CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ▪ Dan Saltzman, Commissioner ▪ Dean Marriott, Director

November 1, 2010

Mr. Rodney Weick
Stormwater and Underground Injection Control Manager
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201

**Subject: Submittal of UICMP Annual Report No. 5**
**City of Portland**
**DEQ Water Pollution Control Facilities Permit No. 102830**

Dear Rodney:

The City of Portland's Bureau of Environmental Services is pleased to submit the *Underground Injection Control Management Plan Annual Report No. 5 – Fiscal Year 2009-2010.* This document was prepared in accordance with the Water Pollution Control Facilities (WPCF) permit (DEQ Permit No.102830) for the City's Class V Stormwater Underground Injection Control Systems (UIC). The permit was issued on June 1, 2005.

The *UICMP Annual Report No. 5* summarizes programmatic activities implemented by the City in fiscal year 09-10 (July 1, 2009 – June 30, 2010), and proposed activities for the coming fiscal year 10-11. Completed activities, key accomplishments, and activities for the coming fiscal year are organized and described relative to the following four UIC program elements:

**System Management** summarizes citywide actions implemented under five BMP categories to prevent, minimize, and control pollutants prior to infiltration conducted during fiscal year 09-10. It also identifies the main projected activities for fiscal year 10-11.

**System Monitoring** summarizes the fifth-year results of UIC monitoring conducted under the *Stormwater Discharge Monitoring Plan* (SDMP) and submitted in the fifth-year *Stormwater Discharge Monitoring Report* (July 15, 2010).

**Evaluation and Response** provides an overview of evaluation and response actions conducted during fiscal year 09-10 and the main projected activities for fiscal year 10-11.

**Corrective Actions** summarizes the corrective actions implemented during fiscal year 09-10 and projected main activities for fiscal year 10-11 to address UICs that do not meet permit requirements.

The report also contains the following appendices:

**Appendix A**: Public UICs Identified, Constructed or Removed FY09-10
**Appendix B**: Category 2 and 3 UIC Status
**Appendix C**: Status of Commercial/Industrial Inspection Work
**Appendix D**: Spills That Have Occurred within Areas Serviced by UICs

If you have questions or need additional information, please call me at 503 823-5737. I look forward to our continued collaboration on implementing the WPCF Permit.

Sincerely,

Barbara Adkins
UIC Program Manager
City of Portland
Bureau of Environmental Services

Enclosures:
*Underground Injection Control Management Plan Annual Report No. 5* – three hard copies

(w/enclosed electronic copy)

cc: UIC project file w/ enclosures

**City of Portland, Oregon**

**Water Pollution Control Facilities (WPCF) Permit For**
**Class V Stormwater Underground Injection Control Systems**

**Permit Number: 102830**

# Underground Injection Control Management Plan Annual Report No. 5

## Fiscal Year 2009-2010
## (July 1, 2009 – June 30, 2010)

**November 1, 2010**

*Prepared By*:
**City of Portland, Bureau of Environmental Services**

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# Executive Summary

## Introduction

This *Underground Injection Control Management Plan (UICMP)Annual Report No. 5* is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the City of Portland's Water Pollution Control Facility (WPCF) Permit for Class V Stormwater Underground Injection Control Systems (UICs). The report summarizes UIC programmatic activities during the fifth permit reporting year (July 1, 2009 through June 30, 2010).

## Background

DEQ issued the WPCF permit to the City on June 1, 2005. As required by the permit, the City prepared a *UIC Management Plan* (UICMP) and submitted it to DEQ for approval on December 1, 2006. The UICMP describes the activities the City will implement throughout the permit term (June 1, 2005 – May 31, 2015) to protect groundwater and meet WPCF permit requirements. The permit also requires the City to submit a UICMP annual report that summarizes the status of implementing the UICMP and each of its components.

The City has organized the UICMP and the annual report into the following four major program elements:

- **System Management** includes ongoing, programmatic activities (best management practices, or BMPs) that prevent, minimize, or control pollutants.

- **System Monitoring** includes ongoing actions to demonstrate that UICs are operated in a manner that protects groundwater and meets WPCF permit conditions.

- **Evaluation and Response** describes the process and criteria used to identify, evaluate, and prioritize actions needed to protect groundwater and meet permit requirements.

- **Corrective Action** includes the processes to evaluate, rank, select, and implement appropriate corrective actions to address UICs that do not meet WPCF permit requirements.

This annual report describes the activities that occurred in FY09-10 in each of these four areas. Key accomplishments are summarized below and described in more detail in the body of the report.

## Key Accomplishments

**System Management**

- Submitted quarterly *UIC Registration Database* updates to DEQ on September 1, 2009, December 1, 2009, March 1, 2010, and June 1, 2010.

- Continued to implement the *Systemwide Assessment Follow-up Actions* (submitted to DEQ December 1, 2006) workplan to address the approximately 950 UICs that were identified for follow-up as part of the systemwide assessment. The work addresses and evaluates UICs that meet any of the following criteria.
  - UICs with inadequate separation distance from groundwater.
  - UICs that receive drainage from facilities that store, handle, or use hazardous or toxic materials in quantities requiring registration under the Superfund Amendment and Reauthorization Action Title III.
  - UICs that receive drainage from commercial/industrial properties with site activities that may cause stormwater entering a public UIC to exceed MADLs established in the permit.
  - UICs within close proximity to domestic or public water wells.

- Completed work to identify and address any potential threat to City-owned UICs that receive drainage from commercial and industrial properties.

- Received and responded to approximately 1,667 complaint calls (citywide) to the City's spill hotline regarding pollution complaints, spills, sanitary sewer overflows, dye tests, and seepage discharges.

- Continued to provide oversight to ensure that commercial and industrial facilities comply with retrofit requirements under the Columbia South Shore Well Field Wellhead Protection Program. Conducted 362 inspections of businesses in the wellhead protection area and conducted 30 plan reviews. Fifty-nine violations were identified, and 62 were abated. (Some abatements were for violations from previous years.) Most violations related to containment, labeling, and reporting requirements.

- Continued public outreach by the Portland Water Bureau and Columbia Slough Watershed Council to increase education and awareness about groundwater protection within the Columbia Slough Watershed and Columbia South Shore Well Field Wellhead Protection Area. In partnership with the Columbia Corridor Association (CCA) and Columbia Slough Watershed Council, provided outreach to regulated businesses.

- In accordance with the City's *Stormwater Management Manual* requirements, signed off on permits for 1,025 source control measures at sites with high-risk characteristics or activities.

- Conducted 4,138 erosion control-related inspections of private construction sites (citywide). Inspected 239 active public construction projects with erosion control components (citywide).

- Worked with other City programs, watershed councils, and community groups to coordinate public education, stewardship activities, and integration of stormwater and groundwater protection messages.

- Provided outreach to Bureau of Development Services (BDS) and Bureau of Environmental Services (BES) to coordinate with and respond to UIC site-specific questions and programmatic items.

- Cleaned 1,824 sedimentation and sump manholes.

- Swept approximately 4,198 miles of streets draining to public UICs. (This number accounts for frequency of sweeping—i.e., streets may be swept more than once.)

- Continued discussions with the Oregon Water Resources Department (OWRD) regarding issues relating to the water supply well construction rules and UIC rules.

- Continued the evaluation process for potential changes to City code/policy to limit the installation of new domestic wells or require connection to public water supply (if available).

- Participated in the ACWA (Association of Clean Water Agencies) Groundwater Committee and participated in the DEQ regional WPCF permit template development process.

- Continued to implement the City's *Stormwater Management Manual* and to provide training and technical assistance on the manual to City staff and the development community.

**System Monitoring**

- Submitted year 5 (October 2009 – 2010) UIC compliance and supplemental monitoring locations to DEQ on August 31, 2009.

- Implemented year 5 stormwater compliance and supplemental monitoring. Forty-two UIC locations were sampled in year 5 and tested for common and priority pollutants.

- Compiled and evaluated year 5 stormwater data. Notified DEQ of year 5 annual mean concentration exceedances of the permit's maximum allowable discharge limits (MADLs).

- Prepared and submitted the *Annual Stormwater Discharge Monitoring Report – Year 5 – October 2009 – May 2010* to DEQ on July 15, 2010.

- Performed a preliminary stormwater discharge trend analysis for the 5 years of data, using box plots to identify potential differences in pollutant concentrations.

- Prepared and submitted year 6 (October 2010 – 2011) UIC monitoring locations to DEQ.

**Evaluation and Response**

- Reviewed UICs that previously received a "no further action" (NFA) designation to determine if previous NFA decisions are still protective of groundwater and if additional analyses need to be performed. As a result of this review, updated the Category 3 UIC list.

- Identified and evaluated additional UICs with potentially inadequate separation as new data became available. Performed compliance determinations on UICs identified to have potentially inadequate separation distance. Prioritized and reported newly identified Category 3 UICs to DEQ.

- Identified two new Category 4 UICs. Identified six locations to be carried over for a second year of sampling before a Category 4 determination can be made.

- Responded to year 5 MADL exceedances. During year 5 stormwater discharge monitoring, four common pollutants were detected during individual sampling events at concentrations above their respective MADLs: PCP, B(a)P, DEHP, and arsenic.

**Corrective Action**

- Completed engineering design and initiated a request for proposals for construction activities for Category 2 UIC corrective actions.

- Received a one-year extension from DEQ (February 25, 2010) for completion of the Category 2 UICs. The new completion date is November 1, 2011.

- Completed pre-design activities for Category 3 UICs.

- Received a permit modification (February 25, 2010) to extend the completion deadline for Category 3 corrective actions to May 31, 2015.

- Received a "no further action" designation from DEQ (October 21, 2009) for 22 UICs with < 5 feet vertical separation distance located in City of Portland parks. This designation is based on a groundwater protectiveness demonstration as the selected corrective action.

# 1 Introduction

## 1.1 Overview

The Oregon Department of Environmental Quality (DEQ) issued the City of Portland's Water Pollution Control Facility (WPCF) Permit for Class V Stormwater Underground Injection Control Systems (UICs) on June 1, 2005 (Permit No. 102830).

As required by Schedule D(1) of the WPCF permit, the City prepared a *UIC Management Plan* (UICMP) and submitted it to DEQ for approval on December 1, 2006. The UICMP describes the activities the City will implement throughout the permit term (June 1, 2005 – May 31, 2015) to protect groundwater and meet WPCF permit requirements. (See Section 1.2 for additional information about the UICMP.)

The WPCF permit also requires the City to submit a UICMP annual report that summarizes the status of implementing the UICMP and each of its components. Accordingly, this annual report summarizes activities that occurred during the fifth fiscal year of permit implementation (July 1, 2009 through June 30, 2010). This includes detailed information, including proposed timelines and implementation schedules, for work associated with the following:

- UICs in areas of shallow groundwater
- UICs within close proximity to commercial and industrial facilities
- Overall monitoring strategy

Table 1-1 summarizes the WPCF permit requirements for the annual report and identifies where the requirements are addressed in this annual report.

**Table 1-1**
**Summary of WPCF Permit Annual Report Requirements[a]**

| Requirement | Permit Reference | Where Requirement is Addressed in Annual Report |
|---|---|---|
| **General Requirements** | | |
| The Permittee must notify the Department of any changes in key personnel or areas of responsibility. | D(5)(b) | Section 1.7 |
| Unusual conditions encountered | D(15)(a)(i) | No unusual conditions were encountered. |
| Permit violations that may have occurred | D(15)(a)(ii) | No permit violations have occurred. |
| Minor and/or major permit modifications | D(15)(a)(vi) | Section 1.8 |
| A demonstration of legal authority to implement the UICMP | D(15)(i) | Section 1.6 |
| A discussion of significant land use changes that alter traffic volume, patterns of potential pollutants to a Permittee owned or operated public UIC. If the affected public UIC is a permanent trend monitoring point, then the Permittee must discuss the impact to the trend analyses and identify, for Department approval, a replacement UIC for trend analysis. | D(15)(j) | Included in *Annual Stormwater Discharge Monitoring Report - Year 4* (July 2008). |
| The status of implementing the UICMP and each of its components | D(15)(d) | Section 1.9 |
| A discussion of any proposed changes to the UICMP or its components | D(15)(f) | Section 1.10 |
| **System Management** | | |
| Employee Training and Public Education program must be developed and implemented to educate Permittee's personnel and the public of the permit conditions and requirements | D(10)(d) | Section 2.4 |
| …summarize any public UIC discovered or identified during or after the system-wide assessment | C(20)(b) | Section 2.2 |
| A list of newly constructed …. public UICs during the reporting period | D(15)(k) | Section 2.2 |
| A summary of BMPs implemented during the annual reporting period and the results of those BMPs and a description of BMPs to be employed during the next reporting year | D(15)(h) | Sections 2.2 through 2.6 |
| Summarize the decommissioning of motor vehicle floor drains that discharge to public UICs. | C(13)(d) | Not applicable; no floor drains identified as draining to public UICs. |
| A summary of maintenance activities and supporting data. | D(15)(c) | Information on inspections, cleaning, and repair activities included in Section 2.5. O&M conducted as a response action described in *Stormwater Discharge Monitoring Plan*. |

| Requirement | Permit Reference | Where Requirement is Addressed in Annual Report |
|---|---|---|
| **System Monitoring** | | |
| Any other information, finding, condition, spills and/or action that is relevant to the management of the Permittee's public UICs or groundwater protection during operation of the public UICs. | D(15)(n) | Sections 3 and 4 |
| A summary and analysis of BMP monitoring accumulated during the annual reporting period | D(15)(l) | Section 3 |
| Provide BMP monitoring results in the annual UICMP reports. | D(10)(c)(iv) | Section 3 |
| Provide a brief overview summary of the monitoring results provided in the annual monitoring report for the reporting period. | D(15)(b) | Section 3 |
| Include a comparison of the data to data from previous annual reporting periods. | D(15)(g) | Section 3 |
| Violations (i.e., exceedances of permit established limits) | F(4)(d) | Section 3 |
| **Corrective Actions** | | |
| Identify Category 2 UICs. | C(12)(d)<br>C(20)(c) | Identified in first annual report; update provided in Section 5 |
| Identify Category 3 UICs. | C(12)(e) | Section 5 and Appendix B. |
| Identify Category 4 UICs. | B(7)(j) | Sections 3, 4, and 5 |
| Provide a summary of the UIC system management for the reporting period, including:<br>(iii) Corrective actions taken to prevent further permit violations<br>(iv) Other corrective actions taken or initiated | D(15)(a) | Section 5 |
| An updated prioritized list of non-compliant public UICs with implementation and completion schedules | D(15)(a)(v) | Section 5 and Appendix B. |
| A discussion of any compliance response action taken during the reporting period | D(15)(e) | Included in *Annual Stormwater Discharge Monitoring Report – Year 5* (July 2010) and summarized in Section 5. |
| Provide a prioritized list of all non-compliant public UICs by category. Include a prioritized subset of the non-compliant public UICs that must be corrected during the CIP year. | D(15)(m) | Section 5 |
| Any part of the UIC system placed under a Department Order for a regional corrective action and the nature of the Department Order (if applicable) | D(15)(a)(vii) | Section 5 |

[a] Where applicable, permit requirements are grouped by the UICMP categories developed by the City of Portland.

## 1.2 Overview of the UICMP

As required by the WPCF permit, the UICMP identifies and discusses the best management practices (BMPs) the City will employ throughout the permit period to protect groundwater quality, support watershed health, and meet permit conditions. These include structural, non-structural, and institutional controls. In accordance with the permit, the UICMP also includes the following:

- UIC Registration Database
- Operations and Maintenance (O&M) Plan
- BMP Monitoring Program
- Employee Training and Public Education
- Spill Prevention and Pollution Control (SPPC) Plan
- Abandonment, Decommissioning, or Alteration of Public UIC Injection Systems Plan

The UICMP also meets the requirements of OAR 340-044-0018(3)(b)(C). These requirements specify that municipalities with 50 or more stormwater injection systems must prepare and implement a written UIC management plan that includes a systemwide assessment, system controls, monitoring, and a plan for record keeping and reporting.

The UICMP is organized into the following four major elements:

- **System Management** includes ongoing, programmatic activities (best management practices, or BMPs) that prevent, minimize, or control pollutants before they can be discharged to a UIC. BMPs are organized into the following five categories:

  - System Inventory and Assessment (SA)
  - Pollution Control (PC)
  - Education and Training (ET)
  - Operations and Maintenance (OM)
  - Policy and Regulation (PR)

- **System Monitoring** includes ongoing actions to demonstrate that UICs are operated in a manner that protects groundwater and meets WPCF permit conditions. It includes two types of monitoring: stormwater discharge monitoring and BMP monitoring.

Information collected through implementation of System Management and System Monitoring activities are used to identify program improvements or UICs that may require additional evaluation, response action, or corrective action.

- **Evaluation and Response** uses data and information from System Management (e.g., UIC location, depth to groundwater) and System Monitoring (e.g., results of maximum allowable discharge limits [MADL] monitoring) activities to assess UIC compliance status. It also defines the process and criteria used to identify, evaluate, and prioritize actions necessary to protect groundwater and meet permit requirements.

- **Corrective Action** addresses UICs shown to be non-compliant with WPCF permit requirements through the Evaluation and Response process. It includes the process used to evaluate, rank, select, and implement appropriate corrective actions. A variety of corrective actions are available, including options that do not involve construction (such as institutional controls or an assessment to demonstrate protectiveness), structural/engineering controls, and UIC closure.

## 1.3 Relationship of the UICMP to the UIC Program and UICMP Annual Reports

The UICMP is a comprehensive plan that describes the City's overall UIC program. It includes processes, tasks, and, where possible, implementation schedules. In many cases, however, it is difficult to determine implementation details years in advance because so many variables are involved. For that reason, UICMP implementation details will be included on a yearly basis in the UICMP annual reports. This annual report provides information about key accomplishments during FY09-10 (July 1, 2009 to June 30, 2010) and identifies activities planned for implementation in the next fiscal year (FY10-11).

## 1.4 Other UIC Program Documents

The WPCF permit requires the City to prepare a variety of documents that together describe the programmatic actions and management practices the City will implement to protect groundwater and meet permit requirements. Some of these documents are included as appendices to the UICMP, while others were submitted to DEQ separately. Table 1-2 shows the relationship of these documents to the four major UICMP elements.

## 1.5 Other Program Reporting Requirements

In addition to the UICMP annual report, the City will fulfill reporting requirements specified in the WPCF permit by submitting the following reports to DEQ:

- *Annual Stormwater Discharge Monitoring Locations* (due September 1 of each year)
- *Annual Stormwater Discharge Monitoring Report* (due July 15 of each year)
- Interim compliance reporting:
  - Detection of priority pollutant screen (PSS) pollutants
  - Exceedance of MADLs for individual sampling events
  - Exceedance of annual mean concentration for any MADL
- *UICMP Review and Update* (in fifth year of permit)
- *Corrective Action Plan Update* (due November 1, 2010)

**Table 1-2**
**UIC Program Documents Related to UICMP Elements**

| UICMP Element/Document | Submittal Information |
|---|---|
| **System Management** | |
| *Systemwide Assessment* | Submitted July 15, 2006 |
| *UIC Registration Database* | Submitted September 1, 2005 and updated quarterly |
| *UIC Management Plan* | Submitted December 1, 2006<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ Approval: October 6, 2008 |
| *Operations and Maintenance Plan* | Submitted December 1, 2006 (UICMP Appendix B)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |
| *Spill Prevention and Pollution Control Plan* | Submitted December 1, 2006 (UICMP Appendix C)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |
| *Decommissioning Procedure for Underground Injection Control Systems* | Draft submitted November 1, 2006<br>Final submitted December 1, 2006 (UICMP Appendix D)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |
| *WPCF UIC Permit Modification #1* | DEQ Approval: December 10, 2009 |
| **System Monitoring** | |
| *Stormwater Discharge Monitoring Plan* (SDMP)<br>- *Sampling Design Plan*<br>- *Quality Assurance Project Plan (QAPP)*<br>- *Sample Analysis Plan (SAP)* | Submitted July 15, 2005<br>Final submitted August 30, 2006<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ Approval: October 6, 2008 |
| *BMP Monitoring Program* | Submitted December 1, 2006 (UICMP Appendix E)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |

| UICMP Element/Document | Submittal Information |
|---|---|
| *Annual Stormwater Discharge Monitoring Report – Year 1* (October 2005 - May 2006) | Submitted July 15, 2006 |
| *Annual Stormwater Discharge Monitoring Report* – Year 2 (October 2006 - May 2007) | Submitted July 15, 2007 |
| *Annual Stormwater Discharge Monitoring Report* – Year 3 (October 2007- May 2008) | Submitted July 15, 2008 |
| *Annual Stormwater Discharge Monitoring Report* – Year 4 (October 2008- May 2009) | Submitted July 15, 2009 |
| *Annual Stormwater Discharge Monitoring Report* – Year 5 (October 2009- May 2010) | Submitted July 15, 2010 |
| **Evaluation and Response/Corrective Actions** | |
| *Corrective Action Plan* | Submitted July 15, 2006<br>DEQ Public Comment Period: June 24 – July 24, 2008<br>DEQ Approval: October 6, 2008 |
| *Corrective Actions: Category 1 Underground Injection Control Systems* | Submitted July 15, 2005; completed July 2006 |
| *Compliance Determination Procedure* | Submitted December 1, 2006 (UICMP Appendix F)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |
| *Prioritization Procedure* | Submitted December 1, 2006 (UICMP Appendix G)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |
| *Evaluation and Response Guidelines* | Submitted December 1, 2006 (UICMP Appendix H)<br>DEQ Public Comment Period: June 24-July 24, 2008<br>DEQ UICMP Approval: October 6, 2008 |
| *Systemwide Assessment Follow-up Actions* Workplan | Submitted December 1, 2006<br>DEQ Approval: October 6, 2008 |

| UICMP Element/Document | Submittal Information |
|---|---|
| *Category 4 UIC Corrective Actions – Groundwater Protectiveness Demonstrations (UICs identified in sampling year 2)* | Submitted May 30, 2008<br>DEQ No Further Action Determination – May 30, 2008 |
| *Category 4 UIC Corrective Actions – Groundwater Protectiveness Demonstrations (UICs identified in sampling year 3)* | Submitted March 30, 2009<br>DEQ No Further Action Determination – May 30, 2008 |
| *Evaluation of Vertical Separation Distance – Groundwater Protectiveness Demonstration* | Submitted May 27,2008<br>DEQ Approval: June 5, 2008 |
| *Decision Making Framework for Groundwater Protectiveness Demonstrations* | Submitted June 19, 2008<br>DEQ Approval: October 20, 2008 |
| *Category 3 UICs – Groundwater Protectiveness Demonstration – Vertical Separation Distance ≥5 Feet – No Further Action Request* | Submitted June 18, 2008<br>DEQ Approval: October 6, 2008 |
| *Ubiquitous Pollutants – Groundwater Protectiveness Demonstration* | Submitted July 17, 2008<br>DEQ Approval: October 6, 2008 |
| *UICs within Permit-Specified Well Setbacks – Groundwater Protectiveness Demonstration – No Further Action Request* | Submitted July 24, 2008<br>DEQ Approval: October 6, 2008 |
| *City of Portland Park UICs Groundwater Protectiveness Demonstration No Further Action Request* | Submitted July 13, 2009<br>DEQ Approval: October 21, 2009 |
| *Category 2 UIC Corrective Actions Request for Timeline Extension City of Portland WPCF Permit No. 102830* | Submitted February 19, 2010<br>DEQ Approval: February 25, 2010 |
| *Groundwater Protectiveness Demonstration and Request for Approval of 5- foot Separation Distance for Three Category 2 UIC Corrective Actions* | Submitted May 14, 2010<br>DEQ Approval: August 5, 2010 |

| UICMP Element/Document | Submittal Information |
|---|---|
| **Annual UICMP Reports** | |
| *Underground Injection Control Management Plan – Annual Report No. 1 - Fiscal Year 2005-2006* (July 1, 2005 – June 30, 2006) | Submitted December 1, 2006 |
| *Underground Injection Control Management Plan – Annual Report No. 2 - Fiscal Year 2006-2007* (July 1, 2006 – June 30, 2007) | Submitted November 1, 2007<br>DEQ Approval: October 14, 2008 |
| *Underground Injection Control Management Plan – Annual Report No. 3 - Fiscal Year 2007-2008* (July 1, 2007 – June 30, 2008) | Submitted November 1, 2008 |
| *Underground Injection Control Management Plan – Annual Report No. 4 - Fiscal Year 2008-2009* (July 1, 2008 – June 30, 2009) | Submitted November 1, 2009 |
| *Underground Injection Control Management Plan – Annual Report No. 5 - Fiscal Year 2009-2010 (July 1, 2009 – June 30, 2010)* | Submitted November 1, 2010 |

## 1.6 Legal Authority

The Charter of the City of Portland grants broad authority to the City "to exercise any power or authority granted to the City by statute *** and [provides that the City] may do any other act necessary or appropriate to carry out such authority, or exercise any other power implied by the specific power granted." Such authority includes, among other things, "all powers commonly known as the police power to the same extent as the State of Oregon has or could exercise said power and make and enforce *** [as] necessary or appropriate water, local, police, sanitary and safety laws and regulations." *Chapter 2-105, Charter of the City of Portland, Oregon*

In addition, the Portland City Code addresses regulation of stormwater discharges, building requirements, zoning, erosion and sediment control and public improvements in Chapters 10, 17, 24, 29, and 33. Chapter 17.38 and 17.39 specifically address Drainage and Water Quality and Stormwater Discharges, respectively.

## 1.7 UIC Program Staff

### 1.7.1 Key Roles and Responsibilities

The WPCF permit designates the Bureau of Environmental Services (BES) as the bureau responsible for implementing the WPCF permit and for identifying and managing the regulatory and technical components of the UIC program citywide and across bureaus. Key staff roles and responsibilities for the UIC program are summarized in the December 2006 UICMP.

### 1.7.2 Personnel Changes

As part of a minor reorganization of BES in FY09-10, the UIC program was reduced from five to three permanent staff members. Mary Stephens left the UIC program; Tracy Rauscher rejoined the UIC program; and Joel Bowker was promoted to UIC Program hydrogeologist.

## 1.8 Minor and/or Major Permit Modifications

One major permit modification was completed during FY09-10: The City was granted an extension of the Category 3 corrective action completion timeline, from November 2010 to May 31, 2015.

One minor permit modification was completed during FY09-10: The City was granted a one-year extension of the Category 2 corrective action completion timeline, from November 1, 2010 to November 1, 2011.

## 1.9 Status of Implementing the UICMP and Its Components

This annual report provides the status of implementing the UICMP and it components.

## 1.10 Proposed Changes to the UICMP or Its Components

As required by the permit, a 5-year UICMP review was performed during FY09-10. A summary report, including proposed changes, is submitted under separate cover. Five years of monitoring have been evaluated, and a few monitoring changes will be proposed to DEQ. Some recommended changes may require a request for permit modification and/or changes to components of the UICMP, including the *Stormwater Discharge Monitoring Plan* and *Decommissioning Procedure for Underground Injection Control Systems.*

## 1.11 Relationship to Other Water Quality Programs

BES works cooperatively with many other City bureaus on water quality issues. Although not all of the following activities are specifically required as part of the NPDES MS4 and UIC WPCF permits, they are closely associated with the stormwater program and are related to stormwater quality.

### 1.11.1 Watershed Programs

The City implements watershed programs in the Columbia Slough, Johnson Creek, Fanno Creek, Tryon Creek, and Willamette River watersheds. BES uses an integrated watershed approach to manage watersheds comprehensively and implement multi-objective watershed management actions, as reflected in the *Portland Watershed Management Plan*. In addition, BES coordinates with the various jurisdictional and public interests within Portland's watersheds. This approach helps identify and prioritize projects and activities on a watershed basis to maximize water quality benefits.

### 1.11.2 NPDES MS4 Permit

DEQ first issued a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit to Portland co-permittees (the City of Portland, Port of Portland, and Multnomah County) on September 7, 1995, and renewed the permit for a second term in March 2004. DEQ subsequently reconsidered the second-term permit and reissued a modified permit in July 2005. The permit was scheduled to expire on February 28, 2009; it has been administratively extended by DEQ. The co-permittees submitted a permit renewal application for the third permit term to DEQ on September 2, 2008.

The permit establishes controls and limitations for stormwater discharges from the municipal separate storm sewer system (MS4) to receiving waters. Its purpose is to reduce the discharge of pollutants from the MS4 to protect water quality and meet the intent of the federal Clean Water Act. The City's stormwater management area includes sections of the City within the urban services boundary that drain to the City's separate storm sewer system. The permit does not cover discharges from private facilities with individual NPDES permits, stormwater that discharges to sumps, the combined sewer system, or directly to natural stream systems.

The permit regulations do not prescribe specific numerical water quality standards or limits that must be met. Rather, the standard is reduction of pollutants in discharges from the MS4 to the "maximum extent practicable", allowing permittees flexibility to implement the program, based on local conditions, resources, and priorities.

The permit is implemented through a *Stormwater Management Plan* (SWMP), which is incorporated into the permit by reference. The SWMP includes the following key elements:

- Best management practices (BMPs) the City will implement throughout the permit term to reduce pollutants in stormwater discharges.
- Performance measures, which track implementation of the BMPs.

- Benchmarks, which estimate the future reduction of pollutants with EPA-approved total maximum daily load waste load allocations. (The benchmarks are goals, not numeric standards.)
- Monitoring that will be conducted to track the long-term progress of the SWMP.

Prior to issuance of the WPCF permit, some activities specifically related to public UICs were reported in the *NPDES MS4 Annual Compliance Report*. Examples of these activities include number of sumps and sedimentation manholes cleaned and repaired.

Some components of the UICMP are similar to BMPs in the SWMP—for example, public education, pollution control, and operations and maintenance activities such as street sweeping. Reporting on these elements may therefore be common to both annual reports.

### 1.11.3 BES System Plan

The BES *System Plan* update began in late 2005; a draft document is due in spring 2011. This project is the update of the 1999 BES *Public Facilities Plan*. The *System Plan* is a comprehensive facilities planning document that guides the bureau's expenditures by identifying and recommending projects that maintain, improve, or expand the wastewater/stormwater infrastructure system. Projects are developed using both natural and engineered solutions to satisfy regulatory requirements and are implemented in a manner protective of public health, water quality, and the environment. The infrastructure focus of the *System Plan* is complementary to the watershed approach of the PWMP.

The *System Plan* is being developed with an asset management context that considers life-cycle costs, risk, and the environmental and social benefits in the project's ranking. This new ranking methodology will enable the ranking of projects across different asset classes (e.g., a stormwater project ranked against a sanitary sewer project).

Elements of the *System Plan* include a sewer rehabilitation plan, an updated combined sewer plan, and an updated sanitary sewer plan. Work on the stormwater facilities element of the *System Plan* began in spring 2010 and will be completed in 2015. UIC elements will be included as part of the stormwater portion of the plan.

### 1.11.4 Combined Sewer Overflow Reduction

The City is in the last of four major phases of a program to control combined sewer overflows (CSOs) to the Willamette River and Columbia Slough. Activities have included a combination of stormwater inflow reductions (roof drain disconnections, sump installation, local separation) and large structural solutions (including the West Side CSO tunnel system completed in 2006 and the East Side CSO tunnel system scheduled for completion in 2011), as well as treatment plant and pump station upgrades. Since 1990, Portland has reduced CSOs from 6.0 billion gallons per year to about 2.0 billion gallons on an annual average basis. CSO discharges to the Columbia Slough have been reduced by over 99 percent, while discharges to the Willamette River have been reduced by approximately 65 percent to date. Over 2 billion gallons of local stream and stormwater runoff have been removed from the combined sewer system through the

use of sumps, downspout disconnections, and stream separations. Inflow reduction to the CSO is reliant on local area infiltration of stormwater, both in surface BMPs and through UICs.

### 1.11.5 Pretreatment Programs and Publicly Owned Treatment Works (POTWs)

Many of the City's more traditional operations and infrastructure support water quality goals. Sanitary sewage is collected for treatment at the Columbia Boulevard and Tryon Creek publicly owned treatment works (POTWs). Existing pretreatment programs protect the sanitary system infrastructure, reduce pollutant releases to surface waters during combined sewer overflows, and prevent discharges that could cause treatment upsets or result in pollutant pass-through to surface waters.

BES's Industrial Source Control Division (ISCD) has administered a state and federally approved industrial pretreatment program since 1983. The program was implemented as a federal mandate to control the discharge of toxic pollutants from industrial sources that interfere with the operation of Portland's wastewater treatment plants, collection systems, and biosolids uses.

### 1.11.6 Science, Fish and Wildlife Section—Endangered Species Act (ESA) Program

Portland's Endangered Species Act Program was created in March 1998, shortly after the National Oceanographic and Atmospheric Association (NOAA) listed steelhead trout in the lower Columbia River system as a threatened species under the federal Endangered Species Act (ESA). Chinook and chum salmon were subsequently listed as a threatened species in March 1999 and coho salmon in June 2005. On August 12, 2005, the National Marine Fisheries Service (NMFS) announced designations of critical habitat areas in Portland for salmon and steelhead listed under the ESA. The designated areas in Portland include Johnson Creek (including Kelley Creek and Crystal Springs), Tryon Creek, the north part of the Columbia Slough (and Smith and Bybee Lakes), and the mainstem Willamette River. In addition, the Columbia River is home to 13 ESA-listed salmon and steelhead and is designated as critical habitat for all of these species along the Portland city boundary.

The ESA program takes an integrated, citywide approach to salmon recovery, recognizing that the most important step the City can take to restore healthy salmon populations is to restore healthy watersheds. This comprehensive approach ensures that salmon recovery goals are compatible with other City goals and that restoration actions address multiple environmental objectives. Stormwater program activities closely relate to ESA goals; implementation of BMPs can help mitigate stormwater quantity impacts and improve water quality. An important element of aquatic species protection is maintenance of base level stream flows. Infiltration via UICs helps support those stream flows.

### 1.11.7 Portland Harbor Superfund Site

The current Portland Harbor Superfund Study area covers about a 10-mile stretch of the Lower Willamette from below the Broadway Bridge to just upstream of the Columbia Slough confluence. It is designated as a Superfund site because of sediment contamination. Portland

Harbor has a long history of shipping, industrial, and commercial activity because of its key location on the Willamette River. The operational and waste disposal practices common to these industries many years ago polluted the river. Discharges from sewer outfalls, stormwater, and agricultural runoff may also contribute to the contamination. The City of Portland is a member of the Lower Willamette Group (LWG), a coalition of businesses and the Port of Portland. The LWG has voluntarily stepped forward to fund and participate in the site investigation. It submitted a draft Remedial Investigation (RI) to EPA in October 2009. The RI characterizes the extent of contamination in fish, wildlife, and sediments in the harbor and assesses risks to humans, fish and wildlife, and the environment from contaminated sediments.

Additionally, BES has an Intergovernmental Agreement with DEQ to jointly investigate and control sources of contamination discharging to the City's conveyance systems. The BES Portland Harbor program works closely with DEQ and the BES Industrial Stormwater program to identify sites with potential contamination, evaluate stormwater and groundwater pathways, and determine appropriate controls. The interplay of UICs with groundwater resources is an important element of the evaluation of Portland Harbor.

## 1.12 City Budget and Funding

The City of Portland has invested more than $734 million in stormwater management services and facilities over the past 15 years.[1] The revenue requirements for FY09-10 totaled approximately $81 million, allocated as follows:

| Major Program Category | Requirements | Percentage Share |
|---|---|---|
| Enforcement and Development Review | $ 7.3 million | 9% |
| Watershed Program & Habitat Restoration | 19.0 million | 23% |
| Facilities Operations and Maintenance | 22.4 million | 28% |
| Capital Improvements* | 32.3 million | 40% |
| **Total Revenue Requirements** | **$ 81.0 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 FY10-11, 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

[1] The 15-year time period reflects the implementation period of the City's NPDES MS4 permit.

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 years:

| | **2005-2006** | **2006-2007** | **2007-2008** | **2008-2009** | **2009-2010** |
|---|---|---|---|---|---|
| Single-Family Residential Charge | $14.26 | $16.82 | $17.33 | $18.55 | $19.80 |
| Residential rate per 1,000 square feet of impervious area | $5.94 | $7.01 | $7.22 | $7.73 | $8.25 |
| Non-residential rate per 1,000 square feet of impervious area | $6.45 | $7.56 | $7.91 | $8.43 | $8.86 |

At the close of FY 2009-2010, City Council increased the monthly stormwater management charge for single-family residences from $19.80 to $21.79. The residential rate increased from $8.25 to $9.08 per 1,000 square feet of impervious surface per month, and the commercial rate increased from $8.86 to $9.66 per 1,000 square feet of impervious area per month.

On October 30, 2006, the City launched Clean River Rewards to promote private stormwater management efforts. Ratepayers earn discounts worth as much as 35 percent of their monthly stormwater user fee, based on the extent and effectiveness of private onsite stormwater facilities. BES developed program criteria that will set the highest financial incentive for facilities that manage stormwater to the strictest water quality, volume, and flow control standards, particularly for commercial, industrial, and institutional ratepayers. As of June 30, 2010, a total of 34,345 utility ratepayers with active accounts have registered for stormwater discounts:

- 33,246 single-family residential ratepayers account for a total of 71,991,732 square feet of impervious area managed for stormwater.
- 1,099 multifamily, commercial, and industrial ratepayers account for a total of 39,621,109 square feet of impervious area managed for stormwater.

**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 FY09-10, this onsite portion was assessed based on $145.00 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 FY09-10, the rates were $4.50 per linear foot and $2.36 per vehicle trip. At the end of FY09-10, City Council increased the rates for stormwater system development charges to $154.00 per 1,000 square feet of impervious area, $4.78 per linear foot of frontage, and $2.51 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.

## 1.13 Organization of the Annual Report

The remainder of this annual report contains the following sections:

**Section 2: System Management,** identifies citywide actions implemented under the five BMP categories to prevent, minimize, and control pollutants prior to infiltration. It also identifies projected main activities for FY10-11.

**Section 3: System Monitoring,** summarizes the fifth-year results of UIC monitoring conducted under the *Stormwater Discharge Monitoring Plan* (SDMP) and submitted in the *Annual Stormwater Discharge Monitoring Report, Year 5, October 2009-May 2010* (July 15, 2010).

**Section 4: Evaluation and Response,** identifies evaluation and response actions conducted during FY09-10 and projected main activities for FY10-11.

**Section 5: Corrective Actions,** summarizes the corrective actions implemented during FY09-10 and projected main activities for FY10-11 to address UICs that do not meet permit requirements.

**Appendix A** identifies UICs identified/constructed/removed during FY09-10.
**Appendix B** identifies the status of Category 2 and 3 UICs.
**Appendix C** identifies the status of commercial/industrial inspection work.
**Appendix D** identifies spills that occurred within areas serviced by UICs.

# 2 System Management

## 2.1 Overview

The System Management program element involves a series of actions, called best management practices (BMPs) that serve to prevent, minimize, and control pollutants in stormwater prior to discharge to a UIC. These BMPs are organized into the following five general BMP categories and are applied to the entire UIC system on an ongoing basis.

- System Inventory and Assessment
- Pollution Control
- Education and Training
- Operations and Maintenance
- Policy and Regulation

## 2.2 System Inventory and Assessment (SA)

Ongoing activities necessary to provide stormwater drainage infrastructure include the registration and construction of new UICs, replacement of existing UICs, and decommissioning of existing UICs. Ongoing system inventory and assessment activities are important to manage all known public UICs within the City of Portland and to assess drainage to each UIC for potential impacts to groundwater. This BMP category focuses on updating and refining information related to the location and physical characteristics of existing and new UICs. It fulfills two WPCF requirements:

- Develop and implement a comprehensive *UIC Registration Database*.
- Evaluate UICs relative to the factors that could present a risk to groundwater quality.

**SA-1: Install, replace, retrofit, and decommission UICs as needed to provide public infrastructure for stormwater management. Maintain a comprehensive system inventory/data management system to register new UICs and track the location, physical characteristics, and status of all public UICs.**

### 2.2.1 SA-1: Key Accomplishments for FY09-10

- Submitted quarterly *UIC Registration Database* updates to DEQ on September 1, 2009, December 1, 2009, March 1, 2010, and June 1, 2010.

- Identified 39 new public UIC[2] records in quarterly *UIC Registration Database* updates:

[2] Some UICs identified as new facilities in quarterly reports may not be recently discovered or newly constructed UICs. UICs may be identified as new as a result of database management. For example, correcting a database identifier for a facility from a sedimentation manhole to a UIC would trigger the UIC to appear as a new sump in the BES database, even though the facility itself is not new.

- 3 new UIC records in the September 1, 2009 database update
- 12 new UIC records in the December 1, 2009 database update
- 6 new UIC records in the March 1, 2010 database update
- 18 new UIC records in the June 1, 2010 database update

These UIC records are listed in Appendix A.

- Submitted decommissioning pre-closure reports for 8 UICs to DEQ in FY09-FY10.

- Removed 23 public UIC records in quarterly UIC *Registration Database* updates. The removals may have been decommissioned or identified through field investigations as not existing. These records are listed in Appendix A.

### 2.2.2 SA-1: Projected Main Activities for FY10-11

- Continue to regularly update the *UIC Registration Database* to include new and decommissioned UICs and other relevant information.

- Continue to submit quarterly *UIC Registration Database* updates to DEQ.

**SA-2: Evaluate the location of public UICs relative to factors that may create adverse impacts to groundwater.**

### 2.2.3 SA-2: Key Accomplishments for FY09-10

- Continued to implement/complete the *Systemwide Assessment Follow-up Actions* (submitted to DEQ December 1, 2006) workplan to address the approximately 950 UICs that were identified for follow-up as part of the systemwide assessment. The work addresses and evaluates UICs that meet any of the following criteria.
  - UICs with inadequate separation distance from groundwater (see Sections 4 and 5).
  - UICs that receive drainage from facilities that store, handle, or use hazardous or toxic materials in quantities requiring registration under the Superfund Amendment and Reauthorization Action Title III (work complete).
  - UICs that receive drainage from commercial/industrial properties with site activities that may cause stormwater entering a public UIC to exceed MADLs established in the permit (see Section 2.3).
  - UICs within close proximity to domestic or public water wells (work complete).

### 2.2.4 SA-2: Projected Main Activities for FY10-11

- Continue implementation of remaining actions identified in the *Systemwide Assessment Follow-up Actions* workplan.

- Evaluate newly constructed or identified UICs for the four characteristics that may potentially create adverse impacts to groundwater. Incorporate the resulting information into the Evaluation and Response process, as appropriate.

- Integrate new system data into the *UIC Registration Database*, as appropriate.

## 2.3 Pollution Control (PC)

Activities and practices such as spills, illegal disposal, improper site management, and erosion can increase the discharge of pollutants to public UICs, with potential negative impacts to groundwater. This BMP category focuses on reducing such pollutant discharges from both public and private sites and activities. It fulfills two WPCF permit requirements:

- Implement a *Spill Prevention and Pollution Control (SPPC) Plan*.
- Identify activities conducted on commercial/industrial properties or SARA Title III facilities that may result in a violation of MADLs in stormwater discharging to a public UIC.

**PC-1: Identify, prevent, minimize, and control activities and practices that can increase pollutant discharges to public UICs.**

### 2.3.1 PC-1: Key Accomplishments for FY09-10

**Spill Prevention and Pollution Control (SPPC) Plan**

- Continued to implement the SPPC Plan (submitted in December 2006), which includes improving ongoing citywide pollution control activities to identify and control activities on private properties, including commercial/industrial properties and SARA Title III facilities where site activities (e.g., illegal disposal, improper storage and handling of materials, and erosion) could result in a violation of MADLs in stormwater discharging to a UIC.

- Completed inspections of commercial/industrial properties identified as part of the *Systemwide Assessment Follow-up Action* workplan. The purpose of the work is to identify and address any potential threat to City-owned UICs that receive drainage from commercial/ industrial businesses. (See Appendix C for details.)

**Spill Protection-Citizen Response (SPCR) Team**

SPCR staff responds immediately to emergency spills and investigates pollution complaints regarding spills, illegal disposal, improper site management, and erosion. Citizens can call in reports on a dedicated spill response hotline 7 days a week, and staff is available 24 hours a day to respond to spills, slicks, and other suspicious or inappropriate discharges. The program refers problems to other enforcement agencies as appropriate. The SPCR team also provides education and technical assistance to property owners to improve site management and address work practices that may impact stormwater discharges. SPCR staff support the entire City, including areas that use UICs for management of stormwater.

- In FY 09/10, the BES Spill Section received 17 calls regarding spills located within or near an area where UICs are the primary method for stormwater disposal. Only five of these spills entered a UIC system. All of the spills were of a very small amount and, upon inspection, were determined to have little to no impact. All of the systems were cleaned as appropriate. Appendix D shows this information in table format, including date, release type, location, identification of the closest UIC, and if the spill entered a UIC.

- 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. Many events do not require the duty officer to respond to the site. In FY09-10, 10 two-alarm fire results 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. Many events do not require the duty officer to respond. In FY 09-10, 17 after-hours calls were received by the duty officer from towing companies. No enforcement actions were taken.

- BES and the Water Bureau continued 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."

**Regional Spill Response Committee**

This multi-agency committee was established in 1995 to consult and debrief on spill response activities throughout the region. It also provides staff training and coordination. Members include representatives from the Oregon Emergency Response System, Environmental Protection Agency Criminal Investigations, United States Coast Guard, DEQ, Oregon State Police, Oregon Department of Transportation, Clean Water Services, Water Environment Services, Port of Portland, Portland Fire Bureau, Portland Fire Bureau Hazmat, City of Gresham, City of Milwaukie, City of Portland Water Bureau, and BES. BES chairs and attends all of the meetings.

**Columbia South Shore Well Field Wellhead Protection Program**

The City continued to implement the Columbia South Shore Well Field Wellhead Protection Program and reference manual for the City of Portland (and also in effect in Gresham and Fairview). The program focuses on groundwater protection through the implementation of mandatory spill containment BMPs and facility inspections for commercial and industrial facilities located within the Columbia South Shore Well Field Wellhead Protection Area (WHPA) overlay zone. The program also includes education and outreach efforts to affected residents and businesses and one-on-one technical assistance to businesses to help them comply

with program requirements. Program requirements include structural and operational BMPs to reduce the occurrence of spills and minimize spill impacts.

- Continued to provide oversight to ensure that commercial and industrial facilities and stormwater facilities comply with requirements of the Columbia South Shore Well Field Wellhead Protection Program:
  - Updated the Columbia South Shore Well Field Wellhead Protection Program Reference Manual.
  - Conducted 362 inspections (includes re-inspections, regular fire inspections, and building final inspections) of businesses in the wellhead protection area, and conducted 30 plan reviews. Fifty-nine violations were identified, and 62 were abated. (Some abatements were for violations from previous years.) Most violations related to containment, labeling, and reporting requirements.
  - Promoted hazardous waste reduction and non-hazardous alternatives.

- Completed the seventh 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 program, in conjunction with the Columbia Corridor Association and Columbia Slough Watershed Council.

  <u>Technical Assistance:</u>
  - 18 phone consultations
  - 5 site visits
  - 2 articles in the Columbia Corridor Association (CCA) newsletter
  - Distribution of 15 spill kits, signs, secondary containment pallets, and stormdrain covers
  - Multiple presentations at CCA breakfast forums
  - Webpage maintenance
  - Workshop for regulated businesses on proposed changes to the manual (with 20 attendees)

  <u>Public Outreach</u>
  - Slough School - groundwater module: 90 students
  - Groundwater 101: 31 participants
  - Subs on the Slough: 31 participants
  - Cycle the Well Field: 43 participants
  - Aquifer Adventure: 347 participants
  - Explorando: 543 participants
  - Clean Water Festival:150 students
  - Metro Hazardous Waste Round-up: 300 participants
  - Other events with groundwater content (Regatta, Awards Celebration, Wetlands 101)
    *Total participants/contacts*: 1,538 (not including technical assistance activities listed above)

## Source Control Measures

The City's *Stormwater Management Manual* (SWMM) requires storm and sanitary source controls for site uses and characteristics that generate, or have the potential to generate, specific pollutants of concern. These requirements apply to new development projects, redevelopment projects, tenant improvements, and existing sites proposing new offsite discharges.

- In accordance with SWMM requirements, the City signed off on permits for a total of 1,025 source control measures at sites with high-risk characteristics or activities. This inventory is citywide and is not limited to areas draining to UICs. Table 2-1 shows facility location by watershed. (Note: When the SWMM is applied, drainage from high-risk areas is prohibited from draining to public UICs, and stormwater is managed onsite.)

**Table 2-1**
**Source Control Measures**

| Source Control Type | Willamette River | Columbia Slough | Johnson Creek | Fanno Creek | Tryon Creek | Other | Totals |
|---|---|---|---|---|---|---|---|
| Trash/Recycling/Compactor | 331 | 102 | 39 | 6 | 6 | 1 | 485 |
| Grease Management | 67 | 24 | 3 | 2 | | | 96 |
| Extra Strength Charge | 44 | 14 | 3 | 1 | | | 62 |
| Fueling | 7 | 6 | | | | | 13 |
| Tank Farms | 5 | | 1 | | | | 6 |
| Liquid Storage | 14 | 10 | 3 | | | | 27 |
| DEQ Permits | 31 | 40 | 3 | 2 | 3 | | 79 |
| Groundwater Depth | 33 | 26 | 4 | 1 | | | 64 |
| Loading Docks | 16 | 12 | 1 | 2 | | | 31 |
| Covered Parking | 12 | 2 | | | | | 14 |
| Water Feature | 7 | 5 | | | | | 12 |
| Extra Bulk Material Storage | 1 | 6 | 1 | 1 | | | 9 |
| Boiler and Chiller | 5 | 2 | | | | | 7 |
| Dewatering | 20 | 7 | | 2 | | | 29 |
| Contamination | 37 | 18 | 6 | | | | 61 |
| Wash Rack | 2 | 5 | | | | | 7 |
| Dental Program | 2 | 1 | | 1 | | | 4 |
| Subgrade Structure | 8 | | | | | | 8 |
| Submeter Program | 10 | | | | | | 10 |
| Water Reclaim & Reuse | 1 | | | | | | 1 |
| **FY09-10 Totals** | **653** | **280** | **64** | **18** | **9** | **1** | **1,025** |

**Erosion Control**

- There were 4,818 active private construction permits subject to erosion control inspection (citywide). The Bureau of Development Services (BDS) conducted 4,138 erosion control-related inspections of private construction sites (citywide).

- There were 239 active public construction projects (citywide) with erosion control components. In general, public sites are inspected daily during construction.

- Erosion control complaints (received through the complaint hotline or staff referrals) were tracked through the City's building permit tracking program, TRACS. A total of 60 cases were opened and responded to, with 39 cases closed (citywide).

- The pre-permit-issuance site meeting program was continued, where the applicant's team meets onsite to discuss erosion control and other sensitive site issues. One pre-issuance site visit was completed.

**Prevention of Illegal Disposal**

- Continued to implement solid waste and recycling programs (curbside recycling and yard debris collection, and neighborhood cleanup collection events) to help prevent illegal dumping.

### 2.3.2 PC-1: Projected Main Activities for FY10-11

- Continue to implement the *Spill Prevention and Pollution Control Plan*, including the Spill Protection-Citizen Response (SPCR) team hotline and response activities.

- Continue to address, as appropriate, commercial/industrial businesses that were identified in the systemwide assessment as potentially draining to a City-owned UIC and that conduct activities that may pose a threat to a UIC, requiring further evaluation.

- Continue to implement the Columbia South Shore Well Field Wellhead Protection Program.

- Continue to implement the *Stormwater Management Manual*.

- Continue to operate the citywide erosion and construction site pollutant control program, including the erosion control hotline.

## 2.4 Education and Training (ET)

This BMP category fulfills the WPCF permit requirement for an employee training and public education program to educate City personnel and the public of the conditions and requirements of the permit.

**ET-1: Implement public education activities that will raise awareness of groundwater protection and promote pollution prevention and control.**

### 2.4.1 ET-1: Key Accomplishments for FY09-10

**Clean Rivers Education Program**

This program involves hands-on activities that teach students about the causes and effects of water pollution and what individuals can do to protect water resources. The programs also provide community service projects, teacher workshops, and curriculum resources. A number of the programs focus on stormwater and pollution prevention. An estimated 17,000 students participated in these activities.

- Reached 8,460 students (grades K-12) with classroom programs that provide hands-on, interactive science education about stormwater and other environmental issues.

- Involved 5,284 students (K-12) in education field programs that offer watershed investigations and field assessments, such as how to measure water quality and conduct macroinvertebrate sampling as indicators of water quality health. Also included are stormwater tours, boat tours, and restoration experiences along streams and wetlands. In addition, 2,038 of these students combined education with natural area restoration service projects.

- Provided canoe trips to 253 students in the Columbia Slough and northern Willamette River watersheds. All students completed special classroom studies and a stewardship project to be eligible. The focus of the tours was on slough history, how land usage impacts waterways, stormwater pollution, and how personal actions can help prevent stormwater pollution.

- Checked out stormwater and watershed curriculum kits and field equipment to 10 Portland elementary and middle school teachers for them to work independently with students in the classroom and at special school events.

- Provided teacher and community training workshops, involving 73 participants.

- Presented Stormwater - Soak it Up, a 75-minute classroom program for grades 4-12, and special interest groups totaling 852 students and teachers. The students learned to identify pollutants, distinguish between pervious and impervious surfaces, calculate runoff, and design greener cities within given budget constraints.

- Presented Tours of Stormwater Solutions to 198 students. Students visited bioswales, stormwater planters, ecoroofs, porous pavement, and creative downspout disconnections. They learned how these solutions can filter pollution, slow down stormwater, and prevent erosion.

- Presented Watershed Awareness to 1,097 students, grades 3-6. This program focuses on common non-point sources of pollution found in a watershed and how to prevent stormwater pollution.

- Targeted schools with onsite stormwater facilities for extended outreach. Schools included Mt. Tabor Middle School, Maplewood Elementary, Laurelhurst School, and Glencoe School. Students learned about stormwater pollution prevention and their school's sustainable stormwater facilities and participated in maintenance activities for their facilities.

- Participated in six community events, with a total of 1,155 participants. These were the Columbia Slough Regatta, Explorando El Columbia Slough, Sustainable Living Show, Oregon Zoo Frog Event, Sunday Parkways, and East Portland Exposition. All events included stormwater pollution prevention messages.

- Held quarterly Education Advisory Committee meetings to review and advise on public education approaches and activities.

**Stewardship Activities and Community Events**

- Sponsored, co-sponsored, and participated in numerous community activities and events throughout the City's watersheds that involved stormwater management and watershed protection issues and actions. An estimated 14,600 people took part in these activities.

- Partnered with East Multnomah Soil and Water Conservation District, Metro, and many community hosts to offer the Naturescaping Program. The program offers workshops to teach participants to manage their property to use native plants, stop erosion, manage stormwater, and reduce chemical and water use. In FY09-10, 1,223 participants attended workshops, and the program reached over 20,000 people at public events. The programs are offered throughout Portland and nearby suburbs. Participants can attend any workshop, regardless of location.

**Regional Coalition for Clean Rivers and Streams**

- Continued participation in the Regional Coalition for Clean Rivers and Streams, with the following activities:
  - Continued working with a local advertising agency to develop and implement a multi-year public awareness campaign.
  - As part of the updated and upgraded website, continued to promote a social marketing effort throughout FY09-10, including "blog seeding" (providing information to similar-content blogs), providing "tweets" for distribution through Twitter, and providing additional information for Facebook.

- Distributed water bill inserts with tips regarding stormwater runoff to 214,000 Portland ratepayer accounts from March-May 2010.
- Maintained a budget of $72,000 per year to educate the public about the impact stormwater runoff pollution has on the health of rivers and streams for people, fish, and wildlife.

**Publications and Signage**

- Included inserts in City water/sewer bills:
  - September/October/November 2009: A bill insert titled "Floodplains, Watersheds, and Clean Rivers" was distributed to 214,000 accounts.

  - March/April/May 2010: A Regional Coalition bill insert with information and tips regarding stormwater runoff was distributed to 214,000 accounts.

- Updated and posted fact sheets, brochures, and educational materials on the BES Sustainable Stormwater Management website. The materials included information about green streets, ecoroofs, stormwater management facility planting guides, green streets and other sustainable stormwater approaches. The website received over 234,000 views during FY09-10, a 57 percent increase over FY08-09.

- Distributed a variety of educational materials at community meetings and events.

**Coordination with Other Programs and Groups**

- BES coordinated with other City projects and programs (e.g., Endangered Species Act Program, Willamette Stormwater Control Program, Portland Harbor Superfund Program, BES Watershed Programs) to integrate stormwater activities and messages.

- BES worked with watershed councils and other community groups to coordinate public education and stewardship activities.

**Eco-logical Business Program**

- Continued to work with the Regional Pollution Prevention Outreach Team, Automotive Eco-Logical Advisory Subcommittee, and Landscape Eco-Logical Advisory Subcommittee for the Portland metropolitan region to certify automotive repair and service shops and landscape service businesses. By the end of permit year 15, 40 automotive shops and 11 landscape service businesses were certified in the City of Portland.

- Continued a promotional campaign to raise awareness and communicate the importance of supporting auto shops and landscape service businesses that operate environmentally responsible business practices. The campaign used newspapers, the Redirect Guide, the Chinook Book, and local news advertising to promote the Eco-Logical Business message.

- Continued participation in local environmental and neighborhood events, including the annual sustainability fair and the greener home and garden show, to promote use of certified automotive and landscape services businesses. Also attended the annual Oregon Landscape Contractors Association conference to garner more interest from program participants.

**BEST Business Center**

- The BEST Business Center assists Portland businesses with resources and information to help them green their operations. The BEST Business Center is run by the Bureau of Planning and Sustainability (formerly Office of Sustainable Development), in partnership with the Portland Water Bureau, Portland Development Commission, Metro, Pacific Power, and Portland General Electric. To date, the center OSD has been contacted by over 380 businesses looking to green their operations.

  Each year, the City recognizes Portland's most sustainable businesses with the BEST Awards. In 2010, 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.

**UIC Website Reorganization and Update**

- Updated the UIC program website. Incorporated links to the *Stormwater Management Manual*, programmatic documents, annual reports, federal UIC regulations, DEQ website, depth to groundwater information, and other relevant agencies.

### 2.4.2 ET-1: Projected Main Activities for FY10-11

- Continue the Clean Rivers Education Program for grades K-12.

- Continue Education Advisory Committee meetings to review and advise on public participation approaches and activities.

- Continue to produce publications and website materials.

- Continue to work with other City bureaus, watershed councils, and other community groups to provide educational activities and messages.

- Continue science education outreach to community youth to increase students' knowledge and awareness of urban watershed and water quality issues, to foster a connection to local greenspaces and streams, and to educate youth about how they can protect their watersheds.

- Continue certifications in the Eco-Logical Business Program. The goal for FY 10-11 is to have five more auto shops and five more landscape service businesses certified in the City of Portland.

- Continue participation in the BEST Program.

**ET-2: Conduct employee training to ensure that UICs on public property are designed, constructed, operated, and closed in ways that meet WPCF permit requirements and protect groundwater.**

### 2.4.3 ET-2: Key Accomplishments for FY09-10

- Conducted UIC program overview and water quality data presentation to BES watershed services group.
- Provided ongoing coordination with Bureau of Development Services (BDS) and BES Engineering Services and responded to UIC site-specific questions and programmatic items.
- Conducted training for new duty officer staff on the BES spill response hotline and staff response duties.

### 2.4.4 ET-2: Projected Main Activities for FY10-11

- Continue to conduct training to City staff on the BES spill response hotline and staff response duties. Continue duty officer training sessions.
- Continue to develop information focused on groundwater protection and UICs for City staff.
- Continue to coordinate with BES engineering and construction groups to identify any UIC process issues and data gaps.
- Continue to coordinate with BDS development review staff on UIC design standards and on the review and approval process for UICs registered on private property.
- Continue to work with other bureaus to coordinate with and provide training on source control, operations and maintenance, spill prevention and response, and development review.
- Continue evaluation of existing training approaches and schedules and revise/update as needed.

## 2.5 Operations and Maintenance (OM)

Operations and maintenance BMPs for City UICs are important in order to both remove pollutants from UICs (e.g., UIC cleaning) and prevent pollutant discharges into UICs (e.g., street sweeping). This BMP category identifies O&M practices both for UICs located in City-managed rights-of-ways and for UICs on other City-owned property. It fulfills the WPCF permit requirement to implement an O&M Plan for public UICs.

**OM-1: Implement operations and maintenance practices to remove or prevent pollutants from entering public UICs located in City-managed rights-of-ways and on other City-owned property.**

### 2.5.1 OM-1: Key Accomplishments for FY09-10

**Facility Maintenance**

- Implemented the UICMP *Operations and Maintenance Plan*.
- Continued discussions with other City bureaus to standardize operations and maintenance procedures for UICs on City property, based on the O&M templates established in the City's *Stormwater Management Manual*.
- Made inlet inspection/maintenance visits to 592 locations citywide (multiple visits to some locations after major rain events). (This number includes, but is not limited to, UIC-specific visits.)
- Cleaned approximately 12,454 inlets (citywide).
- Repaired or constructed 125 inlets, 19,053 linear feet of inlet lead, and 2,174 linear feet of culvert.
- Cleaned 1,824 sedimentation and sump manholes.
- Continued to implement retrofits to the existing storm drainage system, as identified during routine operations and maintenance activities. Completed conversion of a total of 1,200 linear feet from ditches to swales or porous shoulders.
- Continued to evaluate UIC stormwater quality monitoring data to evaluate the relationship between stormwater quality, maintenance frequency, and traffic volumes.

**Street Sweeping**

- Swept approximately 4,198 miles of streets draining to public UICs. [3]

[3] This number accounts for frequency of sweeping (e.g., 1 mile of street that is swept twice during the year equals 2 street miles). Numbers in previous years' annual reports did not account for frequency and were therefore significantly lower.

**Portland Bureau of Transportation Maintenance Operations (PBOT Maintenance Operations) BMPs**

- Continued to implement BMPs within the right-of-way to protect water quality. This includes:
  - 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 and hydrocarbon-absorbing booms to trap sediment, oil, and grease while cleaning the grinding machine.
  - 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 to prevent these materials from entering the storm drain system
  - Placing bio pillows and oil-absorbent booms before entering storm drains.
  - Using water-based asphalt emulsions and biodegradable asphalt release agents.

- Continued to look at piloting new materials and applications directed toward enhancing water quality.

Site-specific O&M actions conducted as a response action are discussed in Section 4: Evaluation and Response.

### 2.5.2 OM-1: Projected Main Activities for FY10-11

- Continue to implement the UICMP *Operations & Maintenance Plan*.

- Continue to use UIC stormwater quality monitoring data to evaluate the relationship between stormwater quality, maintenance frequency, and traffic volume. Where appropriate, adjust current O&M Plan maintenance schedules and targets.

- Continue to standardize operations and maintenance procedures for UICs on City property, based on the O&M templates established in the *Stormwater Management Manual*. Develop applicable tracking systems.

- Continue ditch-to-swale conversions.

- Continue to evaluate new materials and processes, pilot test tools and techniques, and monitor developments in related fields.

- Continue to invite guest speakers and host vendor demonstrations to keep apprised of new materials and practices.

## 2.6 Policy and Regulation (PR)

The development of policies, codes, and administrative rules is a key element in providing long-term protection of groundwater. This BMP category includes City initiatives, such as policies that promote the implementation of green streets as alternatives or retrofits for UICs, as well as code and administrative rules pertaining to groundwater protection.

**PR-1: Review and modify City policies, codes, and regulations to enhance groundwater protection.**

### 2.6.1 PR-1: Key Accomplishments for FY09-10

**Development Review Process and UICs**

- Continued ongoing evaluation of the review and approval process for private UICs, identifying issues and process gaps and identifying strategies for a more streamlined and consistent registration process for both public and private UICs.

**Policy Initiatives**

- Continued discussions with the Oregon Water Resources Department (OWRD) regarding issues relating to the water supply well construction rules and UIC rules. DEQ and OWRD acknowledge conflicts in their rules, but have not recommended a course of action or designated staff resources.

- Continued the evaluation process for potential changes to City code/policy to limit the installation of new domestic wells or require connection to public water supply (if available). The City has demonstrated through water quality monitoring that UICs within domestic, irrigation, or public water well setbacks meet annual mean MADLs and are compliant with permit requirements. Based on the responses from DEQ and OWRD and on water quality monitoring results, further code, rule petitioning, or legislative activity is not recommended at this time.

**Regional Coordination**

- The City participated in the ACWA (Association of Clean Water Agencies) Groundwater Committee and participated in the DEQ regional WPCF permit template development process.

**Grey to Green Initiative**

- The City continued to implement the Grey to Green initiative, including a 5-year goal to implement over 43 acres of ecoroofs and more than 900 green streets citywide as a way to improve watershed health.

**Stormwater Management Manual Revision**

- The last revision of the *Stormwater Management Manual* occurred in October 2008. UIC updates or changes will be provided for the next revision.

**Land Acquisition**

- The Johnson Creek Willing Seller Program acquired approximately 8 acres of floodplain property in FY 09-10. Since June 1997, the program has purchased a total of approximately 142 acres. Much of the property that has been acquired as part of this program is located in areas of shallow groundwater and adjacent to identified Category 2 and Category 3 UICs.

- The Grey to Green Land Acquisition Program acquired 14 acres of natural area: 9 acres in the Johnson Creek Watershed, 1.7 acres in the Willamette River Watershed, and 3 acres in the Fanno Creek Watershed.

### 2.6.2 PR-1: Projected Main Activities for FY10-11

- Continue to encourage DEQ and OWRD to evaluate/revise rules (OAR 340-044 and 340-071).

- Participate in DEQ UIC rule revision (OAR 344-040) as appropriate.

- Continue to coordinate the review and approval process with BDS for private UIC registrations and development issues.

- Continue to work with BDS and DEQ to develop consistent design standards and guidance for UICs on private and public property.

- Continue to purchase land for stormwater management and natural resource protection, and work with property owners to protect existing natural areas.

- Continue to provide training and technical assistance on the *Stormwater Management Manual* to City staff and the development community.

- Continue implementation of the Grey to Green initiative.

# 3 System Monitoring

The System Monitoring program element involves ongoing UIC monitoring activities conducted to demonstrate that UICs are operated in a manner that meets WPCF permit requirements and protects groundwater as a drinking water resource. System Monitoring includes two types of monitoring:

- Stormwater discharge monitoring of a representative subset of UICs, as identified in the *Stormwater Discharge Monitoring Plan* (SDMP). This is subsequently referred to as compliance monitoring.

- Monitoring to determine the effectiveness of BMPs in controlling pollutant discharges to UICs and to identify technologies that can be used to improve stormwater quality or successfully implement corrective actions, as identified in the *BMP Monitoring Program*.

## 3.1 Compliance Monitoring

### 3.1.1 Key Accomplishments for FY09-10

- Submitted year 5 (October 2009 – 20010) UIC compliance and supplemental monitoring locations to DEQ on August 31, 2009. Supplemental monitoring locations were selected to assess the quality of stormwater discharged to UICs located near commercial and industrial facilities.

- Implemented year 5 stormwater compliance and supplemental monitoring. Forty-two UIC locations were sampled in year 5 and tested for common and priority pollutants as defined by the permit.

- Compiled and evaluated year 5 stormwater data. Notified DEQ of year 5 annual mean concentration exceedances of the permit's maximum allowable discharge limits (MADLs) on June 24, 2010.

- Prepared and submitted the *Annual Stormwater Discharge Monitoring Report – Year 5 – October 2009 – May 2010* to DEQ (July 15, 2010). The report results are summarized in Section 3.1.2, below

- Performed a preliminary stormwater discharge trend analysis for the 5 years of data, using box plots to identify potential differences in pollutant concentrations. Preliminary results are summarized in Section 3.1.2, below.

- Prepared and submitted year 6 (October 2010 – 2011) UIC monitoring locations to DEQ on August 31, 2010, including 30 compliance monitoring locations selected in accordance with the SDMP. Because of annual geometric mean exceedances for pentachlorophenol and lead MADLs, two additional sites from year 5 will be sampled again in year 6.

### 3.1.2 UIC Stormwater Year 5 Monitoring Summary

The City of Portland's UIC compliance monitoring program was implemented in accordance with the final SDMP. The monitoring program was designed to be representative of the estimated 9,000 City-owned/operated UICs. Five sampling events were completed, as required by the permit, between October 2009 and May 2010. Stormwater samples from discharges to City-owned UICs were analyzed for common pollutants and priority pollutants derived from the analytical methods for common pollutants, as defined by the permit. Field and laboratory data collected during year 5 met the data quality objectives defined in the SDMP.

Forty-two UIC locations, stratified based on estimated traffic volume (>1,000 vehicle trips per day [TPD] and <1,000 TPD), were sampled in year 5, as follows:

- Thirty UICs selected to implement the year 5 compliance monitoring (i.e., monitoring network) described in the SDMP:
  - Panel 5 (15 rotating UIC locations sampled in permit years 4 and 9)
  - Panel 6 (15 fixed UIC locations sampled in permit years 1 through 10)

- Two sites carried over from year 4 because of annual MADL exceedances.

- Ten supplemental UICs located near commercial and industrial facilities (see Section 4.4.2).

**Year 5 Results** [4]

- Thirteen of the 14 common pollutants and one priority pollutant analyte (2,4-D) were detected in year 5.

- Four common pollutants—pentachlorophenol (PCP), di(2-ethylhexyl)phthalate [DEHP], benzo(a)pyrene [B(a)P], and arsenic—were detected in year 5 at concentrations above their respective MADLs in at least one sample. Detected concentrations of other common and priority pollutant analytes were below their respective MADLs. The City reported MADL exceedances to DEQ, as required by the permit.[5]

- Twenty-three ancillary pollutants (i.e., pollutants detected using the analytical methods for common pollutants) were detected at low concentrations (generally less than 5 µg/L). The six ancillary pollutants detected at the highest frequencies (greater than 50 percent) for individual sampling events are polycyclic aromatic hydrocarbons (PAHs). Of the PAHs detected, dimethyl phthalate had the highest concentration (15 µg/L).

[4] A full discussion of monitoring methodology and results can be found in the *Annual Stormwater Discharge Monitoring Report – Year 5* (July 2010).

[5] Actions taken in response to individual MADL exceedances are reported in Section 4.5: Response Actions.

**Annual Mean Concentrations**

- Annual mean concentrations were calculated for pollutants that were detected during individual sampling events at concentrations >50 percent of the MADL. Theoretically, the mean concentration cannot exceed the MADL if detected concentrations during the five individual sampling events are <50 percent of the MADL.

- Annual geometric mean concentrations for ten UIC locations (P5_15, P6_1, P6_7, P6_14, SP3_6, SP3_8, SP4_2, SP4_3, SP4_4, and SP4_10) exceeded the MADL for PCP (1.0 µg/L). Annual geometric means for these locations ranged from 1.11 to 3.884 µg/L, slightly above the MADL. An additional site (P5_5) exceeded the MADL for benzo(a)pyrene [B(a)P] (0.2 µg/L).

- The WPCF permit requires the City to identify UICs in which the annual mean concentration exceeds the MADL for two consecutive years as Category 4 UICs[6]. Five of the 11 UICs exceeded the MADL for PCP for a second consecutive year. Three of the five locations (P6_1, P6_7, and P6_14) were identified as Category 4 UICs in previous years. The remaining two locations (SP3_6 and SP3_8) have been indentified as new Category 4 UICs and will move forward for corrective action.

- The remaining 6 UICs that exceeded PCP or B(a)P for the first time in Year 5 (P5_5, P5_15, SP4_2, SP4_3, SP4_4, and SP4_10) will be sampled again in year 6.

- Annual geometric mean concentrations for DEHP, arsenic, and lead were less than their respective MADLs.

**Preliminary Trend Analysis**

Years 1 through 5 pollutant concentration data were compared using box plots. Box plots were prepared to identify potential differences in pollutant concentrations between:

- Permit years (year 1, year 2, year 3, year 4, year 5)
- Traffic categories (<1,000 TPD, ≥1,000 TPD)
- Sample panels (Panel 5, Panel 6, supplemental panel [SP4]).

In general, the box plots prepared for years 1, 2, 3, 4, and 5 data are very similar for each variable. For the pollutants evaluated (lead, arsenic, PCP, DEHP, and benzo(a)pyrene), the concentration ranges were generally narrow, and the annual medians and geometric means were well below their respective MADLs (i.e., <50 percent). Pollutant concentrations appear to be slightly higher in the ≥1,000 TPD traffic category than in the <1,000 TPD category and very similar between sample panels.

[6] Category 4 UICs are those UICs that become non-compliant by failing to meet the annual mean MADL within one wet season after the exceedance or failing to satisfy any groundwater protection conditions of Schedule A of the permit.

**Response Actions**

Section 4 summarizes the actions taken during the year 5 wet season (October 2009 – May 2010) to further understand pollutant sources, prevent pollutants of concern from exceeding respective MADLs, and respond to conditions identified during implementation of the stormwater discharge monitoring program. These actions are discussed in the *Annual Stormwater Discharge Monitoring Report – Year 5* (July 2010).

### 3.1.3 Projected Main Activities for FY10-11

- Select UIC locations for year 6 monitoring (i.e., Panels 1, 6, and SP5). (UIC locations were submitted to DEQ on September 1, 2010.)
- Implement year 6 UIC compliance monitoring in accordance with the SDMP.
- Document, analyze, and report results of the 2010-2011 (year 6) stormwater monitoring in the *Annual Stormwater Discharge Monitoring Report – Year 6*. That report will be submitted to DEQ by July 15, 2011 or an approved alternate date.
- Continue to work with DEQ to demonstrate through the SDMP-required compliance monitoring that discharges to public UICs meet permit MADLs and are protective of groundwater quality (see Section 4).
- Initiate planning and selection of year 7 compliance, year 6 carryover, if any, and supplement panel stormwater monitoring locations.
- Notify DEQ of year 7 stormwater monitoring locations by September 1, 2011.

## 3.2 BMP Monitoring

### 3.2.1 Key Accomplishments for FY09-10

- Completed demonstration projects to evaluate technologies to increase the separation distance between shallow groundwater and the bottom of the UIC.

### 3.2.2 Projected Main Activities for FY10-11

- Continue BMP evaluation to ensure BMPs are effective.

# 4 Evaluation and Response

The Evaluation and Response program element uses data and information from System Management (e.g., UIC location, depth to groundwater) and System Monitoring (e.g., results of stormwater discharge monitoring) activities to assess UIC compliance status. It also defines the process and criteria used to identify, evaluate, and prioritize actions necessary to protect groundwater and meet permit requirements.

## 4.1 Decision-Making Framework for Groundwater Protectiveness Demonstrations

During FY 07-08, a Groundwater Protectiveness Demonstration (GWPD) tool was developed by the City and approved by DEQ. This tool is a solute transport spreadsheet model that evaluates the reduction of stormwater pollutant concentrations entering the UIC by unsaturated soil before the infiltrated stormwater reaches groundwater. The tool is used to evaluate the fate and transport of pollutants in different geologic units by modifying the appropriate physical and chemical input parameters to characterize the properties of the geologic materials and pollutants.

In June 2008, the City submitted the *Decision Making Framework for Groundwater Protectiveness Demonstrations,* to DEQ, which includes the protocols for applying the GWPD tool to UICs that fall within four specific categories identified during permit negotiations and permit implementation:

- UICs with inadequate separation distance
- UICs located within permit-specified setbacks from domestic or public water wells
- UICs with stormwater concentrations exceeding permit-specified MADLs at end-of-pipe where stormwater enters the UIC
- UICs that have ubiquitous stormwater pollutants (e.g., PCP in stormwater)[7]

The decision-making framework includes a groundwater fate and transport analysis, which demonstrates that identified domestic and public water wells located within permit UIC setbacks (i.e., Category 2 and Category 3 UICs, both non-compliant because of inadequate vertical separation distances) are protected pending the completion of corrective actions. DEQ approved the *Decision Making Framework for Groundwater Protectiveness Demonstrations* on October 20, 2008.

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[7] Ubiquitous pollutants are defined as "pollutants frequently detected in stormwater as a result of their widespread, non-point source origin, such as PCP associated with treated wood utility poles found throughout the urban environment" (*Ubiquitous Pollutants Groundwater Protectiveness Demonstration,* submitted to DEQ July 17, 2008). They have also been defined as "a pollutant detected in the City's Year 1 and Year 2 Stormwater Discharge Monitoring Program at a detection frequency of > 75% and with a concentration of ≥50% of the MADL (*Decision Making Framework for Groundwater Protectiveness Demonstrations,* submitted to DEQ July 19, 2008).

The City applied the decision-making framework to evaluate the four categories identified above. As a result, the City received "no further action" (NFA) determinations for UICs identified within those categories. Specific details about the framework development and applications for NFAs can be found in *UICMP Annual Report No. 3* (November 2008) and in the reports listed in Table 1-2.

As part of this UICMP annual report, UICs that received an NFA designation in each of the four categories were reviewed to verify that the previous NFA decisions are still protective of groundwater and ensure that additional analyses do not need to be performed. The following key assumptions of the GWPD were used as the basis of the review:

- **Vertical separation distance:** Separation distances are calculated using the most current total UIC depth and USGS-generated depth to groundwater estimates for the Portland area. If the depth-to-groundwater estimates are revised or modified, separation distances must be recalculated, and the minimum 5-foot separation distance must be verified.
- **Results of the stormwater discharge monitoring program**: Results must be reviewed to ensure that:
    - Pollutants detected are similar in concentration and frequency of detection to those identified in Year 1 – Year 4 monitoring.
    - New pollutants of interest are not identified.
    - Significant increases in pollutant concentrations or pollutant concentration trends are not identified.

Sections 4.2 to 4.4 provide the results of this review.

## 4.2 Further Evaluation of UIC Separation Distance

The WPCF permit requires that UICs more than 5 feet deep must have a minimum separation distance of 10 feet between the bottom of the UIC and seasonal high groundwater. UICs less than 5 feet deep must have a minimum separation distance of 5 feet. See section 5.1 of this report for a current summary of UICs with inadequate vertical separation distance.

### 4.2.1 Decision Verification

During FY09-10, the City did not identify any new Category 3 UICs. Of the current list of Category 3 UICs identified in *UICMP Annual Report No.4*, ADT475 and BGS001 have been found to meet the requirements of the City's permit and will be removed from the list. The details of the removal of these UICs, as well as the overall scope and schedule for the remaining Category 3 UICs, are discussed in further detail in section 5 of this report.

For the 141 UICs that were previously identified as having a vertical separation distance between $\geq$ 5 feet and < 10 and previously received an NFA confirmation (Appendix B, Table B-1), the

decision verification process was applied (as required annually, per the permit) through the following steps:

- **Verification of vertical separation distance:** Updated USGS depth to groundwater data were used in combination with existing construction information to calculate vertical separation distance between the bottom of the UIC and seasonal high groundwater. All locations previously identified as having > 5 feet and < 10 feet vertical separation distance were confirmed and are reported in section 5 of this report. All vertical separation distances are reported and updated as part of the UIC database quarterly updates.

- **Verification of stormwater discharge monitoring results:** In general, pollutants detected in year 5 monitoring are similar to detections, frequency, and concentration ranges in years 1 - 4. Common pollutants detected in year 1 - year 5 data are generally at low concentrations and below their respective MADLs. Concentration ranges for pentachlorophenol, DEHP, and lead are similar for years 1, 2, 3, 4, and 5. Concentrations are generally at low concentrations and within narrow ranges at individual UIC locations. Concentrations for the ≥1,000 trips per day (TPD) traffic category appear to be slightly higher than the <1,000 TPD traffic category in years 1 - 5. There are no new pollutants of interest, no significant increases in pollutant concentrations, and no increases in pollutant concentration trends. For details, refer to *Annual Discharge Monitoring Report – Year 5 (October 2009 – May 2010).*

### 4.2.2 Key Accomplishments for FY09-10

- Continued evaluation and selection of corrective action alternatives for UICs determined to be non-compliant with the permit (see Section 5).

- Identified and evaluated additional UICs with potential inadequate separation as new data became available. Performed compliance determinations on UICs identified to have potentially inadequate separation distance. Reported and prioritized newly identified Category 3 UICs to DEQ in accordance with the permit requirements (see Section 5).

### 4.2.3 Projected Main Activities for FY10-11

- Continue identification and evaluation of UICs as new data become available.

- Perform compliance determinations on any new UICs identified with potentially inadequate separation distance. Report and prioritize any newly identified Category 3 UICs to DEQ in accordance with the permit, as appropriate.

- Apply the protocols in the *Decision Making Framework for Groundwater Protectiveness Demonstrations* to any new UICs identified with vertical separation distances >5 feet to determine if groundwater is protected or corrective action is required.

## 4.3 Further Evaluation of Stormwater Pollutants Exceeding MADLs

The WPCF permit requires the City to notify and report stormwater discharges that exceed the MADLs defined in Table 1 of the permit. Notification and reporting requirements of individual stormwater event and annual mean MADL exceedances are described in the *Quality Assurance Project Plan* (QAPP; City of Portland, 2006). In addition, annual monitoring reports must include (per Permit Schedule B, Section 7) identification and discussion of any exceedance of an individual storm event MADL or annual mean MADL concentration, including:

(1) Any potential cause of the exceedance, to the extent practicable and if known; and

(2) Actions taken during the wet season to reduce the concentration of the pollutant of concern.

Actions taken to assess the potential cause of the exceedance were evaluated in general accordance with *UICER Guideline No. 2: MADL Exceedances* and are described below. Actions taken during the wet season to reduce concentrations are described as response actions in Section 4.5.

### 4.3.1 Decision Verification

Seven UICs were previously identified as Category 4 UICs and received NFAs based on groundwater protectiveness demonstrations. The decision verification process was applied through the following steps:

- **Verification of vertical separation distance:** Updated USGS depth to groundwater data (as described in Section 4.2) were used in combination with existing construction information to calculate vertical separation distance between the bottom of the UIC and seasonal high groundwater for the seven Category 4 UICs with NFA designations. Based on the updated USGS depth to groundwater information, all seven locations still have >10 feet vertical separation distance and meet the conditions of the groundwater protectiveness demonstration.

- **Verification of stormwater discharge monitoring results:** In general, pollutants detected in year 5 monitoring are similar to detections, frequency, and concentration ranges in years 1 - 4. Common pollutants detected in year 1 - 5 data are generally at low concentrations and below their respective MADLs. Concentration ranges for pentachlorophenol, DEHP, and lead are similar for years 1, 2, 3, 4, and 5. Concentrations are generally at low concentrations and within narrow ranges at individual UIC locations. Concentrations for the ≥1,000 TPD traffic category appear to be slightly higher than the <1,000 TPD traffic category in years 1 - 5. There are no new pollutants of interest, no significant increases in pollutant concentrations, and no increases in pollutant concentration trends. For details, refer to *Annual Discharge Monitoring Report – Year 5 (October 2009 – May 2010)*. Based on this information, the seven Category 4 UICs meet the conditions of the groundwater protectiveness demonstration.

### 4.3.2 Key Accomplishments for FY09-10

- Reported MADL exceedances to DEQ within 7 days following receipt of validated analytical data for five storm events. Forty-nine sample concentrations from 17 UIC locations exceeded the MADL of 1.0 µg/L for PCP. One individual sample concentration from one UIC location exceeded the MADL of 10 µg/L for arsenic. Eight individual sample concentrations from seven UIC locations exceeded the MADL of 6.0 µg/L for DEHP. Two individual sample concentrations from one UIC location exceeded the MADL of 0.2 µg/L for benzo(a)pyrene.

- Two new Category 4 UICs were identified in FY09-10. Six locations were identified to be carried over for a second year of sampling before a Category 4 determination can be made. Details are provided in the July 2010 *Annual Stormwater Discharge Monitoring Report – Year 5*.

### 4.3.3 Projected Main Activities for FY10-11

- Implement year 6 stormwater compliance monitoring, and report MADL exceedances in accordance with the permit and QAPP.

## 4.4 Further Evaluation of UICs near Domestic Wells

The WPCF permit requires that stormwater discharges meet the MADLs defined in Table 1 of the permit for UICs that are located:

- Less than 500 feet from a domestic well;
- Within a 2-year time of travel of a public water well; or
- Less than 500 feet from a public water well without a delineated time of travel.

Stormwater quality discharge limits established in the WPCF permit are designed to protect groundwater as a drinking water resource in accordance with OAR 340-040.

### 4.4.1 Decision Verification

Previously, 398 UICs were identified within the permit-specified setbacks from confirmed and unconfirmed drinking water wells. These locations have received NFAs based on groundwater protectiveness demonstrations. The decision verification process was applied through the following steps:

- **Verification of vertical separation distance:** USGS depth-to-groundwater data were used in combination with existing construction information to calculate vertical separation distance between the bottom of the UIC and seasonal high groundwater. Based on that information, 20 locations were identified with < 5 feet vertical separation distance and have been identified for corrective actions, as described in section 5. The

remaining 378 locations were determined to have > 5 feet vertical separation distance and still meet the conditions of the groundwater protectiveness demonstration.

- **Verification of stormwater discharge monitoring results:** In general, pollutants detected in year 5 monitoring are similar to detections, frequency, and concentration ranges in years 1 - 4. Common pollutants detected years 1 - 5 data are generally at low concentrations and below their respective MADLs. Concentration ranges for pentachlorophenol, DEHP, and lead are similar for years 1, 2, 3, 4, and 5. Concentrations are generally at low concentrations and within narrow ranges at individual UIC locations. Concentrations for the ≥1,000 TPD traffic category appear to be slightly higher than the <1,000 TPD traffic category in years 1 - 5. There are no new pollutants of interest, no significant increases in pollutant concentrations, and no increases in pollutant concentration trends. For details refer to *Annual Discharge Monitoring Report – Year 5 (October 2009 – May 2010)*. Based on this information, the UICs meet the conditions of the groundwater protectiveness demonstration.

### 4.4.2 Key Accomplishments for FY09-10

- Implemented corrective action engineering pre-design and design activities on Category 2 and Category 3 UICs identified as having inadequate separation distance and located near domestic wells.

### 4.4.3 Projected Main Activities for FY10-11

- Collect year 6 stormwater quality data. Compliance stormwater monitoring data will be used to evaluate the quality of stormwater entering UICs and confirm that groundwater is protected. Projected timeline: October 2010 – May 2011.

- Evaluate stormwater quality data. Continue evaluation of the results of the annual compliance monitoring program (described in the SDMP). Projected timeline: October 2010 – November 1, 2011.
  - Identify pollutants, if any, that exceed permit limits (e.g., PCP) during individual sampling events or annual geometric mean concentration (see Section 4.3).
  - Verify the results of the *UICs within Permit-Specified Well Setbacks - Groundwater Protectiveness Demonstration – No Further Action Request.* This document was prepared by the City of Portland Bureau of Environmental Services and submitted to DEQ for approval in July 2008. DEQ's approval was obtained on October 6, 2008.

- Continue corrective action engineering pre-design and design activities on Category 2 and Category 3 UICs identified as having inadequate separation distance and located near domestic wells. The City is actively evaluating corrective action alternatives for these UICs to provide adequate separation distance, meet permit requirements, and protect groundwater in accordance with OAR 340-040, which protects all groundwater as a drinking water resource. A detailed description of the City's efforts to address Category 2 and Category 3 UICs is provided in Section 5 of this report.

## 4.5 Response Actions

Response actions are intended to reduce elevated stormwater discharge concentrations at the surface in order to meet permit discharge limits. Meeting permit limits (i.e., MADLs) at the "end of pipe" demonstrates compliance with state and federal requirements for the protection of "underground sources of drinking water" and "waters of the state." Response actions are intended to be implemented in a timely manner and are considered interim in nature, until a final compliance determination is made or a final corrective action is implemented.

Implementation of *UIC Evaluation and Response Guidelines* (UICER) Nos. 1 through 8 (see UICMP - Appendix H) is considered to be applicable and appropriate response actions. UICER guidelines implemented since July 2009 are described in this section.

### 4.5.1 Key Accomplishments for FY09-10

- Implemented *UIC Evaluation and Response Guidelines* (UICER) No 2 in response to year 5 individual and annual mean MADL exceedances (see Section 3). During year 5 stormwater discharge monitoring, four common pollutants were detected during individual sampling events at concentrations above their respective MADLs: PCP, B(a)P, DEHP, and arsenic.

### 4.5.2 Projected Main Activities for FY10-11

- Implement actions, as needed and appropriate, in response to any year 6 individual stormwater discharge monitoring MADL exceedances, unusual conditions observed during UIC sampling, inspections, or citizen complaints.

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# 5 Corrective Actions

The Corrective Actions program element addresses UICs that are determined to be non-compliant with WPCF permit requirements through the Evaluation and Response process. This program includes the processes used to evaluate, rank, select, and implement appropriate corrective actions. A variety of corrective actions are available, including options that do not involve construction (such as institutional controls or an assessment to demonstrate protectiveness), structural/ engineering controls, and UIC closure.

## 5.1 Summary of UICs with Inadequate Separation Distance

*UICMP Annual Report No 3* identified 308 Category 3 UICs. That group included 186 Category 3 UICs with < 5 feet vertical separation distance that would require corrective action; 119 Category 3 UICs that received NFA designations through the use of a groundwater protectiveness demonstration (GWPD); and 3 locations determined to be compliant based on updated construction information. For a summary of UICs with inadequate separation distance prior to FY 09-10, refer to *UICMP Annual Report No 4*.

In early 2009, the USGS modified the depth to groundwater information for the City of Portland. As a result of that modification, the City identified changes to the list of Category 3 UICs reported in *UICMP Annual Report No.4*. Updated information was reported to DEQ through written correspondence titled *Changes to USGS Depth to Groundwater Data Modifications to Category 3 UIC List* (April 1, 2009). As a result of those changes, the prioritized Category 3 list of UICs with < 5 feet vertical separation distance was updated to 190 UICs.

Since *UICMP Annual Report No. 4,* two of the 190 UICs have been removed from the Category 3 list. Twenty-two UICs located in City of Portland parks have also received an NFA designation (October 21, 2009) through application of the GWPD. This leaves 166 Category 3 UICs that still require corrective action. The updated and prioritized list of Category 3 UICs is provided in Appendix B, Table B-2.

## 5.2 Category 2 UICs

The permit defines Category 2 UICs as those identified as non-compliant during the *Systemwide Assessment*. Twenty-nine (29) Category 2 UICs were identified and prioritized in *UICMP Annual Report No. 1* (December 2006). On February 25, 2010, the City received a one-year extension to the corrective action timeline. Under the new timeline, all Category 2 UIC corrective actions must be completed by November 1, 2011. As part of the permit modification to extend the completion timeline for Category 3 UICs, one of these Category 2 UICs (ADU751) was included with the Category 3 UICs and is to be completed by May 31, 2015.

### 5.2.1 Key Accomplishments for FY09-10

- Completed design evaluation of potential corrective alternatives for Category 2 UICs.
- Completed engineering design and initiated a request for proposals for construction activities for Category 2 UIC corrective actions. Corrective actions are estimated to start construction around November 2010.
- Received a one-year extension from DEQ (February 25, 2010) for completion of the Category 2 UICs. The new completion date is November 1, 2011.

Appendix B, Table B-3 lists prioritized Category 2 UICs, the corrective status, and identification of the anticipated corrective action response.

### 5.2.2 Projected Main Activities for FY10-11

- Complete corrective actions for the identified Category 2 UICs to meet the permit-required corrective action completion date of November 1, 2011.
- Meet with DEQ on a periodic basis to provide an overview of work completed to date, schedule, issues, etc.

## 5.3 Category 3 UICs

The permit defines Category 3 UICs as those identified as non-compliant following completion of the *Systemwide Assessment*. The permit requires Category 3 corrective actions to be completed within three full CIP cycles following the annual report date for the reporting period in which the non-compliant public UICs are reported as discovered, or in accordance with a DEQ-approved regional corrective action. An updated Category 3 UIC list is provided in Appendix B (Table B-2). Specific changes to the Category 3 list are described in the following section.

### 5.3.1 Key Accomplishments for FY09-10

- Completed (July 2010) pre-design activities for Category 3 UICs, in accordance with the scope of the *Systemwide Assessment Follow-Up Actions* work plan.
- Received a permit modification (February 25, 2010) to extend the completion deadline for Category 3 corrective actions to May 31, 2015.
- Received a “no further action” designation from DEQ (October 21, 2009) for 22 UICs with < 5 feet vertical separation distance located in City of Portland parks. This designation is based on a groundwater protectiveness demonstration as the selected corrective action.

- Met with DEQ on a periodic basis to provide an overview of work completed to date and discuss next steps.

### 5.3.2 Eliminated Category 3 UICs

Two category 3 UICs were removed from the corrective action list for the following reasons:

- Based on a field investigation, BGS001 was determined to be not a UIC, but rather a stormwater collection manhole with a discharge outlet to a City-owned outfall.

- The depth of ADT457, originally estimated to be 30 feet, was confirmed to be 22 feet below ground surface, providing a separation distance greater than the permit-required 10 feet.

These UICs are compliant with the permit and have been removed from the Category 3 list. Appendix B (Table B-4) lists these two UICs.

### 5.3.3 New Category 3 UICs

No new Category 3 UICs were identified during FY 09-10

### 5.3.4 Projected Main Activities for FY10-11

- Initiate design and implementation of corrective actions for the remaining 166 Category 3 UICs with separation distance < 5 feet (see Appendix B, Table B-2). Projected timeline: Complete by May 31, 2015.

- Shallow the initial group of 25 Category 3 UICs to receive corrective actions. Projected timeline: Design is complete, with construction to be completed in fall 2010.

- Meet with DEQ on a periodic basis to provide an overview of work completed to date and discuss next steps. Projected timeline: September 2010 – July 2011.

## 5.4 Category 4 UICs

The permit defines Category 4 UICs as those that become non-compliant by failing to meet the annual geometric mean MADL within one wet season after the exceedance or failing to satisfy any groundwater protection conditions of permit Schedule A.

### 5.4.1 Key Accomplishments for FY09-10

- Based on the results of the year 5 stormwater monitoring data, identified two new Category 4 UICs in year 5 (see Sections 3.1.2 and 4.3.2).

### 5.4.2 Summary of Category 4 UICs

**Previously Identified Category 4 UICs (in Years 2 through 4)**

UICs in which the annual mean concentration exceeds the MADL for two consecutive years are identified as Category 4 UICs. Tables 5-1 and 5-2 list Category 4 UICs that were identified in years 2 and 3. No Category 4 UICs were identified in year 4. Category 4 UICs are reported in the annual *Stormwater Discharge Monitoring Report*.

**Table 5-1**
**Category 4 UICs Identified in Year 2**

| Location Code | Approximate Address | BES UIC No. | Traffic Category (TPD) | Estimated Separation Distance Between UIC and Groundwater (ft) | Year 1 Annual Geometric PCP Conc. (µg/L) | Year 2 Annual Geometric PCP Conc. (µg/L) |
|---|---|---|---|---|---|---|
| P1_1 | 6940 N. Macrum Ave. | AAG769 | < 1000 | 73 | 1.1 | 1.2 |
| P6_1 | 3500 SE 112th Ave. | ADW577 | ≥ 1000 | 64 | 1.2 | 1.0 |
| P6_7 | 608 NE 87th Ave. | ADV645 | < 1000 | 148 | 2.0 | 1.8 |
| P6_14 | 4289 NE Prescott St. | AD1252 | ≥ 1000 | 64 | 1.5 | 1.4 |

**Table 5-2**
**Category 4 UICs Identified in Year 3**

| Location Code | Approximate Address | BES UIC No. | Traffic Category (Trips per Day) | Separation Distance [a] (ft) | Year 2 Annual Geometric Mean Pentachlorophenol Concentration (µg/L) | Year 3 Annual Geometric Mean Pentachlorophenol Concentration (µg/L) |
|---|---|---|---|---|---|---|
| P2_5 | 10150 SE Ankeny St. | ADR885 | ≥ 1,000 | 158 | 3.2 | 1.7 |
| P2_13 | 4107 SE Reedway St. | ADU790 | ≥ 1,000 | 58 | 1.9 | 1.1 |
| P2_14 | 8409 N. Woolsey Ave. | AAH289 | ≥ 1,000 | 55 | 2.5 | 1.3 |

a The estimated separation distance is defined as the approximate depth in feet from the bottom-most perforation in the UIC to the approximate seasonal-high groundwater level. The bottom-most perforation is defined as the bottom of the UIC minus 2 feet. Two feet were added to all separation distance calculations to account for the standard depth of the sediment trap ring on standard City UIC design.

Corrective actions for the Category 4 UICs listed above were identified, evaluated, and selected in accordance with the *Corrective Action Plan* (CAP) (2006). The corrective action for these Category 4 UICs was a groundwater protectiveness demonstration (i.e., risk assessment), performed in accordance with *UICER Guideline No. 6: Groundwater Protectiveness*

*Demonstration*. The groundwater protectiveness demonstrations were developed with DEQ input, and the final documents were reviewed and approved by DEQ (see Section 4.1).

DEQ issued an NFA determination for the four Category 4 UICs identified in year 2 on May 30, 2008. A copy of that letter is included in the *Decision Making Framework for Groundwater Protectiveness Demonstrations.*

The groundwater protectiveness demonstration for the three Category 4 UICs identified in year 3 was performed in accordance with the *Decision Making Framework for Groundwater Protectiveness Demonstrations* and submitted to DEQ on February 11, 2009.

**Category 4 UICs Identified in Year 5**

Following completion of the year 5 monitoring, two new Category 4 UICs were identified in year 5 (see Sections 3.1.2 and 4.3.2), as shown in Table 5.3. Corrective actions will be evaluated, selected, and implemented within three CIP cycles.

**Table 5-3**
**Category 4 UICs Identified in Year 5**

| Location Code | Approximate Address | BES UIC No. | Traffic Category (Trips per Day) | Separation Distance [a] (ft) | Year 4 Annual Geometric Mean Pentachlorophenol Concentration (µg/L) | Year 5 Annual Geometric Mean Pentachlorophenol Concentration (µg/L) |
|---|---|---|---|---|---|---|
| SP3_6 | 490 NE 133rd Ave. | ADS048 | ≥ 1,000 | 96 | 1.3 | 1.8 |
| SP3_8 | 12198 SE Holgate Blvd. | ADW251 | ≥ 1,000 | 8 | 1.4 | 3.88 |

### 5.4.3 Projected Main Activities for FY10-11

- Sample six UICs with annual MADL exceedances again in year 6: five that exceeded the annual geometric mean for PCP and one for benzo(a)pyrene (see Section 3.1.2).
- Evaluate whether any year 6 UICs will be identified as Category 4 UICs.

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# Appendix A
# Public UICs Identified, Constructed, or Removed
# FY09-10

# Appendix A: Public UICs Identified, Constructed, or Removed FY09-10

| Date UIC Reported | BES Unit ID | UIC DEQ ID | EPA UIC Classification | Current Status [1] | UIC Location | Traffic Volume | Pre-treatment Type | Action Type |
|---|---|---|---|---|---|---|---|---|
| 9/1/2009 | APD477 | 10102-9526 | Class V Injection Well | AC | 2222 SW SPRING GARDEN ST | > 1000 | Sediment manhole | Add |
| 9/1/2009 | R00152 | 10102-9525 | Class V Injection Well | UC | SE 46th Ave & SE Flavel Dr | < 1000 | Bioswale | Add |
| 9/1/2009 | R00155 | 10102-9528 | Class V Injection Well | UC | SE Pardee St. and SE 122nd Ave (SW Corner) | < 1000 | Bioswale | Add |
| 12/1/2009 | ACR905 | 10102-9538 | Class V Injection Well | AC | 6787 SW 30TH AVE | > 1000 | No Sed MH | Add |
| 12/1/2009 | ANA969 | 10102-323 | Class V Injection Well | AC | 14302 NE SAN RAFAEL ST | > 1000 | No Sed MH | Add |
| 12/1/2009 | APF903 | 10102-9538 | Class V Injection Well | AC | 11700 SE STARK ST | > 1000 | No Sed MH | Add |
| 12/1/2009 | R00156 | 10102-9529 | Class V Injection Well | UC | NE Cully Blvd & NE 62nd Ave | > 1000 | planter box | Add |
| 12/1/2009 | R00157 | 10102-9530 | Class V Injection Well | UC | NE Cully Blvd & NE 62nd Ave | < 1000 | planter box | Add |
| 12/1/2009 | R00158 | 10102-9531 | Class V Injection Well | UC | NE Cully Blvd & NE 62nd Ave | > 1000 | planter box | Add |
| 12/1/2009 | R00159 | 10102-9532 | Class V Injection Well | UC | NE Cully Blvd & NE Wygant St | > 1000 | planter box | Add |
| 12/1/2009 | R00160 | 10102-9533 | Class V Injection Well | UC | NE Cully Blvd & NE Wygant | > 1000 | planter box | Add |
| 12/1/2009 | R00161 | 10102-9534 | Class V Injection Well | UC | NE Cully Blvd & NE Sumner | > 1000 | planter box | Add |
| 12/1/2009 | R00162 | 10102-9535 | Class V Injection Well | UC | SE 31st Ave & SE Francis St (North End of Street) | < 1000 | planter box | Add |
| 12/1/2009 | R00163 | 10102-9536 | Class V Injection Well | UC | SE 31st Ave & SE Francis St (North End of Street) | < 1000 | Bioswale | Add |
| 12/1/2009 | R00164 | 10102-9537 | Class V Injection Well | UC | Frontage on NE Irving St. & NE 91 Ave. | < 1000 | Bioswale | Add |
| 3/1/2010 | ACM574 | 10102-9544 | Class V Injection Well | AC | 2300 SW IOWA ST | < 1000 | No Sed MH | Add |
| 3/1/2010 | ACM575 | 10102-9545 | Class V Injection Well | AC | 2300 SW IOWA ST | < 1000 | No Sed MH | Add |
| 3/1/2010 | APG736 | 10102-9542 | Class V Injection Well | UC | 8108 SE 86TH AVE | < 1000 | Sediment manhole | Add |
| 3/1/2010 | APH093 | 10102-9543 | Class V Injection Well | AC | 14509 NE FREMONT ST | < 1000 | Sediment manhole | Add |
| 3/1/2010 | R00167 | 10102-9540 | Class V Injection Well | UC | SE Ogden St & SE 66th Ave - 7135 SE 66th Ave | < 1000 | Bioswale | Add |
| 3/1/2010 | R00168 | 10102-9541 | Class V Injection Well | UC | SE Ogden St and SE 66th Ave | < 1000 | Bioswale | Add |

| Date UIC Reported | BES Unit ID | UIC DEQ ID | EPA UIC Classification | Current Status [1] | UIC Location | Traffic Volume | Pre-treatment Type | Action Type |
|---|---|---|---|---|---|---|---|---|
| 6/1/2010 | APK053 | 10102-9561 | Class V Injection Well | AC | 10151 NE WEIDLER ST | < 1000 | No Sed MH | Add |
| 6/1/2010 | APK787 | 10102-9562 | Class V Injection Well | AC | 11827 SE WASHINGTON ST | > 1000 | No Sed MH | Add |
| 6/1/2010 | APK788 | 10102-9563 | Class V Injection Well | AC | 10924 SE BUSH ST | > 1000 | No Sed MH | Add |
| 6/1/2010 | APK961 | 10102-9554 | Class V Injection Well | AC | 10421 N LOMBARD ST | > 1000 | No Sed MH | Add |
| 6/1/2010 | APK965 | 10102-9555 | Class V Injection Well | AC | 10421 N LOMBARD ST | > 1000 | No Sed MH | Add |
| 6/1/2010 | APK966 | 10102-9556 | Class V Injection Well | AC | 10421 N LOMBARD ST | > 1000 | No Sed MH | Add |
| 6/1/2010 | APL033 | 10102-9557 | Class V Injection Well | AC | 5000 N WILLAMETTE BLVD | < 1000 | No Sed MH | Add |
| 6/1/2010 | APL389 | 10102-9558 | Class V Injection Well | AC | 2520 NE 33RD AVE | > 1000 | No Sed MH | Add |
| 6/1/2010 | APL427 | 10102-9559 | Class V Injection Well | AC | 2520 NE 33RD AVE | > 1000 | No Sed MH | Add |
| 6/1/2010 | APL428 | 10102-9560 | Class V Injection Well | AC | 2520 NE 33RD AVE | > 1000 | No Sed MH | Add |
| 6/1/2010 | R00173 | 10102-9546 | Class V Injection Well | UC | 1437 SE 174th Ave | < 1000 | Sediment manhole | Add |
| 6/1/2010 | R00174 | 10102-9547 | Class V Injection Well | UC | SE 122nd Ave & SE Ramona St | < 1000 | No Sed MH | Add |
| 6/1/2010 | R00175 | 10102-9548 | Class V Injection Well | UC | 7137 SE 68TH AVE | < 1000 | No Sed MH | Add |
| 6/1/2010 | R00176 | 10102-9549 | Class V Injection Well | UC | 7133 SE 68th Ave | < 1000 | No Sed MH | Add |
| 6/1/2010 | R00177 | 10102-9550 | Class V Injection Well | UC | 7101 SE 68th Ave | < 1000 | No Sed MH | Add |
| 6/1/2010 | R00178 | 10102-9551 | Class V Injection Well | UC | 7029 SE 68th Ave | < 1000 | Bioswale | Add |
| 6/1/2010 | R00179 | 10102-9552 | Class V Injection Well | UC | 2330 - 2249 SE 153rd Ave Taxlot 12600 | > 1000 | Bioswale | Add |
| 6/1/2010 | R00180 | 10102-9553 | Class V Injection Well | UC | 4711 NE 101st Ave | < 1000 | Bioswale | Add |
| 6/1/2009 | ADW596 | 10102-6725 | Class V Injection Well | unkn | 11953 SE POWELL BLVD | Unavailable | ODOT - Ownership | Remove |
| 6/1/2009 | ANS261 | 10102-9374 | Class V Injection Well | unkn | 604 SE 119TH AVE | Unavailable | Never Built | Remove |
| 9/1/2009 | ADR988 | 10102-7905 | Class V Injection Well | unkn | 11410 SE STARK ST | Unavailable | DNE - Does not exist | Remove |
| 9/1/2009 | AMT782 | 10102-299 | Class V Injection Well | unkn | 3440 SE 90TH PL | Unavailable | Never Built | Remove |

| Date UIC Reported | BES Unit ID | UIC DEQ ID | EPA UIC Classification | Current Status [1] | UIC Location | Traffic Volume | Pre-treatment Type | Action Type |
|---|---|---|---|---|---|---|---|---|
| 9/1/2009 | APD477 | 10102-9526 | Class V Injection Well | AC | 2222 SW SPRING GARDEN ST | Unavailable | POT Hole - Incorrectly Mapped | Remove |
| 12/1/2009 | AAV955 | 10102-3973 | Class V Injection Well | AC | 3533 NE 147TH AVE | < 1000 | SED | Remove |
| 12/1/2009 | ABA052 | 10102-1119 | Class V Injection Well | AC | 14221 NE FREMONT ST | < 1000 | SED | Remove |
| 12/1/2009 | ABA181 | 10102-4302 | Class V Injection Well | AC | 15902 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ABA182 | 10102-4303 | Class V Injection Well | AC | 15960 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADQ605 | 10102-4329 | Class V Injection Well | AC | 14329 NE FREMONT ST | < 1000 | SED | Remove |
| 12/1/2009 | ADU512 | 10102-7506 | Class V Injection Well | unkn | 1920 SE 82ND AVE | > 1000 | ODOT - Ownership | Remove |
| 12/1/2009 | ADW033 | 10102-3916 | Class V Injection Well | AC | 10310 NE PRESCOTT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW121 | 10102-4147 | Class V Injection Well | AC | 11434 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW125 | 10102-1751 | Class V Injection Well | AC | 11710 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW126 | 10102-4153 | Class V Injection Well | AC | 11926 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW127 | 10102-4154 | Class V Injection Well | AC | 12122 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW168 | 10102-4168 | Class V Injection Well | AC | 13026 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW169 | 10102-4169 | Class V Injection Well | AC | 13124 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW193 | 10102-4382 | Class V Injection Well | AC | 13247 NE FREMONT ST | > 1000 | SED | Remove |
| 12/1/2009 | ADW194 | 10102-4383 | Class V Injection Well | AC | 13325 NE FREMONT ST | < 1000 | SED | Remove |
| 12/1/2009 | ADW204 | 10102-1690 | Class V Injection Well | AC | 14509 NE FREMONT ST | < 1000 | SED | Remove |
| 12/1/2009 | ANB192 | 10102-697 | Class V Injection Well | unkn | 12622 SE RHONE ST | < 1000 | UNKN - Private | Remove |
| 3/1/2010 | ADK207 | 10102-4483 | Class V Injection Well | AC | 300 SW 27TH AVE | < 1000 | Not Sump - Inlet vert pipe No Perf | Remove |

[1] AC = in service; UC = under construction; unkn = unknown

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# Appendix B
# Category 2 and 3 UIC Status

INSERT TABLES B-1, B-2, B-3, B-4 (11x17, single-sided)

# Appendix C
# Status of Commercial/Industrial Inspection Work

## STATUS OF COMMERCIAL/INDUSTRIAL INSPECTION WORK

### Commercial/Industrial Activities

The City of Portland's water pollution control facilities (WPCF) permit requires an inventory of all UICs that receive drainage from industrial and commercial properties with site activities that may result in a discharge of pollutants to a UIC and may cause a violation of permit conditions. As part of the *Systemwide Assessment*, the City identified 138 businesses that may be conducting site activities that could pose an impact to drainage to 147 UICs. During FY08-09, the UIC program implemented follow-up actions, as detailed in the *Systemwide Assessment Follow-up Actions* workplan. As described in the workplan, the City conducted site visits for all of the identified businesses. At the time of the FY08-09 annual report, all site visits had been completed, but the information was being reviewed for accuracy and identification of potential follow-up actions.

During FY09-10, businesses received either a follow-up letter detailing any needed follow-up actions or an additional facility visit when needed. Table C-1 identifies the facilities, site visit dates, and inspection results.

Staff developed site-specific recommendations for each site where one or more activities demonstrated a potential to introduce pollutants to a City-owned UIC. The recommendations include one or more of the five following mechanisms.

- **Site Visit Follow-up Letters**. After completion of the facility visit, the City will document the meeting with a follow-up letter to the facility representative. This letter will document the results of the meeting, identify additional information needed, and identify the City's expectations for future stormwater-related activities.

- **Education and Training**. Education and training may be provided to increase facility awareness of issues associated with UIC requirements (e.g., city, state and federal regulations) and the potential impacts to groundwater associated with stormwater discharges to the subsurface. This training could include use of fact sheets, guidance, signage, or other materials to educate employees about stormwater pollutants and UICs. Educational efforts may also include discussion of resources available from DEQ, EPA, and other agencies and organizations regarding stormwater management and BMPs. The City may provide limited training regarding potentially applicable BMPs.

- **Technical Assistance.** Technical assistance, often provided during site visits or inspections, provides information tailored to help individual facilities comply with pertinent regulations. The City will work with the facility owner or representative to identify potential pollutant sources and to minimize or eliminate the potential of pollutants entering stormwater. In addition, the City may also refer facilities to DEQ for technical assistance (e.g., DEQ's Hazardous Waste Program or Toxic Use Reduction Program).

- **BMP Implementation.** The City will help the identified facility owner or operator identify potentially applicable structural or nonstructural BMPs. BMPs will be identified using the

City of Portland *Stormwater Management Manual*, DEQ's *BMPs for UICs* (DEQ, 1998; http://www.deq.state.or.us/wq/groundwa/uicbmp.htm), or other available sources. The City will also assist or provide oversight in developing the scope and schedule for implementation of selected BMPs by the facility. In addition, the City may provide recommendations for selecting BMP performance measures.

- **Follow-up Facility Visits.** As necessary, the City may conduct a follow-up visit(s) to verify that identified site issues have been addressed. If identified issues are not addressed within the identified timeframe, the City may, as necessary and appropriate:
  - Initiate enforcement activities,
  - Install temporary BMPs (e.g., berms, catchbasin closure) or permanent structural BMPs (e.g., vegetated swales) to prevent stormwater pollutants from entering the City's UIC, or
  - Refer the facility to DEQ for further evaluation, permitting, and/or investigation under the appropriate regulatory authority (e.g., Water Quality, UIC, Environmental Cleanup, Solid Waste, Hazardous Waste, UST).

INSERT TABLE C-1

# Appendix D
# Spills That Have Occurred within Areas Serviced by UICs

## Spills That Have Occurred within Areas Serviced by UICs

| Date | Release Type | Volume | Spill Location | Did Fluids Reach UIC? (Y/N) | Closest UIC Catchbasin |
|---|---|---|---|---|---|
| 9/6/09 | Fire fluids, nail salon chemicals | minimal | 12033 SE Powell Blvd | N | ADW620 |
| 10/20/09 | Paint | minimal | 11916 NE Halsey St | Y | ADR710 |
| 12/17/09 | Oil | minimal | 14948-14998 SE Stark St | N | ADT131 |
| 2/23/10 | Oil | 5 qts | SE 42nd and Carlton | N | ADU858 |
| 2/26/10 | Oil | minimal | 4536 NE Skidmore | Y | ADQ787 |
| 3/10/10 | Fuel | minimal | 3900 SE 122nd | N | ADV214 |
| 3/11/10 | Auto Fluids | minimal | 11340 NE Halsey St | Y | ADR699 |
| 3/22/10 | Oil | minimal | SE Powell and 136th | N | AMR752 |
| 3/31/10 | Oil | minimal | N. Ainsworth west of MLK | N | unknown |
| 4/3/10 | Fuel | 15 gal | 1500 N Kilpatrick | N | ADN869 |
| 4/4/10 | Oil (non-PCB) | 15 gal | 13313 NE San Rafael | N | ADR355 |
| 4/4/10 | Auto Fluids | minimal | 646-699 SE 148th Ave | N | ADT138 |
| 4/6/10 | Sewage | minimal | NE 104th and Fremont St | N | ADQ968 |
| 5/23/10 | Auto Fluids | minimal | 9728 SE Holgate Blvd | N | ADU698 |
| 5/25/10 | Oil | minimal | 2005 N Rosa Parks Wy | Y | ADR240 |
| 5/28/10 | Fuel | 2 gal | NE Wygant and NE 97th | Y | ADQ401 |
| 6/18/10 | Cement | minimal | 134 SE 84th Ave | N | AM9833 |
| 6/25/10 | Paint or Drywall Mud | minimal | 10552 NE Glisan St | N | ADR922 |