 - Eight landscape service businesses were newly certified and one business was lost from the program (bringing the total number of certified landscapers to 18).
 - No automotive shops were newly certified and one shop was lost from the program (bringing the total number of certified automotive shops to 39).
 - The Eco-Logical Business Program expanded into the car washing sector. Program materials and checklists were provided to car wash businesses, and 3 businesses were newly certified.
 - The Eco-Logical Business Program launched a partnership with the Food Alliance to cross-promote the Food Alliance’s wholesale nursery certification program that is currently under development.
 - Continued a promotional campaign to raise awareness and communicate the importance of supporting businesses that operate environmentally responsible business practices. The campaign used newspapers, the Redirect Guide, the Chinook Book, and local news advertising to promote Eco-Logical Businesses.
 - Continued to participate in local environmental events, including the annual sustainability fair and the greener home and garden show, to promote the use of certified businesses.
 - Gave a presentation to the Association of Car Washers; attended the annual Oregon Landscape Contractors Association conference; contacted the International Society of Arborists (ISA local chapter) and the Oregon Association of Nurseryman (OAN).

- The BEST Business Center continued to assist Portland businesses with resources and information to help them green their operations. The center is run by the Bureau of Planning and Sustainability, in partnership with the Portland Water Bureau, Bureau of Environmental Services, Bureau of Transportation, Metro, Portland General Electric, Pacific Power, and the Energy Trust of Oregon. BEST conducted the following activities in FY10-11:
 - Conducted on-site assessments for 76 businesses.
 - Administered the annual BEST Awards, which recognize Portland’s most sustainable businesses. Seven businesses received the BEST Award for their efforts to reduce waste and toxics, conserve energy, develop green products and services, and promote sustainable food systems.
 - Administered the Portland Climate Champions award to recognize businesses that have taken measurable steps to reduce their greenhouse gas emissions through energy efficiency, renewable power, transportation incentives, water conservation, recycling and waste prevention. To date, 32 businesses have been certified.
- Completed the eighth year of providing education and outreach to affected residents and businesses 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 permit year 16 included:
 - Provided technical assistance to 29 businesses.
 - Made two public presentations.
 - Published one newspaper article (Daily Journal of Commerce) and two newsletter articles on the protection program.
 - Distributed free spill kits, required signs, secondary containment pallets, and stormdrain covers.
 - Maintained the CCA and PortlandOnline webpage on the protection program and requirements.
 - Sponsored a workshop for regulated businesses on new training requirements in the updated Columbia South Shore Well Field Wellhead Protection Program Reference Manual, with 36 businesses attending.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|--|--|
| Under the Eco-Logical Business Program, certify 10 additional auto shops and 20 additional landscape firms that provide services within the City Portland by 2015. | Certified eight additional landscape firms. |
| Evaluate one new business sector for implementation of the Eco-Logical Business Program. | Expanded the program into the car washing sector and certified three car washing businesses. |

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.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY10-11)

- BES's Illicit Discharges Elimination Program (IDEP) conducted the following activities during FY 10-11:
 - Conducted 137 inspections of 126 priority outfalls; no illicit discharges were identified.
 - Continued dry-weather monitoring at all major City-owned outfalls, with some priority outfalls monitored twice.
 - Continued to revise the priority outfall list.
- BES's Industrial Stormwater Program continued to address illicit discharges and connections as they were identified during stormwater inspections and as referred by other parties. During FY 10-11, 15 illicit discharges were identified and subsequently corrected and/or mitigated. Appropriate follow-up and/or enforcement letters were issued to all of the responsible parties, and penalties totaling \$500 were assessed. The program continues to address prohibited discharges and other non-stormwater discharges to the storm sewer system. Policies and appropriate control measures, if needed, are developed and implemented.
- Began developing pollutant parameter field screening action levels to evaluate illicit discharges and inform response actions.
- The Regional Spill Response Committee continued its coordination meetings, holding four quarterly meetings during permit year 16. The committee includes representatives from the Oregon Emergency Response System, Environmental Protection Agency Criminal Investigations (EPA CID), United States Coast Guard (USCG), Oregon Department of Environmental Quality (DEQ), Oregon Department of Transportation (ODOT), Clean Water Services (CWS), Water Environment Services (WES), Port of Portland, Portland Fire Bureau (PFB) Hazmat, City of Gresham, City of Milwaukie, City of Portland Water Bureau, and BES. BES chairs and attends all of the meetings.
- Continued to operate the BES Spill Response Hotline. Activities in FY 10-11 included:
 - Received and responded to approximately 1,300 daytime calls (citywide) regarding pollution complaints, spills, sanitary sewer overflows, and dye tests.
 - Received and responded to 382 after-hours complaint calls (citywide).
 - Received approximately 2,200 additional daytime information-only calls (citywide) and responded by providing agency referrals, industrial information, technical assistance, and regulatory information.

- BES and the Water Bureau continue to implement Columbia South Shore Well Field (CSSW) Protection Area signage. The signs list the BES spill response hotline number and read: “TO REPORT SPILLS CALL (503) 823-7180.”
- The BES Spill Section continued a communication protocol with the Portland Fire Bureau that automatically pages the BES duty officer for a two-alarm event. Upon receiving the page, the duty officer contacts the Fire Bureau to identify if the duty officer is needed by the fire responders. In FY 10-11, seven two-alarm fire events resulted in pages to the duty officer.
- The BES Spill Section continued a communication protocol with the towing companies on the City of Portland towing contract. This notification ensures that BES will be contacted for auto fluid clean-up actions and for events that threaten to impact a stormwater facility (catch basin and downstream stormwater system). The duty officer may respond to events, depending on the reported information. In FY 10-11, 19 after-hours calls were received by the duty officer from towing companies. No enforcement actions were taken.
- Continued activities related to the Spill Response Program, Accidental Spill Prevention Program, tank farm policy, Hazardous Materials Response Team, hazardous substances, and buildings plan review.
- Conducted training for new duty officer staff on the BES spill response hotline and staff response duties.
- The Industrial Stormwater Program administered 225 general NPDES stormwater industrial 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.
- The Industrial Stormwater Management Program required 8 stormwater and/or spill prevention plans from non-permitted sites that address concerns regarding potential spills or other exposure-based releases from industrial activities.
- Continued to implement solid waste programs (curbside recycling, yard debris collection, and bulky waste collection) to prevent illegal dumping.
- Continued to implement measures to limit impacts from non-stormwater discharges related to City operations, per the Non-Stormwater Discharge Evaluation report submitted to DEQ in May 2006.
- Updated City Code Title 17.39, the Stormwater Discharge Code, to clarify City authority to control discharges to the MS4 and increase the City’s authority to enter private property. (The revised code was adopted by City Council in September 2011.)

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|--|
| Conduct dry weather sampling at all major City-owned outfalls at least once annually. | Done. |
| Inspect the priority outfalls a minimum of three times a year. | BES conducted 137 inspections of the current list of 126 priority outfalls. In accordance with permit requirements, the revised list of priority outfalls will be completed by July 1, 2012, and those outfalls will then be inspected three times per year. |
| Expand the 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. | Continued to update eastside storm system and outfall maps to reflect system changes resulting from completion of the East Side Combined Sewer System Tunnel Project. |
| Maintain the spill response hotline 24 hours a day. | Done. |

ND-1: Control erosion, sediment, and pollutant discharges from active construction sites.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

- There were 4,753 active private construction permits subject to erosion control inspection (citywide). The Bureau of Development Services (BDS) conducted 4,092 erosion control-related inspections of private construction sites (citywide). This number includes only approved inspections.
- 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 207 active public construction projects (citywide) with erosion control components. In general, public sites are inspected daily during construction.
- Continued the pre-permit-issuance site meeting program, where the applicant's team can meet onsite to discuss erosion control and other sensitive site issues. No pre-issuance site visits were done this fiscal year.
- Provided annual construction inspector training to staff in the public works bureaus.
- Developed and implemented the new 2010 *City of Portland Standard Construction Specifications*. This manual is a revision to the November 2007 edition and is a collaborative effort between BES, PBOT, and the Portland Water Bureau (PWB). The standard specifications include an update of erosion control requirements for consistency with Title 10 and the Erosion Control Manual.
- Tracked erosion control complaints (received through the complaint hotline or staff referrals) through the City's building permit tracking program, TRACS. A total of 27 cases were opened and responded to, with 20 cases closed (citywide).

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|--|
| Evaluate the <i>Erosion and Sediment Control Manual</i> and update as needed (at least once during the 2011-2016 permit cycle); conduct public involvement on updates. | No activity this fiscal year. |
| Inspect public sites with erosion control permits daily during construction. | Done. |
| 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. | All private development sites with qualifying ground disturbance areas are inspected for temporary and permanent erosion control measures at the beginning and near or at completion of the project. Interim checks are conducted during the course of regular building inspections. |

ND-2: Implement and refine stormwater management requirements for new development and redevelopment projects to minimize pollutant discharges and erosive stormwater flows.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY19-11)

- Continued to implement the 2008 *Stormwater Management Manual* (SWMM). Conducted 479 land use reviews to determine compliance with SWMM requirements and responded to 181 early assistance requests, including pre-application conferences. Permitted 29 public works projects and 295 private projects subject to SWMM requirements.
- Conducted 323 land use reviews for source control measures at sites subject to SWMM requirements. Signed off on permits for approximately 1,065 source control measures at sites with high-risk characteristics or activities.
- Began review of Chapter 4 of the SWMM to identify potential source control requirement updates.
- Conducted the following monitoring and evaluation activities:
 - Conducted trials of different mulches to determine which provide the best performance in Green Streets facilities and which can be incorporated into general maintenance practices.
 - Monitored sediment accumulation in a group of Green Streets facilities to document impacts on facility performance and refine maintenance requirements.
 - Tested and approved a new aggregate material for use in Green Streets as the transition layer between the imported soil medium and underlying drain rock.
 - Tested and evaluated plants and trees for use in Green Streets facilities. Continued to revise lists of acceptable plants and trees based on the results of field trials.
 - Evaluated two Filterra water quality devices installed as a pilot project in southwest Portland.
 - Conducted stormwater monitoring of infiltration facilities (called Green Streets when managing the public right-of-way), flow-through (lined) facilities, and ecoroofs. The evaluated facilities are located throughout the City and represent a variety of facility types, configurations, ages, and land uses. Results were published in December 2010 in the *2010 Stormwater Management Facility Monitoring Report Summary*, available on the Sustainable Stormwater Monitoring section of the BES webpage.
- Continued to provide training and technical assistance on the SWMM to City staff and the development community.

- Inspected 295 private stormwater management facilities to ensure compliance with plans.
- The Maintenance Inspection Program (MIP) provides technical assistance to property owners on the operation and maintenance (O&M) of private stormwater management facilities. It ensures that property owners follow site-specific, BES-approved O&M agreements. The program also collects information on stormwater management facility deficiencies and corrective actions taken to address deficiencies. MIP activities in FY 10-11 included:
 - O&M agreements signed during the fiscal year covered approximately 96 properties (tax lots) and 198 new private stormwater management facilities installed under the requirements for new development/redevelopment. The facilities will manage approximately 75 acres of new impervious area. Fifty-six percent of the O&M agreements were for commercial and industrial properties.
 - MIP staff inspected 589 properties and 1,211 associated private stormwater management facilities. This represents approximately 14 percent of the properties in the program. Technical assistance is provided during inspections to ensure that stormwater management facilities are sufficiently operated and maintained. Additionally, pollution prevention best management practices (BMPs) for site activities may also be evaluated during MIP inspections where needed.
 - Mapped MIP data, including MIP properties, facilities, inspections, and O&M plan and facility maintenance deficiencies.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|--|
| 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 589 properties and 1,211 associated private stormwater management facilities. Provided technical assistance and education to ensure facilities are sufficiently operated and maintained. |
| Revise the SWMM during the 2011-2016 permit term. | Began review of Chapter 4 of the manual to identify potential source control requirement updates. |
| Track number, type, size, drainage area ² and location of private facilities constructed annually. | Done as part of the Maintenance Inspection Program. |

² Drainage area will be tracked for all private stormwater management facilities subject to the SWMM (under an O&M plan).

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.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

Citywide

- Continued to implement retrofits to the existing storm drainage system, as identified during routine operations and maintenance activities. Completed conversion of a total of 1,715 linear feet of roadside ditches to swales or porous shoulder (1,615 feet in the Fanno Creek Watershed, 40 feet in the Tryon Creek Watershed, and 60 feet in the Stephens Creek Watershed).

Columbia Slough Watershed

- Obtained permits for the NE 148th Water Quality Facility, which will receive stormwater runoff from 180 acres in northeast Portland.
- Completed design of the Mason Flats project, which will improve in-stream, riparian, and wetland habitat; protect and improve water quality by providing additional stormwater treatment; and provide other groundwater, stream, and habitat benefits.
- Completed design for the Wellhead Sump Retrofit project, which includes eight water quality planters along NE 122nd Avenue between NE Fremont and NE Shaver designed to treat stormwater runoff from 2.89 acres and 16 water quality swales along NE Fremont Street between 156th and 158th designed to treat stormwater runoff from 3.56 acres.

Johnson Creek Watershed

- Completed 60 percent design on the Luther Road Habitat Restoration to address an exposed combined sewer/stormwater interceptor. The project will bury the sewer pipe crossing, restore a portion of Johnson Creek and its floodplain, improve stream habitat, provide stormwater treatment, and protect natural areas.
- Initiated pre-design and water quality/quantity monitoring for mitigating stormwater impacts of I-205 on Johnson Creek through a partnership with the Oregon Department of Transportation.
- Completed 60 percent design for the East Lents Floodplain Restoration Project, which will reduce nuisance flooding while improving water quality.
- Continued to monitor existing floodplain restoration projects to ensure effectiveness at Brookside, Kelley Creek, Tideman Johnson, and Schweitzer.

- Coordinated with the Army Corps of Engineers on design of the Springwater Wetlands Restoration Project, which will include water quality elements as part of a habitat restoration project.

Willamette Watershed

- Completed construction of the Tryon Creek Habitat Enhancement Project. This project created a floodplain bench along approximately 400 feet of lower Tryon Creek; regraded the floodplain at the confluence of Tryon Creek and the Willamette River to restore hydrologic connectivity; installed large wood and boulder structures along the banks of the lower 900 feet of Tryon Creek to improve aquatic habitat; and revegetated with native plants to improve near channel floodplain and riparian habitat.
- Continued pre-design of the Stephens Creek water quality treatment facility, which will detain and treat runoff from I-5 and SW Barbur Blvd. before it enters Stephens Creek.
- Completed predesign and received permits to retrofit the Willamette Park boat ramp bioswale. The project will increase the facility's capacity to treat stormwater from the parking area.
- Continued predesign of the Willamette Park off-leash area water quality facility to treat runoff from Willamette Park's off-leash dog area as well as from roads and parking lots.
- Installed a stormwater treatment facility (linear wetland system) at PBOT's Albina Yard (on N. Mississippi Ave.) to treat approximately two acres of impervious pavement used as a parking lot.

Fanno and Tryon Creek Watersheds

- Completed 60 percent design for the Multnomah Arts Center Parking Lot Stormwater Retrofit. The planned facilities will detain and treat stormwater runoff from approximately 50,000 square feet of impervious area.
- Completed construction of the Oregon Department of Transportation Baldock Maintenance Yard Stormwater Retrofits (SW 35th Avenue, adjacent to I-5 and SW Barbur Blvd.). The project includes stormwater facilities (planters and swales) to treat runoff from 2.7 acres of existing impervious area.
- Completed design of stormwater facilities to treat 2.75 acres of existing impervious area at the Tri-Met Park and Ride on SW Barbur Boulevard.
- Constructed a water quality swale at Beaverton Hillsdale Highway and SW 35th Avenue. The swale treats runoff from 8.6 acres, including Beaverton Hillsdale Highway and adjacent areas.

- Completed design for five stormwater facilities for the Multnomah Blvd. Stormwater Project.
- Designed and began construction on the Tryon Creek Sanitary Sewer Protection Project in lower the Tryon Creek watershed. The project includes approximately 200 feet of reconstructed streambanks and instream habitat improvements.

Stormwater System Plan

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

Green Streets

- Completed construction of the following Green Street projects:
 - One green street facility at N Vancouver & Graham to manage 10,500 square feet of street runoff that was flowing directly into a storm sewer and into the Willamette River.
 - Two green street planters at NE 47th & Columbia that manage 15,500 square feet of street runoff that was flowing directly to the Columbia Slough.
 - Seven green street planters and swales along NE 109th north of Marx to manage 70,300 square feet of street runoff that was flowing directly to the Columbia Slough.
 - Two green street swales (one at NE Cornfoot & Alderwood to manage 17,450 square feet and one at NE Alderwood west of 82nd) to manage 11,700 square feet of street runoff that was flowing directly to the Columbia Slough.
 - One green street curb extension on SW Spring Garden & 19th to manage 4,500 square feet of street runoff that was flowing directly from the City street into the ODOT drainage system along Barbur Blvd.

Technical Assistance, Incentives, and Grants Programs

- Continued to provide technical assistance and grant funding to Green Investment Fund (GIF) recipients for projects that incorporate green building principles, including stormwater pollution prevention and management. Additional green building events and activities related to stormwater management included:
 - Sponsored the Build it Green! Tour of Homes, attended by about 1,000 people. The tour demonstrated green building techniques, including ecoroofs, bioswales, pervious paving, rainwater harvesting and other sustainable stormwater management strategies in new development, redevelopment, and remodeling projects.
 - Made 39 presentations to a variety of building-related organizations. Audience numbers ranged from 4 to 100 people per event, reaching a total of approximately 1,118 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 and exhibits provided residents with self-help information and resources on topics including stormwater management, Naturescaping, composting and water conservation. During permit year 16, 2,400 people attended three fairs.
- Continued to implement the Ecoroof Incentive Program (which offers a financial incentive to property owners and developers to construct ecoroofs). During FY10-11, the program accomplishments included:

| | |
|-----------------------------|--------------|
| Total projects completed | 28 |
| Total square feet completed | 74,919 |
| Total acres completed | 1.72 |
| Total amount paid out | \$ 1,366,260 |

- Conducted ecoroof design and construction seminars for Portland residents and professionals with 113 attendees. Topics included structure, design, waterproof membranes, plants, soil, irrigation, permitting, and maintenance. A new seminar was created specifically for do-it-yourself installation, including the first printing and distribution of the 2011 Ecoroof Guide.
- Conducted Ecoroof Portland 2011 to connect vendors with potential projects and each other, create awareness of ecoroofs as a cost-effective tool for sustainable stormwater management, and promote the Ecoroof Incentive Program. Forty local and regional vendors participated in the event, and over 450 people attended.
- Through the Sustainable Stormwater Management Program, fielded public requests for information and technical assistance and provided technical assistance to a variety of projects:
 - Received over 50 requests for tours and speaking engagements. Conducted tours for professional planners, designers, developers, politicians, and staff from national and international jurisdictions.
 - Received 30 requests for a green street.
 - Received more than 25 requests for assistance from non-profit groups, students, and other jurisdictions in the form of design review and information sharing.
 - Presented information at 12 local, regional, and national seminars and conferences.
 - Updated the home page for the Sustainable Stormwater Management Program website. The website received over 248,000 hits, a 7 percent increase over last fiscal year.
 - Developed public outreach fact sheets and tools, including a website and materials for the newly launched Green Street Steward program and an updated stormwater monitoring report.
- Through the Clean River Rewards program, provided information about stormwater management and eligibility for reductions in customers' monthly utility bills for managing stormwater onsite.

- Attended 23 public events on stormwater retrofits of existing development for residential, commercial and multifamily properties, contacting approximately 579 people.
- Managed the Clean River Rewards website to provide information and technical assistance. The website registered approximately 63,000 external hits during FY10-11.
- Provided technical stormwater retrofit and registration assistance to 175 people.
- Verified stormwater discount registration at 669 active utility accounts, providing stormwater technical assistance on maintenance and stormwater facility improvements.

At the end of the fiscal year, a total of 35,344 utility ratepayers with active accounts have registered for stormwater discounts:

- 34,145 single-family residential ratepayers account for a total of 75,842,316 square feet of impervious area managed for stormwater.
- 1,199 multifamily, commercial, and industrial ratepayers account for a total of 46,326,060 square feet of impervious area managed for stormwater.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|--|--|
| <p>Construct the following public facilities to provide treatment for stormwater runoff from approximately 336 acres:</p> <ul style="list-style-type: none"> • Construct the NE 148th Avenue stormwater management facility by FY 2014-15. • Construct stormwater management facilities in the NE 122nd Ave subbasin by December 2012 (Columbia Slough Watershed). • Convert 5,000 linear feet of roadside ditches to swales or porous shoulder (Tryon Creek and Fanno Creek watersheds) during the permit term. • 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. | <ul style="list-style-type: none"> • Obtained permits for NE 148th Avenue Water Quality Facility • Completed design for eight water quality planters along NE 122nd Avenue • Completed conversion of a total of 1,655 linear feet of roadside ditches to swales or porous shoulder in the Tryon Creek and Fanno Creek watersheds, managing approximately 0.75 acres of road runoff. • Completed construction of stormwater management facilities along SW Beaverton-Hillsdale Highway, treating a total of 11.3 acres. |
| <p>Track the number, type, drainage area, and location of public facilities constructed annually.</p> | <p>Done (using GIS to track this information)</p> |

NS-1: Protect and enhance natural areas and vegetation that help prevent pollutants from entering into the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

Land Acquisition and Protection

- Acquired approximately 0.41 acre of floodplain property through the Johnson Creek Willing Seller Program.
- Acquired 213 acres of natural area through the Grey to Green Land Acquisition Program.

Land Use and Zoning Tools

- Adopted the *Airport Futures Plan*, an integrated, long-range development plan for the Portland airport and the surrounding area. The plan includes an update of existing environmental overlay zones along the Columbia Slough; as a result, 698 acres of environmental overlay zoning has been applied to protect natural resources along the slough.

River Plan Update

- Began work on the *River Plan/Central Reach*, which will be completed in FY13-14. During FY10-11, initiated work on a *Concept Plan for the Central City* (including the river). Staff held two river-focused symposiums to obtain feedback from stakeholders and river experts on the issues that affect the central reach. Staff also began to analyze potential issues surrounding the zoning regulations that affect the river.

Tree Code

- Adopted code changes identified under the Citywide Tree Policy Review and Regulatory Improvement Project. A single new Portland City Code title (Title 11 Trees) was established that will significantly strengthen the protections for existing trees and require replacement of trees that are removed. When fully implemented (scheduled for 2013), the code will protect and expand urban tree canopy by encouraging preservation of existing trees, applying new tree density standards on development sites, clarifying tree rules that apply in environmental overlay zones, and standardizing the City's tree removal permit system.

Watershed Revegetation Program

- Under the Watershed Revegetation Program, many businesses and other private landowners participated in and helped fund revegetation projects on their properties and neighboring properties. The program is currently managing 3,000 project acres on both public and private property. Activities in FY10-11 included:

Willamette River

- Planted 56,007 plants on 23,019 linear feet of riverbank and 90 acres. This included 27,980 deciduous trees, 1,658 coniferous trees, and 26,369 shrubs.

Columbia Slough

- Planted 14,257 plants on 750 linear feet of riverbanks and 32 acres. This included 1,311 deciduous trees, 3,950 coniferous trees, and 8,996 shrubs.

Johnson Creek

- Planted 8,770 plants on 1,356 linear feet of streambank and 11 acres. This included 2,030 deciduous trees, 580 coniferous trees, and 6,160 shrubs.

Tryon Creek

- Planted 8,840 plants on 7.7 acres. This included 2,340 deciduous trees, 1,000 coniferous trees, and 5,500 shrubs.

Fanno Creek

- Planted 4,815 plants on 3.75 acres. This included 400 deciduous trees, 200 coniferous trees, and 4,215 shrubs.

Partnerships with Other Organizations

- BES supported SOLV's Team Up for Watershed Health to engage community volunteers in riparian area restoration. The program conducted stream restoration projects (erosion reduction, invasive plant control, and native plantings) at 12 sites on private property. FY 10-11 accomplishments included:

Willamette River Watershed

- Planted 1,075 native plants, removed 870 pounds of invasive vegetation and 2,000 pounds of trash, and maintained plantings on 4 sites.

Johnson Creek Watershed

- Planted 180 native trees and shrubs, removed 800 pounds of invasive vegetation, and maintained native plantings on 1 site.

Fanno Creek Watershed

- Maintained native plantings and monitored 1 site.

Columbia Slough Watershed

- Planted 150 native plants, removed 1,250 pounds of invasive vegetation, and removed 20 pounds of trash on 1 site.

Tryon Creek Watershed

- Planted 1,220 native plants, removed 16,410 pounds of invasive vegetation, removed 30 pounds of litter on 6 sites, and monitored and maintained vegetation on 2 sites.

- In partnership with Friends of Trees, planted 4,232 street trees and 3,116 yard trees in City of Portland right-of-way, on school properties, and in private yards.
- Through a BES/Parks and Recreation partnership, involved citizens in their local natural areas. Activities included invasive plant species removal and native plant installation.

| Fanno Parks Project Summary | |
|------------------------------------|-------|
| Restoration | |
| # Restoration Events | 43 |
| # Plants | 3,182 |

| Tryon Creek Parks Project Summary | |
|--|-----|
| Restoration | |
| # Restoration Events | 4 |
| # of Plants | 420 |

| Willamette Watershed Parks Projects | |
|--|----------------|
| Restoration | |
| # Restoration events | 86 |
| # Plants planted | 8,050 |
| Area of invasive removal | 70,000 sq. ft. |

- Co-sponsored the Johnson Creek Watershed Council’s 13th annual Johnson Creek Watershed-Wide Restoration Event, where 356 volunteers planted 7,970 native plants, removed 22 cubic yards of invasive plants, removed 14 bags of trash, and mulched 350 plants.

Technical Assistance, Incentives, and Grants Programs

- Under BES’s Community Stewardship Grants Program, awarded 15 stewardship grants totaling \$83,201 for projects that included planting native vegetation. (See PI-1 for project names and watershed location.) The grants program also awarded 17 mini-grants totaling \$3,100 in fiscal year 2010-2011. 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.

Urban Forest Management Plan and Portland Plan

- Continued to implement the *Urban Forest Management Plan*.

- Continued to develop the *Portland Plan*, which will provide policy guidance for the pending update to the City’s 1980 *Comprehensive Plan* and 1988 *Central City Plan*. The plan will guide the physical, economic, social, cultural, and environmental development of Portland over the next 30 years, including natural resource and green infrastructure goals and strategies. Outreach for FY10-11 included Phase 2 and Phase 3 public workshops and a speaker series. Over 850 people attended workshops, and 6,700 people completed surveys.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|--|---|
| Plant 20,000 trees and initiate revegetation work on 70 acres by the end of the permit cycle. | Planted 41,449 trees (34,061 deciduous and 7,388 coniferous) on 144.45 acres. |
| Acquire 50 acres of land by the end of the permit cycle. | Acquired 213.4 acres of land in FY10-11. |
| Update the <i>Portland Plan</i> (an update to the City’s <i>Comprehensive Plan</i>) by December 2013. | Completed Phase 2 and Phase 3 public workshops on the <i>Portland Plan</i> . |

PM-1: Conduct program management, coordination, and reporting activities.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 16 (FY 10-11)

- Submitted a revised proposed *Stormwater Management Plan* to DEQ on August 13, 2010 for public review during DEQ’s comment period on the Public Review Draft NPDES MS4 Discharge Permit.
- Submitted a final *Stormwater Management Plan*, revised to reflect the final permit, to DEQ on April 1, 2011.
- Coordinated with numerous other City bureaus and jurisdictions to continue implementation of the *Stormwater Management Plan* (as reported under the individual BMPs).
- Began updating the City/Port intergovernmental agreement to address new permit conditions. Coordinated permit implementation activities with the Port of Portland.
- During the NPDES MS4 permit renewal process, coordinated with other statewide jurisdictions through the Oregon Association of Clean Water Agencies (ACWA).
- Submitted the NPDES MS4 annual compliance report 15 for FY09-10 on November 1, 2010.

MEASURABLE GOALS

| Measurable Goal | Status as of 6/30/2011 |
|---|--|
| Submit annual reports by November 1 of each year. | Submitted the FY09-10 annual report on November 1, 2010. |

Section III
PORT OF PORTLAND



PORT OF PORTLAND

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

**ANNUAL REPORT NO. SIXTEEN
Fiscal Year 2010-11
(July 1, 2010 – June 30, 2011)**

Prepared for:
Oregon Department of Environmental Quality

November 1, 2011



— CITY OF PORTLAND —
ENVIRONMENTAL SERVICES



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ■ Dan Saltzman, Commissioner ■ Dean Marriott, Director

TABLE OF CONTENTS

1.1 INTRODUCTION 1

2.0 PORT OF PORTLAND PERMIT AREA AND RESPONSIBILITIES..... 1

 2.1 MS4 Permit Area.....5

 2.1.1 Portland International Airport.....5

 2.1.2 Marine Terminals6

 2.1.3 Industrial Parks6

 2.1.4 Undeveloped Properties.....6

 2.2 MS4 Permit Responsibilities.....6

3.0 PORT OF PORTLAND ORGANIZATIONAL STRUCTURE..... 13

4.0 STORMWATER EXPENDITURES 13

5.0 DEMONSTRATION OF CONTINUED LEGAL AUTHORITY TO IMPLEMENT THE PROGRAMS OUTLINED IN THE SWMP..... 14

6.0 STORMWATER MONITORING 15

 6.1 Environmental Monitoring.....15

 6.2 Best Management Practice (BMP) Monitoring.....15

6.3 ADDITIONAL STORMWATER MONITORING ACTIVITIES..... 16

7.0 ACCOMPLISHMENTS FOR PERMIT YEAR SIXTEEN (2010-11) 16

 7.1 SWMP Implementation.....16

 7.1.1 Element #1: Illicit Discharge Detection and Elimination16

 7.1.2 Element #2: Industrial and Commercial Facilities.....20

 7.1.3 Element #3: Construction Site Runoff Control21

 7.1.4 Element #4: Education and Outreach21

 7.1.5 Element #5: Public Involvement and Participation:27

 7.1.6 Element #6: Post-Construction Site Runoff Control.....28

 7.1.7 Element #7: Pollution Prevention for Municipal Operations.....29

 7.1.8 Element #8: Structural Stormwater Controls Operations and Maintenance.....34

8.0 ADAPTIVE MANAGEMENT PROCESS IMPLEMENTATION AND PROPOSED SWMP CHANGES 37

LIST OF FIGURES AND TABLES

Figure 1-1 Port of Portland MS4 Permit Area

Table 2-1 Port of Portland MS4 Permit Requirements and Responsibilities

Table 4-1 Summary of Port of Portland Stormwater Expenditures

Table 6-1 Monitoring Objective Matrix (Appendix A)

Table 7-1 Port of Portland Pesticide/Herbicide/ Fertilizer Use in 2010-11

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 (MID's general maintenance group)

MID – Marine and Industrial Development

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

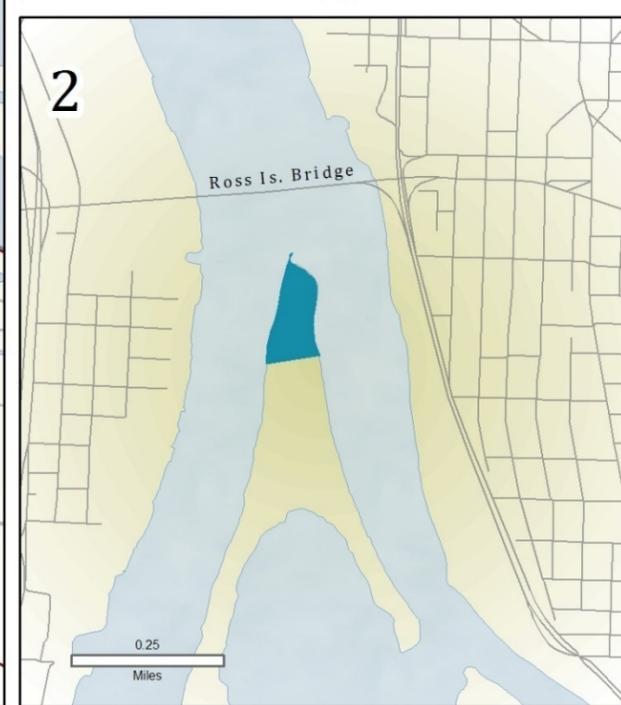
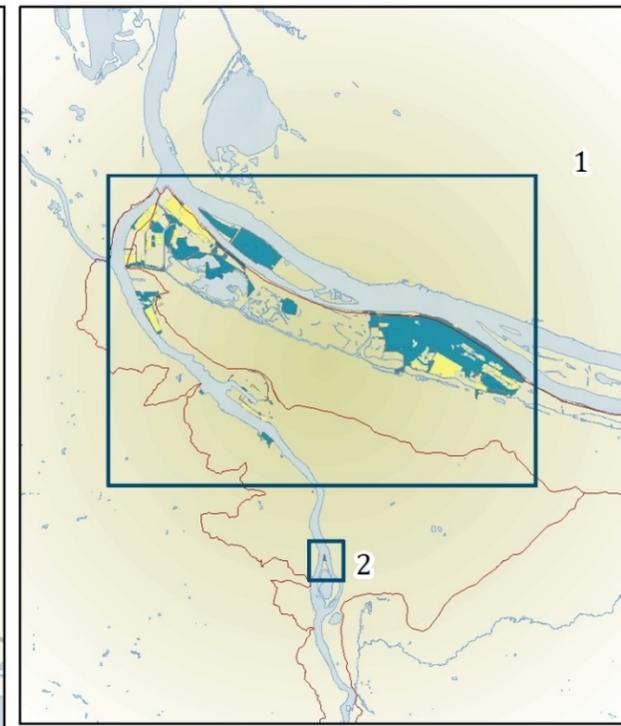
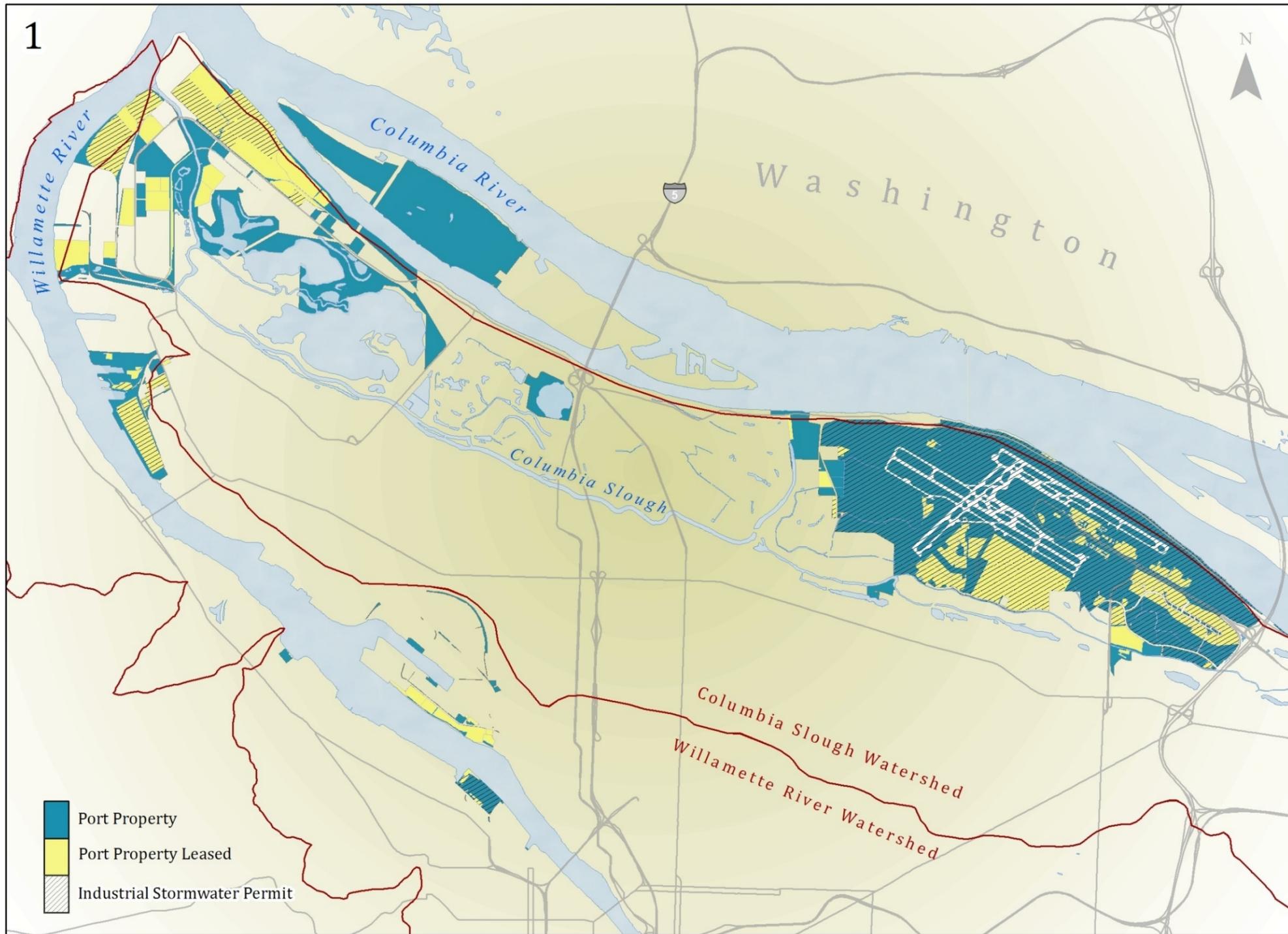
The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from Port of Portland (Port) property through the Municipal Separate Storm Sewer System Discharge Permit No. 101314 (MS4 permit) and other National Pollutant Discharge Elimination System (NPDES) stormwater permits, including 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, 2010 to June 30, 2011 related to the Port's stormwater management efforts under the permit and associated April 1, 2011 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. Section 7.1.1 through 7.1.8 (Status of SWMP implementation)
2. Section 7.1.4 (Status of the public education evaluation)
3. Section 8 (Summary of the adaptive management process for FY2010)
4. Section 8 (Proposed changes to the SWMP)
5. Section 4.0 (Summary of stormwater program expenditures)
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. Section 7.1.1 (Summary describing Port's illicit discharge program)
9. Section 2.1 (Overview of planning, land use changes, and new development)

2.0 PORT OF PORTLAND PERMIT AREA AND RESPONSIBILITIES

The Port of Portland owns approximately 6218 acres within the City of Portland (City) Urban Services Boundary (USB). Port property is divided into two primary operating areas: 1) Aviation and 2) Marine and Industrial Development (MID). Within the City USB, the Aviation Division consists of Portland International Airport (PDX), and the MID Division includes Marine Terminals 2, 4, 5 and 6, as well as the following industrial parks: Swan Island, Mocks Landing, Rivergate, Cascade Station, and Portland International Center (PIC). Figure 1-1 (pg. 3) shows the Port's permit area, breaking out leased property and facilities with Industrial Stormwater General Permits.



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.

Notes: _____



Port of Portland
 Portland, Oregon



Geographic Data Standards
 Projected Coordinate System:
 NAD 1983 HARN State Plane, Oregon N.
 Projection: Lambert Conformal Conic
 Units: International Feet

File:
 N:\Projects\GIS_Program\Work\
 20110908_2011MS4_Cals_Berg\
 MS4_2011_Margin_Update.mxd

Port of Portland Properties in the USB

Figure 1-1. Port of Portland MS4 Permit Area

| | | |
|---|--|-------------------------|
| Prepared By: Andrew Ennis Manager: Dorothy Sperry Revised: October 12, 2011 | Prepared for: Jamey Berg Dept: Environmental Affairs Manager: Dorothy Sperry | Map No. 1 Sheet: 1/1 |
|---|--|-------------------------|

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The Port also owns a number of undeveloped properties within the USB including wetland mitigation sites, vacant tax lots, and part of West Hayden Island (which totals approximately 800 acres). 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 other requirements of B(5)(i), the Port estimates during the 2010-11 reporting period it had 2,157 acres of impervious surface. This represents 21% of total Port property within the City of Portland USB. Future estimates of total and new impervious area will use this baseline.

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 27% 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 general industrial stormwater permits (1200-Z and 1200-COLS permits). Fifty-eight percent of the Port's holdings within USB 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 or 1200-COLS permits. For Port operations within these areas, several of the MS4 permit requirements are addressed through implementation of their 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 2806 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 11 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. With the exception of the Oregon Air National Guard, which has its own 1200-COLS permit, PDX tenants whose operations trigger the need for a stormwater permit 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 Construction Dewatering Waste Discharge Permit, a City of Portland Pre-treatment Permit, a Water Pollution Control Facility (WPCF) 1700-B Wastewater Permit, and a NPDES Anti-icing/Deicing Waste Discharge Permit. The Port completed construction of a new Columbia River outfall in January 2010 as part of the deicing system enhancement project. The outfall is anticipated to be operational beginning with the winter of 2011. Once commissioning is complete, deicing stormwater runoff will be discharged through this outfall during the deicing season only.

2.1.2 Marine Terminals

The Port has four active shipping terminals that are managed by the Port's MID Division. The terminals collectively occupy approximately 1015 acres along the Willamette River (Terminals 2, 4, and 5) and Columbia River/Slough (Terminal 6). The terminals handle the shipping, receiving, and temporary storage of finished goods, agricultural products, and raw materials.

The general industrial stormwater discharge permits required for Terminal 6 discharges into the Columbia River and the Columbia Slough will now be covered by a single 1200-COLS permit held by the new tenant. 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 permits that are issued by DEQ and administered by the City. Unlike PDX, tenants do not have the option to be a co-permittee of the Port's 1200-Z permit.

2.1.3 Industrial Parks

The Port's MID and Aviation Divisions manage the Port-owned industrial parks, Swan Island, Mocks Landing, Rivergate, Cascade Station, and Portland International Center (PIC), totaling approximately 1535 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

MID also manages approximately 2167 acres of undeveloped property within the City's USB. This includes West Hayden Island, which is within the USB but does not receive any services at this time. Stormwater management for undeveloped properties that discharge into the Port's MS4 is conducted under the Port's MS4 permit.

2.2 MS4 Permit Responsibilities

Many of the requirements of the general industrial stormwater discharge permits overlap with requirements of the MS4 permit. A large proportion (58%) 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 is the lead permittee on the Port's MS4 permit. They regulate 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 2-1 (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 2011 SWMP to show specific program coverage for each MS4 permit requirement. Table 2-1 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 6 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 2-1. In addition, permit requirements within the Port's jurisdiction covered by the City's stormwater management activities are also shaded in gray on Table 2-1. Areas left unshaded on Table 2-1 are addressed by BMPs in the Port's 2011 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 2011 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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Table 2-1. 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 (7/1/2007) and COLS (9/1/2006) permits | |
| viii. Spill prevention and response | BMP: Implement a Spill Response Program for Port Operated Property. | | BMP: Implement the Illicit Discharge Detection and Elimination Program. | |
| ix. Notify affected municipality of illicit discharge originating within the permittee's permit area | Covered under 1200-Z (7/1/2007) and COLS (9/1/2006) permits – Schedule A.3.c.ii | | | |
| 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 | | 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 | | 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 specifications. | |
| ii. Require construction site operators to develop site plans and implement erosion and sediment control BMPs. | | | Implemented through the City of Portland's erosion control ordinance; may also be covered under a 1200-C permit. | |
| iii. Require construction site operators to prevent/ control non-stormwater waste | | | | |
| 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 | | | |

| 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 |
| 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 (7/1/2007) and COLS (9/1/2006) permits – Schedule A.3.c.iv | |
| 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. | | | |
| 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 municipal waste facilities not already covered by a 1200 series permit. | No tenant properties currently accommodate municipal facility waste. | BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program. BMP: Implement a Stormwater System Cleaning and Maintenance Program (These BMPs include tasks to decant water from municipal wastes and discharge wastewaters to the sanitary system.) | Covered under 1200-Z (7/1/2007) and COLS (9/1/2006) permits ¹ - Schedule A.3.c.i (1200-Z) and Schedule A.3.c.i (1200-COLS) | Covered under 1200-Z (7/1/2007) and COLS (9/1/2006) permits - Schedule A.3.c.i (1200-Z) and Schedule A.3.c.i (1200-COLS) |
| 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 fire fighting training activities | The only fire fighting 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. | | | |
| 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 (7/1/2007) and COLS (9/1/2006) permits ¹ – Schedule A.3.c.iii (2-3) | Covered under 1200-Z (7/1/2007) and COLS (9/1/2006) permits – Schedule A.3.c.iii (2-3) |

| 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 |
| Operate and maintain public streets, roads, and highways | | | | |
| ii. Develop and implement a plan or approach to guide the long-term maintenance and management of all publically-owned and privately owned stormwater facilities. | BMP: Implement a Stormwater System Cleaning and Maintenance Program BMP: Implement a Tenant Stormwater BMP Program. | | Covered under 1200-Z (7/1/2007) and COLS (9/1/2006) permits ¹ - Schedule A.3.c.iii (2-3) | Covered under 1200-Z (7/1/2007) and COLS (9/1/2006) permits - Schedule A.3.c.iii (2-3) |
| Schedule A.6.c Stormwater Retrofit Project | | | | |
| ii. Identify one stormwater quality improvement project, at a minimum, to be initiated 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. | | | |

Notes:

¹ Maintenance may be conducted by the Port as agreed upon in tenant leases.

Note: 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. Areas unshaded are covered by the Port's SWMP BMPs.

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3.0 PORT OF PORTLAND ORGANIZATIONAL STRUCTURE

The Port's Environmental Affairs Department is responsible for administering the MS4 permit and the SWMP. The Environmental Affairs Manager serves as the MS4 permit manager. Staff from MID and Aviation Divisions are 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 staff in Environmental Affairs, MID and Aviation Divisions is through the Water Resources Coordination Group (WRCG). This group includes staff from Environmental Affairs, Legal, Aviation, Marine and Industrial Development, Public Affairs, and Engineering. The WRCG meets monthly and is responsible for providing input on Port-wide stormwater policy issues, water quality, and permit implementation. The Environmental Affairs Manager serves as the lead for the WRCG.

With respect to implementation of the Port's general industrial stormwater discharge permits, Aviation Environmental staff prepares, updates, and ensures implementation of the PDX SWPCP in coordination with the co-permittees. Marine Environmental staff prepares, updates, and ensures implementation the SWPCP for Terminal 2. 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 percent) of the Port's overall revenue is from property tax. Business transactions generally occur between the MID Division, the Aviation Division (Commercial Aviation and General Aviation), and associated users and tenants of those properties. Revenue from the MID Division is primarily derived from fees, charges and leases with marine customers, leases with tenants of the Port's industrial parks, and sales of property at the industrial parks. 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 divisions and departments involved

in implementation of the program. Specifically, stormwater resources are allocated among the MID and Aviation Divisions (PDX), Environmental Affairs Department, Information Technology (IT) Department, Legal Department, and Engineering Department. 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.

Table 4-1, shows estimated stormwater program expenditures broken out by area and in total for fiscal year 2010-11 and 2011-2012. The decrease in estimated expenditures for the Aviation Division is due to the completion of the Port's new Deicing System. The MID Division also showed a decrease in expenditures due to the significant reduction in cost and stormwater fees since these are now paid by the new tenant operating the container yard at Terminal 6.

Table 4-1. Summary of Port of Portland Stormwater Expenditures

| Department | Estimated 2010-11 Stormwater Expenditures | Projected 2011-12 Stormwater Expenditures |
|-----------------------------------|--|--|
| Marine and Industrial Development | \$1,124,984 | \$816,362 |
| Aviation (including deicing) | \$37,173,272 | \$8,407,430 |
| Engineering | \$2,071,440 | \$2,001,500 |
| IT | \$28,020 | \$28,020 |
| Legal | \$16,640 | \$16,640 |
| Environmental Affairs | \$153,144 | \$191,420 |
| Totals | \$40,567,500 | \$11,461,372 |

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. Lease agreements require the lessees to comply 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:

- i) Determine the status of implementing the components of the SWMP;
- ii) Evaluate the effectiveness of BMPs for specific source controls;
- iii) Evaluate the source of specific pollutants;
- iv) Assess the chemical, biological, and physical effects of MS4 runoff on receiving waters;
- v) Characterize MS4 runoff discharges; and
- vi) Evaluate long-term trends in receiving water quality associated with storm water discharges.

Table 6-1 (shown in 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 <http://www.portlandonline.com/bes/index.cfm?a=350956&c=37485>. A discussion of this program and its operations during FY2010 is included in Section IV (Monitoring Compliance Report).

6.2 Best Management Practice (BMP) Monitoring

The Port's BMP monitoring activities are described as tracking measures and measurable goals in the most recently approved SWMP, submitted to DEQ on April 1, 2011. 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. The MS4 permit was renewed on January 31, 2011. Because the annual reporting period will span time periods covered by both the 2006 permit with its associated (2006) SWMP and the new permit with its associated (2011) SWMP, the Port's 2010-2011 activities will be reported based on the 2011 SWMP requirements. This will simplify the report and avoid confusion.

6.3 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 through DEQ upon request.

Stormwater sampling at PDX and Terminal 2 is required for 1200-COLS and 1200-Z permit compliance. This monitoring provides useful 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:

- NPDES 1200-COLS Industrial Stormwater Discharge Permits, DEQ File No. 107220 (PDX)
- NPDES 1200-COLS Industrial Stormwater Discharge Permit, DEQ File No. 111492 (Terminal 6) *Data reported for 2010-11. This permit is now held by the tenant.
- NPDES 1200-Z Industrial Stormwater Discharge Permit, DEQ File No. 103594 (Terminal 6) *Data reported for 2010-11. This permit is now held by the tenant.
- NPDES 1200-Z Industrial Stormwater Discharge Permit, DEQ File No. 114024 (Terminal 2)

7.0 ACCOMPLISHMENTS FOR PERMIT YEAR SixTEEN (2010-11)

7.1 SWMP Implementation

The annual report content and format is based on the SWMP submitted to DEQ in April 1, 2011. 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). The implementation tasks, reporting on tracking measures and progress towards associated measurable goals are show in italics for each BMP below. Reporting regarding any task not addressed by the corresponding tracking measures or measurable goal response is addressed directly under the task.

7.1.1 Element #1: Illicit Discharge Detection and Elimination

BMP: Implement the Illicit Discharge Detection and Elimination Program

Implementation Tasks:

1. Continue to implement documented illicit discharge detection and elimination procedures (Responsibility: MID Environmental, Aviation 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: MID Properties Maintenance, Marine Facilities Maintenance (MFM), and PDX Maintenance).

- ✓ *MID and Aviation staff continue to be trained on spill notification annually. Notification signage is maintained on both MID and Aviation properties.*

Tracking Measures:

- Track the status of updating the illicit discharge detection and elimination procedures.
 - ✓ *Port Ordinance 361 provides the authority to prohibit illicit discharges. Port-wide rules ensuring consistent and timely enforcement of the ordinance have been drafted and were approved by the Executive Director on October 5th, 2011.*
- Track the number, type, location, and resolution of any illicit discharge investigations conducted.
 - ✓ *Aviation investigated six potential illicit discharges in FY2010. (*See summary under BMP: Conduct Dry-Weather Field Screening tracking measures.)*
 - ✓ *MID investigated 11 potential illicit discharges in FY2010. (*See summary under BMP: Conduct Dry-Weather Field Screening tracking measures.)*

Measureable Goals:

- Update the illicit discharge detection and elimination procedures by November 1, 2011.
 - ✓ *Completed in FY2010. Procedures were approved on October 5th, 2011.*

BMP: Conduct Dry-Weather Field Screening

Implementation Tasks:

1. Conduct annual dry-weather field screening activities at all priority outfall locations (Responsibility: MID Environmental, Aviation Environmental).
2. Annually, as necessary, update Port data files related to outfall locations, in accordance with dry-weather field screening activities (Responsibility: MID Environmental, Aviation Environmental).
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:

- Track the number and location of priority outfalls inspected during dry-weather field screening activities.
 - ✓ *Aviation inspected 14 outfalls.*
 - ✓ *MID inspected 66 outfalls.*
 - ✓ *The location of Port “Priority Outfalls” for dry-weather field screening is mapped in the Port’s GIS system.*
- Summarize dry-weather field screening inspection results and indicate outfalls requiring sampling or follow up activities.

- ✓ *Aviation screening was conducted on 8/16/10.*
 - ***Summary:** Fourteen outfalls were inspected. Outfalls for PDX basins 2, 3, 5, 6, 8, and 9B displayed visible flow. Each of the six outfalls with flow has been investigated in previous years and the source has been determined to be groundwater infiltration and/or landscape irrigation water (both allowable discharges). This year each basin was inspected, 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.*

- ✓ *MID screening was conducted between 9/3/10 and 10/14/10.*
 - ***Summary:** Sixty-six outfalls were inspected. Nine outfalls displayed visible flow. One was private, five required Port follow up, and three were referred to the City of Portland. The City followed up on outfalls (STSOUT 258, STSOUT 264, STSOUT 164). The results of these inspections should be included in the City's MS4 compliance report. Regarding Port outfalls that required follow up (STSOUT 275, STSOUT 278, STSOUT 207, STSOUT SI-E, STSOUT 268, CG-1), drainage areas were inspected for signs of an unauthorized discharge. None were found. All were drips or very light flow with no visual observations indicating a potential illicit source. Based on this information, all were attributed to groundwater infiltration.*

- ✓ *Note: The Port-wide IDDE work instruction has been updated to incorporate the new permit requirements regarding sampling and the use of pollutant parameter action levels. According to this instruction, all dry-weather flows that are not attributed to an authorized discharge will require analytical sampling to help determine the likely source type.*

- Indicate the outcome and resolution of inspection activities conducted.
 - ✓ *MID and Aviation: All investigated discharges were determined to be from authorized sources based on historical observations and field investigations at the time of discharge.*

Measureable Goals:

- Update dry-weather field screening procedures, in accordance with permit requirements by July 1, 2012.
 - ✓ *Completed in FY2010. The Port-wide IDDE work instruction (mentioned above) was revised to incorporate the new permit requirements for notification of other jurisdictions, timing of resolution once a source has been determined, circumstances that require sampling, and pollutant parameter action levels.*

- Inspect priority outfalls annually.
 - ✓ *A total of 80 priority outfalls were inspected Port-wide as part of dry-weather field screening activities in 2010-11.*

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: Marine Environmental).
2. Participate in the City's Spill Response Committee (Responsibility: Marine Environmental).
 - ✓ *Staff from MID Environmental continues to be active on the City of Portland's Regional Spill Committee and attend quarterly meetings when they are held.*
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: Marine Environmental).

Tracking Measures:

- Track the number of spills of a reportable quantity in which a spill response was conducted.
 - ✓ *Aviation responded to one reportable quantity spill in FY2010.*
 - ✓ *MID responded to three reportable quantity spills in FY2010.*

Measureable Goals:

- 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 response 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:

- Implement waterline flushing consistent with guidelines described in this BMP description.
 - ✓ *MID 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.*

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 Affairs).

Tracking Measures:

- Track leaseholds that have an industrial permit.
 - ✓ *The Port maintains a list of tenants who hold an individual Industrial Stormwater General Permit. These include: Yoshida Foods International Limited Partnership, International Container Terminal Services, Inc., Stevedoring Services America, Inc., Kinder Morgan Bulk Terminal 4, Toyota Logistics Services, Inc., Columbia Grain, Inc., Portland Bulk Terminal 5, Auto Warehousing Company (for Hyundai), and Swan Island Batch Discharge Plant (Rinker).*

Measureable Goals:

- Coordinate with the City of Portland on a process for screening industrial facilities over the permit term.
 - ✓ *The Port is currently renegotiating an IGA with the City which will include specific responsibilities regarding screening of industrial facilities.*

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: Marine Environmental, Aviation Environmental).
- 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: Aviation Environmental, Marine Environmental).

Tracking Measures:

- Track the number of facilities inspected annually.
 - ✓ *Aviation conducted 14 inspections of Priority facilities in FY2010.*
 - ✓ *MID conducted 5 inspections of Priority facilities in FY2010.*
- Track improvements made to priority facilities as a result of inspections.
 - ✓ *Inspection follow up letters are kept by Environmental Affairs documenting any issues that require attention. In FY2010 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, secondary containment requirements, conducting required good housekeeping measures, documentation of stormwater treatment facility maintenance documentation, and maintenance/clean up of leaky equipment.*

Measureable Goals:

- Coordinate with the City of Portland on a process for screening industrial facilities over the permit term.
 - ✓ *The Port is currently renegotiating an IGA with the City which will include specific responsibilities regarding screening of industrial facilities within the Port's jurisdiction.*

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) 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 2-1.

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: Aviation Environmental, Marine Environmental, MID Properties Maintenance, MFM, PDX Maintenance).
- 2) Include stormwater education materials at Port sponsored outreach events (Responsibility: Environmental Affairs).

Tracking Measures:

- Track the number of “Dump No Waste, Drains to Stream” decals applied to catch basins.
 - ✓ *The Port applied 70 decals in FY2010.*
- Track events where stormwater educational materials were made available.
 - ✓ *The list of stormwater-related topics and the events where each was addressed is presented below.*

Used porous asphalt exhibit to discuss stormwater management at Port facilities:

- Better Living Show, March 2011
- City Repair Earth Day Event, April 2011
- Take Your Child to Work Day, April 2011

Incorporated information about stormwater into various presentations on Port environmental management:

- Three annual presentations to Portland Community College
- Tabling at Columbia Slough Regatta, July 2010
- Tabling at RiverFest Fair, August 2010
- Tabling at above events: Better Living Show, City Repair Earth Day Event, and Take Your Child to Work Day
- Frequent tours of Port facilities, with special emphasis on new Headquarters building's green features (greenroof, porous hardscapes at main entrance, native plantings)

Presented information about deicing program and new treatment facility:

- American Public Works Association luncheon, September 2010
- Columbia Slough Watershed Council meeting, October 2010
- Columbia Slough Watershed Council's Slough 101, March 2011
- Frequent tours of deicing system components, with emphasis on how material is managed

Supported various efforts that contribute to improved stormwater quality:

- Oregon Environmental Council's Love Your River campaign (financial sponsorship)
- Columbia Slough Watershed Council (financial sponsorship, volunteer assistance at events, in-kind filmmaking services, staff member serves on board)
- Friends of Trees (financial sponsorship)
- RiverFest (financial sponsorship, staff member serves on steering committee)
- Other financial sponsorships include Sustainable Northwest, Freshwater Trust, and SOLV

✓ *Additional outreach efforts include:*

- Annual reporting on environmental objectives and targets, including emphasis on water resources management
- Numerous employee communications that included information on water the resources management program and/or water quality issues
- Launched new Facebook page and transitioned newsletter *Port Currents* to an online format for easier and broader outreach on Port-related topics

Measureable Goals:

- "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).
 - ✓ *Completed in FY2010. *See the tracking measure response above.*
- 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.

BMP: Implement a Tenant Stormwater BMP Program

Implementation Tasks:

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

Tracking Measures:

- Compile/ update a leasehold inventory annually.
 - ✓ *Completed for FY2010. MID and Aviations Properties are asked to provide an updated list of leaseholders annually. This information is also updated on its own GIS layer within PortGIS, through a separate process. The Port's inventory includes 114 leaseholders. However, many of these leaseholds do not have any exposure to stormwater. Operating area environmental staff is familiar with the circumstances and needs of specific leaseholders. This information is taken into consideration when selecting priority facilities for inspection.*
- Provide technical information related to structural and non-structural/ source control BMPs to tenants over the permit term.
 - ✓ *In FY2010, 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 is developing revised stormwater BMP education and outreach materials that can be used in conjunction with these inspections and distributed to a larger group of industrial/commercial entities within the Port's jurisdiction.*

Measureable Goals:

- Verify the completion and/ or update of a leasehold inventory.
 - ✓ *Completed in FY2010. *See tracking measure response above.*
- 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).*

- 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 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 (Responsibility: PDX Maintenance, PDX Landscape, MID Properties Maintenance, MFM).

Tracking Measures:

- Track the Port employees who are ODA-licensed pesticide applicators.
 - ✓ *The following Port employees are ODA-licensed; Tim Cooper, Mark Griffith, Joe Harris, Lyle Larson, Corrine Fritz, Don Goodman, Shawn Groom, Tim Guymon, Michael Sands, Luis Guevara, Marco Guevara, Jeff Morehead, Gary Tudor, Greg Croteau, Eric Dorrance, Richard Henry.*

Measureable Goals:

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

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: Aviation Environmental).

Tracking Measures:

- Track the number of employees receiving erosion and sediment control training.
 - ✓ *The Port provided a one hour training session to 18 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:

- Erosion prevention and sediment control training will be conducted annually for Port construction inspectors.
 - ✓ *Completed in FY2010. *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 Affairs).

Tracking Measures:

- Track related efforts annually.
 - ✓ *The Port would like to work with other Phase I jurisdictions to conduct a large scale Public Education Effectiveness Evaluation in order to maximize the resources available for this effort. The effort is likely to be spearheaded by the Association of Clean Water Agencies (ACWA). The process has not been initiated yet, due to the 2014 completion date.*

Measureable Goals:

- Coordinate with other local, Phase I jurisdictions regarding a public education effectiveness evaluation by November 1, 2014.
 - ✓ **See the tracking measure response above.*

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: Marine Environmental, Aviation Environmental).
2. Conduct general spill response training annually for designated employees (Responsibility: Marine Environmental, Aviation Environmental).

Tracking Measures:

- Document spill response training activities.
 - ✓ *Environmental Affairs 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:

- Annually train designated Port employees on spill response.
 - ✓ *MID provided spill response training for 17 employees*
 - ✓ *Aviation provided spill response training for 104 employees.*

- Document the procedure to determine which employees will receive spill training by November 1, 2011.
 - ✓ *The Port provides Spill Response training annually to operations employees likely to encounter spills (Operations, Environmental, Maintenance, Security, Fire, and Landscape). They receive spill and stormwater training to understand clean up and notification procedures. Employees also receive on the job training regarding the appropriate clean up materials and disposal requirements for small spill clean-up. *All reportable quantity spills are cleaned up by one of the Port's on-call spill response contractors.*
 - ✓ *Other Port facilities and tenants who operate above ground oil storage tanks over the capacity of 1320 gallons are required to maintain a Spill Prevention Control and Countermeasures (SPCC) Plan and abide by SPCC requirements for training.*

BMP: Implement a Staff Training Program for Stormwater Pollution Prevention

Implementation Tasks:

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

Tracking Measures:

- Document all staff training activities.
 - ✓ *Environmental Affairs 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 121 existing employees and 52 new employees during FY2010.*
- Document attendance at conferences.
 - ✓ *Environmental Affairs 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 include, Stormcon, Northwest Environmental Conference, ACWA Stormwater Summit, and various stormwater related training courses).*

Measureable Goals:

- Participate in water quality organizations and stakeholder groups annually.
 - ✓ *The Port continues to participate as a member of the Columbia Slough Watershed Council, with a Port staff member sitting on the board. Other participation includes financial sponsorship, volunteer assistance at events, and in-kind filmmaking services.*

- Conduct annual training.
 - ✓ *Completed in FY2010. *See the tracking measure response above.*
- Conduct new employee training.
 - ✓ *Completed in FY2010. *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: Marine Environmental, Aviation Environmental, Environmental Affairs).

Tracking Measures:

- Report annually on public participation in these areas.
 - ✓ *The Port's September 20th, 2010 SWMP was submitted for public comment along with the proposed permit renewal. DEQ managed this process, responding to comments and requesting SWMP changes to be incorporated into the April 1, 2011 version, as necessary.*

Measureable Goals:

- Provide for public participation on the SWMP revisions and pollutant load reduction benchmarks.
 - ✓ **See the tracking measure response above. Pollutant load reduction benchmarks will not be prepared for public comment again until the renewal application is submitted 180 prior to the permit expiration date.*
- 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>.*

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: Aviation Environmental, MID Environmental, Environmental Affairs, 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 Affairs, Public Affairs).

- ✓ *In FY2010, the public was made aware of involvement opportunities via communications from the Environmental Outreach Coordinator using the website, email, and the Port’s newsletters.*
3. Implement selected projects and document public involvement (Aviation Environmental, MID Environmental, Environmental Affairs, Public Affairs).

Tracking Measures:

- Describe any projects implemented where the public has opportunity to participate and the extent of public involvement for each.
 - ✓ *The following FY2010 events provided the opportunity for the public to participate in implementation of the Port’s stormwater program:*
 - *The September 2010 SOLV Hayden Island Clean Up event was organized by the Port. It was a public outreach event that facilitated the removal of floatable solids and other potential pollutant sources from Hayden Island beaches. The event had approximately 150 members of the public who participated.*
 - *Stormwater treatment facility maintenance (catch basin or other system) is often conducted by our tenants contingent on existing lease language. This is done in coordination with the Port BMP “Implement a Stormwater System Cleaning and Maintenance Program.”*

Measureable Goals:

- Document what projects are identified as public involvement opportunities.
 - ✓ *In addition to those opportunities available this year. The following have been identified as possible opportunities for next year:*
 - *Port tenants will have the opportunity to provide input on the content of new modules for the Tenant Stormwater BMP Program.*
 - *“Dump No Waste” labels will be available to Tenants for application as needed within their facilities.*

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 Affairs)
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: Marine Environmental or Aviation Environmental).

Tracking Measures:

- Adopt Port-wide post-construction development/ redevelopment standards by January 1, 2014.
 - ✓ *Due to the scale and importance of this process, it is still in the early planning stages. The Port will provide an update on the progress in the 2011-12 annual report.*
- Update IGA with the City of Portland by December 31, 2012.
 - ✓ *The Port is in the process of renegotiating an IGA that will address the Port's ability to have their own projects regulated under the new post-construction development standards being developed.*
- Design and initiate construction on a stormwater retrofit project to address a TMDL pollutant of concern.
 - ✓ *This project will be identified (by November 1, 2013) as part of the Retrofit Analysis.*

Measureable Goals:

- Document the design, construction, and rationale for the retrofit project addressing a TMDL pollutant of concern.
 - ✓ **See the first 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: MID Properties Maintenance).
2. Sweep Port-managed areas of the marine terminals annually. If additional sweeping is needed, Marine Environmental will coordinate with MFM staff (Responsibility: Marine Environmental, 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. *PDX maintenance staff conducted efforts to remove runway rubber twice in 2010-11 using a machine that contains and recycles the water used in the cleaning of the runway surface. Follow manufacturer's recommendation for application of deicing products (Responsibility: MFM, PDX Maintenance, MID Properties Maintenance).*

- ✓ *Operating area personnel are aware of the requirement to apply pavement deicing materials per the manufacturer's requirements. Application is calibrated to apply the material at the suggested rate in order to avoid wasting a costly product and to avoid under applying.*
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).
- ✓ *The MID work instruction (currently in use) is being rewritten to combine the stormwater and waste disposal tasks. PDX Maintenance has a different configuration that does not require a cover or water tight box, since the boxes sit in a small area plumbed to sanitary.*

Tracking Measures:

- Track sweeping frequency at McCarthy Park.
 - ✓ *MFM contracts sweeping for McCarthy Park on the frequency of twice a month December through September, five times in October and four times in November.*
- Track sweeping frequency at the marine terminals.
 - ✓ *Environmental sweeping was conducted at Terminals 2, 4, and 6 (according to lease requirements) monthly between March and October.*
- Track sweeping frequency at Airport Way, Frontage Road, and the PDX employee parking lots.
 - ✓ *PDX Maintenance schedules sweeping for these areas based on the frequency outlined in the task.*
- Report the amount of materials removed. Materials will include those collected from catch basins and other structural devices.
 - ✓ *Aviation removed 282.43 tons of material from catch basins and sweeping combined during FY2010. They also cleaned the Basin 4 quiescent pond, resulting in the removal of an additional 57.57 tons of sediment.*
 - ✓ *MID removed a combined 56.26 tons of material from catch basins and sweeping activities during FY 2010.*

Measureable Goals:

- Sweep McCarthy Park parking lot annually.
 - ✓ *Completed in FY2010. *See tracking measure response above.*
- Sweep Port-managed, accessible areas of the marine terminals annually.
 - ✓ *Complete in FY2010. *See tracking measure response above.*
- Sweep Airport Way, Frontage Road, and the PDX employee parking lots a minimum of once per week.
 - ✓ *Completed in FY2010. *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: MID Properties Maintenance, MFM, PDX Maintenance, PDX Landscape).

- ✓ *MID 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.*

MID Environmental provided 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 conducted 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 Maintenance staff, responsible for landscaping at PDX facilities, continued to implement BMPs aimed at improving stormwater quality at the airport. Some of the issues they focused on included maintaining the integrity and proper function of the bioswales, limiting the impact on stormwater of pesticides/herbicides/fertilizers, and incorporating native plants into the landscaping to reduce water and chemical requirements.

2. Review the Port's program to control pesticides, herbicides and fertilizers annually, and update as appropriate (Responsibility: Environmental Affairs, MID Properties Maintenance, MFM, PDX Maintenance, PDX Landscape).

- ✓ *All four Port groups applying landscape chemical documented new approaches considered during FY2010. Some of the issues include: testing lower doses and different combinations of certain pesticides for efficacy, the use of porous ceramics to deal with wet soil conditions, and pH adjustment to increase adjuvant effectiveness on spray applications.*

3. Maintain an inventory of pesticides used on Port property and update annually (Responsibility: Environmental Affairs).

Tracking Measures:

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

| <i>Airside Spraying (PDX Maintenance)</i> | |
|--|------------|
| Payload | 12.38 lbs. |
| Diuron | 231 lbs. |
| Tordon 22K | 2.06 gal. |
| Crossroads | 15.5 gal. |
| Ranger Pro | 29.1 gal. |
| Oust | 3.14 lbs. |
| Breakthru | 3.94 lbs. |
| Coolpower | 4.05 gal. |
| Escort | 12.6 oz. |
| Krovar | 100.8 lbs. |
| Dimilin 2L | 7.5 oz. |
| Zinc Phosphate | 800 lbs. |

| <i>PDX Landscape</i> | |
|-----------------------------|-----------|
| Lada | 5 qts. |
| Attrimec | 15 gal. |
| Casaron | 100 lbs. |
| Merit 75 WSP | 19.2 oz. |
| Surflan AS | 20 gal. |
| Gallery DF | 31 lbs. |
| T-Zone | 9.7 gal. |
| Resolute | 90 lbs. |
| Simazine | 22.5 gal. |
| Element 3A | 2.5 gal. |
| Embark 2s | 1 gal. |
| Roundup Pro | 36.5 gal. |

| <i>Marine Property Maintenance (Landscape)</i> | |
|---|------------|
| Ranger Pro | 4,094 oz. |
| Garlon 3A | 691 oz. |
| Powerzone | 157 oz. |
| Snapshot 2.5 TG | 280.5 lbs. |
| Dimension 270G | 130 lbs. |
| Resolute 65WG | 36.9 lbs. |
| Dimension 2EW | 330 lbs. |
| Dimension Ultra YOWP | 14.8 lbs. |
| Prodiamine 65 WPG | 32.3 lbs. |
| Simatrol 4L | 2542 lbs. |
| Aquamaster | 15 oz. |
| Crossbow | 102 oz. |
| Oust | 2.75 lbs. |
| Simazine 4L | 576 oz. |
| Element 3A | 363 oz. |
| Gallery 75DF | 21 lbs. |
| Casaron 4G | 50 lbs. |

| <i>MFM (Labor Shop)</i> | |
|--------------------------------|------------|
| LI-700 Surfactant | 10 gal. |
| Oust | 129.1 oz. |
| Garlon 3A | 30.75 gal. |
| Ranger Pro | 40.5 gal. |

Measureable Goals:

- Annually update the Port's pesticide use inventory.
 - ✓ *Completed for FY2010. *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).
2. Monitor pump stations through weekly inspections and audible/visual alarms to ensure proper function of MID pump stations (Responsibility: MFM).
 - ✓ *MFM staff documented these inspections for FY2010.*
3. Conduct annual pump station maintenance, including flushing, float and alarm testing, and debris removal for all pump stations (Responsibility: PDX Maintenance, MFM).
 - ✓ *Work orders are generated to ensure the completion of this work at PDX and MID operated sanitary lift stations.*
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 Affairs.*
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:

- Maintain a list of Port tenants implementing the FOG program.
 - ✓ *Environmental Affairs maintains a list of tenants who are inspected as part of the effort 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:

- Document completion of implementation tasks (2-4) associated with this BMP (with PDX Maintenance, Aviation Facilities Maintenance, MFM, and PDX Business/Properties)
 - ✓ *Completed for FY2010. Environmental Affairs 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: Marine Environmental, MFM, MID Properties Maintenance).
2. Inspect and clean catch basins (as necessary) annually in Port-managed areas of Marine and Industrial Development (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, MID Properties Maintenance).
 - ✓ *MID 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: Marine Environmental, Aviation Environmental, Environmental Affairs).
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.
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).

- ✓ *The MID work instruction (currently in use) is being rewritten to combine the stormwater and waste disposal tasks. PDX Maintenance has a different configuration that does not require a cover or water tight box, since the boxes sit in a small area plumbed to sanitary.*

Tracking Measures:

- Track number of catch basins cleaned annually.
 - ✓ *Aviation cleaned 500 catch basins in FY2010.*
 - ✓ *MFM cleaned 522 catch basins in FY2010.*
- Track cleaning frequency for the Port owned and operated structural stormwater controls by facility type.
 - ✓ *MID-operated water quality treatment facilities are cleaned annually.*
 - ✓ *Catch basins in MID-operated areas are cleaned 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. Basin 4 pond was cleaned in FY2010, resulting in the removal of 57.57 tons of material.*
 - ✓ *PDX has over 3,000 catch basins. Aviation 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 Aviation-operated 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.*
- Track storm sewer system pipe cleaning activities annually.
 - ✓ *Aviation cleaned 17,500 feet of storm line during FY2010.*
 - ✓ *MFM cleaned all the storm lines at Terminal 6 in FY2010.*
- Track updates to the stormwater system features maps.
 - ✓ *The stormwater maps for PDX are in the process of being revised. This revision should be completed by December 31, 2011, at the latest. All Port storm system maps are available in PortGIS.*
- 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:

- Inspect and clean all catch basins within the Port-managed areas not otherwise covered by a 1200-series industrial stormwater permit annually.
 - ✓ *Completed in FY2010.*

- 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 FY2010. These facilities are inspected on a regular basis and cleaned when maintenance is needed, at a minimum annually.*

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: Marine Environmental, MID Properties Management, Aviation Environmental, Environmental Affairs).
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: MID Environmental, Environmental Affairs).
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: MID Environmental, Aviation Environmental, Environmental Affairs).

Tracking Measures:

- Track the number of existing and new private structural control facilities installed on Port-properties.
 - ✓ *The Port is renegotiating an IGA with the City of Portland which will address the inventory and tracking requirements.*

Measureable Goals:

- Develop an inventory and mechanism for tracking of private structural controls on tenant properties.
 - ✓ *The Port is renegotiating an IGA with the City of Portland which will address the inventory and tracking requirements.*

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

During permit year 16, the Port conducted an extensive SWMP revision to address the requirements of the MS4 permit issued on January 31, 2011. Many BMPs have new or significantly revised tracking measures or measurable goals. The revised SWMP also includes new BMPs to address sanitary sewer infiltration and providing public involvement opportunities for implementation of the Port's SWMP. As it has, since permit year one, the Port continues to modify how its BMPs are carried out to find the most efficient approach and reduce pollutant loading to the maximum extent practicable. This process directly involves operating area personnel with knowledge of the program goals who provide suggested BMP modifications. In permit year 17, an improved process to more broadly and actively solicit this input will be used to ensure all ideas are heard, documented, and implemented, if viable. The Port is not seeking any further SWMP revisions at this time.

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Section IV
MONITORING COMPLIANCE REPORT

MONITORING COMPLIANCE REPORT

INTRODUCTION

The purpose of this monitoring report is to comply with Schedule B of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. The report summarizes monitoring activities conducted by the City of Portland (hereinafter referred to as Portland) during fiscal year (FY) 2010-11 (permit year 16) and briefly discusses the results.

DEQ issued Portland's current (third-term) NPDES MS4 permit on January 31, 2011. The monitoring requirements in the permit did not come into effect until July 1, 2011, when DEQ gave conditional approval to Portland's *MS4 Quality Assurance Monitoring Plan* (which the City submitted to DEQ June 1, 2011). This monitoring compliance report therefore reports on monitoring activities that were conducted in accordance with the monitoring requirements in the 2005 (second-term) permit.

Tables B-1 and B-2 of the second-term permit summarize required monitoring types, locations, and analytical parameters. The required monitoring information is included under Tasks 4 and 5 of this Monitoring Compliance Report.

The complete set of monitoring data is available on CD-ROM upon request.

PROGRAM COMPONENTS

The purpose of the monitoring program is to assess the chemical, biological, and physical effects of stormwater discharges on receiving surface waters. The program comprises the following six tasks:

- 1:** Program Planning/Annual Report/ Review of Existing Water Quality Data
- 2:** BMP-Specific Monitoring (related to BMPs IND-1, ILL-1, OM-1, and ND-1)
- 3:** Stormwater Management Facility Monitoring
- 4:** Comprehensive Ambient Monitoring to Assess Stormwater Impacts
- 5:** Stormwater Monitoring at Land Use Stations or MS4 Outfalls
- 6:** Collaboration with Oregon DEQ, ACWA, and Other Jurisdictions

The following sections list the respective tasks and their objectives and summarize the monitoring activities of the past year and previous years in a table for each task.

TASK 1: PROGRAM PLANNING/ANNUAL REPORT/REVIEW OF EXISTING WATER QUALITY DATA

Objectives

Task 1 has three objectives. The first objective is to compile and interpret stormwater data collected as part of watershed and other monitoring activities. The second objective is to prepare reports to evaluate data results with respect to stormwater management. The third objective is to review the monitoring program annually and prepare the annual monitoring compliance report.

Accomplishments

To address the first objective, Tasks 2 to 5 of this report summarize the monitoring activities Portland completed during FY 10-11. To address the second objective, monitoring-related technical reports, summary reports, or statistical analyses are developed to evaluate how effective various BMPs are in reducing pollutants in stormwater discharges. Development of these documents depends on the availability of sufficient data to allow for a rigorous statistical analysis. Preparation of this annual monitoring compliance report addresses the third objective.

Results

To date, some of the monitoring of some stormwater management facilities (SMFs) has been sufficient to prepare separate monitoring reports with or without a thorough statistical evaluation of the data. Monitoring of other SMFs or MS4 outfalls has not been compiled in reports, even though preliminary statistical analyses have been conducted. The ambient monitoring data for all major streams were reviewed and analyzed. An update of the 2000 and 2001 water quality trending reports was prepared and submitted to DEQ in September 2008 as part of the MS4 permit renewal application submittal. These 2008 in-stream trend analyses were compared to 2009 and 2010 in the respective annual reports since a substantial number of additional data points became available in most streams.

Based on the results of the analyses that have been conducted, the City adaptively changed its monitoring program, as described in the *MS4 Quality Assurance Monitoring Plan* submitted to DEQ on June 1, 2011. The City began to implement the new monitoring program in July 2011, and the results will be presented in next year's annual compliance report.

TASK 2: BMP-SPECIFIC MONITORING

INDUSTRIAL STORMWATER PROGRAM MONITORING

Objective

The objective of the Industrial Stormwater Program monitoring is to evaluate the long-term water quality trends, which will highlight the overall effectiveness of the Industrial Stormwater Program.

Accomplishments

The City has used monitoring for over 10 years to evaluate the impact of the City's education, technical assistance, and permitting efforts for the Industrial Stormwater Program (described in IND-1). Program monitoring started in 1991, with monitoring of two outfalls (one in the northwest industrial area and one on Swan Island) that drained basins with predominantly commercial and industrial land uses. Early monitoring demonstrated that there were significant amounts of pollutants discharging from these sites.

The current sampling program started in 1999 with the collection of flow-composite water quality samples at Outfall (OF) 19 in the northwest industrial core area. Typically, three storm events are sampled annually and analyzed for common pollutants and seven metals. (The minimum list of analytes is shown in Table MON-3 of the *Stormwater Management Plan*.) Starting in permit year 11 (FY 05-06), semi-volatile organic compounds and PCBs were added to the analyte list. PCB analysis was dropped in FY 07-08 because of the lack of detection at the achievable practical quantitation limits.

The Portland Harbor Program initiated an outfall monitoring program in 2007 that continued through 2008. The *Stormwater Evaluation Report* discussing these sampling events was submitted to DEQ in February 2010. The objective of that report is to present the results of an outfall basin data analysis conducted to identify City outfall basins where DEQ and the City should exercise their respective authorities to implement additional source investigations and/or controls.

Results

Two storm events, which occurred in October 2010 and February 2011, were sampled, as shown on the following table.

OF 19 – Data Summary

| Date | 72-h Antecedent Rainfall (inches) | 24-h Antecedent Rainfall (inches) | 6-h Antecedent Rainfall (inches) | Total Event Rainfall (inches) | Sample Collection Time Rainfall (inches) |
|---------------|-----------------------------------|-----------------------------------|----------------------------------|-------------------------------|--|
| 10/23-24/2010 | 0.06 | 0.06 | 0.01 | 1.91 | 1.87 |
| 2/12/2011 | 0.01 | 0 | 0 | 0.48 | 0.41 |

With the exception of total copper, concentrations of TSS and all total recoverable metals were similar to the long-term median concentrations. It is unclear why the total copper median was more than nine times greater than the long-term median while none of the other metals showed a similar pattern.

Concentrations of almost all PAHs in the October event were below the long-term median and mean concentrations. During the February event, on the other hand, a number of PAHs had new maxima for the monitoring record that started in 2006.

The *Basin 19 Stormwater Quality Trend Analyses Effectiveness of City Stormwater Source Control Efforts* technical memorandum (BES 2011) describes the trends of copper, lead, and zinc at outfall 19 and concludes that the City’s stormwater management programs (e.g., Industrial Stormwater Program, MS4 permit implementation) have been effective in reducing pollutant discharges to City stormwater conveyance systems. Continued implementation of City programs and enforcement of City Code requirements for stormwater management at new development and redeveloped sites are expected to result in additional control of pollutant sources and subsequent reductions in pollutant discharges to City-wide stormwater systems.

ILLICIT DISCHARGES MONITORING

Objective

The objective of the Illicit Discharge Elimination Program (IDEP) is to identify illicit discharges to the MS4 system, investigate citizen complaints, and evaluate the potential impact of permitted non-stormwater discharges to the MS4 system.

Accomplishments

The City’s Illicit Discharge Elimination Program (described in ILL-1) has been conducting the following monitoring activities since 1995 to identify and eliminate illicit discharges.

- **Dry-Weather Monitoring.** The City monitors City-owned outfalls every summer to locate illicit discharges such as cross-connections, washing, or illegal dumping operations. Monitoring consists of field observations and testing with meters, kits, and grab samples. During the 3-month dry summer period in FY10-11, all major outfalls were monitored at least once; some of the 126 priority outfalls (outfalls that showed a discharge in the past) were monitored twice. Historically, approximately four hits have been detected each month, ranging from illicit discharges (e.g., equipment cleaning, cooling water, commercial fleet

vehicle washing) to allowed non-stormwater discharges (e.g., residential car washing, landscape irrigation).

- **Spill Response.** 1,682 complaint calls were made to the City's spill hotline during this permit year. Staff members conduct visual observation and some monitoring to identify and track reported spills or other illicit discharges. The vast majority of identified materials are sediment, washwater, or discharges related to dye tests.
- **Non-Stormwater Monitoring.** The City began non-stormwater sampling activities in 1994. The City's approach was to identify sampling locations or surrogate sampling locations for each type of non-stormwater discharge and analyze the samples across a suite of common pollutants found in stormwater runoff. The results were compared to instream and/or groundwater water quality standards to identify potential concerns and determine if the discharges had the potential to negatively impact beneficial uses found in waters of the state. If discharges were identified as problematic, the City evaluated whether improvement actions were practicable. In some cases, City policies or procedures were changed to limit discharges, route certain discharges to the sanitary sewer, or otherwise help mitigate their impacts.

The City submitted a non-stormwater discharges evaluation report to DEQ as part of the City's Interim Evaluation Report (IER) in May 2006. The report evaluated the 19 non-stormwater discharge categories identified in the City's 1995 permit. The five categories added in the 2004 permit have a limited presence within the City's jurisdiction, and the City has limited scope in regulating or participating in these state-regulated activities. For that reason, those categories were assessed on a policy basis only and were not fully evaluated with sampling. The City has implemented new policies that address two of these categories (draining/ flushing of water storage reservoirs and discharges from environmental clean up sites). The other three (discharges from start up flushing of groundwater wells, aquifer storage and recovery wells, and potable groundwater monitoring wells) have no or limited applicability in the Portland permit area and are regulated by state agencies.

Results

The majority of dry-weather discharges from major outfalls are from groundwater infiltrating into stormwater pipes and are not of concern. This permit year, the number of discharges of potential concern was very small. Three follow-up investigations were initiated; one resulted in a pipe retrofit, and the other two, both at the same outfall, are still under investigation. The following table summarizes illicit discharge monitoring activities.

Illicit Discharge Monitoring – Summary of Activities

| Sampling Date | Sampling Locations | Follow-up Investigations |
|-----------------------|--|---|
| July 2010 | 28 – Total 8 – Columbia Slough 14 – Willamette River 6 – Johnson Creek | 13 had discharges at the time of inspection. No potential concerns were found and no follow-up investigations were initiated. |
| August 2010 | 51 – Total 23 – Columbia Slough 22 – Willamette River 3 – Columbia River 3 – Johnson Creek | 25 had discharges at the time of the inspection. <u>Outfall 22B</u> (Willamette River at 7200 NW Front Ave.) On August 12, water emerging from this outfall had an elevated pH of 8.9. Over the past three years, this outfall has often had elevated pH values, with no apparent surface water sources. Because of apparent inflow from adjacent contaminated sites, BES Construction has fitted most of the outfall pipe with a liner. However, the liner was not installed properly and is ineffective in preventing groundwater with elevated pH from discharging from the outfall. |
| September 2010 | 46 – Total 43 – Columbia Slough 3 – Willamette River | 17 had discharges at the time of the inspection. <u>Outfall 8</u> (Willamette River at SW Clay Street) Water collected from this outfall on July 20 tested positive for E. coli (>20,000 MPN per 100mL). Follow-up inspection was conducted on October 7. |
| October 2010 | 13 – Total 13 – Willamette River | 8 had discharges at the time of the inspection <u>Outfall 8</u> (Willamette River at SW Clay Street) Water collected from this outfall on October 7 tested positive for E. coli (16,000 MPN per 100mL). Investigation is ongoing but difficult because of traffic control problems on a busy downtown street. |

OPERATIONS AND MAINTENANCE MONITORING

Objectives

Evaluate the effectiveness of maintenance practices, identify the need for improvements, propose better designs for facilities and activities, and monitor the effectiveness of these improved designs.

Accomplishments

Throughout the first permit period, the City used monitoring to help evaluate the effectiveness or need for enhancement of maintenance practices (described in BMP OM-1 in the *Stormwater Management Plan*). The City has sampled the effectiveness of old and new facility designs (sedimentation manhole and infiltration shoulder swale designs) and conducted some monitoring of discharges from City facilities (the Albina Maintenance Yard) and City activities (street sweeping). Data from these monitoring activities have helped prioritize the types of source control measures to implement and provided guidance on the value or undesirable impacts of some system designs.

O&M monitoring in the second permit term has included the continuation of a sediment quality study started in 2001, a sediment accumulation study started in FY 2004-05, and monitoring of two test ditch-to-swale conversions to evaluate the effects of maintenance activities. The ditch-

to-swale conversion test study concluded in FY07-08, and the results of a simple statistical analysis were provided in that year's monitoring report.

Results

No new results are available.

EROSION CONTROL MONITORING

Objectives

The City's erosion control strategy (described in BMP ND-1 in the *Stormwater Management Plan*) includes erosion and sediment control monitoring. The objective is to evaluate the effectiveness of the City's erosion control code.

Accomplishments

In the first permit cycle, the City monitored three separate developments, from approximately the time that public utilities were installed all the way through housing construction. Two of the sites were in southeast Portland (an apartment complex and a large subdivision), and the third site (another subdivision) was in northwest Portland. Each site was monitored across four storm events in 1997. In general, the monitoring showed that a large amount of sediment was being released from construction sites. The northwest site released more than three times the amount of TSS in one storm event than the reference site sampling station located in northwest Portland released in one year.

Extensive monitoring of a subdivision under construction in southeast Portland was conducted from April 2000 to April 2003. Collected water quality data indicated that 1) the runoff concentrations of all major pollutants decreased over time, and 2) the erosion control measures in place were very effective in reducing the pollutant load in the runoff.

In March 2000, the City implemented a new City Code and *Erosion Control Manual* to help reduce the amount of pollution being released from construction sites. The City subsequently began sampling at a new southeast subdivision site to try to determine the effect of the new regulations on pollution reduction. That site proved to have significant construction and related issues that resulted in delays and made sampling impossible.

Because of the substantial variety in erosion control measures that can potentially be applied on a given site, results from one site are most likely not transferable to another site. The City has therefore decided that erosion control monitoring will not be continued for the time being.

Results

No new results are available.

TASK 3: STORMWATER MANAGEMENT FACILITY (SMF) MONITORING

STORMWATER QUANTITY, QUALITY, AND SOIL MONITORING

Objective

The objective of Task 3 is to conduct monitoring to evaluate the effectiveness of existing and new stormwater management facilities (SMFs) to reduce pollutants in discharges and better manage stormwater.

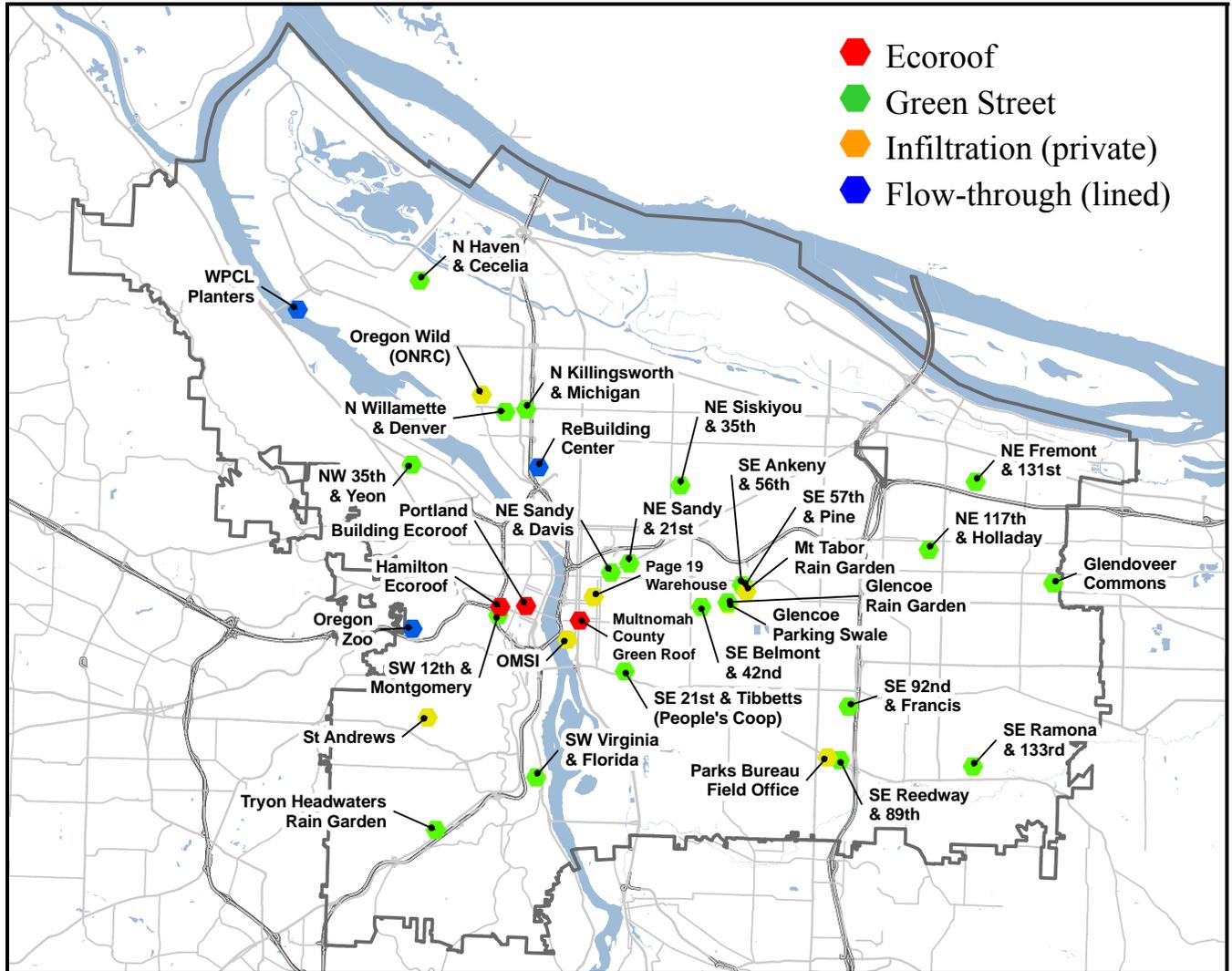
Accomplishments

In the past, little information on the effectiveness of structural stormwater management facilities was available. In 1995, the City began to monitor various types of structural BMPs that were installed as public and private facilities within the City boundaries (as reported in the annual compliance reports). Since then, many types of structural BMPs have been well characterized by various other jurisdictions and organizations nationwide. The City will continue to work with ACWA and other Phase I communities to identify and fill data gaps for mostly newer types of structural BMPs (such as planter boxes and curb extensions) for which little or no effectiveness information is available. The City continues to monitor the effectiveness of stormwater curb extensions and street planters for retention and detention of various sizes of storm events, as well as collect data from stormwater flow-through planters for various storm events. Collection of soil samples in infiltration facilities is ongoing to evaluate the increase in pollutant loadings in these facilities. Monitoring of ecoroofs is also continuing at various locations. The *2010 Stormwater Management Facility Monitoring Report -Summary* describes these activities conducted through June 2010.

Results--Summary

The map and table below show stormwater monitoring facilities that have been monitored through June 2011. Facilities that were monitored during FY 10-11 for parameters other than flow are then discussed.

Location of Monitored Facilities



Summary - Facilities Monitored through June 2011

| Facility | Facility Type | Age (yrs) | Monitoring Type | | | | |
|---|--|-----------|----------------------|--------------|-----------------|---------------|---------------|
| | | | Infiltration Testing | Flow Testing | Flow Monitoring | Soil Sampling | WQ Monitoring |
| Hamilton Apartments | Ecoroofs | 12 | | | ✓ | | ✓ |
| Portland Building | | 5 | | | ✓ | | ✓ |
| Multnomah County Bldg. | | 8 | | | ✓ | | |
| NE Siskiyou | Curb Extensions/ Green Streets/ Swales | 8 | ✓ | ✓ | ✓ | ✓ | |
| SE Ankeny | | 7 | ✓ | ✓ | | | |
| People's Co-op (SE 21 st & Tibbetts) | | 5 | | | | | |
| NE Fremont & 131 st | | 6 | ✓ | ✓ | | ✓ | |
| N Haven & Cecelia | | 6 | ✓ | ✓ | | | |
| N Killingsworth, Maryland & Michigan | | 4 | ✓ | | | | |
| NE 117 th & Holladay | | 4 | ✓ | ✓ | | | |
| SE 42 nd & Belmont | | 4 | ✓ | ✓ | | | |
| SE 92 nd & Francis | | 5 | ✓ | ✓ | | | |
| SE Ramona & 133 rd | | 5 | ✓ | ✓ | | | |
| SE Reedway & 89 th | | 4 | ✓ | ✓ | | | |
| NE Sandy & Davis | | 3 | | ✓ | | | ✓ |
| NE Mt. St. Helens & Alderwood | | 5 | | | | | ✓ |
| 5417 NE 148 th | | 5 | | | | | ✓ |
| N Haven & Cecilia | | 4 | | | | | ✓ |
| N Reno & Edison | | 6 | | | | | ✓ |
| SW 45 th & Pendleton | | 3 | | | | | ✓ |
| SW Palantine & 43 rd | | 14 | | | | | ✓ |
| SE 92 nd & 91 st Place | | 4 | | | | | ✓ |
| NE Sandy & 21 st | | 3 | | | ✓ | | |
| N Willamette & Denver | 3 | ✓ | ✓ | | | ✓ | |
| Glencoe RG | Vegetated Infiltration Basins/ Rain Gardens (RG)/ Swales | 8 | ✓ | ✓ | ✓ | ✓ | |
| Glencoe Parking Lot Swale | | 9 | | | | ✓ | |
| Mt. Tabor Middle School RG | | 4 | ✓ | ✓ | | | |
| OMSI Parking Lot | | 19 | ✓ | | | ✓ | |
| ONRC | | 9 | ✓ | | | | |
| St. Andrews Parking Lot | | 8 | ✓ | | | | |
| SW Community Center | | 16 | | | | ✓ | |
| Tryon Headwaters Rain Garden | | 4 | ✓ | ✓ | | | |
| Walnut Park Police Precinct | 17 | | | | | ✓ | |

| Facility | Facility Type | Age (yrs) | Monitoring Type | | | | |
|----------------------------------|-------------------------------|-----------|----------------------|--------------|-----------------|---------------|---------------|
| | | | Infiltration Testing | Flow Testing | Flow Monitoring | Soil Sampling | WQ Monitoring |
| George Middle School | Flow-through Planters/ Swales | 6 | | | ✓ | | |
| Oregon Zoo Parking Lot | | 5 | | ✓ | | | ✓ |
| BES Water Pollution Ctrl Lab | | 7 | | | ✓ | | |
| ReBuilding Center | | 6 | | ✓ | | | ✓ |
| SW Montgomery & 12 th | Street Planters | 6 | ✓ | ✓ | | ✓ | |
| SW 30 th & Dolph | | 4 | | | | ✓ | |
| SE Foster & 91 st | | 3 | | | | ✓ | |
| SE Powell & 64 th | | 1 | | | | ✓ | |
| New Seasons | | 7 | | | | ✓ | |
| SE Alder & 41 st | Flow Restrictors | 7 | | ✓ | ✓ | | |

Results—Water Quality Monitoring

Ecoroofs

Ecoroofs are vegetated facilities that replace a standard roof, mostly on buildings with a low roof pitch. They consist of soil media and vegetation atop a waterproof membrane. They are designed to reduce peak flows and total runoff volume.

Ecoroof Effluent Water Quality - Summary

| Parameter | Units | Portland Building | Hamilton West Roof |
|------------------------|-------|--------------------|--------------------|
| | | Mean of 12 samples | Mean of 21 samples |
| Dissolved Copper | µg/L | 11.2 | 11.4 |
| Dissolved Lead | µg/L | 0.65 | 0.10 |
| Dissolved Zinc | µg/L | 16.9 | 18.2 |
| Total Dissolved Solids | mg/L | 152 | 116 |
| Nitrate-N | mg/L | 0.46 | 0.33 |
| Total Phosphorus | mg/L | 0.71 | 0.44 |
| Ortho Phosphate | mg/L | 0.63 | 0.34 |

Two winter storm events were sampled at the Portland Building ecoroof outlet and the Hamilton west roof.

The ecoroof on the Portland Building was installed in 2006, and effluent has been sampled 12 times since June 2007. As expected for disturbed soil, nitrate-nitrogen and total and dissolved phosphorus concentrations were high initially, with the phosphorus concentrations similar to those on the Hamilton ecoroof right after it was installed, but have declined substantially since

then. All of the analytes monitored this FY except total lead and chromium were well below the long-term average and appear to be on a downward trend.

For the Hamilton west roof, total and dissolved zinc concentrations for the February 28, 2011 event were the highest ever seen in the discharge from this portion of the ecoroof, while the concentrations of all other analytes monitored were below the respective long-term averages. Total phosphorus concentrations from both events were the lowest seen to date and were below the TMDL concentration in the Columbia Slough and Fanno Creek of 0.155 and 0.13 mg/L, respectively.

Flow-Through Planters/Swales

Flow-through planters/swales have a bottom and an underdrain system that allow them to be used in poorly draining soils or adjacent to structure foundations. They provide peak flow reduction and water quality treatment, but volume retention is reduced because the underdrain passes some of the infiltrated volume into sewers or open channels.

No water quality samples were collected in FY 10-11.

Results—Soil Quality Monitoring

| Facility | Drainage | Age (yrs) | Land Use | 2005 | 2007 | 2008 | 2010 | 2011 |
|---|---------------------|------------------|-----------------|-------------|-------------|-------------|-------------|-------------|
| SW 12 th & Montgomery Street Planter | Street | 6 | COM | ✓ | ✓ | | ✓ | ✓ |
| Glencoe Parking Swale | Parking | 8 | RES | ✓ | ✓ | | | ✓ |
| New Seasons Green Street | Street | 6 | COM | ✓ | ✓ | | | ✓ |
| Siskiyou Green Street | Street | 7 | RES | ✓ | ✓ | | | ✓ |
| OMSI, North Parking Lot Swale | Parking | 18 | IND | ✓ | | | ✓ | |
| Oregon Zoo Parking Lot Swale | Parking | 4 | COM | | | ✓ | ✓ | |
| SW Community Center | Parking | 14 | RES | ✓ | | | ✓ | |
| Tryon Headwaters Rain Garden | Street | 4 | COM | | | ✓ | | |
| Walnut Park Precinct Parking Lot | Parking/car washing | 17 | COM | ✓ | | | | ✓ |
| Glencoe Rain Garden | Street | 7 | RES | | | ✓ | | |
| N Willamette & Denver Green Street | Street | 4 | RES | | | ✓ | | ✓ |

Typically, soil sampling events will occur about every three to five years, since changes in the composition of the soils and pollutant accumulations are expected to be very small. Once three to four sampling events have been conducted for a given facility, an initial data comparison will be conducted to evaluate if there is a substantial change that could potentially be attributed to the accumulation of stormwater pollutants.

In some facilities, samples were collected at three different depth horizons at several locations within each facility to evaluate the migration of pollutants. Sampled horizons are 6 inches thick,

representing the surface (0 to 6 inches), root zone (6 to 12 inches), and native soil (12 to 18 inches). Samples are typically tested for petroleum products, metals, and polycyclic aromatic hydrocarbons (PAHs). Volatile organic compounds (VOCs) were tested in 2005, but not since then because no detects were recorded.

In 2010, control samples were also taken for the first time. These controls are locations that are close to the stormwater facilities, but do not manage stormwater runoff. The control samples are more likely native soil than the samples in the infiltration facilities, which more likely contain a mix of imported soil and compost. The controls therefore are not necessarily directly comparable to the facility samples, but can be used to evaluate pollutants that are present or introduced through processes unrelated to stormwater infiltration.

SW 12th & Montgomery Street Planter Bay 1 - Soil Sampling Summary (0 - 6 inch)

| Pollutant | Units | 2005¹ | 2007 | 2010 | 2011 | Control 2010 | Control 2011 |
|----------------------------------|--------------|-------------------------|-------------|-------------|-------------|---------------------|---------------------|
| motor oil / lube oil / heavy oil | mg/kg | 342 | 257 | 749 | 310 | 337 | 380 |
| copper | mg/kg | 30.1 | 31.2 | 31.2 | 34.4 | 26.4 | 29.7 |
| lead | mg/kg | 29.9 | 41.3 | 51.7 | 37.6 | 34.3 | 33.7 |
| mercury | mg/kg | 0.043 | 0.125 | 0.049 | 0.044 | 0.047 | 0.051 |
| zinc | mg/kg | 120 | 138 | 233 | 149 | 132 | 125 |
| benzo(a)pyrene | µg/kg | 61 | 77 | 57 | 37 | 52 | 39 |
| benzo(g,h,i)perylene | µg/kg | 91 | 107 | 160 | 61 | 88 | 64 |
| chrysene | µg/kg | 56 | 81 | 52 | 27 | 54 | 25 |
| fluoranthene | µg/kg | 57 | 96 | 77 | 51 | 59 | 38 |
| pyrene | µg/kg | 65 | 90 | 110 | 52 | 73 | 40 |

¹ 0 to 6 inch composite of all bays

Based on four sampling events, the following general observations can be made:

- All 2011 analyte concentrations in the sample and the control are virtually identical.
- All 2011 analyte concentrations, with the exception of copper, are lower than they were in 2010 and comparable to the 2005 and 2007 levels.
- PAH concentrations are the lowest observed to date and are similar to levels in the 2010 and 2011 controls.
- The 2010 and 2011 controls have very similar pollutant concentrations.
- No obvious trends are present over the six-year sampling period, and data from four sampling events are insufficient to establish a statistically significant trend, considering the variability in pollutant concentrations observed.

New Seasons Green Street Swale Bay 1 - Soil Sampling Summary (0 - 6 inch)

| Pollutant | Units | 2005 | 2007 | 2011 | Control 2011 |
|----------------------------------|--------------|-------------|-------------|-------------|---------------------|
| motor oil / lube oil / heavy oil | mg/kg | <50 | 147 | 3900 | <100 |
| copper | mg/kg | 24.2 | 29 | 98.8 | 42.9 |
| lead | mg/kg | 5.3 | 7.4 | 49.8 | 7.9 |
| mercury | mg/kg | 0.023 | 0.021 | 0.042 | 0.017 |
| zinc | mg/kg | 63.2 | 84.4 | 352 | 118 |
| benzo(a)pyrene | µg/kg | NA | <31.7 | 110 | <10 |
| benzo(g,h,i)perylene | µg/kg | NA | 61.2 | 330 | <10 |
| chrysene | µg/kg | NA | 37.7 | 100 | <10 |
| fluoranthene | µg/kg | NA | <31.7 | 200 | <10 |
| pyrene | µg/kg | NA | 50.3 | 340 | <10 |

NA = not analyzed

Based on four sampling events, the following general observations can be made:

- All pollutant concentrations in the 2011 sample are much higher than the control and the 2005 and 2007 samples.
- Motor oil, lead, and the PAHs saw the greatest increases over the previous sampling events.
- The pollutant concentrations in the 2011 control are similar to the 2005 and 2007 samples.
- Data from three sampling events are insufficient to establish a trend. Future monitoring is required to evaluate whether the elevated 2011 concentrations are of concern.

Siskiyou South Curb Extension Bay 1 - Soil Sampling Summary (0 to 6 inch)

| Pollutant | Units | 2005¹ | 2006 | 2007 | 2011 | Control 2011 |
|----------------------------------|--------------|-------------------------|-------------|-------------|-------------|---------------------|
| motor oil / lube oil / heavy oil | mg/kg | 1820 | | 384 | 370 | <100 |
| copper | mg/kg | 34.4 | | 57.8 | 34.2 | 24.9 |
| lead | mg/kg | 56.8 | | 56 | 30.3 | 42.9 |
| mercury | mg/kg | 0.103 | | 0.085 | 0.044 | 0.064 |
| zinc | mg/kg | 170 | | 230 | 125 | 128 |
| benzo(a)pyrene | µg/kg | | <53 | <55 | 22 | 32 |
| benzo(g,h,i)perylene | µg/kg | | 60.8 | 67.1 | 30 | 33 |
| chrysene | µg/kg | | 63.1 | 64 | 14 | 30 |
| fluoranthene | µg/kg | | 96.4 | 60.1 | 32 | 47 |
| pyrene | µg/kg | | 84.6 | 78.4 | 40 | 53 |

¹ Composite of all bays

Based on three sampling events, the following general observations can be made:

- The 2011 sampling event had the lowest pollutant concentrations to date.
- With the exception of copper and motor oil, all pollutant concentrations in the 2011 sample are similar to or lower than the control and the 2005 and 2007 samples.
- Data from three sampling events are insufficient to establish a trend. Future monitoring is required to evaluate whether pollutants are accumulating in this facility.

N Willamette & Denver Green Street Swale - Soil Sampling Summary (0 to 6 inch)

| Pollutant | Units | 2008 | 2011 | Control 2011 |
|----------------------------------|--------------|-------------|-------------|---------------------|
| motor oil / lube oil / heavy oil | mg/kg | 1270 | 2400 | <100 |
| copper | mg/kg | 25.6 | 31.7 | 27.4 |
| lead | mg/kg | 30 | 45.8 | 24.8 |
| mercury | mg/kg | 0.069 | 0.071 | 0.026 |
| zinc | mg/kg | 109 | 161 | 81.3 |
| benzo(a)pyrene | µg/kg | <160 | 210 | <10 |
| benzo(g,h,i)perylene | µg/kg | 300 | 290 | 12 |
| chrysene | µg/kg | <160 | 140 | <10 |
| fluoranthene | µg/kg | 190 | 170 | 14 |
| pyrene | µg/kg | 240 | 240 | 15 |

Based on three sampling events, the following general observations can be made:

- The 2011 metals data are higher across the board than the 2008 data, while the PAH concentrations are very similar.
- All pollutant concentrations in the control are substantially lower than the 2011 sample concentrations. The differences are most pronounced for the PAHs.
- Data from two sampling events are insufficient to establish a trend. Future monitoring is required to evaluate whether the 2011 concentrations are of concern.

In summary, the metal concentrations are typically fairly similar among facilities and between sample and control. The outlier is the 2011 soil sample collected in the New Season Green Street swale. For the heavy oil and PAH concentrations, greater differences are often observed among the sample years and between sample and control. Most of the time, the sample concentrations of heavy oil and PAHs are greater than the control, but no trends are obvious. PAHs and motor oil are potentially subject to microbial decomposition that may be most active during the warmest part of the year. Soil samples were typically collected in May or June, just after the end of the rainy season; PAH and motor concentrations may be at their peak at that time and then slowly decline until the beginning of the following rainy season.

TASK 4: COMPREHENSIVE AMBIENT MONITORING

Objective

The objective of Task 4 is to conduct comprehensive in-stream stormwater monitoring to evaluate stormwater impacts associated with the chemical, biological, and physical characteristics of receiving waters.

Accomplishments

The City has conducted a comprehensive ambient monitoring program since the early- to mid-1990s. The data collected have been used to help DEQ establish TMDLs in the Columbia Slough, Johnson Creek, Willamette River, Fanno Creek, and Tryon Creek. Sites are monitored under both dry-weather and wet-weather conditions. The City will continue this monitoring program at fixed locations at a reduced scale at least through the end of FY 11-12, while at the same time implementing the second year of a probabilistically based monitoring program that will allow for a better evaluation of overall watershed conditions. FY 10-11 was the first year ambient data were collected using the probabilistic approach. The minimum analytical parameters for ambient monitoring are shown in Table MON-3 of the 2005 SWMP and Table B-2 of the 2005 permit.

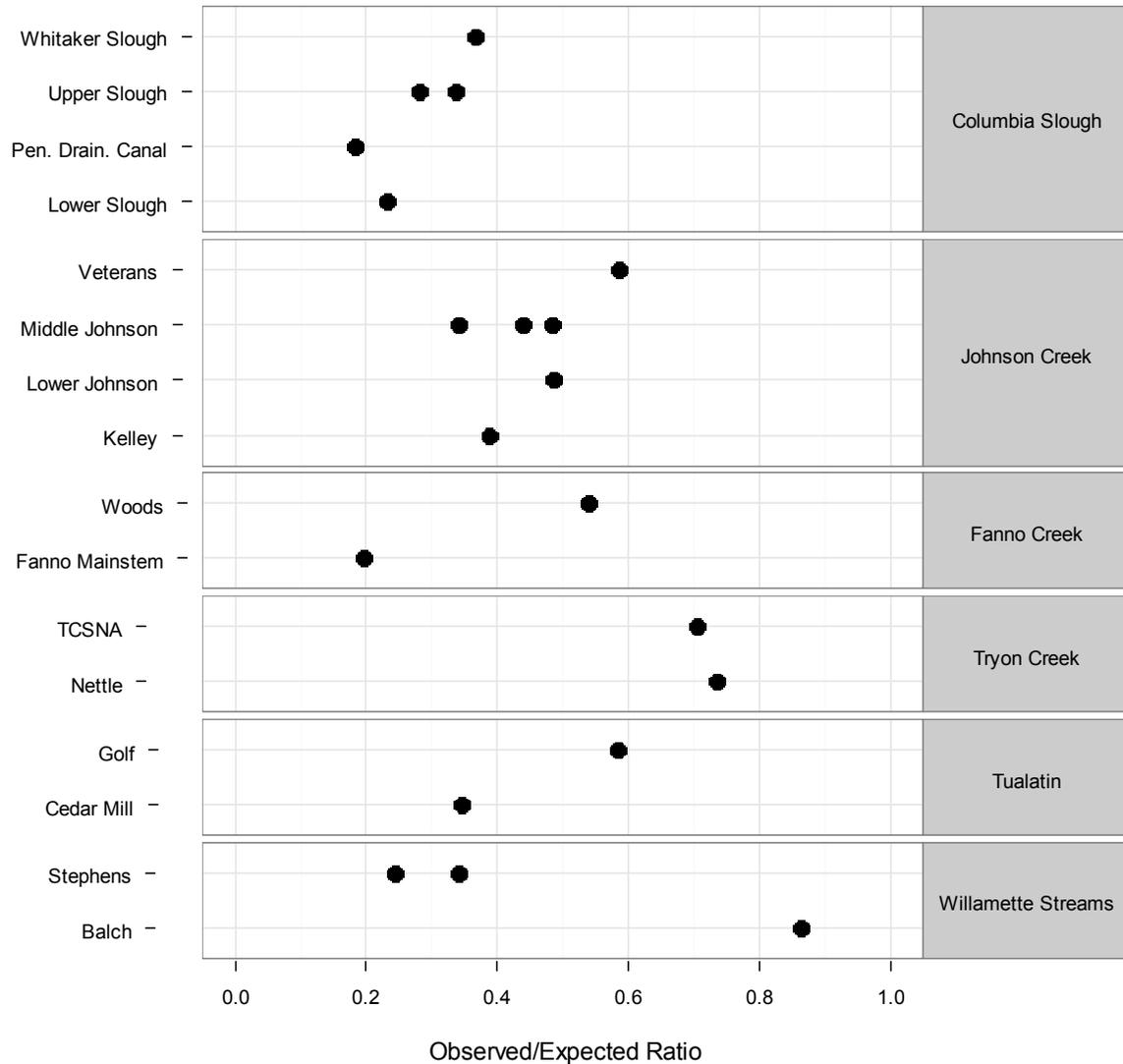
In addition, the City is committed to building upon a macroinvertebrate monitoring program that began about four years ago and includes monitoring by high school students in Johnson Creek, a probabilistic sampling program by the Johnson Creek Interjurisdictional Committee in Johnson Creek, and a five-year monitoring program in Fanno and Tryon Creeks. Macroinvertebrate samples were collected at the same probabilistically selected locations at which water quality samples were collected.

Initial results of the probabilistic monitoring program are provided below.

Results – Macroinvertebrate Monitoring

Macroinvertebrate samples were collected in late summer and early fall of 2010. The sampling protocol is described in the 2011 City of Portland *Quality Assurance Monitoring Plan*. The observed over expected (O/E) ratio, one of a number of options to summarize macroinvertebrate data, was calculated and compared to the benchmark of 0.85 established by DEQ:

- The highest value was found in Balch Creek. This location is the only one that meets DEQ's benchmark.
- The second-highest values were observed in the two Tryon Creek locations.
- The consistently lowest values were found in the five Columbia Slough monitoring locations. However, typical stream metrics may not assess the Slough well because it is not a pool-riffle stream system, but rather an extremely slow-flowing system with a very silty bottom.
- Stephens Creek O/E values are very low.
- In general, the most highly urbanized monitoring locations have the lowest O/E scores.



Results – Ambient Monitoring

Comprehensive Ambient Sampling – Summary

| Surface Water Body | No. of Locations ¹ | | Monitoring Frequency ¹ | |
|-------------------------------------|-------------------------------|---------------|-----------------------------------|---------------------|
| | Fixed | Probabilistic | Fixed | Probabilistic |
| Columbia Slough² | 2 | 5 | bi-monthly | quarterly + 1 storm |
| Fanno Creek | 3 | 2 | monthly to quarterly | quarterly + 1 storm |
| Johnson Creek² | 2 | 6 | Most monthly | quarterly + 1 storm |
| Tryon Creek | 3 | 2 | Most monthly | quarterly + 1 storm |
| Willamette River³ | 3 transects | 0 | monthly to quarterly | --- |

¹ Number of sampling locations and monitoring events are greater than indicated in Table MON-1 of the SWMP, but are not necessarily reflective of future efforts.

² Some sampling locations are outside the City of Portland USB.

³ There are no probabilistically selected monitoring locations in the Willamette River

Attainment of Selected Important Water Quality Standards/Criteria

| Surface Water Body | Attainment of Water Quality Standards or Guidance Values ¹ | | | | |
|-------------------------|---|----------------|-------------------------------|------------------|-------------------------------|
| | Bacteria ² | | Dissolved Copper ³ | TSS ⁴ | Total Phosphorus ⁵ |
| | 406 MPN/100 mL | 126 MPN/100 mL | 5 µg/L | | |
| Columbia Slough | 30/31 | 7/7 | 26/26 | 26/31 | 14/18 |
| Fanno Creek | 20/46 | 1/5 | 20/20 | NA | 17/27 |
| Johnson Creek | 45/54 | 2/8 | 48/48 | 47/54 | NA |
| Tryon Creek | 21/32 | 1/4 | 18/19 | NA | NA |
| Willamette River | 34/36 | 3/3 | 36/36 | NA | NA |

¹ Number of samples that attain standard/number of samples collected.

² 406 MPN/100mL is the single sample standard; 126 MPN/100mL is the 30-day geometric mean of ≥ 5 samples. (For this summary, the geometric mean of weekly or monthly data collected throughout the permit year was calculated for each monitoring location separately.)

³ Compared to NMFS guidance value for salmonids of 5 µg/L.

⁴ Compared to guidance value: Columbia Slough – 25 mg/L; Johnson Creek – 20 mg/L.

⁵ Spring to fall compared to Columbia Slough TMDL of 0.155 mg/L; spring to fall compared to Fanno Creek TMDL of 0.13 mg/L.

NA = Not applicable

Most streams meet most of the criteria or guidance values most of the time.

The greatest concern is the bacteria concentrations in the highly urbanized smaller tributaries, with the single sample standard met between 44 and about 83 percent of the time. The mainstem Willamette River and the Columbia Slough met the single sample bacteria standard almost all the time and the geometric mean standard all the time, even though the eastside CSO control in the Willamette River has not been completed yet.

With the exception of Tryon Creek, which had one exceedance, all streams met the dissolved copper guidance provided by NMFS and thought to be protective of salmonid species all the time. In general, tributaries to the Willamette River had higher concentrations than the Willamette mainstem.

The Columbia Slough and Fanno Creek met their respective phosphorus TMDL concentrations across all locations 78 and 63 percent of the time, respectively. This attainment level is somewhat lower than last year, but in line with previous years.

Johnson Creek and the Columbia Slough met their respective TSS guidance values, established to meet the toxics TMDLs, about 85 percent of the time.

Portland Water Quality Index (PWQI)

The PWQI is designed to compile water quality data of importance in Portland's streams to a single value that can be tracked over time. It will be part of an overall watershed health index and will probably be incorporated into Portland's *Stormwater System Plan* as well as the update to the *Comprehensive Plan*.

The PWQI has its roots in the Oregon Water Quality Index (OWQI) established and used by DEQ to track water quality at key locations in water bodies throughout Oregon. However, there are significant differences that make the PWQI more suitable for Portland’s streams than the OWQI. The PWQI:

- Normalizes the score so that a score of 60 means that water quality standards, TMDL waste load allocations, or other benchmarks are met.
- Puts greater emphasis on the health of aquatic species by including TSS, dissolved copper, ammonia, dissolved oxygen, and temperature.
- Focuses on human health by including mercury, for which DEQ will create a TMDL in the entire Willamette Basin in the near future.
- Continues to track pollutants of concern to contact recreation (E. coli) and aesthetics (phosphorus).
- Uses the 90th percentile of all available data as a conservative measure either at a specific location or at all locations throughout the water body.

Portland Water Quality Index – Summary of Fixed Locations

| Analyte | CS ¹ | FC ¹ | JC ¹ | TC ¹ | WR ¹ |
|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Copper, dissolved | 84 | 76 | 86 | 78 | 92 |
| Dissolved Oxygen | 82 | 82 | 89 | 87 | 93 |
| E. coli | 76 | 10 | 38 | 10 | 71 |
| Mercury, total | --- | --- | --- | --- | 26 |
| Nitrogen, ammonia | 91 | 96 | 97 | 97 | 92 |
| Phosphorus, total | 71 | 41 | 70 | 62 | 80 |
| Solids, total suspended | 44 | 36 | 52 | 71 | 72 |
| Temperature | 85 | 78 | 65 | 87 | 69 |
| PWQI² | 72 | 35 | 64 | 40 | 63 |

¹ CS = Columbia Slough; FC = Fanno Creek; JC = Johnson Creek; TC = Tryon Creek; WR = Willamette River

² Does not include mercury, except in WR

Portland Water Quality Index – Summary of Probabilistic Locations (PAWMAP)

| Analyte | CS | FC | JC | TC | WR Tributaries ¹ |
|--------------------------|-----------|-----------|-----------|-----------|-----------------------------|
| Copper, dissolved | 83 | 79 | 86 | 80 | 74 |
| Dissolved Oxygen | 70 | 87 | 74 | 84 | 87 |
| E. coli | 88 | 40 | 60 | 50 | 44 |
| Mercury, total | 29 | 24 | 20 | 10 | 13 |
| Nitrogen, ammonia | 78 | 91 | 97 | 99 | 99 |
| Phosphorus, total | 41 | 66 | 68 | 71 | 55 |
| Solids, total suspended | 37 | 58 | 52 | 80 | 21 |
| Temperature ² | 56 | 91 | 69 | 81 | 88 |
| PWQI | 52 | 56 | 53 | 41 | 38 |
| PWQI w/o Mercury | 58 | 68 | 70 | 75 | 52 |

¹ Two locations in Stephens Creek and 1 location in Balch Creek

² Temperature is based on grab samples and not continuous monitoring and is not truly representative of watershed conditions throughout the critical summer period

The results of the PWQI calculations described below are based on one year of data collection and have the following limitations:

- Insufficient temperature data are available at the probabilistically selected monitoring locations; the scores therefore are not reflective of true temperature conditions in these streams.
- The mercury benchmark for the Willamette River mainstem is based on the mercury target established in the 2006 Willamette Basin TMDL. The mercury benchmark for the other Portland streams is based on best professional judgment. Both benchmarks are subject to change, which may result in different PWQI scores.
- Mercury data were not available for most fixed monitoring locations.

Based on monitoring data from one year, the following general observations can be made:

- The scores for dissolved copper, dissolved oxygen, and ammonia nitrogen in the fixed and probabilistically selected monitoring locations were well above the score of 60, indicating that the concentrations showed better water quality than the respective standards or benchmarks.
- Total mercury concentrations at all locations are clearly higher than the benchmark, as indicated by the scores of between 10 and 29.
- E. coli has the second lowest score across the board, with only the Columbia Slough and Willamette River locations meeting the single sample standard.
- The PWQI for the fixed locations in the Columbia Slough, Johnson Creek, and the Willamette River are above 60, and the water quality can be considered good.
- The PWQI for the probabilistic monitoring locations in all streams is below 60. After removing total mercury from the index calculations, only the scores for the Columbia Slough and the Willamette River tributaries are below 60.

TASK 5: STORMWATER MONITORING AT LAND USE STATIONS OR MS4 OUTFALLS

Objective

Monitoring at land use stations and outfalls allows the City to evaluate the physical, chemical, and biological characteristics of stormwater and its potential impact on ambient water quality.

Accomplishments

The City monitors public outfalls that drain mixed land uses and include a substantial portion of industrial/commercial land uses. Even though previous monitoring has indicated that stormwater quality is influenced mainly by land use and not by watershed (ACWA 1997), the City monitors three outfalls in the three major watersheds within the City: the Willamette River, Columbia Slough, and Johnson Creek. The Willamette River outfall in northwest Portland (OF 19) has a high percentage of industrial land use, while the other two outfalls drain a mix of residential, commercial, and industrial land uses. (This northwest Portland outfall is the one described above in Task 2: BMP-Specific Monitoring, under Industrial Stormwater Program Monitoring.) These outfalls are monitored only during rainfall events that generate sufficient runoff.

This was the last year of monitoring at these outfalls because the stormwater monitoring emphasis under the renewed permit is shifted to smaller catchments in an attempt to better describe drivers of stormwater pollutant concentrations and to create a mechanistic model describing stormwater pollutant concentrations.

Results

Outfall – Data Summary

| Sampling Locations | Date | Antecedent Dry Period (hours) | 72-h Antecedent Rainfall (inches) | 24-h Antecedent Rainfall (inches) | Total Event Rainfall (inches) | Sample Collection Time Rainfall (inches) |
|---------------------------|---------------|--------------------------------------|--|--|--------------------------------------|---|
| M1 | 12/7-8/2010 | 31 | 0.24 | 0.02 | 0 | 0.45 |
| Columbia Slough | 2/12/2011 | > 72 | 0.01 | 0 | 0 | 0.39 |
| S45U | 10/23-25/2010 | > 72 | 0.04 | 0.04 | 0.03 | 2.23 |
| Johnson Creek | 2/12/2011 | > 72 | 0.01 | 0 | 0 | 0.47 |
| OF 19 | 10/23-24/2010 | > 72 | 0.06 | 0.06 | 0.01 | 1.87 |
| Willamette River | 2/12/2011 | > 72 | 0.01 | 0 | 0 | 0.41 |

Comparison to Selected Important Water Quality Standards/Criteria ¹

| Outfall Name – Location | Comparison to Water Quality Standards/Guidance Values ² | | | | |
|---------------------------------|--|----------------|-------------------------------|------------------|-------------------------------|
| | Bacteria ³ | | Dissolved Copper ⁴ | TSS ⁵ | Total Phosphorus ⁶ |
| | 406 MPN/100 mL | 126 MPN/100 mL | 5 µg/L | | |
| M1 – Columbia Slough | 1/2 | 0/1 | 2/2 | 1/2 | 0/2 |
| S45U – Johnson Creek | 0/2 | 0/1 | 2/2 | 0/2 | --- |
| OF 19 – Willamette River | 1/2 | 0/1 | 1/2 | --- | --- |

¹ Water quality standards or criteria do not apply to stormwater discharges and are listed here on as a reference.

² Number of samples that are below standard or guidance value/number of samples collected.

³ 406 MPN/100mL is the single sample standard; 126 MPN/100mL is the 30-day geometric mean of ≥ 5 samples. (For this summary, the geomean of all data collected throughout the year was calculated.)

⁴ Compared to NMFS guidance value for salmonids of 5 µg/L.

⁵ Compared to guidance value: Columbia Slough – 50 mg/L; Johnson Creek – 20 mg/L.

⁶ Spring to fall average compared to Columbia Slough TMDL of 0.155 mg/L.

MI

The total copper, total zinc, and TSS median concentrations were above the long-term median, but still within the range of concentrations previously observed. Concentrations of all other analytes were very similar to the long-term medians.

Between 10 and 55 data points were available for water quality trending analyses. Most analytes, including the heavy metals cadmium, chromium, and lead, show a significantly ($p \leq 0.05$) or somewhat significantly ($p \leq 0.1$) decreasing trend. Solids and most nutrients also show a significantly decreasing trend. The only increasing trend was observed for hardness, which has the benefit of making some of the heavy metals less toxic.

Overall, the quality of the stormwater discharge at outfall M1 has improved significantly since monitoring started in 1991. Considering that substantial development in this catchment has taken place during the monitoring period, it appears that the best management practices employed as part of the MS4 permit have been successful.

S45U

Concentrations of most analytes were below the long-term median concentrations. The E. coli concentrations in both events were the highest ever recorded at this location and may be indicative of human sources.

In spring 2010, a homeowner in Error Heights, which is part of the catchment draining to this outfall, was required to connect to the sanitary sewer because sewage from the septic system was leaking into Errol Pond and Errol Creek. Since this outfall has a substantial groundwater component throughout the year, it is very likely that sewage reached the pipe system draining to the outfall and caused the high E. coli levels.

As expected, no significant trends were observed for the most part, mainly because of the small number of data points available. The increasing trends for dissolved copper and zinc still reflect the higher than normal concentrations observed in all three monitoring events during permit year 15. Concentrations in permit year 16 were much lower and within the range of values observed prior to permit year 15.

OF 19

Concentrations of most analytes from both storm events were within the range previously observed. The exception was for total copper in the October 2010 storm event, which had the second-highest concentration recorded at this location. Since the TSS concentration was fairly low and all of the other metals were similar to the long-term averages, there is no immediate explanation for this above-average copper concentration.

Between 13 and 37 data points were available for water quality trending analyses. All significant trends, with the exception of conductivity, indicate decreasing concentrations across all pollutant types, heavy metals as well as nutrients. Since TSS does not show a decreasing trend, unlike most of the heavy metals, it could be reasoned that cleanup activities at industrial sites in this largely industrial catchment could be the cause of the metal reduction, unlike the metal reduction at outfall M1, which could be related to the reduction in sediment load. While conductivity shows a significantly increasing trend, the concentrations are typically well below concentrations seen in smaller tributaries to the Willamette River and are not of any concern.

Water Quality Trending

Trend analyses for all three outfalls were conducted, as shown in the table below. However, insufficient data were available from outfall S45U for the trends to be meaningful, since data collection at this outfall started only in FY 06-07.

Trend Analysis for Outfalls M1, OF19, and S45U

| Analyte | Location | M1 | | OF19 | | S45U | |
|---------------------------------------|----------|-------|----|-------|----|-------|--|
| | N | Trend | N | Trend | N | Trend | |
| Total Suspended Solids (TSS) | 57 | ↓ | 37 | --- | 14 | --- | |
| Total Cadmium (Cd,T) | 37 | ↓ | 37 | ↓ | | | |
| Dissolved Cadmium (Cd,d) | 36 | ↓ | 37 | ↓ | | | |
| Total Chromium (Cr,T) | 30 | ↓ | 32 | --- | 14 | --- | |
| Dissolved Chromium (Cr,d) | 10 | ↓ | 32 | --- | | | |
| Total Copper (Cu,T) | 57 | --- | 37 | --- | 14 | --- | |
| Dissolved Copper (Cu,d) | 57 | ↓ | 37 | ↓ | 14 | ↑ | |
| Total Lead (Pb, T) | 57 | ↓ | 37 | --- | 14 | --- | |
| Dissolved Lead (Pb,d) | 57 | ↓ | 37 | --- | 14 | --- | |
| Total Zinc (Zn,T) | 57 | --- | 37 | ↓ | 14 | --- | |
| Dissolved Zinc (Zn,d) | 57 | --- | 37 | ↓ | 14 | ↑ | |
| Hardness | 54 | ↑ | 35 | --- | 14 | --- | |
| COD | 32 | --- | 28 | --- | | | |
| Ammonia-Nitrogen (NH ₃ -N) | 57 | --- | 37 | ↓ | 14 | --- | |
| Nitrate-Nitrogen (NO ₃ -N) | 57 | ↓ | 37 | ↓ | 14 | --- | |
| Total Phosphorus | 57 | ↓ | 37 | --- | 14 | --- | |
| Ortho Phosphorus | 57 | ↓ | 37 | ↓ | 14 | --- | |
| Total Dissolved Solids (TDS) | 51 | ↓ | 37 | --- | 14 | --- | |
| Conductivity | 36 | ↓ | 34 | ↑ | 12 | --- | |
| E. coli | 39 | --- | 13 | --- | 13 | --- | |

NOTES

Location Key

- M1 Columbia Slough - NE 122nd Ave
- OF19 Willamette River - Portland Harbor
- S45U/JCF Johnson Creek - SE 45th Ave/Umatilla

- - N
 - ↑
 - ↓
 - ↑
 - ↓
 - 30
 - ↓
 -
- No significant trend observed
 Number of data points in trend analysis
 Significant increasing trend (p < 0.05)
 Significant decreasing trend (p < 0.05)
 Somewhat significant increasing trend (0.05 ≤ p < 0.1)
 Somewhat significant decreasing trend (0.05 ≤ p < 0.1)
 Number of data points does not minimum requirement set by the MS4 trend analysis subcommittee (MTAS)
 Improving trend
 No data available

TASK 6: COLLABORATION WITH OREGON DEQ AND ACWA

Objective

Collaboration with other agencies and jurisdictions, including Oregon DEQ, Oregon ACWA, USGS, the City of Gresham, and Clean Water Services, allows the City to provide the most cost-effective services to its customers, as well as share knowledge and information to further the common goal of improving storm and surface water quality.

Accomplishments

The City continues to collaborate with DEQ and ACWA to share information and minimize duplication of efforts. Collaboration with ACWA includes participating in regular stormwater and water quality subcommittee meetings and participating in joint efforts and projects (e.g., coordination of permit renewal discussions among all six Phase I MS4 jurisdictions).

The City also participates in regular meetings with the Johnson Creek Interjurisdictional Committee (IJC). This committee deals with a variety of issues related to Johnson Creek. It has been instrumental in helping DEQ prepare a scientifically sound draft TMDL and furthering the understanding of water quality concerns and the hydrologic assessment of Johnson Creek, in collaboration with USGS. More recently, the IJC has focused on monitoring overall watershed health without regard to jurisdictional boundaries.

Results

The City's participation in MS4 permit renewal discussions with all six MS4 Phase I jurisdictions and DEQ resulted in a better understanding of permit-related issues and agreement on monitoring and assessment strategies. This process culminated in the issuance of a new permit in 2011.

The IJC conducted the second watershed-wide macroinvertebrate monitoring event using probabilistic principles. This will allow the evaluation of overall watershed health and changes in conditions that may result from development and restoration activities within the next few years.